



# The Consequences of Unintended Childbearing

*A WHITE PAPER*

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# OVERVIEW

There is a general consensus among most people in the United States that teen childbearing is problematic. The vast majority of teen births are unintended<sup>6,13</sup> and research has shown that teen mothers are more likely than other young women their age to drop out of school, live in poverty and rely on public assistance,<sup>28,38,41</sup> and their children tend to grow up in economically and educationally disadvantaged households.<sup>41,60</sup> But, there has been less attention paid to unintended births among young adults in their early twenties. However, past research has suggested that unintended births are associated with a number of negative social and economic outcomes for parents of all ages and for their children.<sup>5</sup>

This report provides a critical review of the current research literature on the consequences of unintended childbearing for families and children. The review addresses the following potential consequences: prenatal and perinatal risks (e.g., inadequate or delayed initiation of prenatal care, smoking/drinking/substance use during pregnancy, prematurity, low birthweight and not breastfeeding); risks for the children born from unintended births (e.g., poor physical and mental health; poor developmental, behavioral and educational outcomes; poor mother-child relationships; and weaker union formation in young adulthood); and risks for parents who have an unintended birth (e.g., poor psychological well-being, negative attitudes towards parenting, and low relationship quality). In compiling the review, we identified the most methodologically- and analytically-sound articles we could find that examine the potential outcomes associated with unintended childbearing. We rely primarily on multivariate studies, but we also report findings from bivariate and qualitative analyses that offer important insight into this topic. When reporting on results from only one study to support an argument, we specify the sample and methods used in the analysis. We focus our examination on articles published since 1995 and, when possible, distinguish those births that were reported as mistimed at the time of conception (i.e., occurred sooner than originally wanted) from those that were unwanted. Although there is research on the prevalence and consequences of unintended pregnancies that result in abortion or miscarriage, we focus our literature review on the consequences of only those unintended pregnancies that result in a live birth. We set out to focus our review on young adults; however, we found no research that specifically focuses on unintended births to young men and women in their early twenties, although most studies did control for maternal age. Therefore, unless otherwise indicated, the outcomes reported are for unintended births that occur across a broad age range. Finally, this literature review focuses on the methodological issues of self-selection and endogeneity, to address whether or not the consequences of unintended births are primarily due to pre-existing characteristics of the parents involved. Thus, where relevant, we indicate when methods are used to control for selection effects and endogeneity.

This comprehensive summary serves as an important update to the chapter on the consequences of unintended pregnancy published in 1995 in *The Best Intentions: Unintended Pregnancy and the Well-Being of Children and Families*;<sup>5</sup> it provides a well-documented and more current statement about the consequences of unintended childbearing for children and families. In addition, it offers important background material for educating the public about the importance of decreasing unintended childbearing among people of all ages, not just teenagers.

## Unintended Childbearing – Definition, Prevalence, and Trends

Unintended pregnancies are defined as pregnancies that, at the time of conception, are either mistimed (the mother wanted the pregnancy to occur at a later time) or unwanted (mother did not want it to occur at that time or any time in the future).<sup>56</sup> Pregnancies that occur to women at the right time, later than desired, or to women who are indifferent about the pregnancy are considered to be intended pregnancies.<sup>56</sup>

Most studies measure pregnancy intention with a retrospective survey question asking women whether or not they wanted the pregnancy at the time of conception. Examples of commonly accepted questions can be found in the National Survey of Family Growth (NSFG) and the Pregnancy Risk Assessment Monitoring System (PRAMS), both of which ask whether the woman got pregnant too soon, too late, at the right time, or whether she did not want to become pregnant at all.<sup>56</sup> However, other studies measure intentions by asking respondents about their feelings regarding the pregnancy, for example, feeling happy to be pregnant<sup>24</sup> or denying the pregnancy (defined by whether the woman said that she had not wanted to think about being pregnant, had not wanted others to know she was pregnant, or did not know she was pregnant)<sup>53,54</sup> or about behavioral factors, such as whether the mother was using contraception when she conceived<sup>7,56</sup> or whether she tried to obtain an abortion during pregnancy.<sup>9</sup> While intendedness theoretically may refer to the intentions of both the mother and her partner, many data sources ask only the mother about her intentions (e.g., PRAMS), and others that assess father intentions generally rely on the mother's reports of the father's intentions without directly surveying both members of a couple (e.g., the NSFG).<sup>29,56</sup> Almost all of the published studies we found only considered mothers' reports of intendedness in their analyses.

This section provides descriptive information about percentages and rates of unintended pregnancies and births based on nationally representative data collected by the National Center for Health Statistics. Of all births among women aged 15-44 in 2002, 14% were unwanted and another 21% were mistimed.<sup>6</sup> However, the prevalence of unintended births varies greatly by the characteristics of the woman, especially by age. For example, teens who have a birth are more likely than older women to consider the birth unintended. Among births to females under the age of 20, 21% were unwanted and 57% were mistimed, compared with 17% of all births to women in their early twenties being reported as unwanted and 27% as mistimed.<sup>6</sup> Among women aged 25-29, the percentage of births that are unwanted and/or mistimed is lower than that of younger women, but still remains high, with 10% of births being unwanted and 16% being mistimed. Additionally, a higher proportion of births are reported to be unwanted among women who are single or cohabiting, Hispanic or black, and below the poverty level, compared with those who are married, white, and of a higher socioeconomic status, respectively.<sup>6</sup>

