

Conceptualizing a “Strong Start”: Antecedents of Positive Child Outcomes at Birth and Into Early Childhood

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Overview. Most people agree that children are important both for their own sake and for America’s future. Therefore, it is vital to nurture children’s development and well-being, and to identify those factors that can increase the odds that children will experience a “strong start” in life. This Research Brief identifies and examines factors associated with children being born and growing up healthy—in other words, with a strong start.

To identify potential factors, Child Trends conducted an extensive review of research studies to identify maternal and family antecedents (conditions and characteristics before and during pregnancy) of healthy infant and child outcomes. We examined factors that might be related to children’s prospects at the time of their birth and then assessed the research on these potential constructs to see whether studies show that each factor matters. Our work extends previous research by identifying characteristics of the mother and her environment that are associated not only with positive health outcomes at the time of the birth (such as healthy birthweight or full-term delivery) but that also may be linked to positive physical, behavioral, and cognitive outcomes in early childhood and into adolescence.

From our review of studies, we identified seven major categories of antecedents associated with a strong start in life: the mother’s health, health-related services, health-related behaviors, lack of material hardship, social support and marriage, attitudes, and social and demographic characteristics. We also identified individual factors falling within each category that have been found to be associated with child outcomes. For example, mothers’ being in good physical health,^{13,24} receiving long-term prenatal care,^{29,49} having an intended birth⁴⁸ or having a positive attitude about the birth,^{57,68} and not smoking, drinking, or using drugs during pregnancy^{49,60,65,68} are associated with carrying a baby to full term and having a baby who is born at a healthy weight. Similarly, having a mother with access to adequate financial resources^{10,46} and higher education¹⁶ and being born into a household with two biological parents in a high-quality marital relationship^{10,39} and social support lower the risks of problem behaviors and poor cognitive development in childhood.

KEY ASSUMPTIONS

Several assumptions have guided our work on conceptualizing a strong start.

- **We assume that a strong start is influenced by multiple factors.** It is not just a matter of having well-educated parents or just having prenatal care that can determine children’s prospects for developing well. Rather, a number of factors accumulate to enhance these prospects. Moreover, the number of risks has been found to be more important to children’s development than the type of risk experienced.⁵⁹
- **We assume that some of these important influences occur at the time of birth and that others occur during or even before**

a pregnancy. For example, the Centers for Disease Control and Prevention (CDC) has emphasized the importance of improving the health of women and couples *before* conceiving a child, which can result in improved pregnancy outcomes.²⁴

- **We identify antecedents (preconditions) of healthy development, rather than focus on a definition of healthy development.** Thus, we identified maternal and family factors that are associated with critical child outcomes across multiple areas of development, such as preterm birth, congenital anomalies (detected at birth or during the first year of life), intrauterine growth retardation, low birthweight (which is often a consequence of preterm birth and intrauterine

STUDIES REVIEWED

We selected the studies cited on the basis of certain criteria. These criteria included, but were not limited to the following: the use of multivariate analysis (i.e., examining multiple variables at the same time), longitudinal data (i.e., data collected over time), and/or experimental research methods (i.e., those that involve comparing outcomes of a treatment group with outcomes of a control group); publication in a peer-reviewed journal, book, or government report; and the inclusion of strong demographic and socioeconomic control variables.

These were the most rigorous studies found that analyzed the various constructs in the strong start framework. For five of the indicators (maternal mental health, maternal education, poverty, marital status, and parental relationship quality), measures assessed at birth or before the time of the birth were scarce and reported retrospectively. In those instances, we also drew on other relevant research studies that used postpartum measures, and we specifically indicate when we did so.

growth retardation), and cognitive development and behavior.^a Note that infant outcomes, such as birthweight and full-term delivery, are often identified as indicators of healthy births. However, in this study our focus was on antecedents of these outcomes. For example, we identified characteristics, such as prenatal care and parent education, that are associated with low birthweight and prematurity. Therefore, birthweight and preterm delivery were not included in our components of a strong start.

- **We identify factors associated with healthy child outcomes after controlling for critical social, demographic, and economic factors.** This is important because our review focuses on factors that, if they were changed, might enhance outcomes for children. For this reason, we have relied on studies that control statistically for confounding influences or that use an experimental method.
- **We assume that a strong start is a continuum.** It is not an “either-or” measure, and not all factors need to be present for children to benefit. Rather, children may still benefit from experiencing only a subset of elements. For example, some children may enjoy social and economic advantages but they may be challenged by maternal health problems.

