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# Report of the APA Task Force on Mental Health and Abortion

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Date of this Report: 8/12/2008

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

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**REPORT OF THE APA TASK FORCE  
ON MENTAL HEALTH AND ABORTION**

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## REPORT OF THE APA TASK FORCE ON MENTAL HEALTH AND ABORTION

### Executive Summary

5-07-08

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

139  
140       The TFMHA evaluated all empirical studies published in English in peer-  
141 reviewed journals post-1989 that compared the mental health of women who had  
142 an induced abortion to the mental health of comparison groups of women ( $N=50$ )  
143 or that examined factors that predict mental health among women who have had  
144 an elective abortion in the United States ( $N=23$ ). This literature was reviewed and  
145 evaluated with respect to its ability to address four primary questions: (1) Does  
146 abortion *cause* harm to women’s mental health? (2) How prevalent are mental  
147 health problems among women in the United States who have had an abortion?  
148 (3) What is the relative risk of mental health problems associated with abortion  
149 compared to its alternatives (other courses of action that might be taken by a  
150 pregnant woman in similar circumstances)? And, (4) What predicts individual  
151 variation in women’s psychological experiences following abortion?

152  
153       A critical evaluation of the published literature revealed that the majority of  
154 studies suffered from methodological problems, often severe in nature. Given the  
155 state of the literature, a simple calculation of effect sizes or count of the number  
156 of studies that showed an effect in one direction versus another was considered  
157 inappropriate. The quality of the evidence that produced those effects must be  
158 considered to avoid misleading conclusions. Accordingly, the TFMHA  
159 emphasized the studies it judged to be most methodologically rigorous to arrive  
160 at its conclusions.

161  
162       The best scientific evidence published indicates that among adult women  
163 who have an *unplanned pregnancy* the relative risk of mental health problems is

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

170  
171 The few published studies that examined women's responses following an  
172 induced abortion due to fetal abnormality suggest that terminating a wanted  
173 pregnancy late in pregnancy due to fetal abnormality appears to be associated  
174 with negative psychological reactions equivalent to those experienced by women  
175 who miscarry a wanted pregnancy or who experience a stillbirth or death of a  
176 newborn, but less than those who deliver a child with life-threatening  
177 abnormalities.

178  
179 The differing patterns of psychological experiences observed among  
180 women who terminate an unplanned pregnancy versus those who terminate a  
181 planned and wanted pregnancy highlight the importance of taking pregnancy  
182 intendedness and wantedness into account when seeking to understand  
183 psychological reactions to abortion.

184  
185 None of the literature reviewed adequately addressed the prevalence of  
186 mental health problems among women in the United States who have had an  
187 abortion. In general, however, the prevalence of mental health problems  
188 observed among women in the United States who had a single, legal, first-  
189 trimester abortion for nontherapeutic reasons was consistent with normative  
190 rates of comparable mental health problems in the general population of women  
191 in the United States.

192  
193 Nonetheless, it is clear that some women do experience sadness, grief,  
194 and feelings of loss following termination of a pregnancy, and some experience  
195 clinically significant disorders, including depression and anxiety. However, the  
196 TFMHA reviewed no evidence sufficient to support the claim that an observed  
197 association between abortion history and mental health was caused by the  
198 abortion *per se*, as opposed to other factors.

199  
200 This review identified several factors that are predictive of more negative  
201 psychological responses following first-trimester abortion among women in the  
202 United States. Those factors included perceptions of stigma, need for secrecy,  
203 and low or anticipated social support for the abortion decision; a prior history of  
204 mental health problems; personality factors such as low self-esteem and use of  
205 avoidance and denial coping strategies; and characteristics of the particular  
206 pregnancy, including the extent to which the woman wanted and felt committed  
207 to it. Across studies, prior mental health emerged as the strongest predictor of  
208 postabortion mental health. Many of these same factors also predict negative  
209 psychological reactions to other types of stressful life events, including childbirth,

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

212

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

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223 **REPORT OF THE APA TASK FORCE**  
224 **ON MENTAL HEALTH AND ABORTION**

225  
226 **4/25/2008**

227 **I. Introduction**

228 Although the U.S. Supreme Court legalized abortion in the United States  
229 more than 35 years ago (*Roe v. Wade*, 1973), it continues to generate enormous  
230 emotional, moral, and legal controversy. Over the last two decades, one aspect  
231 of this controversy has focused on the effects of abortion on women's mental  
232 health (Bazelon, 2007; Cohen, 2006; Lee, 2003). Public debate on this issue can  
233 be traced to 1987, when then-President Ronald Reagan directed then-Surgeon  
234 General C. Everett Koop to prepare a Surgeon General's report on the public  
235 health effects (both psychological and physical) of abortion. After conducting a  
236 comprehensive review of the scientific literature, Dr. Koop declined to issue a  
237 report; instead, he sent a letter to President Reagan on January 9, 1989, in which  
238 he concluded that the available research was inadequate to support any scientific  
239 findings about the psychological consequences caused by abortion (Koop,  
240 1989a). In subsequent testimony before Congress, Dr. Koop stated that his letter  
241 did not focus on the physical health risks of abortion because "obstetricians and  
242 gynecologists had long since concluded that the physical sequelae of abortion  
243 were no different than those found in women who carried to term or who had  
244 never been pregnant" (Koop, 1989, p. 195). Dr. Koop also testified that although  
245 psychological responses following abortion can be "overwhelming to a given  
246 individual," the psychological risks following abortion were "miniscule" from a  
247 public health perspective (Koop, 1989b, p. 241).

248 Dr. Koop's letter and an unofficial draft of his report read into the  
249 *Congressional Record* were cited by both abortion opponents and proponents to  
250 claim both the presence and absence of scientific evidence showing a  
251 detrimental effect of abortion on women's mental health (see Wilmoth, deAlteriis,  
252 & Bussell, 1992). Recognizing the importance of this issue, the American  
253 Psychological Association (APA) convened a panel of scientific experts in  
254 February 1989 to conduct a review of the scientific literature on psychological  
255 responses to abortion. The panel focused on studies with the most rigorous  
256 research designs, reporting findings on the psychological status of women who  
257 had legal, elective, first-trimester abortions in the United States. Based on their  
258 review of this literature, the task force concluded that the most methodologically  
259 sound studies indicated that "severe negative reactions after legal, nonrestrictive,  
260 first-trimester abortion are rare and can best be understood in the framework of  
261 coping with a normal life stress" (Adler, David, Major, Roth, Russo, & Wyatt,  
262 1990, pp. 43; see also Adler, David, Major, Roth, Russo, & Wyatt, 1992). The  
263 task force recognized that some individual women experience severe distress or  
264 psychopathology following abortion. However, the task force also noted that it  
265 was not clear that these symptoms are causally linked to the abortion. The



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

269

270 Since publication of Koop's letter and unofficial draft report (1989a, 1989b)  
271 and the 1989 Task Force Report (see Adler et al., 1990), a number of new  
272 studies have been published in peer-reviewed journals that address the  
273 association between abortion and women's mental health. Some of these studies  
274 support the conclusions of the 1989 Task Force Report (e.g., Cohan, Dunkel-  
275 Schetter, & Lydon, 1993; Gilchrist, Hannaford, Frank, & Kay, 1995; Russo &  
276 Dabul, 1997; Russo & Zierk, 1992), whereas others challenge them (e.g.,  
277 Cogle, Reardon, & Coleman, 2003; Fergusson, Horwood, & Ridder, 2006;  
278 Gissler, Kauppila, Merilainen, Toukoma, & Hemminki, 1997; Reardon & Cogle,  
279 2002a). Reviewers of this emerging literature have reached  
280 differing conclusions. Based on their review of the post-1990 literature, for  
281 example, Bradshaw and Slade (2003) concluded that "The conclusions drawn  
282 from the recent longitudinal studies looking at long-term outcomes following  
283 abortion, as compared to childbirth, mirror those of earlier reviews (e.g., Adler et  
284 al., 1992; Wilmoth et al., 1992), with women who have abortions doing no worse  
285 psychologically than women who give birth to wanted or unwanted children" (p.  
286 948). In contrast, in testimony introduced in support of a law that would have  
287 banned all abortions in South Dakota except for those in which the mother's life  
288 was in danger, Coleman (2006b) concluded that the scientific evidence shows  
289 that "abortion poses significant risk to women's mental health and carries a  
290 greater risk of emotional harm than childbirth."

291

292 Recognizing the need for a critical review of the recent literature, in 2006  
293 the Council of Representatives of APA established a new Task Force on Mental  
294 Health and Abortion (TFMHA) composed of scientific experts in the areas of  
295 stigma, stress and coping, interpersonal violence, methodology, women's health,  
296 and reproductive health. The APA Council charged the TFMHA with "collecting,  
297 examining, and summarizing the scientific research addressing the mental health  
298 factors associated with abortion, including the psychological responses following  
299 abortion, and producing a report based upon a review of the most current  
300 research." This report summarizes the findings of the 2006 TFMHA. This report  
301 updates rather than duplicates efforts of the 1989 Task Force. We refer the  
302 reader to Adler et al. (1992) for a discussion of APA's involvement in abortion-  
303 related issues, the history and status of abortion in the United States, and a  
304 methodological critique of the literature on abortion prior to 1990 (see also the fall  
305 1992 issue of the *Journal of Social Issues*).

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

311 and interpreted scientific evidence. The TFMHA considered its mission not only  
312 to review, but also to critically and objectively evaluate the quality of the scientific  
313 evidence without regard to the direction of its findings in order to draw  
314 conclusions about the mental health implications of abortion based on the best  
315 scientific evidence available. This TFMHA report represents the most thorough,  
316 current, and critical evaluation of the literature published since 1989 (see  
317 Bradshaw & Slade, 2003; Coleman, Reardon, Strahan, & Cogle, 2005; Dagg;  
318 1991; Posavac & Miller, 1990; Stotland, 1997; Thorp, Hartmann, & Shadigian,  
319 2003, for prior published reviews of this literature).

## 320 **I. A. Overview**

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

## 336 **I. B. Definitions and Scope of Report**

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

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

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

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

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

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

### 409 410 **I. C. Questions Addressed**

411  
412 When considering the empirical literature on the association between  
413 abortion and mental health, it is useful to keep in mind four primary questions  
414 that this literature addressed: (1) Does abortion *cause* harm to women's mental  
415 health? (2) How prevalent are mental health problems among women in the  
416 United States who have had an abortion? (3) What is the relative risk of mental  
417 health problems associated with abortion compared to its alternatives (other  
418 courses of action that might be taken by a pregnant woman in similar  
419 circumstances)? And, (4) What predicts individual variation in women's  
420 psychological experiences following abortion? As we discuss below, each of  
421 these different questions requires a different research approach. Some of these  
422 questions are scientifically testable; others are not.

423  
424 **1. Does abortion *cause* harm to women's mental health?** Although this  
425 is the question that is posed most often in public debates, this question is not  
426 scientifically testable as stated. An adequate answer to this question requires a  
427 randomized experimental design that would rigorously define the experimental,  
428 control, and outcome variables and specify any limitations in generalizing the  
429 results. Unlike many other areas of research, however, the study of abortion is  
430 not open to the methodologies of randomized clinical trials. For obvious reasons,  
431 it is neither desirable nor ethical to randomly assign women who have unwanted  
432 pregnancies to an abortion versus delivery versus adoption group. Thus,  
433 although people have frequently used the existing literature to make causal  
434 statements, inferences of cause from this literature are inappropriate.

435  
436 **2. How prevalent are mental health problems among women in the**  
437 **United States who have had an abortion?** This question focuses attention on  
438 the extent to which abortion poses a threat to women's mental health, i.e., is  
439 associated with a clinically significant mental disorder (see Wilmoth et al., 1992

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

464  
465 **3. What is the relative risk of mental health problems associated with**  
466 **abortion compared to its alternatives (other courses of action that might be**  
467 **taken by a pregnant woman in similar circumstances)?** This question  
468 addresses *relative risk*. It focuses attention on the crucially important but  
469 frequently overlooked point that the outcomes associated with elective abortion  
470 must be compared with the outcomes associated with other courses of action  
471 that might be taken by a pregnant woman in similar circumstances (i.e., facing an  
472 unwanted pregnancy). *Once a woman is pregnant, there is no mythical state of*  
473 *"unpregnancy."* Questions of relative risk include: How does the mental health of  
474 a woman who has an abortion compare to the mental health that a woman in  
475 comparable circumstances would experience were she not to have an abortion or  
476 were she to be denied an abortion? Are negative feelings that may accompany  
477 abortion of an unwanted pregnancy more severe than alternative solutions, such  
478 as giving up a child for adoption or raising a child a woman does not want or  
479 feels emotionally, physically, or financially unable to care for? Only research  
480 designs that include a comparison group that is clearly defined and otherwise  
481 equivalent to women who have an elective abortion are appropriate for  
482 answering this primary question. Otherwise, any previously existing group  
483 differences associated with the outcome variable may bias conclusions. As will  
484 be discussed below, few studies examining the mental health implications of  
485 abortion include appropriate comparison groups for answering this question.

486

487

**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.

502

#### **I. D. Variability in the Abortion Experience**

504

505

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.

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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

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

538 Gestational age at time of abortion varies. The vast majority (over 90%) of  
539 abortions in the United States occur in the first trimester of pregnancy (Boonstra,  
540 Gold, Richards, & Finer, 2006). Later-trimester abortions occur for a variety of  
541 reasons. In some cases, particularly involving teenagers, a woman may be  
542 unaware that she is pregnant until the second trimester or must go through legal  
543 proceedings (e.g., judicial bypass) in order to obtain an abortion (Boonstra et al.,  
544 2006). Later-trimester abortions also are performed after discovery of fetal  
545 abnormalities or risks to the mother's health.

546  
547 Abortion procedures vary as well. Although most first-trimester abortions  
548 are performed using electric vacuum aspiration (EVA), nonsurgical methods  
549 involving use of a drug or combination of drugs to terminate pregnancy (e.g.,  
550 mifepristone) are increasingly being used. Nonsurgical abortions comprised 14%  
551 of nonhospital abortions in 2005 as compared to 6% in 2001 (Jones, Zolna,  
552 Henshaw, & Finer, 2008). Procedures for abortions later than the first trimester  
553 include dilation and evacuation and induction of labor.

554  
555 The experience of abortion may also vary as a function of a woman's  
556 ethnicity and culture. The United States is home to a growing number of ethnic  
557 and immigrant populations, including Hispanic (13%), African American (12.9%),  
558 and Asian and Pacific Islanders (4.2%). According to the 2000 Census data,  
559 African American women are more than three times as likely as White women to  
560 have an abortion (Dugger, 1998). Latinas are approximately two times as likely  
561 as White women to have an abortion, although there are important subgroup  
562 differences. Based on estimates from the Hispanic Health and Nutrition  
563 Examination Survey, among Latinas, Mexican women used abortion least;  
564 Puerto Rican women used abortion more than Mexican women, and Cubans  
565 used abortion the most (Erickson & Kaplan, 1998). The overrepresentation of  
566 ethnic minority women among those who obtain abortions in the United States  
567 may represent the general problem of greater poverty and reduced access to  
568 health care, including reproductive health services, among women of  
569 color. Although there appears to be a strong influence of traditional African  
570 American and Latino cultural and religious values on women's use of abortion,  
571 this influence varies by age, country or area of ancestry or origin, level of  
572 acculturation, socioeconomic status, and educational and occupational  
573 attainment (Dugger, 1998; Erickson & Kaplan, 1998). Thus, it appears that for  
574 women of color, moral and religious values intersect with identities conferred by  
575 race, class, or ethnicity to influence women's likelihood of obtaining an abortion

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

581

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

587

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

596

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

605

606

## 607 **II. Conceptual Frameworks**

608

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

615

### 616 **II. A. Abortion Within a Stress and Coping Perspective**

617

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



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

630  
631 A hallmark principle of psychological theories of stress and coping is  
632 variability (e.g., Billings & Moos, 1981; Lazarus & Folkman, 1984). From this  
633 perspective, although unwanted pregnancy and abortion can pose challenges  
634 and difficulties for an individual woman, these events will not inevitably or  
635 necessarily lead to negative psychological experiences for women. Stress  
636 emerges from an interaction between the person and the environment in  
637 situations that the person appraises as taxing or exceeding his or her resources  
638 to cope. A woman's psychological experience of abortion will be mediated by her  
639 appraisals of the pregnancy and abortion and their significance for her life, her  
640 perceived ability to cope with those events, and the ways in which she copes with  
641 emotions subsequent to the abortion. These are shaped by conditions of the  
642 woman's environment (e.g., age, material resources, presence or absence of a  
643 supportive partner) as well as by characteristics of the woman herself (e.g., her  
644 personality, attitudes, and values). Thus, for example, a woman who regards  
645 abortion as conflicting with her own and her family's deeply held religious,  
646 spiritual, or cultural beliefs but who nonetheless decides to terminate an  
647 unplanned or unwanted pregnancy may appraise that experience as more  
648 stressful than would a woman who does not regard an abortion as in conflict with  
649 her own values or those of others in her social network.

650  
651 Research derived from a stress-and-coping perspective has identified  
652 several factors that are associated with more negative psychological reactions  
653 among women who have had an abortion. These include terminating a  
654 pregnancy that is wanted or meaningful; perceived pressure from others to  
655 terminate a pregnancy; perceived opposition to the abortion from partners,  
656 family, and/or friends; and a lack of perceived social support from others. Other  
657 factors found to be associated with more negative postabortion experiences  
658 include personality traits (e.g., low self-esteem, a pessimistic outlook, low-  
659 perceived control) and a history of mental health problems prior to the pregnancy  
660 (see Adler et al., 1992; Major & Cozzarelli, 1992; Major et al., 2000 for reviews).

661  
662 Importantly, many of the same individual and interpersonal factors that  
663 predict how women will appraise, cope with, and react psychologically to abortion  
664 are also predictors of how women will appraise, cope with, and react  
665 psychologically to other types of stressful life events, including unwanted  
666 motherhood or relinquishment of a child for adoption. For instance, low-perceived  
667 social support, low self-esteem, and pessimism also are risk factors for

668 postpartum depression (Beck, 2001; Grote & Bledsoe, 2007; Logsdon & Usui,  
669 2001). Consequently, the same risk factors for adverse reactions to abortion can  
670 also be risk factors for adverse reactions to its alternatives.

671

## 672 **II. B. Abortion as a Traumatic Experience**

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

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

## 705 **II. C. Abortion Within a Sociocultural Context**

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

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

715         The psychological implications of stigma are profound (see Major &  
716 O'Brien, 2005, for a review). Experimental studies have established that  
717 stigmatization can create negative cognitions, emotions, and behavioral reactions  
718 that can adversely affect social, psychological, and biological functioning. Effects  
719 of perceived stigma include cognitive and performance deficits (Steele &  
720 Aronson, 1995), increased alcohol consumption (Taylor & Jackson, 1990), social  
721 withdrawal and avoidance (Link, Struening, Rahav, Phelan, & Nuttbrock, 1997),  
722 increased depression and anxiety (Taylor, Henderson, & Jackson, 1991), and  
723 increased physiological stress responses (Blascovich, Spencer, Quinn, & Steele,  
724 2001). Societal stigma is particularly pernicious when it leads to "internalized  
725 stigma"—the acceptance by some members of a marginalized group of the  
726 negative societal beliefs and stereotypes about themselves. Women who come  
727 to internalize stigma associated with abortion (e.g., who see themselves as  
728 tainted, flawed, or morally deficient) are likely to be particularly vulnerable to later  
729 psychological distress.