The rate of unintended pregnancy has remained constant between 1994 and 2001, with 51 unintended pregnancies reported per 1,000 women aged 15-44 at both time points. Conversely, due to a decline in the proportion of unintended pregnancies ending in abortion, the rate of unintended pregnancies that were carried to term increased, resulting in a slight overall increase in the rate of unintended births to women during this time period (from 20 to 22 unintended births per 1,000 women).<sup>13</sup>

Rates of unintended births (measured as the number of unintended births per 1,000 women) also differ by age, race/ethnicity and socioeconomic status. For example, although teens report the highest percentage of births that are unintended, unintended birth rates are highest among women in their early twenties. In 2001, the unintended birth rate for women aged 20-24 was 46 unintended births per 1,000 women, compared with rates of 34 for women aged 15-19 and 22 among women of all ages. Women aged 25-29 also have high rates of unintended births (32 unintended births per 1000 women). Trends in unintended birth rates also vary by the age of the mother. Between 1994 and 2001, unintended birth rates increased among women in their early twenties (from 43 to 46 per 1,000 women aged 20-24) and among women aged 25-34 (from 25 to 32 per 1,000 women aged 25-29 and from 15 to 20 per 1,000 women aged 30-34), but declined among teens during the same period (from 38 to 34 out of 1,000 women aged 15-19).<sup>13</sup> These changes could be due to increasing rates of contraceptive use among teens and decreasing marriage rates among older women.<sup>13</sup>

Unintended birth rates vary by socioeconomic status as well, with unintended birth rates being much higher for women below the poverty level (58 per 1,000 women) than women at or above 200% of

the poverty level in 2001 (11 per 1,000 women). Moreover, the rate of unintended births increased by 44% among poor women but declined among women who were at or above 200% of the poverty level between 1994 and 2001.<sup>13</sup> Finer and Henshaw (2006) hypothesize that these trends may be due to lower rates of effective contraceptive use among poor women, a lower likelihood that poor women will have health insurance, and decreased federal funding for family planning services for low-income women over time.<sup>13</sup>

Finally, unintended birth rates differ by race/ethnicity, with rates of 40 unintended births per 1,000 Hispanic women in 2001, and of 35 for black women, compared with 17 among white women. Between 1994 and 2001, rates of unintended births showed slight declines among black women, slight increases among white women, and more dramatic increases among Hispanic women.<sup>13</sup> The slight rise in unintended birth rates among white women and larger rise among Hispanic women can, in part, be explained by a decline in the proportion of unintended pregnancies resulting in abortion among these groups.<sup>13</sup>

## FINDINGS FROM EXISTING RESEARCH

As discussed earlier, our literature review is based primarily on multivariate studies that control for sociodemographic background factors. Unless otherwise stated, all reported findings are statistically significant, net of relevant sociodemographic background control variables. In cases where we highlight findings from qualitative or bivariate studies, we specifically note the study's analytical approach.

### Prenatal and Perinatal Outcomes

A relatively large body of research examines the association between pregnancy intentions and a range of prenatal and perinatal outcomes, including both maternal behaviors during pregnancy and outcomes for the child at the time of the birth. This research consistently shows that women with mistimed and unwanted pregnancies initiate prenatal care at a later time than those whose pregnancies were intended.<sup>8,26,31,32,34,46,47,54</sup> In terms of other prenatal behaviors, the connection between pregnancy intention and smoking during pregnancy is less clear,<sup>8,20,26,34</sup> and little recent research has examined other healthy behaviors such as alcohol use and increased vitamin intake.<sup>20</sup> After the birth, however, studies find that mothers with intended pregnancies are more likely to breastfeed than those with unwanted and mistimed pregnancies.<sup>8,9,11,26,31,59</sup> Research exploring the relationship between pregnancy intentions and infant health outcomes shows only weak support for a relationship, net of controls between intention and prematurity<sup>4,21,22,33,39,46</sup> and low birthweight.<sup>4,22,33,39,46,52,53</sup> More specifically, although some studies note an association between unintended pregnancy and a higher risk of prematurity or low birth weight,<sup>12,22,33,39</sup> results from some of these studies indicate that the association is accounted for by sociodemographic characteristics and maternal health behaviors.<sup>22,33</sup> These findings are further explained below.

*Prenatal Care.* Receiving the correct number of prenatal care visits and beginning prenatal care early in the pregnancy is important for infant health; for example, receipt of prenatal care has been found to be positively associated with a healthy birthweight.<sup>30,43</sup> Given the importance of prenatal care to an infant's health, researchers have examined whether pregnancy intentions are associated with receiving adequate prenatal care. Women with unwanted or mistimed pregnancies are less likely to use any maternal and child health services than women with intended pregnancies.<sup>47</sup> Specifically, research shows that women who have unwanted and mistimed pregnancies are more likely to delay the initiation of prenatal care relative to women with intended pregnancies.<sup>8,31,32,46,54</sup> Although the definition of delayed prenatal care is inconsistent across studies, for example, some measure delay as prenatal care obtained after 8 weeks,<sup>34</sup> while others

