

Consequences for Children of Their Birth Planning Status

By Nazli Baydar

Of 1,327 children younger than two in 1986 whose mothers were participants in the National Longitudinal Survey of Youth, 61% were wanted, 34% were mistimed and 5% were unwanted. Planning status is associated with the level of developmental resources the child receives at home: At ages one and older, mistimed and unwanted children score significantly lower on a scale measuring opportunity for skill development and on a scale measuring nonauthoritarian parenting style than their wanted peers; by preschool age, they also have significantly less-positive relationships with their mothers. Measures of the direct effects of planning status on development also indicate that mistimed and unwanted children are at a disadvantage: Those younger than two have higher mean scores for fearfulness than wanted infants and lower scores for positive affect; unintended preschoolers score lower on a measure of receptive vocabulary.

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Despite continuing high levels of unintended childbearing in the United States and its assumed negative consequences for children, surprisingly little research has examined its effects on children's cognitive, emotional and academic outcomes. With mistimed and unwanted births accounting for 39% of births to ever-married women aged 15–44 in 1988¹ and 67% of those to their never-married counterparts,² it is important to understand whether planning status is associated with developmental deficits in children. If such an association exists, then its sources must be investigated. Understanding the consequences of unintendedness will facilitate evaluations of preventive programs and remedial interventions, as well as facilitate assessments of the effects of ineffective contraceptive use and limited access to abortion services.

Previous Research

A substantial body of research has shown that certain characteristics of women that predict their children's outcomes also pre-

dict the planning status of their births. For example, educational attainment³ and income level⁴ are two of the most significant predictors of planning status, consistent with the hypothesis that women of high socioeconomic status tend to use more effective contraceptive methods⁵ and use these methods more effectively than disadvantaged women.⁶

Of the other factors that influence planning status, the most important are race and age. Black women consistently identify a higher proportion of their births as unwanted or mistimed than other women.⁷ The probability of an unintended birth declines with a woman's age, because births to teenage women are highly likely to be classified as mistimed.⁸

Several studies have focused on the characteristics associated with the decision whether to terminate an unintended pregnancy or bring it to term. Using self-reported data, these studies have found that young age, being married, low educational attainment, having traditional views on roles of women, being religious, having a good relationship with the partner and belief in fate rather than self-determination influence the decision to carry an unintended pregnancy to term.⁹ These attributes are also associated with parenting style and child emotional and academic outcomes.

Most research on the consequences of unintendedness has examined the effects on the woman rather than on her child. A Swedish study documented prenatal and postpartum emotional problems in women having an unwanted birth.¹⁰ Research involving Australian women found a limited impact of unwanted childbearing on later serious mental health problems.¹¹ Various investigations have found that women with an unwanted pregnancy are less likely than others to seek and receive prenatal care, and more likely to engage in behaviors that may increase their risks of health problems associated with pregnancy and birth.¹²

Related research has focused on the consequences of teenage births. Some investigators have found moderate negative consequences of teenage childbearing, but have also pointed to a large variance in long-term outcomes.¹³ Others have discovered little or no negative effect of teenage childbearing.¹⁴ Several studies have shown that a substantial proportion of teenage births may be planned and wanted.¹⁵

The consequences for children of being unwanted have received little attention. The Swedish study mentioned earlier¹⁶ could not adequately examine this issue because it did not include a comparison group of wanted births. Results of a longitudinal study of births to Czechoslovakian women who had twice been denied abortions and a matched comparison group¹⁷ revealed that unwantedness was associated with behavioral problems in early childhood and with lower school achievement later; it also found that unwantedness had stronger negative effects on mother-son relationships than on mother-daughter relationships.

A longitudinal study of Finnish women¹⁸ found major differences between unwanted and wanted children. Unwanted girls had weaker relationships with their fathers than wanted girls, and they were more like-

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ly to exhibit problem behaviors and disinterest in school during adolescence.

A few studies in the United States have documented effects of unwantedness on outcomes in childhood and adolescence, although it was not their main focus. For example, researchers examining prenatal and perinatal determinants of adolescent drug use identified an independent effect of unwantedness;¹⁹ however, the retrospective study design made it likely that unwantedness was endogenous to the outcome measure.

Other research has revealed that unwantedness contributed to the likelihood of abuse or neglect;²⁰ one prospective study found that two of the 20 early warning signs of child abuse pertain to unwantedness.²¹

A recent study shows no effects of wantedness on the use of well-baby care or maternal employment.²² The investigators interpret these findings as evidence that unwantedness does not lead to neglect by the mother, but the assumption that the choices not to use well-baby services and to work outside the home are good indicators of child neglect is questionable.