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

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

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

## 759 **II. D. Abortion and Co-Occurring Risk Factors**

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

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

788 **1. Systemic risk factors.** Poverty is a systemic risk factor for unplanned  
789 pregnancy and for abortion. Women at particularly high risk for unintentional  
790 pregnancy and women who obtain abortions tend to be young, unmarried, poor,  
791 and women of color (Finer & Henshaw, 2006a; Jones, Darroch, & Henshaw,  
792 2002a, 2002b; Jones & Kost, 2007). In 2000, women with resources below the  
793 federal poverty level represented 57% of all abortions (Jones, Darroch, &  
794 Henshaw, 2002b). Exposure to sexual or physical abuse during childhood and

795 exposure to intimate partner violence including rape also are associated with  
 796 greater likelihood for both unintended pregnancy and abortion (e.g., Boyer  
 797 & Fine, 1992; Dietz et al., 1999; Gazmararian, Lazorick, Spitz, Ballard, Saltzman,  
 798 & Marks, 1996; see Coker, 2007; Pallitto & O'Campo, 2005; Russo & Denious,  
 799 1998b for reviews).

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

806  
 807 Indeed, these same systemic factors shown to be associated with  
 808 increased risk for unintended pregnancy and abortion have also been shown to  
 809 be associated with increased risk for mental health problems. For example,  
 810 studies based on nationally representative samples show that poverty is strongly  
 811 related to an increased likelihood of psychiatric disorder (e.g., Kessler, et al.,  
 812 1994; Robins & Regier, 1991). Children who grow up in poor neighborhoods are  
 813 at higher risk for teen pregnancy, substance abuse, obesity, smoking, and  
 814 dropping out of school, all of which are risk factors for psychological problems  
 815 (Mather & Rivers, 2006; Messer, Kaufman, Dole, Savitz, & Laraia,  
 816 2006). Exposure to domestic (intimate) violence also is a strong and well-  
 817 documented predictor of physical and mental health problems, including suicide,  
 818 posttraumatic stress disorder, depression, and substance abuse (see Golding,  
 819 1999, for a meta-analysis and review). The more violence-related events a  
 820 woman has experienced and the more stressful life events she has experienced  
 821 in general, the greater her risk for developing a mental disorder (Breslau,  
 822 Kessler, Chilcoat, Schultz, Davis, & Andreski, 1998; Brown & Harris, 1978;  
 823 Golding, 1999).

824  
 825 **2. Personal risk factors.** In addition to systemic factors, personality or  
 826 behavioral factors may also predispose a woman to unplanned pregnancy and  
 827 abortion, as well as to mental health problems. There is substantial evidence that  
 828 problem behaviors tend to co-occur among the same individuals. For example,  
 829 high school students who report engaging in early sexual activity also are more  
 830 likely to report smoking; using alcohol, marijuana, and hard drugs; minor  
 831 delinquency; and, to a lesser extent, major aggression and gambling  
 832 (Willoughby, Chalmers, & Busseri, 2004). Women who have unintended  
 833 pregnancies and abortions are more likely than other women to have previously  
 834 engaged in a behaviors such as smoking, using alcohol and illicit drugs,  
 835 engaging early in sexual intercourse, and having unprotected sexual intercourse  
 836 (Costa, Jessor, & Donovan, 1987).

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

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

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

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

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

## 898   **II. E. Summary of Conceptual Frameworks**

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

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





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

982

### 983 **III. B. Co-Occurring Risk Factors**

984

985 Unfortunately, very few studies encountered in our review of the literature  
 986 adequately assessed and controlled for co-occurring risks. As discussed above,  
 987 there are naturally occurring interrelations among many of the phenomena  
 988 associated with elective abortion that make it difficult to tease apart the causal  
 989 chains that might be operating. Elective abortion commonly co-occurs with  
 990 unwanted or unintended pregnancy, and unwanted/unintended pregnancy is  
 991 often associated with adverse circumstances and characteristics that may be  
 992 associated with mental health problems. Because few studies adequately  
 993 controlled for these co-occurring risks, it is almost impossible from the available  
 994 literature to distinguish outcomes that flow from abortion *per se* from outcomes  
 995 that might appear to be associated with abortion, but in actuality have their  
 996 origins in the unwanted/unintended pregnancy (or some other co-occurring risk),  
 997 which is more highly represented in the abortion group than in the comparison  
 998 group. It was particularly difficult to detect these co-occurring conditions and their  
 999 consequences from secondary data analyses of data sets collected for other  
 1000 purposes because potential confounds that were not of interest in the initial data  
 1001 collection were unlikely to have been adequately assessed.

1002

### 1003 **III. C. Sampling**

1004

1005 Problems of sampling characterized most of the studies reviewed. Two  
 1006 basic designs in the abortion literature presented sampling problems. The first  
 1007 occurred when convenience samples of women were recruited specifically for the  
 1008 study without concern for the degree to which they represented a definable  
 1009 population, for example, women seeking pregnancy testing at a health clinic  
 1010 (Cohan, Dunkel-Schetter, & Lydon, 1993), women waiting to see their doctor  
 1011 (Williams, 2001), or pregnant teens residing at a maternity home (Medora,  
 1012 Goldstein, & von der Hellen, 1993). Often the samples were extremely small (<

1013 30; e.g., Cohan et al., 1993). In many cases, little, if anything, was reported about  
1014 the inclusion rates of the women in either the abortion group or the comparison  
1015 groups or the context of their situations, information necessary to establish the  
1016 representativeness and generalizability of the data. Sometimes data were based  
1017 on volunteer samples of women who responded to mailed questionnaires about  
1018 their reproductive history (Reardon & Ney, 2000). Such volunteers do not  
1019 represent an unbiased sample representative of the population as a whole and  
1020 cannot be used as evidence to establish prevalence rates or normative  
1021 responses.

1022 The second and equally problematic situation occurred when subsamples  
1023 were selected for analysis from extant studies that were initially conducted for  
1024 other purposes. This characterized most of the studies based on secondary  
1025 analyses of medical records or public survey data sets. Many of the studies with  
1026 the largest sample sizes that have been used to make claims about the effects of  
1027 abortion are of this type—e.g., studies based on the National Longitudinal Study  
1028 of Youth (NLSY) (e.g., Reardon & Cogle, 2002a; Russo & Zierk, 1992), National  
1029 Survey of Family Growth (NSFG) (e.g., Cogle, Reardon, & Coleman, 2005), or  
1030 the National Longitudinal Study of Adolescent Health (Coleman, 2006). In these  
1031 studies, subsets of the complete sample were taken to allow certain comparisons  
1032 of interest to be made. For example, only women who reported terminating or  
1033 delivering a first pregnancy might be selected (e.g., Cogle et al., 2003).

1034 There are a number of serious problems with selecting subsamples from  
1035 the larger data set in this way: (a) The secondary sampling destroys the sampling  
1036 properties that might have originally characterized the sample, particularly if  
1037 population-based sampling weights were not properly taken into account.  
1038 Distorted sampling weights (or non-use of sampling weights) can lead to  
1039 inaccurate estimations when the results are used to estimate prevalence of  
1040 mental health problems in the general population following abortion. (b) Sampling  
1041 on certain characteristics (e.g., first pregnancy; Cogle et al., 2005; Schmiede &  
1042 Russo, 2005) may affect other characteristics of the sample, thereby  
1043 compromising generalizability. For example, women who have an abortion on  
1044 their first pregnancy are more likely to be younger and to be unmarried than  
1045 women who have their first abortion on a later pregnancy. (c) In some studies,  
1046 additional sources of nonequivalence between abortion and comparison  
1047 groups were created by selecting a first “target” pregnancy occurring in a  
1048 specified time period of data collection (e.g., the latter 6 months of 1989). This  
1049 was to create abortion and delivery comparison groups without attention to  
1050 reproductive history differences between these groups, when reproductive history  
1051 is a factor affecting retention in the population sampled (e.g., Cogle, Reardon, &  
1052 Coleman, 2003; Reardon & Coleman, 2006; Reardon & Cogle,  
1053 2002a). (d) Serious violation of sampling principles also occurs when differential  
1054 exclusion is used in constructing comparison groups such that one group is  
1055 advantaged relative to the other (e.g., Coleman et al., 2002; Cogle, et al., 2005).

1056 **III. D. Measurement of Reproductive History and Problems of**  
1057 **Underreporting**

1058 Many of the studies reviewed were characterized by inaccuracy in the  
1059 information available regarding a woman's reproductive history, particularly her  
1060 abortion history. In some studies, a woman's abortion status was verifiable (e.g.,  
1061 data were collected at the time that she sought an abortion at a clinic or from her  
1062 medical records). More typically, however, abortion status was established based  
1063 on self-report. For example, in all of the studies based on a secondary analysis of  
1064 survey data, abortion status was established by asking women to indicate, either  
1065 on a questionnaire or verbally, to an interviewer whether or not they had had an  
1066 abortion in the past. Women's reports of an earlier abortion were then correlated  
1067 with current mental health/emotional status, with the latter attributed to the former  
1068 (e.g., Coleman, Reardon, Rue, & Cogle, 2002a; Cogle et al., 2005).

1069 This approach has many problems. Abortion, like other stigmatized  
1070 conditions, is typically underreported (Jones & Kost, 2007). It has long been  
1071 recognized that individuals are unlikely to frankly answer questions that have the  
1072 potential to be embarrassing, overly self-disclosing, or in other ways reflect  
1073 negatively on them. One of the earliest applications of a statistical model  
1074 designed for reducing bias in obtaining answers to sensitive questions—the so-  
1075 called randomized response methodology—was for estimating the mean number  
1076 of abortions in an urban population of women (Greenberg, Kuebler, Abernathy, &  
1077 Horvitz, 1971). The percentage of women reporting an abortion on surveys is  
1078 consistently lower than the number expected based on estimates made from  
1079 national provider data, sometimes markedly so (Jones & Forrest, 1992; Jones &  
1080 Kost, 2007). Absent the use of techniques such as randomized response  
1081 methodology or the selection of highly disclosing samples, one is likely to obtain  
1082 biased estimates of prevalence rates. Generally, there are two types of  
1083 underreporting: failure to acknowledge having had any abortions and having had  
1084 multiple abortions but reporting only some of them (Jones & Kost, 2007).

1085 Underreporting of abortion in surveys is of particular concern when there  
1086 is differential underreporting by subgroups of women (Fu, Darroch, Henshaw, &  
1087 Kolb, 1998; Jones & Forrest, 1992). Women more likely to underreport include  
1088 those who are unmarried, Black or Hispanic, Catholic, low-income, and aged 20–  
1089 24 (Jones & Kost, 2007). Underreporting can introduce systematic bias into a  
1090 study. Only a few studies reviewed attempted to test for possible underreporting  
1091 biases. For example, Schmiede and Russo (2005) examined and compared the  
1092 relation of abortion versus delivery to depression (CESD cutoff score) in the  
1093 NLSY data set among groups known to vary in underreporting (e.g., White  
1094 married women, unmarried Black women, Catholics). Their analyses suggested  
1095 that at least in the NLSY data set, underreporting by specific subgroups did not  
1096 appear to introduce systematic bias into observed associations between abortion  
1097 and a mental health outcome.  
1098

1099 In general, the nature of the potential bias introduced by underreporting  
1100 (i.e., whether it biases toward overestimating or underestimating adverse impact  
1101 of abortion) is unclear. It is possible that women who feel most distressed by an  
1102 abortion are less likely to report it to others; as a consequence, they may be  
1103 underrepresented in the abortion group, biasing results toward underestimating  
1104 negative effects. It is also possible that response biases in the other direction  
1105 may be observed. For example, women who are experiencing distress may view  
1106 the survey as an opportunity for catharsis and hence be more likely to disclose  
1107 their abortion than women less distressed. In addition, women most willing to  
1108 report one “problem” (e.g., depression, anxiety, abuse) may also be those most  
1109 able to recall or willing to report another “problem behavior” (abortion), biasing  
1110 results toward overestimating negative effects. Many scholars have noted the  
1111 problem of selective recall bias in surveys on the part of individuals experiencing  
1112 a disorder who may (1) more thoroughly scrutinize their history in an effort to  
1113 explain their disorder and (2) more accurately recall stigmatizing events, such as  
1114 abortion, than individuals not experiencing a disorder (e.g., Neugebauer & Ng,  
1115 1990; Chouinard & Walter, 1994). Recall biases can explain, for example, why a  
1116 positive relationship between abortion history and breast cancer has been  
1117 observed in retrospective surveys but is absent in prospective studies (American  
1118 Cancer Society: <http://www.cancer.org/>). Specifically, breast cancer patients  
1119 seeking to understand their disease are thought to be more motivated to search  
1120 their memories as well as more willing to report socially stigmatizing conditions  
1121 (such as abortions or sexually transmitted infections) to a health care provider  
1122 than are healthy women, leading to a spurious relationship.

1123  
1124 Measurement of abortion also typically suffers from underspecification.  
1125 Many studies lack important information about the abortion, such as length of  
1126 gestation, type of procedure, or whether the abortion was performed for  
1127 therapeutic reasons, all of which may affect how women respond emotionally and  
1128 physically after an abortion. For example, abortions performed beyond the first  
1129 trimester involve a more risky medical procedure and more pain, which may have  
1130 negative effects. They also occur at a more advanced stage of development,  
1131 which may change the meaning of the pregnancy, making abortion more  
1132 stressful (Major, Mueller, & Hildebrandt, 1985). Delay may also reflect  
1133 ambivalence toward the pregnancy or indicate that a wanted pregnancy was  
1134 terminated because of discovery of a health problem or fetal defect. It is also  
1135 unclear to what extent research on earlier surgical methods of abortion applies to  
1136 newer nonsurgical methods of abortion, which are used at the earliest stages of  
1137 gestation and differ from traditional methods in other ways as well, although  
1138 studies suggest comparable postabortion emotional adjustment for women  
1139 experiencing each method (Ashok, Hamoda, Flett, Kidd, Fitzmaurice, &  
1140 Templeton, 2005; Howie, Henshaw, Najo, Russell, & Templeton, 1997;  
1141 Lowenstein et al., 2006; Sit, Rothschild, Creinin, Hanusa, & Wisner, 2007).

### 1142 **III. E. Attrition**

1143 Another potentially serious methodological confound encountered was  
1144 attrition—loss of cases during the course of an investigation. Attrition has been a  
1145 long-standing concern in the study of abortion (see for example, Adler, 1976).  
1146 The consequences of attrition range from potentially serious loss of power to  
1147 biasing of results when attrition is not random (i.e., biased in a specific direction)  
1148 and differs by group. In the case of abortion, for example, underestimation of the  
1149 prevalence of distress in the final sample would occur if women who were most  
1150 upset by the abortion were more likely to be lost to a follow-up than those who  
1151 were retained in the sample. Similarly, overestimation of the prevalence of  
1152 distress would occur if women who were least distressed by the abortion were  
1153 more likely to be lost to a follow-up. Consequently, it is essential that  
1154 researchers test for biases in attrition. Only a few studies reviewed did so. One  
1155 study that did test for attrition (Major et al., 2000) found that among women who  
1156 had a first-trimester abortion, those who were retained in the sample at the 2-  
1157 year postabortion measurement period did not differ significantly from those who  
1158 were lost to attrition on any demographic or psychological variable assessed  
1159 either prior to the abortion, immediately post abortion, or 3 months post abortion.  
1160 Thus, at least in this sample, no evidence of systematic bias in attrition was  
1161 observed.

### 1162 **III. F. Outcome Measures: Timing, Source, and Clinical Significance**

1163 Problems of outcome measurement also were frequently encountered in  
1164 this literature. It is vital that the measures of mental health are valid and reliable.  
1165 In some studies reviewed, claims of mental health impact (or no impact) were  
1166 made on the basis of psychometrically poor measures, including one-item  
1167 measures (e.g., Coleman, 2006a; Reardon & Ney, 2000). For example, Reardon  
1168 and Ney (2000) measured substance abuse with yes/no responses to the single  
1169 question “Have you ever abused drugs or alcohol?” This is not a reliable  
1170 measure of substance abuse. A clinically relevant measure (as opposed to a  
1171 scale score without known clinical relevance) should be the minimal standard for  
1172 measuring impact. In addition, claims of impact should be accompanied by  
1173 epidemiologically meaningful effect size indicators such as odds ratios, which  
1174 provide clinically relevant measures of impact. Odds ratios should be presented  
1175 in conjunction with data of the rates or proportions of women affected (i.e., a  
1176 finding of 3 to 1 in 100 women presents a different level of threat than 3 to 1 in 1  
1177 million women). Absolute and relative levels of the effect should be clear.

1178 An associated problem encountered in both primary and secondary  
1179 studies was related to the timing of measurement. Some studies first contacted  
1180 their participants months or years (or an unspecified time interval) after the target  
1181 abortion and engaged them in retrospective reporting of their preabortion status  
1182 (e.g., Bradshaw & Slade, 2005; Cogle et al., 2005) or their mental  
1183 health/emotional status at selected points after the event (e.g., Kersting et al.,  
1184 2005). Retrospective reporting is subject to a large number of distortions and  
1185 biases. There is agreement among methodologists that measures taken nearer

1186 an event are more likely to be accurate than measures taken at a time distant  
1187 from the event.

1188 Finally, assessing the clinical significance of abortion, as with any other  
1189 medical procedure, requires asking "what is the benefit?" as well as "what is the  
1190 harm?" of the procedure. Many of the abortion studies reviewed focused only on  
1191 negative outcomes. Focusing solely on adverse effects can create a distorted  
1192 picture of the information needed to provide complete and accurate informed  
1193 consent. It is akin to focusing on the risks of chemotherapy without addressing its  
1194 potential benefits for curing cancer. For example, in separate reports based on  
1195 the same sample, one research team reported a negative association between  
1196 abortion and mental health (Fergusson, Horwood, & Ridder, 2006) and a positive  
1197 association between abortion and other life outcomes (e.g., education,  
1198 employment; Fergusson, Boden, & Horwood, 2007). The authors concluded that  
1199 there is a "need for further research into the risks and benefits associated with  
1200 abortion as a means of addressing the issues raised by unwanted or mistimed  
1201 pregnancies" (Fergusson et al., 2007, p. 11).

### 1202 **III. G. Other Statistical Issues**

1203 Many of the studies included in our review were characterized by  
1204 statistical problems. One frequently encountered problem, especially in the  
1205 studies based on secondary data analyses, was inflation of the probability of  
1206 making a Type I error in inference by performing many significance tests at the  
1207 same level one would if there were to be only a single test. This appeared in two  
1208 forms. The first form occurred when the initial sample (often a reasonably large  
1209 sample) was divided into smaller and smaller subsets, and these subsets were  
1210 then used to test for differences between abortion and nonabortion cases within  
1211 each subset without any overall control for the number of significance tests  
1212 conducted (e.g., Coleman, Reardon, & Cogle, 2002; Reardon & Ney, 2000).  
1213 This practice increases the probability of a statistically significant difference  
1214 occurring due to chance. The second form encountered was the ad hoc search  
1215 for covariates. In many studies, especially those based on analyses of secondary  
1216 data sets, the data analyst began with a set of all possible covariates (usually  
1217 defined by the measures available in the data set) and tested each covariate for  
1218 significance (testing the partial regression coefficients for significance). The  
1219 analyst then proceeded to conduct analyses using only the significant covariates  
1220 (e.g., Coleman, Maxey, Rue, & Coyle, 2005). Without any correction for chance  
1221 via alpha-level control, this completely ad hoc, atheoretical approach also  
1222 capitalizes on chance. Furthermore, the choice of covariates to include in  
1223 analyses can play a key role in how much variance in the outcome variable is  
1224 explained by pregnancy outcome.