measure delay as prenatal care obtained after the first trimester<sup>31</sup> or after 6 months,<sup>26</sup> the findings remain consistent. However, using a more methodologically strong fixed-effects model, which uses a sample of women with at least two children to control for unmeasured family background characteristics, one study found that this relationship is only true for women with unwanted, not mistimed, pregnancies.<sup>26</sup> Another study found that whereas unintendedness is associated with a delayed start of prenatal care using data from the National Maternal and Infant Health Survey, there was no such relationship using data from the National Survey of Family Growth.<sup>34</sup> Other measures of maternal pregnancy attitudes, such as pregnancy denial and unhappiness about the pregnancy, are also found to be associated with delayed initiation of prenatal care.<sup>54</sup> One study posits that women with unintended pregnancies are less likely to recognize a pregnancy early, which may explain their delayed initiation of prenatal care.<sup>34</sup> Although women with unintended pregnancies begin receiving prenatal care later than women with intended pregnancies, one study found no relationship between pregnancy intentions and whether women reported the recommended number of prenatal visits.<sup>34</sup> Overall, these studies show a consistent association between unintended pregnancy and delayed prenatal care despite using diverse samples (nationally representative samples of women in the U.S.,<sup>31,46</sup> large representative samples of women living in certain states in the U.S.,<sup>8,54</sup> and a nationally representative sample of women in Thailand).<sup>47</sup>

*Prenatal Health Behaviors.* Maternal prenatal health behaviors, such as smoking or drinking alcohol during pregnancy, have been shown to negatively affect infant outcomes, such as birthweight and carrying a baby to term.<sup>43,55,62,64</sup> Yet recent research does not provide clear evidence about whether an association exists between pregnancy intentions and the likelihood that women engage in these harmful prenatal behaviors. Some studies show that women are more likely to smoke during pregnancy if their pregnancy is unintended,<sup>8,20</sup> however, other researchers report conflicting results depending on the type of model used or the particular dataset analyzed. In a cross-sectional analysis of nationally representative data, Joyce, et al. (2000) found that having an unwanted pregnancy is positively associated with smoking during pregnancy, but found no such association using more advanced methods comparing outcomes among siblings who were and were not the result of an unwanted pregnancy.<sup>26</sup> Similarly, using the National Maternal and Infant Health Survey, Kost, et al. (1998) reported that women with mistimed pregnancies are less likely to quit smoking than women with intended pregnancies; but, they found no association using data from the National Survey of Family Growth.<sup>34</sup> The authors suggest that the differences in results may be due to either the slightly different samples represented in the two surveys or to the differences in question wording in the two surveys.<sup>34</sup> These inconsistent findings contradict earlier research, which found a stronger link between unintended pregnancy and negative prenatal health behaviors,<sup>5</sup> and are likely due to the use of more sophisticated methods used in more recent research on the topic.

We only identified one study published since 1995 that examined alcohol use during pregnancy, and the authors found no relationship between intendedness and alcohol use during early pregnancy.<sup>20</sup> However, although this particular study used multivariate analyses, it used a geographically limited sample of women receiving prenatal care, which limits the ability to generalize the findings.<sup>20</sup> The small amount of recent research on this topic and the restricted sample of the study we did identify may explain why this finding contradicts previous research that found a stronger association between unintendedness and alcohol use during pregnancy.<sup>5</sup> However, one study also examined other health behaviors such as increasing vitamin intake and decreasing caffeine consumption and found that women with intended pregnancies are more likely to adhere to these healthy practices than women with unintended pregnancies.<sup>20</sup>

*Prematurity.* Babies who are born prematurely are more likely to have a low birthweight, which is associated with experiencing physical and cognitive disabilities when they are infants as well as lower educational attainment in adulthood.<sup>17,44,48</sup> Some research indicates that women with unwanted or seriously mistimed pregnancies are at a higher risk of delivering a premature baby than women whose pregnancies

were intended.<sup>22,33,39</sup> However, two studies found that this association disappeared once sociodemographic controls (e.g., poverty and education) and controls for risky maternal behaviors (e.g., smoking, drinking, inadequate vitamin intake and insufficient weight gain during pregnancy) were added to the model, suggesting that the association between unwanted pregnancy and preterm births may operate through other factors.<sup>22,33</sup> Not all research findings are consistent with respect to the relationship between intendedness and premature births. One study of women in four countries who became pregnant using natural family planning found no association between planning status and pregnancy intention and the risk of having a preterm birth.<sup>4</sup> However, these women may be self-selected, as reflected by their choice of natural family planning.

*Birthweight.* Babies born at a low birthweight are at an increased risk of experiencing problems during infancy and later in life, such as cognitive and physical disabilities and lower educational attainment.<sup>17,44,48</sup> Research has shown that infants born from unwanted pregnancies,<sup>12</sup> mistimed pregnancies,<sup>52</sup> pregnancies where the mother denied the pregnancy,<sup>52,53</sup> or pregnancies where the mother felt ambivalent<sup>39</sup> are more likely to be of a low birthweight than those from wanted pregnancies. Subgroup analyses by race and Medicaid status (i.e., white women, black women, women on Medicaid, women not on Medicaid) revealed that, within each subgroup, women who denied their pregnancies were more likely to have very low birthweight babies than babies of normal or moderately low birthweight.<sup>53</sup> Conversely, one other study that used a large sample of women who participated in PRAMS found that women with mistimed pregnancies are less likely to have a low birthweight baby than women with intended pregnancies, a finding contradictory to other research and one that the authors were unable to explain.<sup>39</sup> Similar to findings on prematurity, some studies found that although there is a relationship between unintended pregnancy and low birthweight in bivariate analyses, the association is no longer significant once mothers' adverse health behaviors are controlled for,<sup>22,33</sup> suggesting that the association between unwanted pregnancy and birthweight actually operates through other factors (such as smoking, drinking, inadequate vitamin intake, and insufficient weight gain).