Research Aims

Using data from the National Longitudinal Survey of Youth (NLSY) and its child assessments, the analyses presented in this article examine the consequences of planning status for the child. Planning status is defined as follows: A wanted pregnancy is one for which the mother planned or one that she did not plan, but nevertheless wanted. A mistimed pregnancy is one that occurred at a time the woman would rather have postponed childbearing, whether or not she was practicing contraception. An unwanted pregnancy is one that a woman would have preferred not to have at any time. ("Unintended" denotes a pregnancy that was either unwanted or mistimed.) Births are correspondingly categorized as wanted, mistimed or unwanted.

Children's cognitive, behavioral and emotional development is partly determined by the developmental resources available to them in their family environment, and unintendedness may have a negative effect on these resources. The developmental resources that parents provide may target cognitive development or social and emotional development. In this article, three types of developmental resources are considered: opportunities for cognitive stimulation and skill development; the quality of the relationship between the mother and the child; and the parenting style.

Resources for cognitive stimulation and

skill development include learning materials (e.g., toys, books, musical instruments), as well as family members' activities with the child that target cognitive stimulation (e.g., going on outings to playgrounds or museums, engaging in teaching behaviors, reading books to the child); the availability of such resources may be associated with the family's economic well-being. The quality of the relationship between the mother and the child is associated with the mother's warmth and emotional availability. "Parenting style," as used in this article, describes the degree of authoritarianism that the parents adopt in resolving disciplinary issues.

The three types of resources probably are interdependent. However, examining them individually may yield a better understanding of the dimensions of the family environment that mediate the association between children's planning status and developmental outcomes.

To understand the relationship between the planning status of a birth and available developmental resources, one must consider that the mother subjectively defines planning status on the basis of her circumstances, her family's circumstances and her expectations regarding a child's needs. Hence, wanted children probably are born to women who consider their circumstances adequate; unwanted children, to women who consider their circumstances inadequate; and mistimed children, to women who consider their current circumstances inadequate but anticipate improvement.

Because planning status is based on the mother's anticipation of the availability of resources, unintendedness may be a powerful predictor of an environment that is inadequate for promoting cognitive or emotional development. On the other hand, because planning status is defined after conception, post hoc rationalizations may contaminate its measurement and may limit its usefulness as an indicator of a mother's view of her ability to provide for her child.

Methodology

Data

The NLSY began in 1979, with interviews of a nationally representative cohort of 12,686 men and women aged 14–21; follow-up surveys take place each year. The survey's oversampling procedures ensured adequate representation of minority groups.

In 1986, the NLSY gathered data on 4,971 of 5,876 children born to the women in the original sample. Mothers rated various behavioral and temperament-related child outcomes, and reported on their

parenting styles and on activities in which they participate with their children. Additionally, the interviewers conducted direct assessments of child cognitive and achievement outcomes, and evaluated the home environment. The 1988 survey included a similar battery of assessments.

The analyses focus on the subsample of children younger than two in 1986. One child per mother was selected at random to ensure the independence of observations. The NLSY child assessment data have several advantages. First, the sample is large and represents children of a wide range of family backgrounds. Although the study children are not nationally representative, their mothers are a nationally representative cohort of women. Second, the NLSY is the only large national data set that provides both cognitive and emotional assessments of children at more than one point in time, facilitating investigation of whether the effects of planning status change as children mature. Third, the longitudinal information that the NLSY provides on the mothers' lives is unique in its quality and quantity.

Planning Status

Since 1982, the NLSY has gathered detailed information, including the planning status, on respondents' pregnancies. For each child born to the NLSY women, the pregnancy that resulted in the child's birth can be identified by matching the date of birth obtained during the 1988 child assessments with the date of birth the mother reported at the first interview after the birth. The planning status of 1,327 children (85% of all those younger than two) could be determined. The planning status of 61% of the study children was reported before their birth (including 39% during the first two trimesters of pregnancy), and that of another 25% was reported within 90 days of their birth;* therefore, recall errors and redefinition problems should be minimal.

Controls

Several maternal, family and child characteristics that may influence child developmental outcomes and may be influenced by planning status serve as controls. Maternal race or ethnicity was determined in the baseline interview and is categorized as Hispanic, black (non-Hispanic) or other. The last group consists predominantly of white women and is referred to

*The assessment was conducted after the birth only for children whose mother became pregnant and gave birth between assessments. Children whose planning status was ascertained before birth were, on average, 19 months old in 1986; those whose planning status was ascertained after birth were 13 months old.