### 1225 **III. H. Interpretational Problems and Logical Fallacies**

1226 In addition to the methodological problems described above, the TFMHA  
1227 also encountered a number of cases in which data were incorrectly interpreted or  
1228 generalized, if not in the actual research reports themselves, then in reviews,  
1229 summaries, and press releases based on that research. Accordingly, the TFMHA  
1230 felt it important to point out several logical fallacies that must be guarded against  
1231 in drawing conclusions from this literature.

1232 The first logical fallacy is the tendency to infer causation from correlation.  
1233 Frequently, significant correlations observed between abortion history and other  
1234 variables (e.g., substance abuse, depression, higher educational outcomes) were  
1235 misinterpreted as evidence that abortion caused these variables to occur. Such  
1236 causal claims are unwarranted, as the relationships may be spurious, the causal  
1237 direction may be reversed, or the relationship may be due to a third variable that  
1238 is associated with both abortion and the outcome variable (e.g., poverty). It is  
1239 sometimes argued that a case for causality is stronger in abortion studies that  
1240 establish (a) time precedence of the abortion before an outcome variable, (b)  
1241 covariation of abortion and the outcome variable, and (c) lack of plausible  
1242 alternative explanations or control of third variables associated with both abortion  
1243 and the outcome variable. These, however, are only necessary but not sufficient  
1244 conditions to establish causality. Furthermore, although some of the studies  
1245 reviewed did meet criteria (a) and (b), the TFMHA could identify no study  
1246 reporting a significant association of abortion with a mental health outcome that  
1247 met criterion (c).

1248 A second logical fallacy is the tendency to confuse a risk and a cause. For  
1249 example, some writers appeared to assume that if a prior history of abortion was  
1250 found to be a “risk factor” for a certain outcome (e.g., violent death), then a prior  
1251 history of abortion is a “cause” of violent death. Many things can serve as  
1252 markers for causes or may be associated with causes without themselves being  
1253 a part of the causal mechanisms in play. For example, age is the most important  
1254 known risk factor for Alzheimer’s disease (AD), but it is not the mechanism that  
1255 *causes* people to develop AD. Rather, age is a statistical predictor in a population  
1256 of who in that population is at risk, that is, more likely (older versus younger) to  
1257 develop AD (<http://www.nia.nih.gov/Alzheimers/>). The steps that link risks and  
1258 causes must be explicitly developed and demonstrated before one can validly  
1259 make the assertion that removing a particular risk factor will lead to a desired  
1260 outcome.

1261 A third and very serious logical fallacy is the “interventionist fallacy”—the  
1262 belief that if a relationship is observed between two variables, the form or  
1263 magnitude of the relationship will remain unchanged if an intervention changes  
1264 some part of the current state of affairs. For example, because there is a  
1265 substantial positive relationship between family income and children’s school  
1266 performance, it is tempting to think that increasing family income would lead to  
1267 improved children’s school performance. Such a conclusion, however, does  
1268 not logically follow. It might be that what drives the relationship between family  
1269

1270 income and school performance is the family expenditure on books. Were one to  
1271 intervene and supplement family income, it does not necessarily follow that the  
1272 family would increase its expenditure on books, which are (in this example) the  
1273 actual component that drives the child's school performance, and, hence, the  
1274 intervention might fail.

1275  
1276 As applied to the case of abortion, one example of the interventionist  
1277 fallacy would be the belief that if abortion and depression are related, then  
1278 reducing access to abortion would reduce the prevalence of depression. A  
1279 change in the availability of elective abortion, however, would have many  
1280 consequences. It would mean that women who want to terminate an unwanted  
1281 pregnancy would now be forced to deliver. As a consequence, the characteristics  
1282 of the population of women who delivered children would change. Characteristics  
1283 previously prevalent among women who had an abortion (e.g., greater poverty,  
1284 exposure to violence) would now be prevalent among the delivery group. The  
1285 portrait of the mental health of mothers might reasonably be expected to be  
1286 worse. This potential change in the profile of women giving birth does not include  
1287 any new mental health problems that might develop from stresses associated  
1288 with raising a child a woman feels unable to care for, or may not want, or from  
1289 relinquishing a child for adoption. Thus, reducing access to abortion would be  
1290 likely to result in poorer mental health among women who deliver. Hence, rather  
1291 than reducing the prevalence of depression among women, this intervention  
1292 could potentially increase it.

### 1293 1294 **III. I. Summary of Methodological Issues**

1295  
1296 Most of the studies published on postabortion mental health contain one  
1297 or more of the methodological or interpretational problems discussed above.  
1298 Consequently, reviews of the literature that simply count the number of studies  
1299 that show one effect versus another or that calculate effect sizes without carefully  
1300 considering and weighing the quality of the evidence that produced the effect are  
1301 inappropriate and often misleading. It is essential to keep the methodological and  
1302 interpretational points discussed above in mind when considering the literature  
1303 on postabortion mental health reviewed below.

1304  
1305 It is also important to recognize, however, that not all design problems are  
1306 equally serious. The extent to which a design flaw affects the merits of a  
1307 particular study depends in part on the goal of the study. For example, the lack of  
1308 a comparison group is not overly limiting when the researcher's goal is to  
1309 understand predictors of response among women who have abortions. Some  
1310 flaws can be compensated for by limiting generalization or interpretation.  
1311 However, other flaws are so serious that they limit any conclusions that can be  
1312 drawn from the study (e.g., differential exclusion of women from one group but  
1313 not the comparison group on a variable known to be related to the outcome  
1314 variable).

1315



1316

## IV. Review of Scientific Literature

### IV. A. Search Strategy and Criteria for Inclusion

1318 In order to evaluate the scientific literature on mental health effects of  
1319 abortion, the TFMHA searched PsycINFO and Medline for English-language  
1320 peer-reviewed articles published between 1990 and 2007 based on human  
1321 subjects. Research conducted with U.S. as well as non-U.S. samples was  
1322 searched. Keyword combinations paired *abortion* with each of the following  
1323 words: *anxiety, depression, mental disorders, mental health, trauma, PTSD,*  
1324 *domestic violence, drug abuse, emotions, employment, life satisfaction, self-*  
1325 *esteem, somatoform, stigma, substance abuse, suicide, acute psychosis,*  
1326 *schizophrenia, psychiatric symptoms, and psychosocial factors.* In addition,  
1327 *postabortion syndrome, postabortion adjustment, and therapeutic abortion* were  
1328 also used as search terms. The search results were supplemented by a manual  
1329 search of reference sections of reviewed articles. This search strategy resulted in  
1330 an initial set of 216 unique references. Seven additional references were brought  
1331 to the attention of the task force by reviewers.

1332 Our review process consisted of four steps. In the first step of review, the  
1333 abstract of each article in the initial set was reviewed independently by two task  
1334 force members according to the following inclusion criteria: (1) The study  
1335 reported empirical data of a quantitative nature (qualitative studies were omitted).  
1336 (2) The study was published in a peer-reviewed journal (dissertations, letters to  
1337 editors, reviews, book chapters, and conference proceedings were omitted). (3)  
1338 The study included at least one postabortion measure related to mental health  
1339 (those that considered only mental health prior to the abortion were omitted). (4)  
1340 The study focused on induced abortion [those that focused solely on  
1341 “spontaneous” abortions (miscarriages) or that did not differentiate miscarriage  
1342 from induced abortion were omitted].

1343 Those articles that appeared to meet all of the above criteria were  
1344 included for further review. In the second step, a minimum of two task force  
1345 members independently read all articles identified in our first step. Only articles  
1346 judged to have met all of the above inclusion criteria were retained. In the third  
1347 step, all studies that met criteria for inclusion were coded, summarized, and  
1348 evaluated independently by at least two members of the task force, with the  
1349 restriction that task force members did not evaluate their own work.

1350

1351 In a final step, articles were categorized according to whether or not they  
1352 included a comparison group of women who did not have an abortion. Only  
1353 studies that include a comparison group are capable of addressing the question  
1354 of relative risk. Accordingly, our core review focused only on studies that included  
1355 comparison groups. Studies without a comparison group have the potential to  
1356 address predictors of individual variation in women's responses following  
1357 abortion. They also are capable of addressing the question of prevalence of

1358 mental health problems among women who have abortions, but only to the  
1359 extent that they are based on a sample representative of the population to which  
1360 one intends to generalize. Accordingly, in a separate section we review such  
1361 studies, but only when based on a U.S. sample.

1362

#### 1363 **IV. B. Descriptive Overview of Literature Identified for This Review**

1364

1365 Through the process described above, 50 papers were identified that  
1366 compared psychological experiences of women after abortion to psychological  
1367 experiences of a comparison group of women. These 50 include studies based  
1368 on U.S. and international samples. The restriction of empirical studies to those  
1369 published in English resulted in a relatively narrow slice of international contexts  
1370 represented in this report. One should not assume that this small set is  
1371 representative of the global experience of abortion and mental health, as laws,  
1372 customs, and contexts vary widely. Twenty-five papers compared women who  
1373 had an abortion to women who had a different reproductive history (e.g., a  
1374 delivery, miscarriage, no pregnancy) by performing secondary analyses of public  
1375 data sets or records originally collected for other purposes; 18 of these papers  
1376 were based on U.S. samples; the remaining papers were based on samples from  
1377 New Zealand (1) and Finland (6). These are summarized in Tables 1 and 2. A  
1378 second set of papers ( $N = 19$ ) described original studies conducted primarily for  
1379 the purpose of comparing responses of women who had a first-trimester abortion  
1380 (or an abortion of unspecified gestation) to responses of women who had a  
1381 different reproductive history. Most of these studies were based on samples  
1382 collected at clinics or physicians' offices; some were retrospective. Seven were  
1383 conducted in the United States, the remainder in other countries. These studies  
1384 are summarized in Tables 3a and 3b. A third set of papers ( $N=6$ ) consisted of  
1385 studies comparing psychological experiences of women who had a late-trimester  
1386 abortion of a pregnancy for reasons of fetal anomaly to another group of  
1387 women. All but one was conducted on non-U.S. samples. These studies are  
1388 summarized in Table 4. These 50 papers constitute the core of our review. Our  
1389 literature search also identified 23 papers based on U.S. samples that did not  
1390 include a comparison group but met all other inclusion criteria. These papers are  
1391 summarized in Table 5.

1392

1393

#### 1394 **V. Review of Comparison Group Studies**

1395

##### 1396 **V. A. Record-Based Studies and Secondary Analyses With Comparison 1397 Groups**

1398

1399 The major change in the scientific literature during the time period  
1400 encompassed by our review compared to the literature reviewed by the first APA  
1401 task force was the publication of 25 papers in peer-reviewed journals based on  
1402 secondary analyses of publicly available data sets. The studies are of two types:  
1403 (a) analyses of data based on medical records and (b) analyses of data sets  
collected for purposes other than analyzing the relationship between pregnancy

1404 outcome and mental health. Because publicly available data sets often include  
1405 questions about reproductive histories, including pregnancy outcomes (abortion,  
1406 delivery, miscarriage), they provide an opportunity for comparing women who  
1407 report having had an abortion to other groups of women. Utilizing existing data  
1408 sets, particularly longitudinal data sets, also has the advantage of being able to  
1409 ask and answer questions without having to wait the years it takes to conduct a  
1410 prospective study focused specifically on abortion. Findings based on national  
1411 probability samples potentially may be generalized more widely than those based  
1412 on convenience samples and may be more useful for estimating normative  
1413 effects. Nonetheless, as pointed out above in the methodological issues section  
1414 of this report, there are many serious limitations of this approach that severely  
1415 constrain conclusions that can be drawn from these studies (see also McCall &  
1416 Appelbaum, 1991). In the following discussion, we provide a brief description of  
1417 these studies, followed by an evaluation of their methodology. Table 1 and Table  
1418 2 provide a description of the key methods, measures, and findings of these  
1419 studies, as well as their limitations.

1420  
1421 **1. Medical records.** Ten papers were published based on medical  
1422 records. Four papers were based on analyses of medical records from  
1423 California's state-funded insurance program (Medi-Cal). This program provides  
1424 health care for low-income children and families, as well as elderly, blind, and  
1425 disabled persons in the state of California. These "at-risk" women may be facing  
1426 a wide range of challenges that compromise their physical and mental health. Six  
1427 reports were based on official health register data drawn from medical records  
1428 and on the entire population of Finland (See Table 1).

1429  
1430 All four Medi-Cal studies focused on an initial target pregnancy event  
1431 (abortion vs. delivery) in the last half of 1989 and after excluding women with  
1432 subsequent abortions only from the delivery group, examined the records of the  
1433 remaining sample of women for subsequent death (Reardon et al., 2002),  
1434 outpatient admissions (Coleman, Reardon, Rue, & Cogle, 2002b), inpatient  
1435 admissions (Reardon, Cogle, Rue, Shuping, Coleman, & Ney, 2003), and sleep  
1436 disturbances (Reardon & Coleman, 2006). All four papers reported higher rates  
1437 of negative outcomes in the abortion group compared with the delivery group.

1438  
1439 In considering the weight of the evidence with regard to the mental health  
1440 implications of abortion, it should be kept in mind that the Medi-Cal studies are  
1441 not independent of each other because the samples overlap, and most of the  
1442 outcomes examined are correlated. Strengths of the Medi-Cal studies include an  
1443 objectively verifiable abortion history and the use of diagnostic codes for  
1444 assessing mental illness. Nonetheless, these papers are characterized by a  
1445 number of methodological limitations that make it difficult to interpret the results.  
1446 These include differential exclusion of women with subsequent abortions from  
1447 the delivery group but not from the abortion group, a sampling strategy that both  
1448 advantaged the delivery group and rendered generalizability of the findings  
1449 problematic; lack of basic demographic information known to be associated with

1450 mental health, including marital status and race; lack of information about  
1451 previous reproductive history, lack of adequate assessment of prior mental health  
1452 history, lack of adequate information about co-occurring risks (e.g., health status,  
1453 violence exposure), lack of information about critical characteristics of the  
1454 abortion decision context (e.g., whether the pregnancy was initially intended and  
1455 terminated because of fetal anomalies ), and inclusion of covariates across  
1456 analyses and studies that varied for unspecified reasons (see Table 1). Yet  
1457 another problem with this data set is that women who deliver a child are more  
1458 likely to be eligible for Medi-Cal because they have a baby, independent of their  
1459 own characteristics. Women who have an abortion may qualify for the abortion,  
1460 but those who remain on Medi-Cal post abortion (and who hence would be  
1461 picked up in the follow-up measurement) would have to have other  
1462 characteristics besides motherhood to qualify (e.g., mental illness, other illness,  
1463 poverty not associated with parenthood).

1464  
1465 The Medi-Cal findings with regard to cause of death (Reardon et al., 2002)  
1466 can be compared with record-based studies conducted in Finland that are based  
1467 on the entire population of the nation (Gissler, Hemminki, & Lonnqvist, 1996;  
1468 Gissler et al., 1997), albeit from a differing cultural context. These studies also  
1469 found significantly higher rates of pregnancy-associated deaths for natural and  
1470 violent causes (including accidents, homicide and suicide) in the abortion group  
1471 compared with a delivery group. Like the Medi-Cal studies, these studies also  
1472 had methodological limitations, including lack of information about pregnancy  
1473 wantedness and lack of assessment of other critical variables known to co-vary  
1474 with both pregnancy outcome and mental health (e.g., prior reproductive history,  
1475 prior mental health problems, violence exposure, etc).

1476  
1477 The largest and most methodologically rigorous Finland study used  
1478 definitions provided by the American College of Gynecology (ACOG) to analyze  
1479 direct pregnancy-related deaths (deaths occurring within one year of end of  
1480 pregnancy from causes related to or aggravated by the pregnancy or its  
1481 management, but not from accidental or incidental causes) separately  
1482 from pregnancy-associated (deaths occurring within one year from end of  
1483 pregnancy, regardless of cause of death) (Gissler, Berg, Bouvier-Colle, &  
1484 Buekens, 2004b). These analyses revealed that women in the abortion group had  
1485 lower rates of pregnancy-related deaths than women in the delivery group (1.3  
1486 vs. 3.9 per 100,000 pregnancies), but higher rates of pregnancy-associated  
1487 deaths. However, when therapeutic abortions were excluded from the category of  
1488 pregnancy-associated deaths, women in the abortion group no longer had higher  
1489 pregnancy-associated death rates than women in the delivery group. This study  
1490 affirms the importance of making a distinction between pregnancy-related and  
1491 pregnancy-associated deaths in drawing valid conclusions about the association  
1492 between abortion (vs. delivery) and subsequent risk for various causes of death  
1493 and also establishes the importance of separating therapeutic from elective  
1494 abortions when attempting to draw such conclusions.

1495

1496 The most consistent findings across the Medi-Cal and Finland record-  
 1497 based studies were the higher rates of violent death for women in the abortion  
 1498 group. In the Finland study described above, women in the abortion group had  
 1499 higher rates of violent pregnancy-associated deaths, and a higher proportion of  
 1500 their overall pregnancy-associated deaths were due to violent causes (Gissler et  
 1501 al., 2004b). In interpreting this finding, it is useful to recall the distinction between  
 1502 risk and cause discussed above. Abortion is a marker of risk for violence, not a  
 1503 cause of violence. Thus it is important to control for violence exposure in studies  
 1504 of pregnancy outcome.

1505

1506 **2. Secondary analyses of survey data.** Fifteen papers based on  
 1507 secondary analyses met inclusion criteria for our review. These were based on  
 1508 nine data sets. Eight data sets were from the United States: Five were based on  
 1509 U.S. national probability surveys, and three were based on local metropolitan  
 1510 area surveys. One paper was based on analyses of the longitudinal New Zealand  
 1511 Christchurch Health and Development survey. Key findings and methodological  
 1512 limitations of these studies are summarized in Table 2.

1513

1514 *National Longitudinal Survey of Youth (NLSY).* The NLSY has been the  
 1515 data set used most frequently to examine the relationship of abortion to mental  
 1516 health outcomes. The NLSY is a longitudinal national survey of a cohort of males  
 1517 and females aged 14-21 years in 1979. Papers meeting our inclusion criteria  
 1518 assessed the following outcome variables: self-esteem measured in 1987 (2  
 1519 studies), risk for depression measured in 1992 (3 studies), and substance use  
 1520 measured in 1988 (1 study). This set of papers demonstrates the problems of  
 1521 trying to base conclusions about the mental health effects of abortion on  
 1522 secondary analyses of data sets collected for other purposes. Conclusions of  
 1523 researchers analyzing this same data set and even the same dependent variable  
 1524 varied markedly depending on sampling and analytic strategy.

1525

1526 Self-esteem. The first of the abortion studies to be based on this data set  
 1527 focused on self-esteem as measured by the Rosenberg self-esteem scale (RSE;  
 1528 Rosenberg, 1965). This first study (Russo & Zierk, 1992) analyzed a total sample  
 1529 of 5,295 women (773 of whom reported having at least one abortion). Women  
 1530 who had an abortion had mean RSE scores comparable to those of all women  
 1531 (33.3 vs. 33.2, respectively); women who had one abortion also had significantly  
 1532 higher RSE in 1987 than the other two groups (women with no abortions, women  
 1533 with repeat abortions), although the relationship was extremely small. When  
 1534 contextual variables were controlled (education, income, employment, marriage,  
 1535 number of children, whether the pregnancy was wanted or unwanted), however,  
 1536 neither having one abortion nor repeat abortions was related to subsequent self-  
 1537 esteem. After eliminating from the study women who had an abortion before RSE  
 1538 was measured in 1980, further analyses found that preexisting self-esteem was  
 1539 the most important predictor of 1987 RSE, followed by having more education,  
 1540 higher income, employment, and fewer children.