CONCEPTUALIZING A STRONG START

Mother’s Physical and Mental Health Status

Mother’s health status before a child’s conception and during the gestation period is associated with child outcomes. The physical health of mothers is important to child well-being. Women of childbearing age may suffer from various chronic conditions—such as asthma, obesity, cardiac disease, diabetes, and hypertension—before they become pregnant that can have adverse effects on pregnancy outcomes.²⁴ These pre-conception health conditions can lead to miscarriage,

infant death, birth defects, and other infant complications.²⁴

Prenatal health problems, such as diabetes and preeclampsia, are associated with women having babies who are of low birthweight, who are born prematurely, or who score lower on the Apgar test used to evaluate the condition of newborns.¹³ One study found that mothers with low weight-for-height and those who lost weight while pregnant had an increased risk of delivering low-birthweight babies.⁶⁸ Specifically, maternal weight gain below the recommended range (approximately 25 to 35 pounds) was associated with low birthweight and preterm birth.²⁷ Indeed, aside from cigarette smoking, low pre-pregnancy weight and low gestational weight gain are the most important factors known to reduce fetal growth.⁴⁴

Maternal age at birth, as a marker of biological risk, is also associated with child outcomes. Research shows that mothers who are especially young and mothers who delay childbearing until their thirties are at risk of having children with poor birth outcomes. For example, young mothers, especially those younger than 15 or within two years of beginning menstruation, are at a greater risk of delivering a low-birthweight baby than women who are older at the birth of their child.⁵² Research also shows that mothers who were 30 years of age or older when they gave birth had a higher risk of having a low-birthweight baby than did mothers who were between the ages of 21 and 29 when their child was born.⁴⁹

Studies also show that maternal age at birth has social and demographic implications for child outcomes.²¹ For example, one study found that children born to mothers who began childbearing during their school-aged years (younger than 19) were more likely to become violent delinquents than were children born to older mothers, over and above controls.⁵⁴ Among young children, those born to the youngest mothers have significantly

lower cognitive outcomes.⁴³ Among adolescents, those born to the youngest mothers have greater odds of repeating a grade.⁴³ In contrast, children born to mothers who are 25 or older appeared to have the most favorable cognitive outcomes.²¹ Additionally, a large age difference between parents (father is 10 or more years older than the mother) may be associated with fetal death, preterm delivery, and infant's small size for gestational age, although only one multivariate study has examined this topic.²⁶

Maternal mental health is also significantly associated with child outcomes. Unfortunately, we found that most research articles examined maternal mental health only *after* the child's birth and that few studies examined the association between prenatal mental health and birth outcomes or childhood outcomes.^b Nevertheless, one study found that psychological distress measured during pregnancy was associated with lower fetal weight as a result of high levels of cortisol, a hormone found in the body that is secreted during stress.⁷ Another study found that prenatal maternal depression was associated with child problem behaviors.³⁶ In a third study, an analysis of black and white women from North Carolina, researchers found that white women who experienced stressful life events during pregnancy were twice as likely to deliver a preterm newborn as were white women who did not experience any stressful events. And black women who reported stress from perceived discrimination were more likely to have a preterm birth than were black women who did not perceive any discrimination.⁸

Mother's Receipt of Health-Related Services

Use of prenatal health-related services is correlated with the development and well-being of infants and children. A cause-and-effect relationship cannot be inferred between prenatal care and having a preterm birth (the major cause of low birthweight),¹⁴ because women who are more advantaged or whose pregnancy was intended are more likely to get prenatal care.^c (An alternate explanation, though, is that women who experience preterm births have fewer prenatal visits because routine prenatal visits are scheduled more frequently in the last trimester of pregnancy.¹⁴) However, receiving the recommended amount of prenatal care (starting in the first trimester) has been found to be associated with having a baby who is a healthy weight at birth. Conversely, one study found that women who received late-term or no prenatal care were at an increased risk of having a low-birthweight baby.⁴⁹

In addition, early prenatal participation in WIC (the federally funded Women Infants and Children supplemental nutrition program) has been found to be beneficial to both full-term and preterm infants. One study found that babies born to early WIC enrollees were significantly heavier than were babies born to late enrollees.³¹

In another study, researchers found that receiving advice on healthy behaviors was associated with birthweight. Mothers who were informed of each of the Public Health Service Expert Panel's seven areas of advice^d for pregnant women had greater odds of having a normal-birthweight baby than of having a very low-birthweight baby, compared with mothers who did not receive all seven areas of advice.⁵⁷

Fertility services also have been found to be associated with child outcomes. One study found that women using assisted reproductive technology were more likely to have multiple births or to have single babies who were of low birthweight than were other women. This finding persists despite the addition of a variety of controls, prompting the study's authors to suggest that the procedure itself may be related to an increased likelihood of low birthweight.⁶¹ However, further research is needed.