*Breastfeeding.* Breastfeeding is important to infant health.<sup>10</sup> It has been found to have a protective effect against illness<sup>10</sup> and is recommended for mothers by the Public Health Service Expert Panel as one of seven areas of advice for pregnant women.<sup>51</sup> Research examining the link between unintended pregnancy and breastfeeding consistently finds that women with unintended pregnancies are less likely to breastfeed, a finding that holds across various data sources, samples and methods.<sup>8,9,11,26,31,46,59</sup> While some studies report that this is true for both unwanted and mistimed pregnancies,<sup>8,11</sup> others indicate that only women with unwanted, but not mistimed, pregnancies are less likely to breastfeed.<sup>26,59</sup> Using data from the National Maternal and Infant Health Survey, Kost, et al. (1998) reported that women with unwanted pregnancies are less likely to breastfeed than women with intended pregnancies, but the same did not hold true when using data from the National Survey of Family Growth,<sup>33</sup> a finding likely due to either different samples or question wording in the two surveys.<sup>33</sup> Subgroup analyses indicate that although white women whose pregnancies are unwanted are less likely to breastfeed, there is no association among black and Hispanic women.<sup>59</sup> The authors hypothesize that this finding is due to cultural differences, suggesting that black and Hispanic women may more readily accept an unwanted pregnancy than white women.<sup>59</sup>

## Outcomes for Children

Past research has shown that unintended births have implications for the child that last from early childhood through adolescence and even into adulthood.<sup>1,2,7,9,21,24,58,65</sup> We look at pregnancy intentions as they relate to a number of measures of child, adolescent, and adult well-being, including physical and mental health, cognitive outcomes, and social outcomes. Overall, unintendedness seems to be most clearly associated with poor physical health,<sup>7,9,21,58</sup> poor mental health,<sup>1,9</sup> a less close mother-child relationship,<sup>2,24,65</sup>

and poorer educational outcomes.<sup>9,40</sup> However, findings on the association between unintendedness and child cognitive outcomes have been mixed.<sup>3,7,21,26,32</sup>

*Physical and Mental Health Outcomes.* The bulk of research has shown that children born from unintended pregnancies have poorer physical health than those whose births were intended. Children from unintended pregnancies are more likely to have less than excellent health<sup>7</sup> and to be too active or not active enough<sup>7,21</sup> at age four, based on mothers' reports, compared with children from intended pregnancies. Moreover, unwanted children (measured in this study as those whose mothers attempted twice to obtain an abortion) are more likely to be overweight at age 9 than those in a matched comparison group (matched with the unwanted children on sociodemographic characteristics such as sex, birth order, and socioeconomic status) whose mothers accepted the pregnancy.<sup>9</sup> Prenatal and birth outcomes may mediate some or all of the relationship between intendedness and children's physical health outcomes. Although unintended or mistimed pregnancies are associated with less-than-optimal health at age three in initial models, wantedness is no longer associated with child health once the models include controls for birth outcomes (such as birthweight and parity) and other risk factors (such as poverty).<sup>21</sup>

Studies of children in developing countries have examined whether pregnancy intention is related to stunting (measured as especially low height-for-age), an indicator of malnutrition that is associated with a host of negative health and cognitive outcomes, such as poor neuromotor functioning and obstetrical complications.<sup>58</sup> Findings from studies conducted in various countries indicate that the relationship between unintended pregnancy and stunting varies by the country of residence. In Bolivia, toddlers from mistimed and unwanted pregnancies are more likely to be stunted than toddlers from intended pregnancies.<sup>58</sup> A study of mothers and children in another group of developing countries found that, in Peru, unwanted children are more likely than wanted children to be stunted, but this association was not found for any of the other countries studied, including Egypt and Kenya.<sup>37</sup> The authors suggest that the finding in Peru can be explained by more pregnancies that result from contraceptive failures experienced by women in this country, which may signify a greater extent of unwantedness compared to other unintended pregnancies.<sup>37</sup>

Although we found only two recent studies that examined the consequences of pregnancy intentions on the mental health and functioning of the child, the results indicate that children who were unwanted at conception are more likely to suffer from lower levels of psychological well-being in both childhood and adulthood.<sup>1,9</sup> The association for children who were mistimed is less clear. Those born from unwanted pregnancies are less well-adapted as children (at age 9),<sup>9</sup> have lower levels of self-esteem as young adults (at age 23),<sup>1</sup> and are more likely to report depression or receiving psychiatric care in their late twenties and early thirties<sup>9</sup> as compared with children who were wanted. Children who were born from mistimed pregnancies also have lower levels of self-esteem as young adults (at age 23), although the effect is much smaller than for children who were unwanted.<sup>1</sup>