1541

1542 This study reported a number of relationships that have implications for  
1543 what should be controlled when analyzing NLSY data, especially the importance  
1544 of controlling for wantedness of pregnancy and separating women with one  
1545 abortion from those having repeat abortions. The number of abortions was  
1546 slightly but significantly and positively correlated with unwanted births ( $r = .11$ ).  
1547 Furthermore, repeated unwanted pregnancy, regardless of pregnancy outcome  
1548 (birth or abortion), was significantly correlated with greater likelihood of living in  
1549 poverty ( $r = .15$ ) and lower education ( $-.13$ ).<sup>1</sup>  
1550

1551 Depression risk. Using a very different approach, three studies focused on  
1552 the effects of first pregnancy outcome (abortion vs. delivery) on risk for  
1553 subsequent depression (measured in 1992 by the Center for Epidemiological  
1554 Studies-Depression scale (CES-D; Radloff, 1977). Reardon and Cogle (2002a)  
1555 focused on *unintended* first pregnancy outcome (abortion vs. delivery). After  
1556 correcting an initial coding error, they reported analyses controlling for age at first  
1557 pregnancy, race, marital status, and whether the woman was in her first  
1558 marriage. They also attempted to control for prior mental health by including only  
1559 women who had completed an abbreviated Internal-External Locus of Control  
1560 scale (I-E Scale; Rotter, 1966), assessed in 1979, prior to having a first  
1561 pregnancy. Among all women, 25% of the delivery group exceeded the CES-D  
1562 cutoff score for depression ( $>15$ ) compared to 27% of the abortion group, a  
1563 nonsignificant difference. Among married women in this subsample, a  
1564 significantly higher percentage of women in the abortion group (26%) than in the  
1565 delivery group (19%) exceeded the CES-D cutoff score. Among unmarried  
1566 women in this subsample, the findings were reversed, although not statistically  
1567 significant (36% vs. 29%).  
1568

1569 Cogle et al. (2003) published another paper also focusing on first-  
1570 pregnancy outcome (abortion vs. delivery) relative to the same outcome variable,  
1571 1992 CES-D. This study is based on essentially the same sample as the  
1572 previous one with the primary difference being that women with wanted  
1573 pregnancies were also included in the delivery group. Again, a larger percentage  
1574 of women in the abortion group exceeded the CES-D cutoff score for depression  
1575 compared with women in the delivery group.  
1576

1577 Both of these studies are characterized by a number of problems, the  
1578 most important of which are the miscoding of the first pregnancy variable and the  
1579 differential exclusion of women having subsequent abortions only from the  
1580 delivery group (see Table 2 for details).  
1581

1582 In an effort to redress these problems, Schmiege and Russo (2005)  
1583 reexamined depression risk in the NLSY. Using codes provided by the NLSY  
1584 staff, they identified a sample of 1744 women as having an unwanted first  
1585 pregnancy. (They, too, had a coding error in their initial article, but it did not affect  
1586 the pattern and significance of their findings when corrected. After a series of  
1587 interchanges in which they addressed criticisms of their approach, we report here

1588 the findings based on the corrected codes verified by the NLSY staff and  
1589 published with the analyses.) First, Schmiege and Russo found that the sampling  
1590 strategy that Reardon and Cogle (2002a) and Cogle et al. (2003) had used to  
1591 control for prepregnancy psychological state (which was to include only those  
1592 women who had completed the Rotter I-E scale in 1979 prior to their first  
1593 pregnancy) resulted in excluding from their sample the women who had the  
1594 highest risk for depression—those who had delivered at a younger age.  
1595 Significantly more women who had delivered pre-1980 exceeded the CESD  
1596 cutoff score (33.5%) than who had an abortion pre-1980 (26.5%). Like Cogle et  
1597 al. (2003), they controlled for age of first pregnancy, race, education, and family  
1598 income. However, instead of excluding women based on previous marriage, they  
1599 considered it more appropriate to maximize generalizability by controlling for  
1600 marital status. When Schmiege and Russo analyzed the full sample (not  
1601 restricted on the basis of I-E scores), they found no significant differences in  
1602 depression between the abortion and delivery groups when race, age at first  
1603 pregnancy, 1992 marital status, education, and family income were controlled:  
1604 28.3% of women in the delivery group exceeded the CESD cutoff score  
1605 compared to 25% of the abortion group, a nonsignificant difference. ✓

1606  
1607 They also examined the implications of the practice of differentially  
1608 excluding all women who had subsequent abortions from only the delivery group  
1609 (but not from the abortion group) by comparing abortion and delivery groups with  
1610 women having subsequent abortions excluded from *both* groups. Using this  
1611 approach, significantly more women in the delivery group (28.1%) than the  
1612 abortion group (20.7%) exceeded the CESD cutoff score ( $p. <01$ ). These  
1613 analyses illustrate that the sampling and exclusion strategies researchers use to  
1614 analyze secondary data sets can dramatically alter the conclusions reached  
1615 regarding the relative risks for depression accompanying childbirth versus  
1616 abortion. When attempting to examine the effects of first pregnancy outcome, it is  
1617 important to control for both number of subsequent abortions and number of  
1618 subsequent births in both groups. ✓

1619  
1620 Substance use. Reardon et al. (2004) used NLSY data to examine  
1621 substance abuse among 535 women who had terminated a first unintended  
1622 pregnancy compared with 213 women who had delivered a first unintended  
1623 pregnancy and 1144 women who had never been pregnant. These researchers  
1624 again excluded women pregnant before 1980 (i.e., those known to be at a  
1625 significantly higher risk for depression than other women in the sample and more  
1626 likely to be found in the delivery group; Schmiege & Russo, 2005). They also  
1627 excluded women who had subsequent abortions from only the delivery group. In  
1628 this subsample, controlling for prepregnancy I-E and RSE, age, race, marital  
1629 status, income, and education, few significant differences were found between  
1630 groups in reported substance use. The exceptions were that women in the  
1631 abortion group reported drinking on more days in the last month than the delivery  
1632 group (6.4 vs. 4.8), but not on more days than the never pregnant group (5.9%).  
1633 They were also more likely to report using marijuana in the last month (18.6%)

1634 than did women in the delivery (7.9%) or never pregnant (7.9%) groups. These  
1635 researchers did not control for history of drug use prior to the first pregnancy in  
1636 their analyses despite the availability of this information in the data set and  
1637 despite published findings in the literature that linked such drug abuse to later  
1638 reproductive outcomes including likelihood of having an abortion (Mensch &  
1639 Kandel, 1992; Rosenbaum & Kandel, 1990).

1640  
1641 Evaluation of NLSY studies. Conclusions drawn from the NLSY about the  
1642 mental health effects associated with abortion vary markedly by analytical  
1643 strategy. Although the design of NLSY is longitudinal, like all survey data, it is  
1644 correlational, making causal claims inappropriate. Collectively, these studies  
1645 have a number of methodological limitations beyond those described above that  
1646 make it difficult, if not impossible, to interpret the meaning of the correlations that  
1647 are reported (see Table 2). Perhaps most importantly, none of these studies  
1648 adequately controls for preexisting mental health or other important co-occurring  
1649 risk factors prior to abortion or delivery (the Rotter I-E is not a measure of prior  
1650 mental health), making it difficult to interpret the meaning of correlations  
1651 observed between abortion and a mental health outcome. Covariates included in  
1652 analyses varied across studies for unspecified reasons. Likewise, some  
1653 contextual variables, such as marital status, that were shown in some studies to  
1654 moderate results were not examined as moderators in other studies,  
1655 compounding difficulties of comparing across studies. Further, some variables  
1656 that were present in the NLSY and known to be related to the outcome variable  
1657 under consideration (e.g., prior substance abuse) were omitted as covariates in  
1658 analyses of that outcome variable. Analyses were often based on small  
1659 subgroups or subgroups for which no sample size was provided. On the other  
1660 hand, the overall large sample sizes used for some analyses mean that small  
1661 effects that are statistically significant may have little clinical significance.

1662  
1663 Although initially based on a national probability sample, the ability to  
1664 assess prevalence of mental health problems among women who have abortions  
1665 from this data set is limited because (1) abortion has been underreported in the  
1666 NLSY compared with national norms; (2) sample weights, required to construct  
1667 population estimates from the data, were not used in the analyses of any of the  
1668 studies; and (3) the measurement of mental health outcomes was limited to self-  
1669 esteem, depression risk, and substance abuse. No actual measures of  
1670 psychopathology were included.

1671  
1672 The potentially strongest designs focused on mental health outcomes  
1673 associated with unintended first pregnancy. However, the practices of excluding  
1674 women who became pregnant at a young age (before 1979 or 1980) and  
1675 differentially excluding women having abortions subsequent to first pregnancy  
1676 from the delivery group but not the abortion group were shown to bias results  
1677 toward overestimating adverse effects of abortion in this data set. In the one  
1678 study focusing on first pregnancy that did not use differential exclusion and was  
1679 based on codes provided by NLSY staff, the proportion of women who met or



1680 exceeded the CESD cutoff scores did not significantly differ between abortion  
1681 (25%) and delivery (28.3%) groups (Schmiege & Russo, 2005).

1682 *Washington, DC, Metropolitan Area Drug Study.* Coleman, Reardon, and  
1683 Cogle (2005) used this public release data set to examine substance use during  
1684 pregnancy as a function of reported reproductive history. The initial sample,  
1685 which consisted of 1,020 women interviewed after giving birth in Washington,  
1686 DC, area hospitals in 1992, was predominantly never married, Black, of low  
1687 socioeconomic status, and oversampled for low birth weight and preterm infants,  
1688 and self-reported drug use. Of these cases, Coleman et al. (2005) selected those  
1689 who in their interview reported no abortions, one abortion, or multiple abortions  
1690 prior to their recent pregnancy and examined their reported drug use during their  
1691 recent pregnancy (see Table 2). Adjusted for age, income, and number of people  
1692 living in the house, a statistically higher odds ratio was reported for the use of  
1693 legal and illegal substances during the index pregnancy if the woman had  
1694 reported one prior abortion compared with no abortions, but not if she had  
1695 reported multiple abortions compared with no abortions (with the exception of  
1696 use of cigarettes during pregnancy). Notably, these analyses did not control for  
1697 history of drug use prior to the pregnancy. They also did not control for the  
1698 wantedness of the pregnancy, although those data were available in the data  
1699 set. Because this study is based on a specialized sample, estimates of mental  
1700 health problems among women in the United States who have an abortion  
1701 cannot be determined from this study.

1702 *National Pregnancy and Health Survey.* Coleman, Reardon, Rue, and  
1703 Cogle (2002a) used data from this survey conducted in 1992 to examine the  
1704 association between retrospective reports of a previous abortion and use of  
1705 alcohol, cigarettes, or illicit drugs during the most recent pregnancy. The initial  
1706 sample consisted of 2,613 women who participated shortly after giving birth in  
1707 hospitals within the United States. The women wrote down answers in response  
1708 to interviewer questions; responses were concealed from the interviewer.  
1709 Samples selected for analysis were limited to three groups who had recently  
1710 given birth: women with one previous pregnancy resulting in an induced abortion  
1711 ( $n = 74$ ), women with one previous pregnancy resulting in live birth ( $n = 531$ ), and  
1712 women with no previous pregnancies ( $n = 738$ ). The majority of the women were  
1713 White, married, and employed full-time. Dichotomous measures of drug and  
1714 alcohol use during most recent pregnancy were used as outcome variables.  
1715 Analyses revealed that women who reported a previous abortion also reported  
1716 higher rates of any illicit drug use, marijuana use, and alcohol use than did  
1717 women who had one previous live birth or were first-time mothers. The  
1718 researchers adjusted for sociodemographic covariates by stratifying those related  
1719 to substance use outcomes and conducting separate analyses for each level of  
1720 these variables. Although these analyses identified some differences in the  
1721 relationship of reproductive history to alcohol and drug use for different levels of  
1722 marital status, income, and other demographic variables, findings are suspect  
1723 because of the small number of participants in the abortion group and the failure

1724 to correct for the relatively large number of significance tests. Other limitations  
1725 include the absence of controls for wantedness of the recent pregnancy, history  
1726 of drug use prior to the pregnancy, or previous mental health.

1727

1728 *Fertility and Contraception Among Low-Income Child Abusing and*  
1729 *Neglecting Mothers in Baltimore, MD, 1984-1985 (Baltimore Study).* Coleman,  
1730 Maxey, Rue, and Coyle (2005) analyzed this data set to examine the association  
1731 between self-reported abortion or miscarriage/stillbirth history and child abuse  
1732 and/or neglect, as identified by Child Protective Services. The purpose of the  
1733 original study had been to study family patterns and contraceptive use among  
1734 maltreating mothers. Samples of 118 physically abusive mothers, 119 neglecting  
1735 mothers, and 281 mothers without maltreatment offences were selected from a  
1736 sample of 518 mothers who were receiving Aid to Families With Dependent  
1737 Children (79.9% Black and 93.2% unemployed). In an in-home interview, 159 of  
1738 these women reported having had at least one abortion, and 133 reported at  
1739 least one miscarriage or stillbirth (both occurring on average 6-7 years  
1740 earlier). Controlling for a large number of single-item covariates found in  
1741 preliminary analyses to be associated with maltreatment (and that varied  
1742 depending on their association with the outcome variable, e.g., education was  
1743 controlled only in the analyses on physical abuse; employment controlled only in  
1744 the analyses on neglect), women reporting one abortion were not more likely  
1745 than those reporting no abortions to be in the child neglect group but were  
1746 significantly more likely to be in the physical abuse group. History of multiple  
1747 induced abortions, however, was not related to increased risk for either abuse or  
1748 neglect. In contrast, maternal history of multiple miscarriages and/or stillbirths  
1749 compared with no history was associated with increased risk of both child  
1750 physical abuse and neglect. Because this study is based on a highly specialized  
1751 sample, findings cannot be generalized to the population of women in the United  
1752 States.

1753

1754 *Health of American Women Survey.* Russo and Denious (2001) used data  
1755 from this survey, sponsored by the Commonwealth Fund, to examine correlations  
1756 among abortion history, violence history, and mental health outcomes. This  
1757 telephone survey was based on a national sample of men and women 18 years  
1758 of age or older, with oversampling of ethnic minorities. Among the 2,525 women  
1759 surveyed, 324 reported having had an abortion to the interviewer. Compared with  
1760 other women, a larger percentage of women in the abortion group reported  
1761 experiencing suicidal thoughts in the past year and having a doctor give them a  
1762 diagnosis of anxiety or depression in the past 5 years. Having an abortion was  
1763 also slightly but significantly correlated with higher depressive symptoms and  
1764 lower life satisfaction. When violence history and relevant demographic and  
1765 partner variables were controlled, however, abortion was no longer significantly  
1766 related to diagnoses of depression or anxiety, CES-D score, or the life  
1767 satisfaction measure. This study, like the others of this type, has several  
1768 limitations. Abortion history was assessed through self-report (in this case over  
1769 the phone), and the rate of reported abortions was low compared with national

1770 norms, raising concerns about biases associated with underreporting. It cannot  
1771 be determined from this data set whether the abortion took place before or after  
1772 the violence occurred, or whether diagnoses of anxiety or depression occurred  
1773 pre- or post abortion. In addition, sampling weights were not used.  
1774

1775 *National Survey of Family Growth (NSFG)*. Cogle et al. (2005) used data  
1776 from the 1995 NSFG to examine the association between outcome of first-  
1777 unintended pregnancy (abortion vs. delivery) and an occurrence of “generalized  
1778 anxiety” lasting more than 6 months (defined by a cutoff score). All variables—  
1779 reproductive history, episodes of anxiety, as well as the timing of those episodes  
1780 with respect to pregnancy— were determined retrospectively via self-reports,  
1781 raising questions about reliability and underreporting of abortion. As in their  
1782 earlier studies, women with subsequent abortions were differentially excluded  
1783 from the delivery group but not the abortion group. Controlling for race and age at  
1784 interview, women in the abortion group were more likely to be classified as  
1785 having had an episode of generalized anxiety postpregnancy than women in the  
1786 delivery group (13.7% vs. 10.1%). Sample weights were not used, so these  
1787 percentages cannot be used for normative estimates. Although information on  
1788 rape history, known to be related to both unintended pregnancy and anxiety, was  
1789 in the data set, it was not controlled. The anxiety items were not congruent with  
1790 the DSM definition of generalized anxiety disorder, raising questions about the  
1791 clinical significance of the outcome variable.  
1792

1793 *National Longitudinal Study of Adolescent Health (ADD-Health)*. Two  
1794 studies were based on the ADD-Health data set, a longitudinal, nationally  
1795 representative, school-based survey of adolescents. Coleman (2006a) analyzed  
1796 data from the ADD-Health to examine the relationship between reproductive  
1797 history and various problems in adolescents. From a much larger sample of  
1798 students who had completed an in-school questionnaire at Wave I ( $N = 90,118$ )  
1799 and a computer-assisted home interview at Wave II ( $N = 12,105$ ), Coleman  
1800 selected adolescents in grades 7 through 11 who had completed both Wave I  
1801 and Wave II and who reported experiencing a pregnancy they described as “not  
1802 wanted” or “probably not wanted” that was resolved through abortion ( $n = 65$ ) or  
1803 delivery ( $n = 65$ ). She then examined the likelihood that adolescents who  
1804 reported abortion versus delivery also reported receiving counseling for  
1805 psychological or emotional problems, having trouble sleeping during the past  
1806 year, using cigarettes or marijuana during the past 30 days, using alcohol during  
1807 the past year, or reported having problems with parents because of alcohol use.  
1808 All outcomes were assessed with single-item measures. Adjusted for covariates  
1809 previously shown to differ between the two groups (risk-taking and desire to  
1810 leave home), girls who reported an abortion were more likely than girls who  
1811 delivered to say they had ever had counseling, trouble sleeping during the past  
1812 year, and used marijuana in past 30 days. No differences were observed on  
1813 frequency of alcohol use or cigarette smoking.  
1814

1815 Strengths of this study included the use of a comparison group of girls  
1816 who delivered unwanted pregnancies, the weighting of design factors in the  
1817 analyses, and efforts to enhance the accuracy of self-reports of sensitive topics  
1818 (respondents listened to prerecorded questions through earphones and entered  
1819 their own answers). Nonetheless, problems of sampling and measurement limit  
1820 the utility of this study. The extremely small number of girls in the eventual  
1821 sample analyzed ( $N=130$ ), especially given the very large original sample (of  
1822 approximately 6,000 girls), raises questions about underreporting, drop-out rates,  
1823 and exclusion criteria. Given that the sample is school-based, adolescents who  
1824 drop out of school to care for a child would not be included in the study. The  
1825 single-item measures of psychological problems are psychometrically weak and  
1826 clinically suspect. Because the percentages and  $N$ s for outcome variables were  
1827 not reported, the frequency with which problems occurred cannot be determined.  
1828 Furthermore, the measure of counseling asked whether the respondent had ever  
1829 received counseling for psychological or emotional problems—it cannot be  
1830 determined from this item whether counseling occurred prior or subsequent to  
1831 the pregnancy.

1832  
1833 Hope, Wilder, and Watt (2003) used data from the ADD-Health study  
1834 (Waves I and II) to examine the relationships among adolescent pregnancy,  
1835 pregnancy resolution, and delinquent behavior. Although delinquency includes  
1836 behaviors that are not part of the mental health focus of this review (e.g., lying to  
1837 parents/guardian, taking part in a fight), one domain of delinquent behavior  
1838 examined (alcohol use, use of illegal substances) is within the purview of this  
1839 review. Thus, we focus here on longitudinal analyses examining the relationship  
1840 between pregnancy resolution and substance use. In a set of prospective  
1841 analyses focusing on adolescent girls who became pregnant between Wave I  
1842 and II of the survey, Hope et al. examined the relationship of pregnancy  
1843 resolution (abortion vs. kept baby) to reports of having smoked cigarettes or  
1844 marijuana at least 1 day in the past 30 days. These comparisons of the abortion  
1845 and “kept baby” groups excluded girls who experienced pregnancies prior to  
1846 Wave I as well as those who miscarried or were still pregnant at Wave II.