Mother's Health-Related Behaviors

Engaging in positive health-related behaviors is beneficial to child health and child outcomes. Smoking, drinking, and using drugs during pregnancy are all associated with a higher probability of having a low-birthweight baby.^{49,60,65,68} Prenatal smoking also has implications for children later in life. For example, one study found that conduct disorder during the years before the onset of puberty was four times more likely to occur among sons of mothers who smoked during pregnancy, and adolescent drug abuse was five times more likely to occur among daughters of such mothers.⁶⁵

Nutrition before and during pregnancy is also important. Specifically, folic acid supplementation from four weeks prior to conception through 12 weeks' gestation prevents neural tube defects in infants.⁶⁶ In addition, consuming too few calories while pregnant is associated with a lower infant birthweight.³⁸

Time between pregnancies is another indicator of birth outcomes.^{4,28,55} In a study of black and white infants, researchers found that, among black women, intervals between pregnancies of less than nine months were associated with a higher risk of

preterm delivery and having a low-birthweight baby. Among white women, intervals between pregnancies of less than three months were associated with a greater prevalence of prematurity and having a low-birthweight baby.⁵⁵ Another study of birth spacing found that intervals between pregnancies that were shorter than 18 months and longer than 59 months were associated with a higher probability of having a premature baby, as well as having a baby who was small for his or her age during gestation and at birth.⁴

Finally, mothers' behaviors at the time of birth are also vital factors in the well-being of children. Breastfeeding has a protective effect against illness. For example, one study found that breastfeeding reduced young children's need to take antibiotics at one-and-one-half and two-and-one-half years of age.⁹

Absence of Material Hardship

The absence of material hardship before and at birth, including having access to adequate financial resources, is related to a child's development. However, only limited research has examined the association between *prenatal* income or poverty measures and birth and child outcomes.^e One study did find that, among African-American women, living in a higher-income census tract was associated with a lower risk of having a preterm delivery or a low-birthweight baby.⁵³ Another study found that among women already at a high risk of delivering a low-birthweight infant due to family history, those with a higher income were more likely to deliver a baby with a healthy birthweight.⁵ In addition, a study found that living in overcrowded housing during pregnancy was associated with childhood depression and anxiety at age 10.³²

Marriage and Social Support

Marriage and social support are both related to the healthy development of children. Research shows that children and adolescents whose mothers were not married at their birth had poorer cognitive, behavioral, and relationship quality outcomes than did children and adolescents whose mothers were married when they were born.³⁷ Children between the ages of 2 and 5 years whose mothers had never married and were heads of household had lower cognitive scores and exhibited more problem behaviors than did children in households that were not headed by single women.¹⁰ Among unmarried parents, relationship status is also associated with child well-being. One study found that mothers in romantic but noncohabitating relationships with the fathers of their children had greater odds of having a low-birth-

weight baby, compared with mothers who were cohabiting with their children's fathers.⁴⁹