*Cognitive and Educational Outcomes.* Some research indicates that pregnancy intentions have little effect on cognitive outcomes among children and adolescents.<sup>3,21,26</sup> According to two studies, pregnancy intention is not associated with scores on the Peabody Individual Achievement Tests (which measure math and word recognition) or the Peabody Picture Vocabulary Test (which measures receptive vocabulary) for children under age 14.<sup>3,26</sup> Also, although one study found that children from unintended, and especially unwanted, pregnancies have lower vocabulary scores<sup>32</sup> and another found that children from pregnancies that were unintended but in which the mother was not using birth control were found to have lower scores on the Denver Development Scale (measures social, motor, and language skills at age 4) than those from intended pregnancies,<sup>7</sup> there is evidence that these findings may be due to poorer birth outcomes, such as low birthweight and high parity, and other social risk factors, such as poverty, which are more common among women with unintended pregnancies.<sup>21</sup>



In contrast, there is some evidence from two studies conducted outside the United States that children unwanted at conception are less successful in school compared with children who were wanted by their mothers. Children and teens born from unwanted pregnancies in Czechoslovakia receive poorer grades and teacher ratings (at age 9 and ages 14-16) than those born from a wanted pregnancy.<sup>9</sup> In addition, children born from unwanted pregnancies in Czechoslovakia and Finland complete fewer years of education than those born from wanted pregnancies.<sup>9,40</sup> Moreover, in subgroup analysis, young women (but not young men) born from mistimed pregnancies also complete fewer years of education.<sup>40</sup> One consequence of lower educational attainment is unemployment later in life, and one study found that women born from unwanted pregnancies are more likely to be unemployed as adults than women born from wanted pregnancies, although this association is not true for men.<sup>9</sup>

*Behavioral Outcomes.* Relatively few studies examine the relationship between pregnancy intention and behavior in childhood and adulthood, but the evidence that does exist suggests that unintended births may be associated with delinquency during the teen years, but not with problem behaviors at younger or older ages.<sup>19,26</sup> Adolescents (aged 11-17) born from mistimed or unwanted pregnancies report higher levels of general and serious delinquency than those born from wanted pregnancies, although there is no association between intendedness and delinquency at older ages, i.e., in late adolescence and young adulthood.<sup>19</sup> In subgroup analyses, this same study found that being born from an unwanted pregnancy is positively associated with delinquency among males and those born to mothers older than 20 at the birth.<sup>19</sup> In contrast, pregnancy intentions do not seem to be associated with behavioral outcomes for younger children. In a longitudinal study that used fixed-effects models to control for confounding background characteristics, the authors found that pregnancy intendedness is unrelated to maternal reports of problem behaviors among children aged 3-13.<sup>26</sup>

*Mother-Child Relationship.* Research indicates that children born from intended pregnancies have better relationships with their mothers throughout childhood and even into adulthood than children who were unwanted by their mothers.<sup>2,24,49,65</sup> Results from a qualitative study of pregnant teens found that teens who had an intended pregnancy are more likely than those with unintended pregnancies to say that enhanced relationships (with the baby and others) is an advantage of having a birth as a teen.<sup>49</sup> In another study, the authors found that black, low-income mothers who were happy about their pregnancies are more likely to have toddlers with strong attachment security than those who were less happy about their pregnancies,<sup>24</sup> whereas mothers with unwanted pregnancies spend less leisure time with their children than those with wanted pregnancies.<sup>2</sup> Mothers who had unwanted or unplanned pregnancies also spank their children more frequently<sup>2</sup> and one study found they are more likely to physically abuse their children.<sup>65</sup> The negative relationship between unintended births and mother-child relationships appears to continue into adulthood, as one study found that mothers who had any unwanted births or wished that they had fewer children have lower levels of affection for all of their children (including those who were intended at conception) when their children are aged 18, 23, and 31, and provide less social support to their 31-year-old children than those who never had an unwanted birth.<sup>2</sup> However, the research evidence is not entirely consistent; some scholars find that intendedness is unrelated to mother-infant relationship quality, parenting style, and maternal warmth towards infants.<sup>3,24</sup> Overall, though, research suggests that unintended births often lead to lower quality relationships between mothers and their children, a finding supported by multiple multivariate studies that use both nationally representative cross-sectional and longitudinal datasets,<sup>2</sup> and smaller low-income and minority samples.<sup>24,65</sup>

*Union Formation.* In addition to the effect intendedness status has on the outcomes discussed above, it also appears to play a role in the relationships the children themselves form when they enter adulthood. Being born of an unwanted pregnancy may have negative consequences for later romantic relationships. One longitudinal, multivariate study of children born in Czechoslovakia found that women, but not

men, from unwanted pregnancies, that is, pregnancies where the mother attempted twice to obtain an abortion, are more likely to be single or divorced at ages 26-28 and single at age 28-31 than those from wanted pregnancies.<sup>9</sup> However, this is the only recent study on the link between intendedness status at birth and subsequent union formation that we were able to find, and it does not examine the effect of mistimed pregnancies at all, so we must be cautious about drawing firm conclusions from this work.