1847  
1848 Young women who had abortions reported higher rates of cigarette  
1849 smoking and marijuana use than young women who kept their baby, both prior to  
1850 their pregnancy (Wave I) and subsequent to their pregnancy (Wave II). Keeping  
1851 the baby was associated with a decrease in reported cigarette or marijuana use  
1852 between the two waves of data collection, leading the authors to conclude that  
1853 adolescent motherhood functions as a social control on delinquent behavior. In  
1854 contrast, having an abortion was not associated with a change in rates of  
1855 smoking or marijuana use from Wave I to Wave II, leading the authors to  
1856 conclude that terminating a pregnancy through abortion does not increase the  
1857 likelihood of delinquent behavior or substance use.

1858  
1859 In addition to strengths and weaknesses of the ADD-Health school-based  
1860 database described above, this study is limited by single-item measures of

1861 cigarette and marijuana use that are psychometrically weak. Furthermore,  
1862 despite the large initial sample size of over 6,000 girls, the number of pregnant  
1863 girls (69 who had abortions, 87 who kept their baby) in the final sample was  
1864 small.

1865  
1866 *The Harvard Study of Moods and Cycles.* Harlow, Cohen, Otto,  
1867 Spiegelman, and Cramer (2004) used data from a cross-sectional sample of  
1868 4,161 women between 36-45 years of age residing in the Boston metropolitan  
1869 area to examine the relationship of early life menstrual-cycle characteristics and  
1870 reproductive history to onset of major depression later in life. They analyzed data  
1871 from a subsample of 332 women who met DSM criteria for having had major  
1872 depression and 644 women with no current or past history of major depression.  
1873 In-person interviews were used to establish mental health status and to gather  
1874 information on demographic and lifestyle characteristics, menstrual and  
1875 reproductive history, past and current medical conditions, and use of hormonal  
1876 and nonhormonal medications. Relevant analyses examined the link between  
1877 lifetime history of depression and abortion history. There were no significant  
1878 differences between the proportion of women with a lifetime history of major  
1879 depression (19.3%) who reported having one abortion and the proportion of  
1880 women with no history of depression (17.9%) who reported having had one  
1881 abortion. However, women with a lifetime history of depression were significantly  
1882 more likely to report having had multiple abortions before their first onset of  
1883 depression than were nondepressed women, controlling for age, age at  
1884 menarche, educational attainment, and marital disruption. Direct comparisons  
1885 between women reporting abortion versus delivery were not conducted. The  
1886 researchers also reported a strong association between depression and marital  
1887 disruption, underscoring the importance of controlling for marital status when  
1888 seeking to assess the independent contribution of abortion to depression risk.  
1889 The researchers pointed out that the higher proportion of women with multiple  
1890 abortions found in the depressed versus nondepressed group may reflect a  
1891 variety of antecedent conditions that were not assessed in the study, including  
1892 involvement in abusive relationships. A particular strength of this study is its  
1893 measurement of a clinically significant mental health disorder (depression) with  
1894 established diagnostic criteria. In addition to the usual issues involved with a  
1895 cross-sectional study that relies on retrospective self-report, study limitations  
1896 include the possibility of a selective recall bias on the part of depressed women,  
1897 and lack of information on pregnancy intention or wantedness, whether or not  
1898 abortions were for therapeutic reasons, and women's exposure to violence.

1899  
1900 *New Zealand Christchurch Health and Development Study.* The most  
1901 comprehensive of the secondary analysis studies in terms of assessment of  
1902 mental health outcomes was conducted in New Zealand (NZ). Fergusson et al.  
1903 (2006) analyzed data from a 25-year longitudinal study of a cohort of children  
1904 (including 630 females) born in 1977 in the Christchurch, NZ, urban region who  
1905 were studied from birth to age 25 years. Information was obtained on (a) the self-  
1906 reported reproductive history of participants from 15-25 years (abortion, delivery,

1907 or never pregnant); (b) measures of DSM-IV mental disorders (including major  
 1908 depression, overanxious disorder, generalized anxiety disorder, social phobia,  
 1909 and simple phobia) and suicidal behavior for intervals 15-18, 18-21, and 21-25  
 1910 years; and (c) childhood, family, and related confounding factors, including  
 1911 measures of child abuse.

1912  
 1913 In a series of concurrent analyses adjusting for covariates such as greater  
 1914 childhood social and economic disadvantage, family dysfunction, and individual  
 1915 adjustment problems in the abortion group, Fergusson et al. (2006) found that  
 1916 women in the abortion group had significantly higher rates of concurrent  
 1917 depression, suicidal ideation, illicit drug dependence, and total number of mental  
 1918 health problems than the delivery group. Concurrent analyses also indicated that  
 1919 except for alcohol and anxiety disorder, the abortion group had significantly  
 1920 higher rates of these disorders than the never pregnant group. More important,  
 1921 however, are the prospective analyses reported, as these capitalize on the  
 1922 longitudinal strengths of the study. The authors conducted a prospective analysis  
 1923 using reproductive history prior to age 21 years to predict total number of mental  
 1924 health problems experienced from 21-25 years (samples were too small to permit  
 1925 analyses by disorder). Controlling for covariates, the abortion group had a  
 1926 significantly higher number of disorders than the other two groups, which did not  
 1927 differ significantly from each other.

1928  
 1929 This study is unusual in the quality of measurement of the mental health  
 1930 variables, range of outcomes assessed, and number of co-occurring risk factors  
 1931 controlled. However, several design features limit conclusions that can be drawn  
 1932 from this study. First, neither wantedness nor intentionality of pregnancy was  
 1933 controlled. Second, women with multiple abortions were not separated from  
 1934 women with one abortion (21.6% of the abortion group had more than one  
 1935 abortion).<sup>2</sup> Third, as with other survey studies of this type, comparisons of  
 1936 reported abortions with population data suggest that abortion was underreported  
 1937 in this sample, although not to a great extent. Finally, differing abortion  
 1938 regulations between the United States and NZ also mean that caution should be  
 1939 used in generalizing from these studies to women in general in the United States.

1940 In order to obtain a legal abortion in NZ, a woman must obtain the  
 1941 approval of two specialist consultants, the consultants must agree that either (1)  
 1942 the pregnancy would seriously harm the life or the physical or mental health of  
 1943 the woman, (2) the pregnancy is the result of incest, (3) the woman is severely  
 1944 mentally handicapped, or (4) a fetal abnormality exists. An abortion will also be  
 1945 considered on the basis of the pregnant woman's young age or when the  
 1946 pregnancy is the result of rape.

1947  
 1948 **3. Evaluation of record-based and secondary analysis studies.** In  
 1949 weighing the evidence regarding abortion and mental health derived from the  
 1950 record-based and secondary analysis studies reviewed above, it must be kept in  
 1951 mind that the body of evidence is not as large as it appears. The 10 studies  
 1952 based on medical records are based on two data sets, one from the United

1953 States and one from Finland. The 15 studies based on secondary analyses of  
 1954 survey data are based on nine data sets, eight from the United States and one  
 1955 from New Zealand. Given that caution, what can be concluded from examination  
 1956 of these studies? An answer to that question requires considering their  
 1957 methodological quality.

1958  
 1959 *Problems of sampling.* First, many of the above studies cannot be  
 1960 generalized to the majority of women in the United States who seek abortions.  
 1961 Some are based on specialized data sets not representative of women in general  
 1962 (e.g., Coleman, Maxey, et al., 2005; Coleman, Reardon, et al 2005), some used  
 1963 screening criteria that eliminated a huge proportion of the larger sample (e.g., all  
 1964 of the Medi-Cal studies), some differentially excluded women from one outcome  
 1965 group but not the other (Reardon & Cogle, 2002a), and some were based on  
 1966 samples of women who obtained abortions under more restrictive regulations  
 1967 (Fergusson et al., 2006). Only one of the above studies based on survey data  
 1968 used sampling weights in its analyses (Coleman, 2006a). The study by Coleman  
 1969 (2006a), which did use sample weights, used a school-based population that did  
 1970 not include the most disadvantaged adolescents—those who dropped out of  
 1971 school to care for a child.

1972  
 1973 *Problems of comparison groups.* Although it is necessary to control for  
 1974 wantedness of pregnancy to assess a pregnant woman's mental health risks if  
 1975 she were to choose abortion compared to its alternatives, only three data sets  
 1976 (the NSFG, ADD-Health, and NLSY data sets) included questions about the  
 1977 intendedness or wantedness of pregnancy. Even when this information was  
 1978 available, it was not always used (Cogle et al., 2003). In addition, interpretation  
 1979 of differences observed between the abortion and delivery groups was often  
 1980 compromised by differential exclusions from the delivery group.

1981  
 1982 *Problems in measurement of independent variables.* Other than the  
 1983 studies based on medical records, all of the studies reviewed above established  
 1984 abortion history through retrospective self-reports, raising serious reliability  
 1985 concerns. Few of the above studies took adequate steps to enhance the  
 1986 accuracy of reports of sensitive data. Thus, not surprisingly, abortion was  
 1987 underreported relative to national norms in all of the studies based on survey  
 1988 data. Furthermore, because none of these public data sets was designed  
 1989 specifically to identify the mental health effects of abortion compared with its  
 1990 alternatives, none provides adequate information about the characteristics of the  
 1991 abortion experience, such as the length of gestation at time of the abortion, age  
 1992 at which the abortion occurred, the reason for having the abortion (including  
 1993 medical reasons), and wantedness of the pregnancy. This information is not  
 1994 available for the medical record studies either. Such data are essential to  
 1995 understand the psychological implications of abortion.

1996  
 1997 *Problems in measurement of outcomes.* Studies based on secondary  
 1998 analysis of survey data typically did not use standard measures of mental health.

1999 Some studies were based on single-item measures of outcomes (e.g., Coleman,  
 2000 2006a); others used an unvalidated measure of a psychological problem (e.g.,  
 2001 Cogle et al., 2005) or only one or two measures of general psychological well-  
 2002 being (e.g., Russo & Zierk, 1992). Only two of the studies based on survey data  
 2003 (Fergusson et al., 2006; Harlow et al., 2004) used psychometrically strong  
 2004 assessments of clinically significant outcomes (i.e. a diagnosis). Further, in some  
 2005 cases, it was impossible to determine whether the "outcome" variable occurred  
 2006 prior or subsequent to the abortion (Coleman, 2006a; Cogle et al., 2005; Russo  
 2007 & Denious, 2001). Although less severe, there are problems with outcome  
 2008 measurement in the Medi-Cal data as well. Only one study (Gissler et al., 2004b)  
 2009 made an attempt to separate out therapeutic abortions from elective abortions, a  
 2010 distinction shown to be critical by the Finnish researchers.

2011  
 2012 *Confounds and co-occurring risks.* Researchers relying on secondary  
 2013 analysis of both medical records and survey data collected for other purposes  
 2014 only have access to variables collected in those data sets. As a consequence,  
 2015 key variables that have documented relationships with both pregnancy outcome  
 2016 and mental health and which are thus potential confounders of any observed  
 2017 relationship between those variables may not be included in the data set. These  
 2018 include, for example, measures of prior substance abuse, prior or ongoing  
 2019 exposure to sexual abuse or partner violence, poverty, number of current  
 2020 children, number of prior unwanted pregnancies and prior unwanted births (both  
 2021 of which are correlated with number of abortions), and, most importantly,  
 2022 adequate measures of mental health prior to pregnancy. Only one of the 23  
 2023 studies reviewed above (Fergusson et al., 2006) contained adequate measures  
 2024 of mental health prior to the pregnancy. In addition, with regard to the studies that  
 2025 focus on low-income populations (Medi-Cal studies, Washington study, Baltimore  
 2026 study), such populations are more likely to be in poor health, which itself is  
 2027 associated with psychological problems. Given that pregnant women who have  
 2028 serious illnesses such as diabetes, AIDS, and heart disease may be advised  
 2029 to have an abortion for health reasons, the correlation of abortion and physical  
 2030 and mental health problems might be expected to be higher in low-income  
 2031 populations.

2032  
 2033 *Problems with statistical analyses.* Large public data sets, particularly  
 2034 multiyear data sets, are complex and have an enormous number of variables  
 2035 from which to select for a particular analysis. As seen by the studies above that  
 2036 have published corrections of coding errors (e.g., Reardon & Cogle, 2002b;  
 2037 Schmiege & Russo, 2005), it is easy to make mistakes in the construction of  
 2038 variables. Moreover, it is important to have a conceptual rationale for selecting  
 2039 among the large number of potential variables. The variables researchers select  
 2040 to include in reanalyses of the original data reflect the interests (and sometimes  
 2041 the biases) of the researcher doing the reanalysis. The approach to the data  
 2042 analyses reflected in these studies is also of concern. Large numbers of  
 2043 statistical tests were often performed, increasing the probability of finding  
 2044 significant results when there was in fact no effect. The large sample sizes mean



2045 that effect sizes that are a statistically significant may be clinically meaningless.  
2046 On the other hand, analyses were often based on small subgroups or subgroups  
2047 for which no sample size was provided. In addition, results were frequently  
2048 overinterpreted, with one significant finding emphasized over a number that were  
2049 not significant or were in the reverse direction.  
2050

2051 The selection of covariates in these studies also raised serious concerns.  
2052 As noted above, the choice of covariates to include in analyses can play a key  
2053 role in how much variance in the outcome variable is explained by pregnancy  
2054 outcome. Given the large number of variables often assessed in these data sets,  
2055 there is considerable room for researcher discretion in selection of covariates.  
2056 Inclusion of covariates was often based on atheoretical preliminary analyses and  
2057 often varied for unspecified reasons across analyses, even within the same  
2058 study. In some studies, key covariates known to be associated with the outcome  
2059 in question were omitted from the analyses despite their presence in the data set.  
2060 For example, Reardon et al. (2004) used NLSY data to compare alcohol and  
2061 drug use of women who aborted a first pregnancy to those who delivered their  
2062 first pregnancy or were not pregnant. They did not control for history of drug use  
2063 prior to the first pregnancy in their analyses, despite the availability of this  
2064 information in the data set and despite prior published studies based on this  
2065 same data set showing that use of drugs and alcohol predicted onset of early  
2066 sexual activity (Rosenbaum & Kandel, 1990) and was uniquely predictive of  
2067 subsequent premarital teen pregnancy as well as the decision to terminate a  
2068 premarital teen pregnancy (Mensch & Kandel, 1992). As another example, in  
2069 their analysis of the NSFG, Cogle et al. (2005) did not include items assessing  
2070 rape history in their analysis, despite the presence of relevant items in the data  
2071 set and publication of other studies (e.g., Reardon et al., 2002; Russo & Denious,  
2072 2001) suggesting that women who have abortions are at higher risk for rape and  
2073 other forms of violence in their lives.  
2074

#### 2075 **4. Summary of medical-record and secondary analyses studies.**

2076 In sum, our careful evaluation of studies based on secondary analyses of  
2077 medical records and existing public data sets revealed that in general they were  
2078 methodologically quite poor. Problems of sampling, measurement, design, and  
2079 analyses cloud interpretation. Because of the absence of adequate controls for  
2080 co-occurring risks and prior mental health in these studies, it is impossible to  
2081 determine whether any observed differences between abortion groups and  
2082 comparison groups reflect consequences of pregnancy resolution or preexisting  
2083 differences between groups or methodological artifact. Consequently, these  
2084 studies do not provide a strong basis for drawing conclusions regarding the  
2085 relative risks of abortion compared to its alternatives.  
2086

#### 2087 **V. B. Comparison Group Studies Based on Primary Data**

2088  
2089 Seventeen studies were conducted between 1990 and 2007 with the  
2090 primary purpose of comparing women who had a first-trimester abortion (or an

2091 abortion in which trimester was unspecified) to a comparison group of other  
2092 women on a mental health related variable. These studies resulted in 19  
2093 published papers. Details, key findings, and limitations of these studies are  
2094 summarized in Tables 3a and 3b.

2095 .

2096 **1. Description of findings: U.S. samples.** Seven studies were based on  
2097 U.S. samples. These studies are summarized in Table 3a. Cohan et al. (1993)  
2098 examined responses of 33 women 1 month postpregnancy, 21 of whom had  
2099 terminated their pregnancy and 12 of whom continued their pregnancy. Almost all  
2100 had reported that their pregnancy was unintended. There were no significant  
2101 differences between the 21 women who had terminated their pregnancy versus  
2102 the 12 of those who continued their pregnancy on any of the outcomes assessed  
2103 (positive and negative affect and decision satisfaction).

2104

2105 Lydon, Dunkel-Schetter, Cohan, and Pierce (1996) assessed initial  
2106 commitment to a possible pregnancy as well as positive affect and negative  
2107 affect (Derogatis, 1975) among women just prior to obtaining a pregnancy test at  
2108 health clinics in the United States and Canada. For the women who received a  
2109 positive pregnancy result, these variables were reassessed within 9 days (T2)  
2110 and again at 4-7 weeks (T3) after learning of the positive test result. By the T3  
2111 follow-up, 30 women had terminated their pregnancy, and 25 had decided to  
2112 continue their pregnancy. Initial commitment to the possible pregnancy  
2113 (assessed at T1) interacted with outcome decision (abort vs. deliver) to predict  
2114 affect at T3. Among women continuing their pregnancy, those high ( $N=11$ ) and  
2115 low ( $N=12$ ) in initial commitment to the pregnancy did not differ significantly in  
2116 affect at T3. Both expressed more positive than negative affect. Among women  
2117 who had aborted their pregnancy, those who had been initially less committed to  
2118 the possible pregnancy ( $N=13$ ) did not differ significantly in affect from those  
2119 deciding to continue their pregnancy. They too expressed more positive than  
2120 negative affect. The women who had initially indicated somewhat more  
2121 commitment to the possible pregnancy but who decided to terminate the  
2122 pregnancy ( $N=14$ ) reported significantly less positive affect and significantly more  
2123 negative affect than the other three groups. A particular strength of this study is  
2124 its tracking of commitment and affective state over the time course of first  
2125 learning of a pregnancy and its resolution. Other strengths are its strong  
2126 theoretical framework and good measurement of predictor variables. Limitations  
2127 include the very small sample sizes and absence of measures of clinically  
2128 significant mental health outcomes.

2129

2130 The remaining four U.S. studies measured abortion history through  
2131 retrospective self-reporting (see Table 3a). Felton, Parsons, and Hassell (1998)  
2132 found no significant differences on overall health-promoting behaviors, appraisals  
2133 of problem-solving effectiveness, or global self-image between 26 adolescents  
2134 attending a family planning clinic who reported a history of abortion and 26  
2135 demographically matched adolescents who reported never being pregnant.  
2136 Williams (2001) found no significant differences on any of the subscales of the

2137 Grief Experience Inventory between 45 women waiting to see their health care  
 2138 provider who reported a history of abortion and 48 demographically similar  
 2139 women who reported no elective abortions. Medora et al. (1993) found that  
 2140 among a sample of 121 single, never married, pregnant teenagers, the 28 girls  
 2141 who reported a prior abortion had significantly higher self-esteem than the 93  
 2142 girls who reported no abortion history. Medora and von der Hellen (1997)  
 2143 reported that among a sample of 94 teen mothers, teens who reported a prior  
 2144 abortion did not differ in self-esteem from teens who did not report an abortion  
 2145 (number in each group was not specified). The only U.S. study to report that  
 2146 an abortion group had a poorer outcome than a comparison group was  
 2147 conducted by Reardon and Ney (2000). This study was based on a reproductive  
 2148 history questionnaire mailed to the homes of a large sample of women, only  
 2149 14.2% of whom responded. In analyses restricted to White women, women who  
 2150 reported having had at least one induced abortion ( $N = 137$ ) were more likely  
 2151 than women who reported having had no abortions ( $N = 395$ ) to also agree with a  
 2152 single yes/no question: "Have you ever abused drugs or alcohol?"