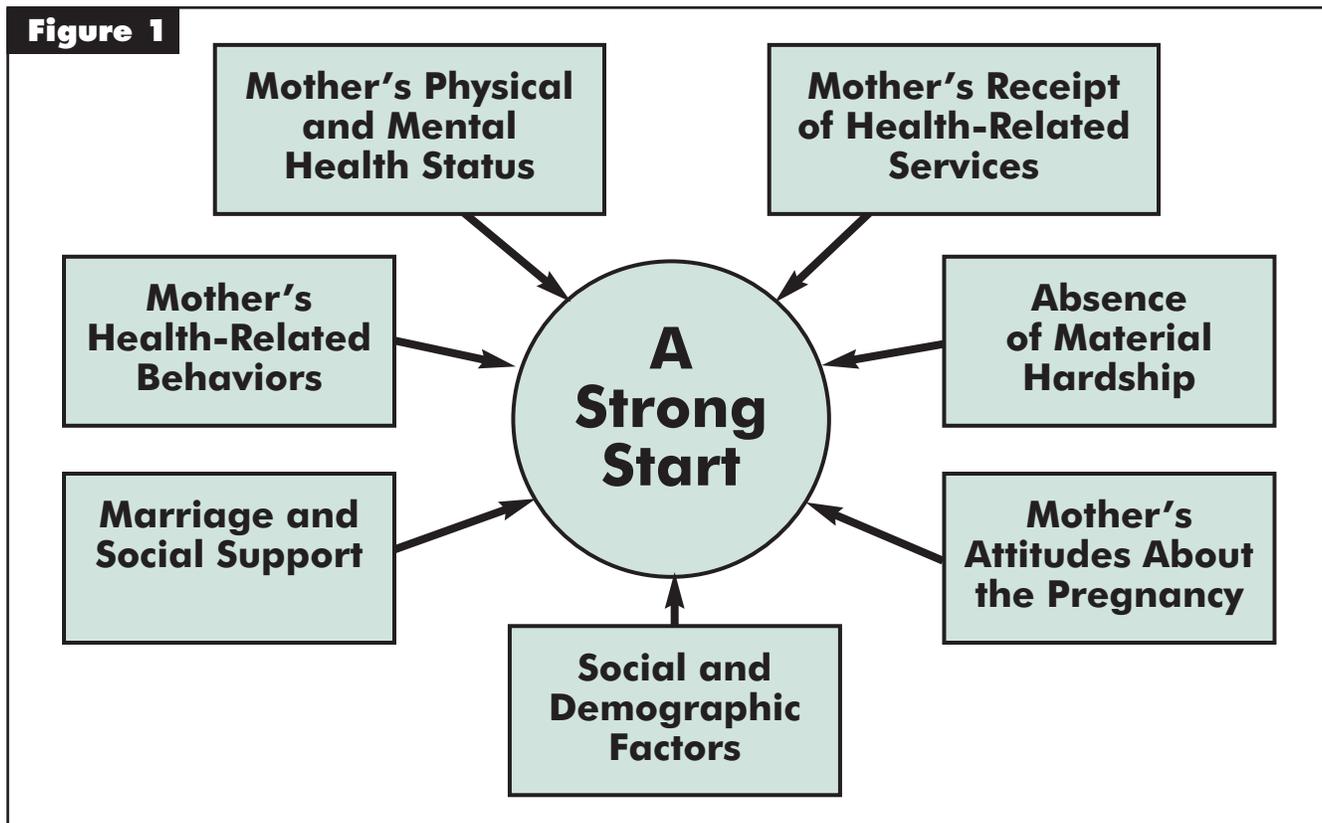
However, marital status alone is not sufficient to ensure healthy child outcomes. Child outcomes are best for children with parents in stable, high-quality, nonviolent relationships. Pregnant women are especially susceptible to domestic violence,⁵⁰ and experiencing domestic violence during pregnancy is associated with premature labor, lower infant birthweight, and even neonatal death.^{23,35} Apart from violence during pregnancy, marital quality during childhood also can affect child outcomes; however, we only found studies that examined marital quality *after* the child was born.^f

Other studies focus on the presence or absence of other sources of support that can affect children's chances of having a strong start, resulting in a mix of findings. For example, women who reported that they had no one or only one person in their lives who could provide social support during pregnancy were significantly more likely to experience poor birth outcomes than were those who reported that they had at least two supporters.⁶⁷ Similarly, mothers who had no social support in the delivery room were at greater odds of having a very low-birthweight baby, compared with mothers with a family member or other support person present at birth.³⁴ An association was also found between mothers' receipt of financial support during pregnancy from the father of their child or children and a reduced risk of having a low-birthweight baby.⁴⁹

In addition, children of mothers who received weekly, prenatal home-visiting, relationship-based interventions were found to be more secure, autonomous, and task-oriented.²² Evidence has shown that having nurses visit the homes of pregnant women resulted in reductions in maternal cigarette smoking and improvements in diet during pregnancy, along with reduced rates of preterm delivery among women who smoked.⁴⁷ The same study also revealed that children had reduced rates of injuries, ingesting dangerous substances, and being victims of child abuse and neglect when their mothers received home-visits from nurses, compared with children in the control group.⁴⁷

Mother's Attitudes About the Pregnancy

Mother's attitudes about the pregnancy and whether it was intended have implications for child physical and mental health. Multivariate studies have shown that women who reported that their pregnancy was unintended (either mistimed or unwanted) were more likely to have a preterm delivery than were those with an intended pregnancy.⁴⁸ These studies also have shown that women who were in denial or unhappy about their pregnancy were more likely to have a

Figure 1

low-birthweight baby,⁵⁸ as were women with a negative attitude about motherhood or who rejected their pregnancies.^{58,68} An unwanted pregnancy (which the mother did not want at any time) is associated with undesirable prenatal and postpartum behaviors, such as late or no prenatal care and lower rates of breastfeeding, that could impact child outcomes adversely.^{25,30} Moreover, one study found that, among white babies, unintendedness was associated with greater fearfulness and less positive affect.¹ Another construct of interest was commitment to the child;⁴² however, in the absence of research, we were unable to include findings about this construct in this *Research Brief*.