## Outcomes for Parents

Having an unintended birth could have effects on the mother, father, and the couple, yet relatively few studies examine the effect of an unintended birth on the parents involved. There is a particular lack of studies that examine the effect of unintended births on fathers and on the couple. The existing body of work indicates that mothers who have unintended births are at a greater risk of suffering negative mental health consequences during and after pregnancy,<sup>2,16,18,23,42</sup> and experiencing physical abuse during the pregnancy.<sup>8,14,15</sup> Some additional research has examined the association between unintended births and attitudes towards parenting<sup>16,24</sup> and parental relationship quality.<sup>27,36</sup>

*Mental Health.* A fairly large body of literature confirms that an unintended birth can have negative consequences for a mother's mental well-being. Women with unwanted, mistimed, or unplanned births demonstrate lower levels of general psychological well-being during pregnancy and following the birth,<sup>16,18</sup> and a higher risk of depression,<sup>2,23,42</sup> and they report lower levels of happiness than those with intended births.<sup>2</sup> Furthermore, one study found that women are more likely to experience depression following the birth when the partner, but not the mother, reported that the pregnancy was unwanted or mistimed.<sup>35</sup> On the other hand, qualitative data indicate that women often receive support from their families, friends, and community following an unintended birth,<sup>27</sup> which may help to ease the psychological consequences in the long run. Although the majority of work does show an important link between unintended births and poorer maternal mental health, it is important to acknowledge that two studies, one which uses a small, geographically limited sample and the other a large nationally representative U.S. dataset, have found no association between pregnancy intendedness and maternal depression.<sup>35,57</sup>

*Mother's Attitudes Towards Parenting.* Although we might expect that having an unintended birth would affect a woman's attitudes towards parenting, the existing research does not necessarily confirm this expectation. Mothers of toddlers who accepted their pregnancies are less likely than those who were less happy about their pregnancies to think that parenting is burdensome,<sup>24</sup> but are no more likely to feel that interactions with their child are enjoyable.<sup>24</sup> There is also no association between pregnancy planning status and maternal attitudes towards parenting two years after the birth.<sup>16</sup>

*Parent Relationship Quality.* Some qualitative work has investigated women's impressions of the implications of an unintended birth on their relationships with the fathers of their children and whether these relationships would likely change following the birth. In a focus group study, some women indicated that an unplanned pregnancy might lead to an increased commitment in their relationship.<sup>36</sup> In a separate set of interviews with women attending family planning and prenatal clinics, some of the younger women who were pregnant with their first child, at first also believed that pregnancy would bring them closer to their boyfriends, but the demands of motherhood eventually caused many of these relationships to end.<sup>27</sup>

While the implications of an unintended birth for the overall quality and duration of the parents' relationship is not clear, some research has shown that women with unwanted or mistimed pregnancies are more likely to experience physical abuse before and during pregnancy than those whose pregnancies were

intended.<sup>8,14,15</sup> In subpopulation analyses, the association between mistimed and unwanted pregnancy and physical abuse was found to be strongest for women who are at a lower risk of abuse, such as women who are 20 years old or older, have more education, are white, married, and of higher socioeconomic status.<sup>15</sup> The authors of this particular study note that this finding likely reflects a risk of violence that is so high among young, single, and minority mothers who are of a low socioeconomic status, that pregnancy intention is unlikely to make a large contribution to the risk of violence.<sup>15</sup>

## Subgroup Findings

Only a few of the studies that examined the consequences of unintended pregnancy conducted subgroup analyses. One study found that, among white women, black women, women on Medicaid, and women not on Medicaid, those who denied their pregnancies were more likely to have very low birthweight babies than babies of normal or moderately low birthweight.<sup>53</sup> Findings from another racial/ethnic subgroup analysis indicate that white women whose pregnancies are unwanted are less likely to breastfeed, whereas there is no association among black and Hispanic women.<sup>59</sup> In addition to subgroup analyses, a few studies examined the association between pregnancy intentions and outcomes within select, homogeneous populations. One study using a sample of black mothers found that among this population, unintended pregnancy, especially an unwanted pregnancy, is associated with exposure to higher levels of stress and depressive symptoms, compared to black women with intended pregnancies.<sup>42</sup> Another study of low-income black women found that those who had been less happy about their pregnancy have toddlers with lower levels of attachment security.<sup>24</sup> Finally, a study of white married mothers found that unintended pregnancy is associated with lower levels of self-esteem among their children.<sup>1</sup> Gender subgroup analysis reveals that young women (but not young men) born from mistimed pregnancies completed fewer years of education,<sup>40</sup> and women, but not men, from unwanted pregnancies, are more likely to be single or divorced at ages 26-28 and single at age 28-31 than those from wanted pregnancies.<sup>9</sup> However, being born from an unwanted pregnancy is positively associated with delinquency among males only.<sup>19</sup> This same study also found that delinquency was associated with being born from an unwanted pregnancy for children born to mothers older than 20 at the birth, but not for children born to teen mothers.<sup>19</sup> Finally, subgroup analyses reveal that having a mistimed or unwanted pregnancy is associated with experiencing physical abuse for women who are 20 years old or older, have more education, are white, married, and of lower socioeconomic status.<sup>15</sup> This small body of evidence, while not conclusive, suggests that unintended childbearing may have greater consequences for children and parents in families where the mother is older than twenty at the birth and is white, versus mothers who are teens or are racial minorities. Although unintended births have different consequences for males and females, we cannot say whether these consequences are worse for either gender. Further research is needed on each of these subgroups before firm conclusions can be made.