2153 **2. Description of findings: Non-U.S. samples.** Nine studies were based  
 2154 exclusively on non-U.S. samples. Most were methodologically quite poor (see  
 2155 Table 3b). The most methodologically sound papers were based on a study  
 2156 conducted by Broen and colleagues in Norway (Broen, Moum, Bodtker, Ekeberg,  
 2157 2004, 2005, 2006) and one conducted jointly by the Royal College of General  
 2158 Practitioners and the Royal College of Obstetricians and Gynecologists in the  
 2159 United Kingdom (Gilchrist et al., 1995).

2160 The study by Broen and colleagues followed two groups of Norwegian  
 2161 women from 10 days to 5 years after a first-trimester induced abortion ( $N = 80$ ) or  
 2162 early miscarriage ( $< 17$  weeks;  $N = 40$ ). Experiences of anxiety and depression,  
 2163 avoidance, intrusion stress reactions (assessed with the Impact of Events scale),  
 2164 subjective well-being, and feelings about the pregnancy termination were  
 2165 assessed at four intervals post abortion. Comparisons between the miscarriage  
 2166 and induced abortion groups, controlling for potential confounders, revealed no  
 2167 significant differences between the two groups in mean anxiety or depression  
 2168 scores or subjective well-being scores at any time point. Women who had an  
 2169 induced abortion reported feeling more guilt, shame, and relief and also more  
 2170 avoidance on the IES scale than women who miscarried. Women who miscarried  
 2171 reported more feelings of grief and loss than those who had an induced abortion  
 2172 in the short term, but this difference disappeared by 5 years post event.

2173  
 2174 Strengths of this study included its repeated and long-term follow-up,  
 2175 attempt to control for prepregnancy mental health (although this was assessed  
 2176 retrospectively via self-report and psychiatric evaluation post abortion), use of  
 2177 established and reliable outcome measures, and high retention rate (91%),  
 2178 although only 47% of those initially approached agreed to participate in the study.  
 2179 This study is useful for comparing grief reactions among different forms of  
 2180 pregnancy loss. However, the comparison group used in this study is

2181 inappropriate for drawing conclusions about the relative risks of abortion versus  
2182 its alternatives. A spontaneous miscarriage of a (wanted) pregnancy is not an  
2183 alternative for women faced with a decision about how to resolve an unintended  
2184 or unwanted pregnancy.

2185  
2186 The strongest study reviewed (Gilchrist et al., 1995) was prospective and  
2187 longitudinal and employed a large sample size, appropriate comparison groups  
2188 of women with unplanned pregnancies, and a long postpregnancy/abortion  
2189 follow-up time. Importantly, this study also controlled for mental health prior to the  
2190 pregnancy as well as other covariates. Women's medical, psychiatric, and  
2191 obstetric history prior to the pregnancy was recorded from their medical records  
2192 or the recruiting physicians' case notes. The final sample consisted of four  
2193 pregnancy outcome comparison groups: (a) 6,410 women who obtained  
2194 terminations (85% occurred before 12 weeks of gestation), (b) 6,151 women who  
2195 did not seek termination, (c) 379 who requested termination but were denied, and  
2196 (d) 321 who requested termination but changed their mind.

2197  
2198 Postdelivery/abortion psychiatric morbidity was assessed using  
2199 established diagnoses and grouped into three categories in order of severity: (a)  
2200 psychosis, (c) nonpsychotic illness (e.g., depression, anxiety), and (c) deliberate  
2201 self-harm (DSH) without other psychiatric illness (e.g., drug overdoses). Similarly,  
2202 prepregnancy psychiatric history was classified into four categories in order of  
2203 severity: (a) psychotic episode, (b) nonpsychotic illness, (c) DSH without other  
2204 psychiatric illness, and (d) no psychiatric illness. The two largest subgroups of  
2205 prepregnancy history were women with no prepregnancy history of psychiatric  
2206 problems or DSH prior to the pregnancy (2476 women) and women with a history of  
2207 nonpsychotic illness (1100 women), followed by women with a history of  
2208 psychosis ( $N=106$ ) and women with a history of DSH alone ( $N=36$ ). Differences  
2209 between the delivery reference group and each of the other three  
2210 comparison groups were examined within each of the four categories of  
2211 prepregnancy psychiatric history. Age, marital status, smoking, education level,  
2212 gravidity, and prior history of abortion were controlled in analyses that focused on  
2213 the overall rate of postpregnancy psychiatric morbidity as well as the rate of each  
2214 of the three postpregnancy diagnoses among the four comparison groups.

2215  
2216 Among women with equivalent past psychiatric histories, there were no  
2217 significant differences between the four comparison groups in overall rates of  
2218 psychiatric illness. Rates of specific postpregnancy psychiatric illnesses,  
2219 however, differed among the comparison groups depending on prepregnancy  
2220 diagnostic history and diagnostic outcome as follows: (1) With respect to  
2221 postpregnancy nonpsychotic illness, no significant differences were  
2222 found between abortion and delivery groups, irrespective of prepregnancy  
2223 diagnostic history. (2) With respect to postpregnancy psychoses, women who  
2224 had an abortion were significantly less likely to have a postpregnancy psychotic  
2225 episode than those who delivered among the subgroup of women with no  
2226 prepregnancy history of psychotic illness (1.1 vs. 4.1) and among the subgroup

2227 of women with a history of nonpsychotic illness (4.9 vs. 11.8). A similar, but  
 2228 nonsignificant pattern was observed among the subgroup of women with a  
 2229 history of psychosis (28.2 vs. 35.2).<sup>3</sup> (3) Findings with regard to the outcome of  
 2230 deliberate self-harm (DSH) were mixed. Rates of DSH did not significantly differ  
 2231 for abortion versus delivery groups among the categories with the highest DSH  
 2232 rates—women with a past history of psychosis (18.2 vs. 19.3) or past history of  
 2233 DSH (8.4 vs. 13.5). Among women with no previous psychiatric history, however,  
 2234 DSH was significantly higher among women who were refused an abortion (5.1)  
 2235 or who had an abortion (3.0) compared with those who delivered (1.8). Most DSH  
 2236 episodes (89%) were drug overdoses; none were fatal. In sum, the authors  
 2237 concluded that, “Rates of total reported psychiatric disorder were no higher after  
 2238 termination of pregnancy than after childbirth.” Further, they noted that women  
 2239 with a history of previous psychiatric illness were most at risk, irrespective of the  
 2240 pregnancy outcome.

2241  
 2242 **3. Evaluation of primary data comparison group studies.** Conclusions  
 2243 that can be drawn from these studies are limited by the methodological problems  
 2244 that characterize the vast majority. Below, we briefly summarize the nature of  
 2245 these problems.

2246  
 2247 *Sampling problems.* Most of the studies had one or more sampling  
 2248 problems. Most were based on small sample sizes (fewer than 100 women).  
 2249 Many provided little or no information about the sample recruitment strategy,  
 2250 response rates, or sample representativeness or were based on a sample that  
 2251 clearly is not representative of the population of women who obtain abortions  
 2252 (e.g., Reardon & Ney, 2000). Only six of these studies were conducted in the  
 2253 United States, raising concerns about generalizability. The rest were conducted  
 2254 in Canada (3), the United Kingdom (3), Norway (1), Germany (1), Israel (1), and  
 2255 Brazil (1). The abortion regulations and sociocultural context of abortion in some  
 2256 of these countries differ in important ways from those of the United States. For  
 2257 example, in some countries where abortion is legal, such as Britain, all abortions  
 2258 must be approved by two physicians, usually on grounds that continuation of a  
 2259 pregnancy involves greater risk to the woman's physical or mental health than  
 2260 does termination (although such requirements may be more of a formality than a  
 2261 barrier).<sup>4</sup> Another example is Brazil, where induced abortion is illegal, except in  
 2262 cases where the pregnancy is dangerous to the mother's health or resulted from  
 2263 rape or incest. Caution must be exercised in drawing conclusions about the  
 2264 responses of women in the United States based on data collected on non-U.S.  
 2265 samples.

2266  
 2267 *Inappropriate comparison groups.* With two exceptions (Cohan et al.,  
 2268 1993; Gilchrist et al., 1995), none of these studies used a comparison group that  
 2269 controlled for the occurrence of an unintended or unwanted pregnancy, and  
 2270 hence was able to adequately address the question of relative risk. Comparison  
 2271 groups used included women who reported never being pregnant (Felton,  
 2272 Parsons, Hassell, 1998), women who were currently pregnant (Bailey et al.,

2273 2001; Lydon et al., 1996; Medora et al., 1993; Teichman, Shenhar, & Segal,  
2274 1993), women who were not currently pregnant (Bradshaw & Slade, 2005;  
2275 Teichman et al., 1993), women who reported no elective abortions (Conklin &  
2276 O'Conner, 1995; Medora et al., 1993; Reardon & Ney, 2000; Williams, 2001),  
2277 women who had miscarried (Bailey et al., 2001; Broen et al., 2004, 2005a, 2006),  
2278 women who had participated in a previous public health survey (Lauzon, Roger-  
2279 Achim, Achim, & Boyer 2000), and women matched on demographic variables  
2280 (Barnett, Freudenburg, & Wille, 1992).

2281

2282 *Co-occurring risk factors.* Just as important as the lack of appropriate  
2283 comparison groups in this set of studies was the absence of measures of mental  
2284 health and other variables *prior to the pregnancy or abortion* likely to be related  
2285 to the outcome studied (e.g., co-occurring risk factors such as prior engagement  
2286 in problem behaviors). Hence, any between-group differences observed post  
2287 abortion may reflect between-group differences present prior to the pregnancy  
2288 and/or abortion. With one exception (Gilchrist et al., 1995), none of the studies  
2289 had adequate measures of preabortion mental health, and thus none could  
2290 separate problems observed post abortion from those present pre-pregnancy.  
2291 Furthermore, few of the studies controlled for important covariates, such as age,  
2292 marital status, number of children, race, education, and duration of partnership  
2293 that might be related to outcome variables independently of abortion history.

2294

2295 *Measurement problems.* In six of the papers, the key event—abortion—  
2296 was determined from retrospective self-report, with no checks on accuracy of  
2297 reporting, and no information on how long since the abortion occurred, whether  
2298 the pregnancy was wanted or not, whether the abortion was first or second  
2299 trimester, or what the age of the woman was at the time of the abortion (Conklin  
2300 & O'Conner, 1995; Felton et al., 1998; Medora et al., 1993; Ney, Fung, Wickett,  
2301 Beaman-Dodd, 1994; Reardon & Ney, 2000; Williams, 2001). As noted above,  
2302 retrospective self-reports are notoriously unreliable and subject to bias, rendering  
2303 conclusions of these six papers particularly untrustworthy. In studies where  
2304 abortion was verified, mental health outcomes were often assessed within only a  
2305 few weeks or months after the abortion. Only two studies assessed mental health  
2306 outcomes more than a year post abortion (Broen et al., 2006; Gilchrist et al.,  
2307 1995).

2308

2309 In several cases a single item of unknown reliability was used as a  
2310 measure of mental health (Ney et al., 1994; Reardon & Ney, 2000). Only one  
2311 study assessed clinically significant outcomes, that is, whether participants met  
2312 diagnostic levels for psychological disorder or had sought psychiatric treatment  
2313 (Gilchrist et al., 1995). The remainder focused on a variety of mental health-  
2314 related outcomes, including self-esteem, positive and negative affect, decision  
2315 satisfaction, life satisfaction, self-reported health-promoting behaviors,  
2316 relationship quality, sexual attitudes and problems, grief, anxiety or depressive  
2317 symptoms, and stress responses.

2318

2319 *Statistical problems.* Some of the studies report numerous analyses  
 2320 capitalizing on chance (e.g., Reardon & Ney, 2000), some used small sample  
 2321 sizes lacking sufficient power to detect potentially meaningful differences (e.g.,  
 2322 Cohan et al., 1993), some did not report sample sizes at all (Ney et al., 1994),  
 2323 and some reported no statistical tests of comparisons on postabortion measures  
 2324 but discussed results as if they had (e.g., Lauzon et al., 2000).

2325

### 2326 **V. C. Studies of Abortion for Reasons of Fetal Abnormality**

2327

2328 All of the studies reviewed above either were restricted to samples of  
 2329 women undergoing first-trimester abortions or did not differentiate first-trimester  
 2330 from later-trimester abortions. Although the vast majority of abortions in the  
 2331 United States are of unplanned pregnancies that are either mistimed or  
 2332 unwanted (Finer & Henshaw, 2006a), and they occur in the first trimester  
 2333 (Boonstra et al., 2006), the increasing accessibility and use of ultrasound  
 2334 technology and other prenatal screening techniques has increased the likelihood  
 2335 of prenatal diagnosis of fetal anomalies, often in the second and sometimes even  
 2336 in the third trimester. Following such a diagnosis, many couples elect to  
 2337 terminate their pregnancy, especially when informed that the fetal anomaly is  
 2338 lethal or severely disabling (see Statham, 2002, for a review of research in this  
 2339 area).

2340

2341 Abortion under these circumstances is a very different physical and  
 2342 psychological event than an abortion of an unplanned or unwanted pregnancy.  
 2343 Not only does abortion for reasons of fetal anomaly typically occur later in  
 2344 pregnancy, but more importantly, it usually occurs in the context of a pregnancy  
 2345 that was initially planned and wanted. Consequently, the meaning and  
 2346 significance of the pregnancy and abortion are apt to be quite different, as is the  
 2347 extent of loss experienced. Understanding women's psychological experiences  
 2348 following an abortion for fetal anomaly is important. Some authors have  
 2349 speculated that women may feel more responsible for the death of their child  
 2350 when they make an active decision to terminate their pregnancy, leading to more  
 2351 negative long-term psychological sequelae compared with experiencing  
 2352 spontaneous miscarriage or perinatal loss (Salvesen, Oyen, Schmidt, Malt, &  
 2353 Eik-Nes, 1997). A full understanding of this issue requires comparing responses  
 2354 of women who undergo induced termination of a pregnancy due to fetal anomaly  
 2355 to responses of women who experience a miscarriage of a wanted pregnancy in  
 2356 the second or third trimester or experience a neonatal loss (e.g., a stillbirth or  
 2357 death of a newborn) or deliver a child with severe physical or mental disabilities.

2358

2359 Our literature search identified six studies in which women who terminated  
 2360 an initially wanted pregnancy because of fetal anomaly were compared with  
 2361 another group of women. Five were based on non U.S. samples. These studies  
 2362 are summarized in Table 4. We also identified one U.S. study that examined  
 2363 psychological experiences among women who terminated an initially wanted

2364 pregnancy due to fetal anomaly, but the study did not include a contrast group.  
2365 Findings of this study are summarized in Table 5.

2366

2367 **1. Description of findings.** Zeanah, Dailey, Rosenblatt, and Saller (1993)  
2368 compared grief and depression scores of 23 women in the United States who  
2369 underwent induced termination of a wanted pregnancy because of fetal  
2370 anomalies to 23 demographically matched women who experienced  
2371 spontaneous perinatal losses (stillbirth or death of a newborn infant). Controlling  
2372 for age, there were no significant differences between the induced and  
2373 spontaneous loss groups in grief, difficulty coping, despair or depression 2  
2374 months post abortion, or post spontaneous perinatal loss.

2375

2376 Lorenzen and Holzgreve (1995) compared grief reactions of 35 women in  
2377 Germany who terminated a pregnancy due to fetal anomalies and 15 women  
2378 who experienced a spontaneous second- or third-trimester miscarriage. Eight  
2379 weeks post event, women who had terminated their pregnancy expressed  
2380 significantly less grief than those who had a spontaneous child loss.

2381

2382 Iles and Gath (1993) compared psychiatric disturbance and grief among  
2383 71 women who underwent second-trimester abortion for reasons of fetal anomaly  
2384 to 26 women who had a second-trimester spontaneous miscarriage. There were  
2385 no significant differences in psychiatric disturbance (determined by interviews  
2386 with a trained psychiatrist) between the termination and miscarriage groups or  
2387 differences in grief between the two groups 4-6 weeks or 13 months post loss.  
2388 Some signs of normal grief persisted for a full year in some women in both  
2389 groups.

2390

2391 Kersting et al. (2005) compared stress responses of three groups of women  
2392 in Germany—83 women who had had an induced late-trimester abortion for  
2393 reasons of fetal anomaly 2-7 years previously, 60 women who had a late-  
2394 trimester abortion for fetal anomaly 14 days earlier, and 65 women who delivered  
2395 a healthy child (time since delivery and abortion history unspecified). Women  
2396 who delivered a health baby had lower stress scores (assessed with the Impact  
2397 of Events scale-IES) than women who had a late-term abortion for fetal anomaly,  
2398 regardless of whether the abortion occurred 14 days or 2-7 years previously. The  
2399 two abortion groups did not differ in their grief responses. While 88% of the  
2400 women in the abortion group believed they had made the right decision, 9.6%  
2401 expressed doubts about their decision, and one woman felt she had made the  
2402 wrong decision.

2403

2404 Salvesen et al. (1997) compared depression, general health, stress  
2405 reactions, and anxiety of 24 women in Norway who terminated a pregnancy for  
2406 fetal anomaly to 29 Norwegian women who experienced a perinatal death or late-  
2407 trimester spontaneous miscarriage. Immediately after the event, both groups of  
2408 women reported high intrusion scores on the IES, but the perinatal loss group  
2409 reported significantly higher depressed affect and had higher scores on the



2410 intrusion and avoidance scales of the IES than did the induced termination group.  
2411 At later assessments, including at 1 year post abortion, there were no significant  
2412 differences between the two groups. One woman out of 36 exhibited symptoms  
2413 of traumatic stress; she was in the perinatal loss group.  
2414

2415 Rona, Smeeton, Beech, Barnett, and Sharland (1998) compared depression  
2416 and anxiety (assessed with the Hospital Anxiety and Depression (HAD) scale) of  
2417 three groups of women in the United Kingdom. One group consisted of 28  
2418 women who received a confirmed diagnosis during their second trimester of a  
2419 severe fetal heart malformation and terminated the pregnancy. A second group  
2420 consisted of 40 women in whom a fetal heart malformation was initially  
2421 diagnosed but later disconfirmed by a specialist. A third group consisted of 40  
2422 women whose fetal malformation was not identified and who had given birth to  
2423 an infant with a severe heart malformation. The HAD scale was administered 6-  
2424 10 months after the heart malformation was initially diagnosed or post delivery in  
2425 the latter group. Based on cutoff scores on the HAD ( $\geq 11$ ), a significantly greater  
2426 proportion of mothers who had an infant with a severe heart malformation  
2427 reported clinical levels of anxiety (43%) and depression (18%) compared to  
2428 women in the other two groups. Among those who had terminated their  
2429 pregnancy, 32% were categorized as anxious, and 4% as clinically depressed.  
2430 Among mothers whose initial diagnosis of fetal abnormality was later  
2431 disconfirmed, the comparable percentages were 15% (anxiety) and 5%  
2432 (depression). Women who had terminated their pregnancy were more anxious  
2433 than this latter group of women who had delivered healthy infants. The authors  
2434 attributed the higher anxiety in the termination group than the latter group to  
2435 either the experience of therapeutic abortion or to a fear of a subsequent  
2436 abnormal pregnancy. Younger age was associated with higher anxiety.  
2437

2438 **2. Evaluation of fetal abnormality studies.** All of the above studies are  
2439 limited by high attrition rates, typically low response rates, and extremely small  
2440 sample sizes. The small sample sizes restrict power, and, hence, the ability of  
2441 these studies to detect significant differences between groups. In most studies,  
2442 the sample also was of unknown representativeness. Despite these  
2443 methodological limitations, these studies tell a fairly consistent story. Women's  
2444 levels of negative psychological experiences subsequent to a second-trimester  
2445 abortion of a wanted pregnancy for fetal anomalies were higher than those of  
2446 women who delivered a healthy child (Kersting et al., 2005; Rona et al., 1998)  
2447 and comparable to that of women who experienced a second-trimester  
2448 miscarriage (Iles & Gath, 1993), stillbirth, or death of a newborn (Salveson et al.,  
2449 1997; Zeanah et al., 1993). There was no evidence, however, that induced  
2450 termination was associated with greater distress than spontaneous miscarriage  
2451 or perinatal loss. Indeed, the one difference observed was that women who  
2452 terminated a pregnancy because of fetal anomaly experienced significantly less  
2453 grief than women who miscarried 8 weeks post loss (Lorenzen & Holzgreve,  
2454 1995). Nonetheless, grief among both groups was high and appears to persist for  
2455 some time. The one study that compared the mental health of women who

2456 terminated a pregnancy for fetal abnormality and women who delivered an infant  
 2457 with a severe abnormality found that 6-10 months post event, a greater  
 2458 proportion of women in the delivery group reported clinically significant anxiety  
 2459 and depression compared to women in the abortion group.