Table 1. Characteristics of children younger than two in 1986, National Longitudinal Survey of Youth cohort (N=1,327)

Characteristic	% or mean*
Sex	
% male	50.7
% female	49.3
Race/ethnicity	
% Hispanic	6.9
% black	15.2
% white	77.8
Birth order	
% firstborn	50.0
% higher order	50.0
% weighing ≤5.5 lbs. at birth	6.0
% with indication of or having severe birth defects	3.2
Mother's age at the time of birth (in yrs.)	24.2
Mother's education (in yrs.)†	12.2
Mother's AFQT score	68.2
Mother's self-esteem score	78.4
Family income‡	\$22,367
Per capita family income‡	\$6,230
% with biological father present at the time of birth	84.1
% of mothers married‡	72.5
% of mothers employed before the birth‡	60.8

*In this and subsequent tables, weighted data are shown. †In this and subsequent tables, characteristics are as measured at the time of the first interview during the child's first 12 months of life. ‡In this and subsequent tables, variable measures percentage employed at least 10 hours per week during the period approximately 9–12 months preceding the birth.

as “white.” Maternal age at the time of the study child's birth is measured in years.

Marital status denotes whether a mother was married at the time of the first interview following the birth of the study child (i.e., within 12 months of the birth). The living arrangements of the biological father at the time of the birth were determined on the basis of marital histories and the mother's report on the father's presence in the household.²³

Maternal employment status approximately 9–12 months prior to the child's birth was based on the weekly employment histories available for all NLSY women. An indicator was constructed to identify mothers who were employed, on average, more than 10 hours per week at that time.

Four measures of maternal socioeco-

*The AFQT score is a composite score based on tests of word knowledge, paragraph comprehension, mathematics and arithmetic reasoning.

†Some items in the HOME scale are inappropriate for the purposes of this research and preclude the use of extant subscales. For example, the HOME scale includes a measure of the presence of a father figure in the home. Since the presence of a father figure may be a determinant of planning status, the inclusion of that item may result in biases.

‡For the first two subscales, reliability for the 1986 and 1988 measures is 0.6. For nonauthoritarian parenting style (consisting of three items only for children younger than two), reliability is 0.4.

§For standard scores, the mean is 100, and the standard deviation is 16.

omic status are available: maternal education, in years, at the time of the first interview following the birth of the study child; maternal ability level, as quantified in 1981 by the percentile score in the Armed Forces Qualification Test (AFQT);* total family income; and per capita family income at the time of the first interview following the birth. In addition, the analyses include the Rosenberg scale of maternal self-esteem,²⁴ administered in 1980, expressed as a percentile score.

The child characteristics taken into account are sex, having been firstborn, having been low-birth-weight (5.5 lbs. or less), and being at risk of or having severe birth defects. Characteristics suggesting a risk of birth defects were very low birth weight (less than 54 oz.), a long hospital stay (longer than two weeks), and extremely high levels of maternal drinking and smoking, as well as maternally reported sonogram or amniocentesis results that indicated a birth defect.

Developmental Resources

The major source of information about the family's developmental resources is the mothers' and interviewers' 1986 and 1988 ratings of items from the Home Observation for the Measurement of the Environment (HOME) scale,²⁵ covering the physical environment, the child's activities and relationships among family members. Three subscales were constructed from the HOME items:‡ opportunities for skill development; positive mother-child relationship; and nonauthoritarian parenting style.‡

The opportunities for skill development scale measures the learning materials and toys available to the child, activities that may be developmentally stimulating and mother-child interactions that target development of specific skills (e.g., reading or teaching letters, colors and shapes). The positive relationship scale measures the quality of the child's emotional environment, particularly regarding interactions between the mother and child. The nonauthoritarian parenting style scale measures the mother's lack of aggressive or controlling behaviors (thus, a higher score indicates a more favorable style). In addition to the three subscales, the analyses include a total developmental resource measure. All of the developmental resource scales are measured by percentile scores.

The 1988 measures of developmental resources will likely be more mean-

ingful than the 1986 measures, because it is more difficult to assess the developmental resources provided to younger children than to older children. In infancy, when parental interactions do not target skill development and socialization, the mother's role is more affective than didactic. Similarly, the affective content of mother-infant interactions may be difficult to assess, since these interactions are not diversified and subtle differences in styles are difficult to measure through short interviews.

Developmental Outcome Measures

The NLSY child assessments consist of age-appropriate instruments. Hence, analyses of outcomes for children at different ages use different measures. Infant assessments may not have the high level of validity and reliability that are displayed by the assessments of older children because of the widely varying rates of development during infancy and the difficulties associated with assessing infants.²⁶

•**1986 outcomes.** For 1986, when the children were younger than two, scales measuring memory for location (or short-term visual recall), knowledge of body parts, motor and social development, and temperament are available.