## METHODOLOGICAL ISSUES

### The Definition of Intendedness

One key methodological problem with studies on the consequences of unintended births is that women and their partners often do not have clearly defined pregnancy intentions that can be summarized in a straightforward survey question. Researchers use self-reports of intendedness (e.g., whether a mother reported wanting to become pregnant at the time of conception, later, or never), behaviors (e.g., contraceptive use at the time of conception), and attitudes (e.g., a mother's report of her happiness to be pregnant or her acceptance of the pregnancy at the time of conception) to measure intendedness. There is considerable de-

bate about which of these is most useful,<sup>56</sup> a debate complicated even further by the fact that individual women's responses to pregnancy intention, contraceptive behavior, and attitude questions are not always consistent.<sup>61</sup> For example, a sizeable percentage of women who become pregnant while using contraception do not consider their pregnancies unintended and many women who consider their pregnancies unintended report feeling happy or very happy to be pregnant.<sup>61</sup> Consequently, some researchers have criticized the idea that pregnancies are always based on rational decisions by the mother, arguing that this outlook masks the complexity of fertility decisions made by women and their partners.<sup>29,56</sup> For example, a woman may consider her pregnancy unintended because she is too young or unmarried, or she may consider herself at the right age for a pregnancy but with the wrong partner.<sup>29</sup> Knowing the reasons why women consider their pregnancies intended or not may be important in understanding the consequences of that pregnancy.

The use of a measure of mistimed pregnancies may be especially problematic, since a birth can be mistimed by a short amount of time or a longer period of time, each possibly having different implications.<sup>46,56</sup> Studies do not often measure the extent of mistiming, so we do not know whether births occurred years or just months too early.<sup>56</sup> Furthermore, many studies compare only intended pregnancies to unintended pregnancies, but do not examine mistimed and unwanted pregnancies separately, even though studies that do separate unwanted from mistimed pregnancies have found many differences in the mother's interpretation of pregnancy intention and the outcomes associated with it.<sup>12,26,39,56,59</sup>

The factors involved in pregnancy intentions also likely vary throughout a woman's life, and an unintended birth might be indicative of a very different circumstance for a younger woman compared with an older woman. For example, unwantedness may better reflect the feelings of older women who are finished childbearing, instead of young women who want children in the future, and whose births would be considered mistimed.<sup>56</sup> Statistics on unintended childbearing support this, since teenage and young adult women with unintended births are much more likely to report that the birth was mistimed than unwanted.<sup>6</sup> Researchers have suggested that more information is needed on the meaning of pregnancy intentions for women and their partners, and on what outside factors influence how they interpret feelings about a pregnancy.<sup>56</sup>

Another important issue in the measurement of unintended births is that pregnancy intention is almost always reported by the mother retrospectively, which may be less useful than intention reported closer to the time of conception.<sup>22</sup> Many circumstances following the conception, such as spending time with the baby or watching a child grow up, may change a woman's recollection of whether or not the pregnancy was wanted. And in fact, studies do show that pregnancy intentions are not constant during pregnancy or after the birth,<sup>25,45,50</sup> and that children with more favorable characteristics are more likely to be retrospectively reported as wanted by their mothers.<sup>50</sup> Thus, it is possible that whether a woman planned her pregnancy before conception or not does not matter as much as her feelings about becoming a mother once her child is born. The fluid, time-varying nature of the meaning of intendedness therefore makes studying its consequences quite complicated. Studies that use prospective designs would likely provide a more accurate assessment of pregnancy intentions much closer to the time of conception. A prospective study measures exposure (e.g., experience of an unintended pregnancy) in a sample of individuals and then follows the individuals forward in time, monitoring possible outcomes. Prospective studies are methodologically strong as they not only allow researchers to tease out causal relationships by controlling for confounding factors assessed prior to conception, but also because they minimize recall error and distortion.<sup>63</sup>

In addition, the views of males and fathers are usually not ascertained, and little work has explored the meaning of fatherhood and intendedness for men. Whether the same measures work or are optimal for males very much needs attention.

## Selection Bias/Endogeneity

An important methodological challenge in the study of the consequences of unintended childbearing is the problem of disentangling the effects of unintendedness from pre-existing background characteristics of the parent(s) that influence both pregnancy intention and potential outcomes. In studies that do not adequately account for pre-existing characteristics of the mother, associations may be incorrectly attributed to pregnancy intentions when, in fact, they are actually due to characteristics of the mother (such as low socioeconomic status) that make the women both more likely to have an unintended birth and more likely to have poorer outcomes for their children or themselves. Only two studies included in this literature review address the confounding influences of family background and individual characteristics<sup>26,31</sup> using either sibling or first cousin fixed-effects models. Fixed-effects models use a sample of women with at least two children or a sample that includes first cousins (i.e., the mothers of the children are sisters) to compare outcomes of intended and unintended pregnancies in the same family in order to control for individual and family background characteristics and to identify the actual effects of unintended pregnancies. Results from one of these studies illustrate the importance of fully accounting for background factors because it shows that the association between unwanted pregnancy and maternal and child outcomes is greatly reduced and, in many instances, completely attenuated when the stricter methods are used.<sup>26</sup> On the other hand, the second study found that, even when controlling for family background characteristics, unintended fertility is significantly associated with maternal prenatal and perinatal behaviors, suggesting that selection does not completely account for the observed effects of unintended status.<sup>31</sup> However, these results are based on a relatively small sample, and the authors caution that definitive conclusions should not be drawn from this analysis.<sup>31</sup> Overall, these findings suggest that the association between unintended fertility and maternal and child outcomes often reflects family background characteristics,<sup>26</sup> but more analyses are needed to address the issues of self-selection and endogeneity before any definitive conclusions can be drawn.