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## VI. Review of Abortion-Only Studies

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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.

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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.

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### VI. A. Prospective Studies

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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

2499 place at four time points: preabortion and 1-hour, 1-month, and 2-years post  
2500 abortion. The three other papers based on Sample 1 did not include the 2-year  
2501 follow-up in their analyses. The other studies by Major and colleagues were  
2502 based on smaller samples of 291 (Sample 2), 283 (Sample 3), and 247 (Sample  
2503 4) women recruited from a single abortion facility who provided preabortion and  
2504 30-minute- and 1-month postabortion follow-up data.

2505 Although the lack of comparison groups of women with an unintended  
2506 pregnancy who carry to term is a significant limitation for assessing relative risk  
2507 of abortion versus alternatives, as a group, the Sample 1 studies have a number  
2508 of methodological strengths, including use of standardized measures of  
2509 psychological experiences, appropriate data collection and analysis procedures,  
2510 a large sample, reasonably long postabortion follow-up, analyses of changes in  
2511 abortion reactions over time, and sound social-psychological theory to direct  
2512 analyses. One potential limitation is the high attrition rate; the 442 women for  
2513 whom data were available 2 years post abortion represent 50% of the original  
2514 sample. However, the researchers conducted detailed analyses to show that  
2515 women who completed the follow-up and those lost to follow-up not did not  
2516 significantly differ on any demographic or psychological characteristic. A second  
2517 limitation is the lack of measures of mental health prior to the  
2518 pregnancy. Strengths and limitations of Samples 2, 3, and 4 are similar to those  
2519 of Sample 1 with the added caveat that these were smaller samples from a single  
2520 site followed for a shorter time period.

2521 Analyses based on the Sample 1 data set examined changes over time in  
2522 women's psychological experiences. Most women reported that they had  
2523 benefited from their abortion more than they had been harmed by it, and these  
2524 appraisals did not change from 1 month to 2 years post abortion (Major et al.,  
2525 2000). Most women also reported that they were satisfied with their decision,  
2526 although the percentage satisfied decreased from 1 month (79%) to 2 years  
2527 (72%). Women also reported feeling more relief than positive or negative  
2528 emotions both immediately and 2 years after their abortion. Over the 2 years,  
2529 however, relief and positive emotions declined, whereas negative emotions  
2530 increased. Depression scores were lower, and self-esteem was higher 2 years  
2531 after the abortion compared with just prior to the abortion.

2532 Collectively, these findings add to knowledge of predictors and mediators  
2533 of psychological outcomes over a longer follow-up period than earlier abortion-  
2534 only studies. These studies showed that women at higher risk for negative  
2535 emotions 2 years post abortion included those with a prior history of mental  
2536 health problems (Major et al., 2000), younger age at the time of the abortion  
2537 (Major et al., 2000), low perceived or anticipated social support for their decision  
2538 (Cozzarelli, Sumer, & Major, 1998; Major, Zubek, Cooper, Cozzarelli, & Richards,  
2539 1997), greater personal conflict about abortion (Cozzarelli, Major, Karrasch, &  
2540 Fueger, 2000), and low self-efficacy about their ability to cope with the abortion  
2541 (Cozzarelli, Sumer, & Major, 1998; Cozzarelli, 1993; Major et al., 1990).

2542 This research also provided new insight into the role of cognitive  
2543 mediators, coping, and stigma in postabortion functioning. Two studies  
2544 investigated the effects of antiabortion picketing on women's postabortion  
2545 responses. Cozzarelli and Major (1994) found that the greater the number of  
2546 antiabortion picketers and the more aggressive the picketing that women  
2547 encountered when entering an abortion clinic (as coded by observers), and the  
2548 more the women reported feeling upset by the demonstrators, the more  
2549 depressed affect they reported right after their abortion. These effects were  
2550 partially mitigated by the presence of prochoice escorts outside the clinic,  
2551 suggesting that prochoice escorts altered not only the social context, but also the  
2552 meaning of that context. A later study that included 2-year follow-up assessments  
2553 concluded the women's encounters with picketers evoke short-term negative  
2554 psychological reactions but do not appear to have long-term negative  
2555 psychological effects (Cozzarelli et al., 2000).

2556 Examination of perceived stigma revealed that almost half of the 442  
2557 women in the multisite sample (Sample 1) felt that they would be stigmatized if  
2558 others knew about the abortion, and over 45% felt a need to keep it secret from  
2559 family and friends (Major & Gramzow, 1999). Secrecy was associated with  
2560 increases in psychological distress (anxiety and depression) over time, via the  
2561 mediators of increased thought suppression and decreased emotional disclosure.  
2562 In particular, Major and Gramzow (1999) found that the more women felt that  
2563 others would look down on them if they knew about the abortion, the more they  
2564 felt that they had to keep the abortion a secret from their friends or family.  
2565 Perceived need for secrecy, in turn, was associated with less disclosure of  
2566 feelings to family and friends, increased thought suppression and intrusion, and  
2567 increased psychological distress 2 years post abortion (controlling for initial  
2568 distress). Thus, feelings of stigmatization led women to engage in coping  
2569 strategies that were associated with poorer adaptation over time.

2570 This research group also extended earlier knowledge about the role of  
2571 social support in abortion. One study showed that perceived social support  
2572 mediated the relationship between cognitive models of attachment and  
2573 adjustment (Cozzarelli et al., 1998). Another study investigated the joint and  
2574 interactive effects of perceived social conflict and perceived social support from  
2575 others surrounding the abortion on negative psychological reactions and well-  
2576 being (Major et al., 1997). Greater perceived social conflict with the partner  
2577 predicted increased distress (but not decreased well-being), whereas greater  
2578 perceived support from partner predicted increased well-being (but not  
2579 decreased distress). Moreover, for mothers and friends, perceived conflict and  
2580 support interacted to predict distress, whereas support was a direct predictor of  
2581 well-being.

2582 Three studies established the importance of cognitive appraisals and self-  
2583 efficacy as proximal predictors of postabortion adjustment. One study showed  
2584 that the relationship between social support and adjustment was mediated by

2585 coping appraisals and self-efficacy. Women who perceived more social support  
2586 from others for their decision felt more able to cope with their abortion prior to the  
2587 procedure, and these appraisals mediated the positive relationship between  
2588 perceived social support and postabortion well-being (Major et al., 1990). Two  
2589 other studies showed that self-efficacy and cognitive appraisals mediated the  
2590 effects of preabortion personal resources on postabortion coping and adjustment  
2591 (Cozzarelli, 1993; Major et al., 1998). Women with more resilient personalities  
2592 (high self-esteem, internal locus of control, and an optimistic outlook on life) felt  
2593 more capable of coping with their abortion and appraised it more benignly prior to  
2594 the procedure. Their more positive cognitive appraisals, in turn, were associated  
2595 with more adaptive forms of coping in the month following the abortion (more  
2596 acceptance, less avoidance), which in turn were associated with reductions in  
2597 psychological distress (depression, anxiety) and increases in positive well-being  
2598 over time.

2599 Two studies specifically compared the responses of minor adolescents  
2600 and adult abortion patients. They reported very similar findings. Using data from  
2601 Sample 1 of Major et al. (2000), Quinton, Major, and Richards (2001) found no  
2602 differences between minors ( $N = 38$ ) and adults ( $N = 404$ ) in psychological  
2603 distress and well-being 2 years after an abortion, although the adolescents were  
2604 slightly less satisfied with their decision and perceived less personal benefit from  
2605 it. In a different sample of 96 women (23 adolescents), Pope, Adler, and Tschann  
2606 (2001) reported that at 4 weeks post abortion, there were no differences in  
2607 depression, anxiety, self-esteem, or posttraumatic stress between the younger  
2608 and older groups, although the adolescents scored slightly lower on "comfort with  
2609 decision." Both of these studies are limited by small samples of  
2610 adolescents. These results appear to conflict with Major et al. (2000), which  
2611 identified younger age at time of abortion as a risk factor for negative  
2612 postabortion emotional experiences. However, the latter study examined the  
2613 association of mental health outcomes with the continuous variable of age  
2614 among a larger sample.

2615  
2616 Miller (1992) examined psychological experiences subsequent to abortion  
2617 among 64 women who had participated in a larger longitudinal study on the  
2618 psychology of reproduction in the San Francisco Bay area in the 1970s. All of the  
2619 967 women in the larger study were White, English speaking, and between ages  
2620 18 and 27 years. At the final interview, the 64 women who reported an abortion  
2621 during the study were asked a series of one-item questions about how their  
2622 abortion had affected them. Prospective analyses using responses from earlier  
2623 interview periods examined predictors of "regret" (the extent to which women  
2624 said they would choose the abortion again (1 = no, 2 = not sure, 3 = yes)) and  
2625 "upset" (how emotionally upset the women recalled being in the first few weeks  
2626 after the abortion). Having a Protestant religious background was associated with  
2627 less regret, whereas having a traditional gender role orientation was associated  
2628 with greater regret. Not being married at the time of the abortion was related to  
2629 greater postabortion upset, whereas a traditional gender-role orientation was

2630 associated with less upset. Other single items measuring reasons for having and  
2631 not having an abortion (measured at the final interview) were also related to the  
2632 two outcome variables. Despite its prospective design, this study is severely  
2633 limited by the single-item measures of the negative psychological reactions to  
2634 abortion, retrospective reporting of the emotional impact of the abortion, lack of  
2635 specification of abortion history, probable underreporting of abortions, small  
2636 sample, and nonrepresentative sample.

2637 Two other prospective studies examined emotional improvement after  
2638 mifepristone abortions in minors (Phelps, Schaff, & Fielding, 2001) and  
2639 depression risk after surgical and nonsurgical abortion (Sit et al., 2007). Phelps  
2640 et al. assessed emotional responses (e.g., perceived stress, fear) of adolescents  
2641 aged 14-17 years at three time points: when mifepristone was first administered,  
2642 4-8 days later, and 4 weeks later. The researchers found little emotional  
2643 improvement from first visit to 4-7 days later, but greater emotional improvement  
2644 (e.g., lower perceived stress, lower fear) at 4-week follow-up. This study was  
2645 limited by small samples ( $N=35$ ), high attrition rates, and other methodological  
2646 problems.

2647 Sit et al. (2007) compared depression scores preabortion and 1 month  
2648 post abortion among women obtaining surgical ( $N = 47$ ) versus nonsurgical  
2649 (mifepristone-misoprostol) abortions ( $N = 31$ ) at less than 9 weeks' gestation.  
2650 One month post abortion, 17% (7/42) of surgical and 21% (5/24) of medical  
2651 patients had an EPDS depression score equal to or greater than 10. Both groups  
2652 experienced a significant decline in depression from pre- to post abortion, and  
2653 the difference in depression between the two groups was not significant either  
2654 before or after the abortion. As observed in other studies, women with a history  
2655 of past psychiatric problems were at higher risk for postabortion depression,  
2656 irrespective of procedure. Findings of this study are consistent with several  
2657 others based on non-U.S. samples in suggesting that method of termination  
2658 during the first trimester does not affect emotional adjustment or psychological  
2659 experiences after the procedure among women, given a choice of procedure  
2660 (Ashok et al., 2005; Howie, Henshaw, Naji, Russell, & Templeton, 1997;  
2661 Lowenstein et al., 2006).

2662 A final U.S. study (Burgoine et al., 2005) examined depression and grief  
2663 among 49 women who terminated a desired pregnancy during the second  
2664 trimester. They examined whether responses differed as a function of the  
2665 abortion procedure they underwent: dilation and evacuation (D&E) or induction of  
2666 labor (IOL). Levels of depression were relatively high in both groups 4 months  
2667 and 12 months post abortion, but incidence of clinically significant depression did  
2668 not differ as a function of abortion procedure. Grief scores did not differ at 4 or 12  
2669 months between women choosing either of the two abortion methods.

## 2670 VI. B. Retrospective Studies

2671 Most of the half dozen retrospective studies of abortion samples had  
 2672 serious methodological flaws and do not warrant further discussion except as  
 2673 examples of poor study designs. In these studies women's current or recalled  
 2674 past mental health or distress often was attributed to an abortion that occurred  
 2675 many years previously (e.g., Franz & Reardon, 1992; Lemkau, 1991; Tamburrino  
 2676 et al., 1990). For instance, Lemkau (1991) queried women about their level of  
 2677 distress experienced 3 months post abortion although the target abortion had  
 2678 occurred an average of 9 years previously. Other limitations include use of one-  
 2679 item unstandardized outcome measures (Coleman & Nelson, 1998; Franz &  
 2680 Reardon, 1992) and small sample sizes (Coleman & Nelson, 1998; Congleton &  
 2681 Calhoun, 1993; Tamburrino et al., 1990). Finally, authors of several papers drew  
 2682 conclusions about prevalence of postabortion mental health problems in the  
 2683 general population from samples of women who had self-identified as having  
 2684 postabortion mental health problems, attributed their psychological problems to  
 2685 having had an abortion, and were members of support groups that foster such  
 2686 attributions (Congleton & Calhoun, 1993; Franz & Reardon, 1992; Tamburrino et  
 2687 al., 1990).

#### 2688 **VI. C. Summary and Evaluation of Abortion-Only Studies**

2689  
 2690 Prospective studies of U.S. abortion-only samples have added to  
 2691 knowledge about predictors, mediators, and moderators of psychological  
 2692 experiences subsequent to abortion. The most methodologically strong studies in  
 2693 this group identified personal and social factors that influence how women  
 2694 cognitively appraise and cope with abortion and demonstrated how appraisals  
 2695 and coping processes predict postabortion psychological experiences, both  
 2696 positive and negative. The retrospective studies in this group suffered from  
 2697 methodological limitations that decreased confidence in the results and limited  
 2698 conclusions that can be drawn from them.

#### 2699 2700 **VII. Summary and Conclusions**

2701  
 2702 As noted at the beginning of this report, the empirical literature on the  
 2703 association between abortion and mental health has been asked to address four  
 2704 primary questions: (1) Does abortion *cause* harm to women's mental health? (2)  
 2705 How prevalent are mental health problems among women in the United States  
 2706 who have had an abortion? (3) What is the relative risk of mental health problems  
 2707 associated with abortion compared to its alternatives (other courses of action that  
 2708 might be taken by a pregnant woman in similar circumstances)? and (4) What  
 2709 predicts individual variation in women's psychological experiences following  
 2710 abortion? As discussed above, the first question is not scientifically testable from  
 2711 an ethical or practical perspective. The second and third questions obscure the  
 2712 important point that abortion is not a unitary event, but encompasses a diversity  
 2713 of experiences. That said, in the following section we address what the literature  
 2714 reviewed has to say with respect to the last three questions.

2715

2716 **VII. A. The Relative Risks of Abortion Compared to its Alternatives**  
2717

2718 The TFMHA identified 50 papers published in peer-reviewed journals  
2719 between 1990 and 2007 that analyzed empirical data of a quantitative nature on  
2720 psychological experiences associated with induced abortion, compared to an  
2721 alternative. These included 10 papers based on secondary analyses of two  
2722 medical record data sets, 15 papers based on secondary analyses of nine public  
2723 data sets, 19 papers based on 17 studies conducted for the primary purpose of  
2724 comparing women who had first-trimester abortions (or an abortion in which the  
2725 trimester was unspecified) with a comparison group, and 6 studies that compared  
2726 women's responses following an induced abortion for fetal abnormality to  
2727 women's responses following other reproductive events. These studies were  
2728 evaluated with respect to their ability to draw sound conclusions about the  
2729 relative mental health risks associated with abortion compared to alternative  
2730 courses of action that can be pursued by a woman facing a similar circumstance  
2731 (e.g., an unwanted or unintended pregnancy).  
2732

2733 A careful evaluation of these studies revealed that the majority suffered  
2734 from methodological problems, sometimes severely so. Problems of sampling,  
2735 measurement, design, and analyses cloud interpretation. Abortion was often  
2736 underreported and underspecified and in the majority of studies, wantedness of  
2737 pregnancy was not considered. Rarely did research designs include a  
2738 comparison group that was otherwise equivalent to women who had an elective  
2739 abortion, impairing the ability to draw conclusions about relative risks.  
2740 Furthermore, because of the absence of adequate controls for co-occurring risks,  
2741 including systemic factors (e.g., violence exposure, poverty), prior mental health  
2742 (including prior substance abuse), and personality (e.g., avoidance coping style),  
2743 in almost all of these studies, it was impossible to determine whether any  
2744 observed differences between abortion groups and comparison groups reflected  
2745 consequences of pregnancy resolution, preexisting differences between groups,  
2746 or artifacts of methodology. Given this state of the literature, what can be  
2747 concluded about relative risks from this body of research?  
2748

2749 One approach would be to simply calculate effect sizes or count the  
2750 number of published papers that suggest adverse effects of abortion and those  
2751 that show no adverse effects (or even positive effects) of abortion when  
2752 compared to an alternative course of action (e.g., delivery). Although tempting,  
2753 such approaches would be misleading and irresponsible, given the numerous  
2754 methodological problems that characterize this literature, the many papers that  
2755 were based on the same data sets, and the inadequacy of the comparison  
2756 groups typically used. Given this state of the literature, the TFMHA judged that  
2757 the best course of action was to base conclusions on the findings of the studies  
2758 identified as most methodologically rigorous and sound.  
2759

2760 Of the studies based on medical records, the most methodologically  
2761 rigorous studies were conducted in Finland. The largest and strongest of these



2762 examined the relative risk of death within a year of end of pregnancy associated  
2763 with abortion versus delivery (Gissler et al., 2004b). It demonstrated that the  
2764 relative risk differs depending on how cause of death is coded. Compared to  
2765 women who delivered, women who had an abortion had lower rates of direct  
2766 pregnancy-related deaths (cause of death was directly related to or aggravated  
2767 by the pregnancy or its management, but not from accidental or incidental  
2768 causes) but higher rates of pregnancy-associated deaths (deaths occurring  
2769 within one year from end of pregnancy, regardless of whether deaths are  
2770 pregnancy-related). When therapeutic abortions were excluded from the category  
2771 of pregnancy-associated deaths, however, this latter difference was not  
2772 significant. Across both the Medi-Cal and Finland record-based studies, a higher  
2773 rate of violent death (including accidents, homicide, and suicide) was  
2774 observed among women who had an abortion compared to women who  
2775 delivered. This correlational finding is consistent with other evidence indicating  
2776 that risk for violence is higher in the lives of women who have abortions  
2777 and underscores the importance of controlling for violence exposure in studies of  
2778 mental health associated with pregnancy outcome.  
2779