Social and Demographic Factors

Social and demographic factors are important indicators of birth outcomes and child well-being. These factors include maternal literacy, education, and immigration status. Unfortunately, no multivariate studies have examined maternal education and literacy before giving birth as a predictor of child outcomes at birth; however, studies regularly find that parental education is positively associated with child outcomes.^{16,18,46,63}

Immigration status is also associated with healthy birth outcomes. Studies have found a greater risk of infant mortality and low-birthweight births among U.S.-born women than among immigrant women, a finding that some people might find surprising. Researchers have suggested that

unmeasured cultural, behavioral, or historical factors may play a role in this association.^{3,15,62}

DISCUSSION

Our review of the available research yielded both clear examples of constructs that are associated with a strong start for children and some surprising instances in which the research base is quite thin. For example, a number of studies indicate clearly that drinking, using drugs, and smoking during pregnancy represent risk factors for poorer infant outcomes, suggesting that screening and services for maternal substance use might enhance the prospects of a strong start for a child. On the other hand, we found a dearth of high-quality, multivariate research on parental commitment to the child and its relationship with child outcomes.

In addition, we found gaps in the research literature on some of our indicators of interest in that these indicators were not measured *before* the birth of the child. Specifically, limited research examines *prenatal* mental health, maternal education, income/poverty, marital status, or parental relationship quality and the associations of these factors with child outcomes. Information about fathers' attitudes and behavior is also scarce. Accordingly, in some cases, a pressing need exists to conduct new and rigorous research on constructs that have been hypothesized to affect a strong start but

where the scientific evidence supporting the hypothesis is weak.

Overall, our review of multivariate research and experimental evaluations highlights a series of variables that are related to children's prospects. We found a set of factors or domains associated with outcomes at birth and into early childhood (see Figure 1). Within each domain is a constellation of factors that can increase the odds that a child has a strong start—that is, that a child is born into a situation that optimizes his or her cognitive, emotional, and physical development.

CONCLUSIONS

A single indicator of a strong start in life, such as birthweight, ignores a growing research literature that examines factors before and during pregnancy and at the time of a birth that are related to the well-being and development of a child. Research indicates that these factors include having a mother in good mental and physical health, who utilizes health-related prenatal services, who avoids substance use during pregnancy and engages in healthy prenatal behavior, who has access to adequate financial resources, who is involved in healthy relationships and has access to strong social support systems, who has a positive attitude toward the pregnancy, who bore her first child as an adult, and who has more years of education. While the research indeed suggests that these factors matter for children, available evidence does not allow us to determine whether some elements carry more weight than do others. As yet, there are not enough rigorous studies comparing multiple factors to allow such a conclusion.

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ENDNOTES

^a These are particularly important outcomes because children who are born prematurely and those who are of low birthweight (even if they are not born prematurely) have an increased risk of dying in the first month of life. These vulnerable babies also are at increased risk of experiencing cognitive and physical disabilities, compared with babies born at a normal weight and at full term.^{51,56} Low birthweight and prematurity also have long-term implications. In fact, these conditions are associated with lower educational attainment in young adulthood,¹⁷ which can determine success in the labor market later in life.⁴¹ However, it should be kept in mind that research has shown that infants who may have been born at a low birthweight can develop as well as normal-weight infants with the proper interventions during the first 36 months of life.²

^b A larger research literature examining postnatal maternal mental health found that poor maternal mental health was significantly associated with attention-deficit hyperactivity disorder (ADHD)³³ among children, childhood depression,^{12,20,32,33} lower sense of security among infants,⁶ poorer infant cognitive outcomes,⁴⁵ higher reports of child behavioral problems,⁴⁶ and child anxiety, disruptive, and depressive disorders.⁶⁴

^c Nonetheless, it seems clear that care such as prescribing vitamins and monitoring a pregnancy to detect problems improves the odds of a child's strong start in life.¹⁴

^d These seven pointers include: breastfeeding; reducing or eliminating alcohol use; reducing or eliminating smoking; abstaining from illegal drugs; eating the proper foods during pregnancy; taking vitamin or mineral supplements; and gaining an appropriate amount of weight during pregnancy.

^e Additional studies examined the effects of income measured after the birth of the child. In these studies, higher family income was found to be associated with higher cognitive outcomes and fewer negative behaviors for children, while poverty, welfare receipt, financial problems, and longer work hours were all found to be associated directly with poorer cognitive outcomes and adverse behavioral outcomes.^{10,40,46}

^f Boys and girls who were exposed to marital conflict during infancy and/or early childhood had more behavioral problems in kindergarten,¹¹ whereas being exposed to high-quality relationships during early childhood was associated indirectly with children having fewer externalizing behaviors and higher math scores.¹⁹

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