## SUMMARY AND CONCLUSION

The goal of this literature review was to examine the consequences of unintended pregnancy and childbearing among young adults in rigorous studies with multivariate controls for confounding factors. We have found evidence of a significant association between unintended childbearing and a number of outcomes. Overall, the findings suggest that experiencing a birth or pregnancy that was unintended by the mother, who is most often studied, is associated with an array of negative outcomes, including delayed prenatal care, reduced likelihood of breastfeeding, poorer mental and physical health during childhood, poorer educational and behavioral outcomes of the child, poorer maternal mental health, lower mother-child relationship quality, and an increased risk of the mother experiencing physical violence during pregnancy. There is also some evidence that unintended pregnancy is associated with a greater likelihood of the mother smoking while pregnant and of the child being born of a low birthweight, as well as a greater likelihood of children from unwanted pregnancies being single or divorced when they reach adulthood. Therefore, it suggests that unintended pregnancy, not just teen pregnancy, *is* an issue about which the general public should be concerned.

We first set out to examine prenatal and perinatal outcomes. A number of studies find that women with unintended pregnancies initiate prenatal care later than women with intended pregnancies.<sup>8,26,31,34,46,47,54</sup> The findings are not as clear on other prenatal health behaviors, such as smoking and alcohol consumption during pregnancy.<sup>8,20,26,34</sup> Some studies show that women are more likely to smoke while pregnant if the pregnancy is unintended,<sup>8,20</sup> but other studies report conflicting results.<sup>26,34</sup> The one study identified that examined alcohol consumption during pregnancy found no association with pregnancy intentions.<sup>20</sup> While

studies have found a link between pregnancy intention or attitudes and prematurity and low birth-weight,<sup>4,12,22,33,39,46,52,53</sup> recent research suggests that this operates through less healthy maternal behaviors.<sup>22,33</sup> Additionally, mothers with unintended pregnancies are less likely to breastfeed than mothers who intended their pregnancies.<sup>8,9,11,26,31,59</sup>

Next, we examined the risks for the children born to mothers who did not intend their pregnancies/births. Children born of unintended pregnancies have poorer mental and physical health, less close mother-child relationships, and poorer educational and behavioral outcomes.<sup>1,2,7,9,21,24,58,65</sup> There is also evidence that being the product of an unwanted pregnancy is associated with being single or divorced later in life.<sup>9</sup>

Finally, we examined outcomes for parents and couples who experienced an unintended pregnancy. Relatively few studies examine the consequences of unintended births on the parents involved, with a particular lack of studies on fathers and the couple. However, most studies indicate that women who experience unintended births are at a greater risk of negative mental health outcomes during and after pregnancy<sup>2,16,18,23,42</sup> and experiencing physical abuse while pregnant.<sup>8,14,15</sup>

This literature review is a compilation of the most recent research on the consequences of unintended childbearing for children, parents and couples. The key strength of this review is that we included a variety of studies, including studies that use bivariate, multivariate and qualitative research methods. We also included the few studies we could find that examine self-selection and confounding individual and background factors that may influence both unintended childbearing and potential outcomes.

We did not find any research that examines the consequences of unintended fertility specifically for young adults. Although two studies included subgroup analyses by age, neither study focused exclusively on mothers or fathers who experienced unintended childbearing in their early twenties. Because unintended pregnancy rates are high among this group, it is especially important for researchers of unintended childbearing to specifically examine the maternal and child outcomes for this age group. In addition, more qualitative analyses and analyses that address self-selection are needed so that we may further understand the true association between unintended fertility and outcomes for children and parents. Finally, studies of fathers and couples are quite sparse. It is particularly important to examine father's fertility intentions as they may have important, specific implications for child outcomes.

## **Directions for Future Research**

Although a number of studies have examined the consequences of unintended childbearing, our review of the most recent literature reveals a number of areas where additional research would be beneficial to the field. First, there is a significant lack of prospective studies. Because pregnancy intention is typically measured retrospectively, the amount of time since conception, coupled with the mother interacting with the child, increases the risk of recall bias. Prospective studies that measure pregnancy intention close to the time of conception could diminish recall bias and would be better suited to determine the causal influence of intendedness on various outcomes. Second, few recent studies examined subpopulations in their analyses. It is important to determine if the consequences of unintended childbearing differ, for example, for blacks and whites, men and women, or teenagers and young adults. Reports from fathers as well as mothers are needed as well, since some research suggests that fathers and mothers may report different intentions.<sup>31</sup> It is also important to examine outcomes by age of the parents at the time of the unintended birth to determine whether unintended births among young adults yield similarly poor outcomes as do unintended births to adolescents. We also found limited or conflicting research on a number of outcomes of interest.

Thus, more research is needed to assess the relationship between unintended childbearing and prenatal health behaviors, prematurity, infant mortality, children's cognitive and socioemotional development, parental relationship stability, and social support. In addition, methodological work, both qualitative and quantitative, is needed to explore the meaning and measurement of unintended, mistimed, and unwanted pregnancies for males and females in different age and social groups. Finally, there is some evidence that prenatal behavior may mediate the association between unintended childbearing and child outcomes<sup>22,33</sup> and other factors (e.g., poverty or race/ethnicity) may moderate the relationship between unintended childbearing and child and parent outcomes.<sup>15,53,59</sup> We need more studies that examine the possible mediating and moderating factors.

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