2780 With respect to the studies based on secondary analyses of survey data,  
2781 the conclusions regarding relative risk varied depending on the data set, the  
2782 approach to the design of the study, the covariates used in analyses, the  
2783 comparison group selected, and the outcome variables assessed. Analyses of  
2784 the same data set (the NLSY) with respect to the same outcome variable  
2785 (depression) revealed that conclusions regarding relative risk differed  
2786 dramatically depending on the sampling and exclusion criteria applied.  
2787

2788 The strongest of the secondary analyses studies was conducted by  
2789 Fergusson et al. (2006). This study was based on a representative sample of  
2790 young women in Christchurch, NZ, was longitudinal (although Fergusson also  
2791 reported concurrent analyses), measured postpregnancy/abortion psychiatric  
2792 morbidity using established diagnostic categories, and controlled for mental  
2793 health prior to the pregnancy in prospective analyses. Fergusson et al. compared  
2794 women who terminated a pregnancy to women who delivered or had not been  
2795 pregnant. The prospective analyses reported by Fergusson et al. are most  
2796 informative. These analyses compared number of total psychiatric disorders  
2797 among women who had an abortion prior to age 21 to number of total psychiatric  
2798 disorders among women who had delivered a child by age 21 or among women  
2799 who had never been pregnant by age 21, controlling for prepregnancy mental  
2800 health and other variables that differed initially among the three groups. In these  
2801 analyses, women who had one or more abortions prior to age 21 had a  
2802 significantly higher number of total psychiatric disorders by age 25 than women  
2803 who had delivered or had never been pregnant by age 21. This study thus  
2804 suggests that women who have one or more abortions at a young age (<21) are  
2805 at greater relative risk for psychiatric disorder compared to women who deliver a  
2806 child at a young age or women who do not get pregnant at a young age.  
2807

2808           There are several reasons why caution should be used in drawing the  
2809 above conclusion from this study. First and most importantly, Fergusson et al.  
2810 (2006) did not assess the *intendedness or wantedness* of the pregnancy. As  
2811 noted earlier, approximately 90% of pregnancies that are aborted are  
2812 unintended, compared to only 31% of those that are delivered (Henshaw,  
2813 1998). Thus, although these were young women, it is reasonable to assume that  
2814 at least some of the women in the delivery group were delivering a planned and  
2815 wanted child. Delivery of a planned and wanted child would be expected to be  
2816 associated with positive outcomes and is not a viable option for women facing an  
2817 unintended pregnancy. Second, the other comparison group used by Fergusson  
2818 et al.—women who had never been pregnant—is not a viable option for women  
2819 already facing an unintended pregnancy. Third, the prospective analyses were  
2820 based on only 48 women who had abortions, an extremely small sample. Fourth,  
2821 the study did not control for number of prior abortions or births. Fifth, the study  
2822 focused on women who had one or more abortions at a young age (< 21 years),  
2823 limiting its generalizability to younger women; younger age has been linked in  
2824 some studies to more negative psychological experiences following abortion  
2825 (e.g., Major et al., 2000). Finally, this study was conducted in New Zealand, a  
2826 country with more restrictive abortion regulations than those in the United States.  
2827 Because the focus of APA is on mental health in the United States, it may thus  
2828 be less useful as a basis for drawing conclusions about relative risks of abortion  
2829 for U.S. women.

2830  
2831           The TFMHA also reviewed and evaluated 19 papers based on 17 studies  
2832 conducted for the primary purpose of comparing women who had first-trimester  
2833 abortions (or an abortion in which trimester was unspecified) with a comparison  
2834 group on a mental health relevant variable. These studies varied widely in  
2835 methodological quality and cultural context. Although most of the studies showed  
2836 no significant differences between the psychological experiences of women who  
2837 had an induced first-trimester abortion and women in a variety of comparison  
2838 groups once important covariates (e.g., marital status, age) were controlled, most  
2839 also were characterized by methodological deficiencies. These  
2840 included problems of sampling, measurement, design, analyses, and  
2841 inappropriate comparison groups. Thus, as a group, these studies also do not  
2842 provide good answers to questions of relative risk or prevalence.

2843  
2844           One study, however, stood out from the rest in terms of its methodological  
2845 rigor. This study was conducted in the United Kingdom by the Royal College of  
2846 General Practitioners and the Royal College of Obstetricians and Gynecologists  
2847 (Gilchrist et al., 1995). It was longitudinal, based on a representative sample,  
2848 measured postpregnancy/abortion psychiatric morbidity using established  
2849 diagnostic categories, controlled for mental health prior to the pregnancy as well  
2850 as other relevant covariates, and compared women who terminated an  
2851 unplanned pregnancy to women who pursued alternative courses of action. In  
2852 prospective analyses, Gilchrist et al. compared postpregnancy psychiatric  
2853 morbidity (stratified by prepregnancy psychiatric status) of four groups of women,

2854 all of whom were faced with an unplanned pregnancy: women who obtained  
2855 abortions, who did not seek abortion, who requested abortion but were denied,  
2856 and who initially requested abortion but changed their mind. The researchers  
2857 concluded that once psychiatric disorders prior to the pregnancy were taken into  
2858 account, the rate of total reported psychiatric disorder was no higher after  
2859 termination of an unplanned pregnancy than after childbirth.

2861 This study provides high-quality evidence that among women faced with  
2862 an unplanned pregnancy, the relative risks of psychiatric disorder among women  
2863 who terminate the pregnancy are no greater than the risks among women who  
2864 pursue alternative courses of action. What appears to be a discrepancy between  
2865 the conclusions of this study and those of Fergusson et al. (2006) is likely due to  
2866 differences in sampling and study design. First and most importantly, Gilchrist et  
2867 al. (1995) restricted their study to women identified by their family doctor as  
2868 having an “unplanned” pregnancy, whereas Fergusson et al. did not assess the  
2869 intendedness of the pregnancy, as noted above. Consequently, the comparison  
2870 groups used by Gilchrist et al. are more appropriate for addressing the question  
2871 of relative risk of negative psychological experiences following elective abortion  
2872 *compared to other courses of action women in similar circumstances (i.e., facing*  
2873 *an unplanned pregnancy) might take. Second, the Gilchrist et al. study was not*  
2874 *restricted to women who became pregnant at a young age; hence the sample is*  
2875 *more representative of women who seek abortion. Third, differences in abortion*  
2876 *sample size were dramatic. The prospective analyses by Gilchrist et al. were*  
2877 *based on an abortion sample of 6,410 women, as compared to 48 in the*  
2878 *Fergusson et al. study. Fourth, unlike the study by Fergusson et al., the Gilchrist*  
2879 *et al. study controlled for number of prior abortions and births. For these reasons,*  
2880 *the TFMHA had more confidence in arriving at conclusions about relative risk*  
2881 *based on the findings of Gilchrist et al. Nonetheless, it should be noted that the*  
2882 *abortion context in the United Kingdom may differ from that in the United States,*  
2883 *weakening generalization to the U.S. context.*

2885 The TFMHA reviewed six studies that compared women’s responses  
2886 following an induced abortion for fetal abnormality to women’s responses  
2887 following other reproductive events. These studies were based on extremely  
2888 small samples often characterized by high attrition rates and low response rates.  
2889 Nonetheless, these studies suggest that terminating a wanted pregnancy,  
2890 especially late in pregnancy, can be associated with negative psychological  
2891 experiences comparable to those experienced by women who miscarry a wanted  
2892 pregnancy or experience a stillbirth or death of a newborn, but less severe than  
2893 those experienced by women who deliver a child with a severe abnormality. At  
2894 least one study also suggests that the majority of women who make this difficult  
2895 choice do not regret their decision (e.g., Kersting et al., 2005). As a group, these  
2896 studies of responses to termination of a wanted pregnancy for fetal abnormality  
2897 underscore the importance of considering the wantedness of the pregnancy, as  
2898 well as the reason for and timing of the abortion, in studying its psychological  
2899 implications. Interpretation of prevalence of psychological distress and relative

2900 risk is clouded when researchers lump together under the category of "abortion"  
2901 women who abort a wanted pregnancy for reasons of fetal anomaly with women  
2902 who have an elective abortion of an unplanned and unwanted pregnancy.  
2903

2904 In summary, although numerous methodological flaws prevent  
2905 the published literature from providing unequivocal evidence regarding  
2906 the relative mental health risks associated with abortion per se compared to its  
2907 alternatives (childbirth of an unplanned pregnancy), in the view of the TFMHA,  
2908 the *best* scientific evidence indicates that the relative risk of mental health  
2909 problems among adult women who have an *unplanned pregnancy* is no greater if  
2910 they have an elective first-trimester abortion than if they deliver that pregnancy  
2911 (Gilchrist et al., 1995).  
2912

2913 The evidence regarding the relative mental health risks associated with  
2914 multiple abortions is more equivocal. One source of inconsistencies in the  
2915 literature may be methodological, such as differences in sample size or age  
2916 ranges among samples. Positive associations observed between multiple  
2917 abortions and poorer mental health (e.g., Harlow et al., 2004) also may be due to  
2918 co-occurring risks that predispose a woman to both unwanted pregnancies and  
2919 mental health problems.  
2920

2921 Terminating a wanted pregnancy late in pregnancy due to fetal  
2922 abnormality appears to be associated with negative psychological experiences  
2923 equivalent to those experienced by women who miscarry a wanted pregnancy or  
2924 experience a stillbirth or the death of a newborn.  
2925

## 2926 **VII. B. Prevalence of Mental Health Problems Among U.S. Women Who** 2927 **Have an Abortion** 2928

2929 A second question this literature has been used to address concerns the  
2930 prevalence of mental health problems among women in the United States who  
2931 have had an abortion. As noted at the outset of this report, research capable  
2932 of adequately addressing this question requires at minimum: (1) a clearly  
2933 defined, agreed upon, and appropriately measured mental health problem (e.g.,  
2934 a clinically significant disorder, assessed via validated criteria); (2) a sample  
2935 representative of the population to which one wants to generalize (e.g., women in  
2936 the United States); and (3) knowledge of the prevalence of the same mental  
2937 health problem in the general population, equated with the abortion group with  
2938 respect to potentially confounding factors. None of the studies reviewed met all  
2939 these criteria and hence provided sound evidence regarding prevalence. Few of  
2940 the U.S studies assessed clinically significant disorders with valid and reliable  
2941 measures or physician diagnosis. In those studies that did use clinically relevant  
2942 outcome measures, sampling strategies were inadequate to address the  
2943 question of prevalence in the larger U.S. population either because the samples  
2944 were biased, highly selected, geographically restricted, or failed to use  
2945 appropriate sampling weights. Furthermore, because of the lack of adequate

2946 control for co-occurring risks, the extent to which the incidence of mental health  
2947 problems associated with abortion was due to the procedure versus to potentially  
2948 confounding factors such as poverty, poorer prior mental health, etc., was  
2949 impossible to establish.

2950  
2951 Given these caveats, however, the prevalence of mental health problems  
2952 observed among women in the United States who had a single, legal, first-  
2953 trimester abortion for nontherapeutic reasons appeared to be consistent with  
2954 normative rates of comparable mental health problems in the general population  
2955 of women in the United States. Consider, for example, the overall prevalence of  
2956 depression among women in the NLSY, a longitudinal national survey of a cohort  
2957 of men and women aged 14-21 years in 1979. Among *all* women in the NLSY,  
2958 irrespective of reproductive history and without controlling for any covariates,  
2959 22% met criteria for depression in 1992 (i.e., scored above the clinical cutoff on  
2960 the CES-D). Among women who reported one abortion, the corresponding  
2961 percentage was 23%. Among women who reported multiple abortions, however,  
2962 the percentage was higher; 31% met criteria for depression (see Table 6).<sup>5</sup> A  
2963 similar pattern was reported by Harlow et al. (2004) in their study of a  
2964 representative sample of women in the Boston metropolitan area.

2965  
2966 To say that women *in general* do not show an increased incidence of  
2967 mental health problems following a single abortion, however, does not mean that  
2968 *no* women experience such problems. Abortion is an experience  
2969 often hallmarked by ambivalence, and a mix of positive and negative emotions is  
2970 to be expected (Adler et al., 1990; Dagg, 1991). Some women experience  
2971 beneficial outcomes, whereas others experience sadness, grief, and feelings of  
2972 loss following the elective termination of a pregnancy. Some women experience  
2973 clinically significant outcomes, such as depression or anxiety. However, the  
2974 TFMHA reviewed no evidence sufficient to support the claim that an observed  
2975 association between abortion history and a mental health problem was caused  
2976 by the abortion per se, as opposed to other factors. As observed throughout this  
2977 report, unwanted pregnancy and abortion are correlated with preexisting  
2978 conditions (e.g., poverty), life circumstances (e.g., exposure to violence, sexual  
2979 abuse), problem behaviors (e.g., drug use), and personality characteristics (e.g.,  
2980 avoidance style of coping with negative emotion) that can have profound and  
2981 long-lasting negative effects on mental health. Differences in prevalence of  
2982 mental health problems or problem behaviors observed between women who  
2983 have had an abortion and women who have not may be primarily accounted for  
2984 by these preexisting and ongoing differences among groups.

## 2985 2986 2987 **VII. C. Predictors of Individual Variation in Responses Following Abortion** 2988

2989 A third issue addressed in the literature on abortion and mental health  
2990 concerns individual variation in women's psychological experiences following  
2991 abortion. The TFMHA reviewed 23 papers based on 15 data sets that were

2992 based solely on samples of women who had abortions in the United States, but  
2993 that otherwise met inclusion criteria. These noncomparison group studies  
2994 typically focused on predictors of individual variation in response. They were of  
2995 two major types: (1) prospective or concurrent studies that usually included  
2996 preabortion measures of psychological adjustment and risk factors and one or  
2997 more postabortion assessments of adjustment, and (2) retrospective studies that  
2998 assessed women's perceived reactions to the event and current level of  
2999 psychological functioning several years after the abortion. The retrospective  
3000 studies had serious methodological problems that made interpretation of their  
3001 findings difficult. The prospective studies, despite limitations of high attrition,  
3002 geographically limited samples, and potential confounds that were not measured,  
3003 provided valuable information about sources of variation in individual women's  
3004 psychological experiences and, to a more limited extent, mental health problems  
3005 subsequent to abortion.

3006  
3007 The most methodologically strong studies in this group showed that  
3008 interpersonal concerns, including feelings of stigma, perceived need for secrecy,  
3009 exposure to antiabortion picketing, and low perceived or anticipated social  
3010 support for the abortion decision, negatively affected women's postabortion  
3011 psychological experiences. Characteristics of the woman also predicted more  
3012 negative psychological experiences after first-trimester abortion, including a prior  
3013 history of mental health problems, personality factors such as low self-esteem  
3014 and low perceived control over her life, and use of avoidance and denial coping  
3015 strategies. Feelings of commitment to the pregnancy, ambivalence about the  
3016 abortion decision, and low perceived ability to cope with the abortion prior to its  
3017 occurrence also predicted more negative postabortion responses. Across  
3018 studies, prior mental health emerged as the strongest predictor of postabortion  
3019 mental health (Major et al., 2000). Type of abortion procedures, at least those  
3020 used in the first trimester, did not appear to be related to postabortion  
3021 psychological well-being or mental health.

3022  
3023 In considering these risk factors, it is important to recognize that many of  
3024 the same factors shown to be associated with more negative postabortion  
3025 psychological experiences also predict more negative reactions to other types of  
3026 stressful life events, including childbirth (e.g., low perceived social support, low  
3027 self-esteem, low self-efficacy, avoidance coping). For instance, low perceived  
3028 social support and low self-esteem also are risk factors for postpartum  
3029 depression (Beck, 2001; Logsdon & Usui, 2001). Most risk factors are not  
3030 uniquely predictive of psychological experiences following abortion. Women  
3031 characterized by one or more such risk factors might be equally (or more) likely  
3032 to experience negative psychological reactions if they pursued an alternative  
3033 course of action (motherhood or adoption).

#### 3034 3035 **VII. D. Conclusions and Future Research**

3036

3037 Based on our comprehensive review and evaluation of the empirical  
3038 literature published in peer-reviewed journals since 1989, this Task Force on  
3039 Mental Health and Abortion concludes that the most methodologically sound  
3040 research indicates that among women who have a single, legal, first-trimester  
3041 abortion of an unplanned pregnancy for nontherapeutic reasons, the relative risks  
3042 of mental health problems are no greater than the risks among women who  
3043 deliver an unplanned pregnancy. This conclusion is generally consistent with that  
3044 reached by the first APA task force (Adler et al., 1990).

3045  
3046 This report has highlighted the methodological failings that are pervasive  
3047 in the literature on abortion and mental health. This focus on methodological  
3048 limitations raises the question of whether empirical science is capable of  
3049 informing understanding of the mental health implications of and public policy  
3050 related to abortion. Some policy questions cannot be definitively answered  
3051 through empirical research because they are not pragmatically or ethically  
3052 possible.

3053  
3054 Other questions, however, are amenable to the methods of well-designed,  
3055 rigorously conducted scientific research. For example, empirical research can  
3056 identify those women who might be more or less likely than others to show  
3057 adverse or positive psychological outcomes following an abortion. Well-designed  
3058 research can also answer questions of relative risk and prevalence. What would  
3059 this research look like?

3060  
3061 Such research would use methods that are prospective and longitudinal  
3062 and employ exacting sampling methods (including the use of sampling weights  
3063 that allow proper generalization back to the populations to whom the conclusions  
3064 are being applied). Careful attention would be paid to adequately assessing  
3065 preexisting and co-occurring conditions such as marital status, domestic  
3066 violence, age, socioeconomic status, parity, prior mental health, and prior  
3067 problem behaviors, as well as other situations that are known to be associated  
3068 with both differential utilization of abortion and mental health problems.  
3069 Importantly, comparison groups would be selected so as to be equivalent to the  
3070 abortion group on all variables other than abortion history. Critical variables such  
3071 as intendedness and wantedness of the pregnancy would be assessed, and  
3072 abortion status verified objectively (not only through self-report). Careful use of  
3073 covariance or similar adjustment techniques (applied to pre-defined covariates)  
3074 would be employed. Precision of measurement (both in terms of specification of  
3075 outcome measure and psychometric adequacy of the measurements) would also  
3076 be guaranteed. Positive psychological responses and experiences as well as  
3077 negative mental health would be assessed. Repeated assessment of responses  
3078 over time would be made to assess relevant changes, positive and negative, in  
3079 the trajectory of responses following abortion. Samples sufficiently large to  
3080 guarantee adequate power to detect effects that are present would be used, and  
3081 attention would be paid to effect-size estimation in addition to the simple reliance  
3082 of null hypothesis statistical testing.

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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.

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## Footnotes

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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.

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3832 Table 6: Population estimates of proportion of all women and women identified  
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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.

<b>Group (M)</b>	<b>CES-D &gt; 15</b>
All women (unweighted N=4401)	22 %
No abortion ever	21 %
Ever abortion	25 %
One abortion	23 %
Multiple abortions	31 %
All women ever pregnant <sup>†</sup> (unweighted N=3503)	23 %
No abortion ever	23 %
Ever abortion	25 %
One abortion	22 %
Multiple abortions	31 %

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Notes: <sup>†</sup>Includes pregnancies ending in miscarriages.  
 No covariates are controlled.