In the memory for location test, children are asked to locate a toy that is placed under one of several cups, after the cups have been hidden from view for a short time. The distribution of the scores for this test is highly skewed for children aged 2.5 or older, but is satisfactory for younger children. This measure was used for children between the ages of eight months (the youngest age of assessment for this scale) and 23 months. Standard scores of memory for location are available.[§]

The body parts test is designed to measure the receptive vocabulary knowledge of 1–3-year-olds. This score can be used as an outcome for study children older than 11 months. Standard scores for this test are not available. Raw scores, ranging between 0 and 10, are used.

For the motor and social development scale, the mothers indicated whether their child could accomplish each of 15 age-appropriate tasks. Standard scores are available.

Table 2. Percentage distribution of children younger than two in 1986, by race or ethnicity, according to planning status

Planning status	Total (N=1,327)	Hispanic (N=228)	Black (N=349)	White (N=750)
Wanted	60.7	60.3	43.5	64.1
Mistimed	34.2	32.5	43.2	32.5
Unwanted	5.2	7.2	13.3	3.4
Total	100.0	100.0	100.0	100.0

Temperament scales measuring fearfulness and positive affect were constructed, as suggested elsewhere,²⁷ and are available for all children older than six months of age. These scales correspond to a general concept of emotionality and disposition, rather than theoretically identified dimensions of temperament. (Such general assessments have been found to predict later emotional adjustment problems.²⁸) Fearfulness is one dimension of emotionality;²⁹ the positive affect scale, like other measures of emotional tone or mood, consists of items on the infant's general disposition. The temperament scales are expressed as percentile scores. •1988 outcomes. For 1988, when the children were of preschool age, results of two cognitive assessments, two temperament scales and one behavioral index are available.

The cognitive assessments used are the Verbal Memory Test and the revised Peabody Picture Vocabulary Test (PPVT-R). The Verbal Memory Test consists of three parts, but because of possible scoring and distributional problems in the third part (story), only the results of the first two parts (word and sentence) were used. The PPVT-R measures the receptive vocabulary of children aged three and older;³⁰ in 1988, the test was administered to all children who reached age three subsequent to the 1986 assessment. Standard scores for the cognitive assessments are used.

Two maternally reported temperament scales, secure attachment and compliance, are available for the children aged 3–5.³¹ Compliance is not a temperamental dimension, but many dimensions of temperament—including reactivity, fearfulness, rhythmicity, distractibility and inhibition—contribute to compliance. The link between temperament and attachment behavior in early childhood has been a subject of dispute.³² Attachment quality may be regarded as a secondary measure of an important aspect of early childhood affect, determined in part by basic temperamental dimensions of emotionality, distress, fearfulness and sociability.³³ Scores are expressed as percentiles.

For about one-third of the study children aged four and older in 1988, the Behavioral Problems Index³⁴ is available. The same-sex standard score is used in these analyses.

Results

Table 1 shows the characteristics of the study children. The children were born to women who were, on average, 24 years of age; more than three-quarters are white. The sample is evenly divided between males and females, and between firstborns and those of

higher birth orders. The proportions who were low-birth-weight and who had characteristics indicative of or had severe birth defects are in agreement with the national averages (7%³⁵ and 3%³⁶ respectively).

Mothers had completed about 12 years of education by the time of the first survey following the study child's birth. They scored, on average, 68 on the AFQT and 78 on self-esteem.

Nearly three-quarters of the children had mothers who were married at the first interview after their birth, and in more than four-fifths of cases, the biological father was present in the household at the time of the child's birth. A majority of the mothers were employed for an average of 10 hours or more per week during the 9–12 months preceding the birth. Total and per capita family income indicated that the level of disadvantage observed for older cohorts of NLSY children³⁷ had, for the most part, tapered off by the time of birth of this cohort.

Table 2 shows the proportion of children whose births were wanted, mistimed and unwanted, by race and ethnicity. Overall, 34% of the births were mistimed, and 5% were unwanted. These proportions agree with those estimated from the 1988 National Maternal and Infant Health Survey for 20–29-year-old mothers.³⁸

The proportion of children classified as mistimed or unwanted is higher among blacks than among whites or Hispanics. This disparity is due to compositional differences between black women and others giving birth: Black women are more likely than others to have nonmarital births, and nonmarital births are more likely than those occurring within marriage to be classified as unintended. However, among women of a given marital status, blacks are not more likely than others to have unintended births.³⁹ White children are particularly unlikely to be classified as unwanted.*

Differences by Intendedness

Table 3 illustrates that children whose births were mistimed or unwanted may experience a variety of conditions that can put them at a developmental disadvantage. On average, they are of higher birth order than

Table 3. Characteristics of children younger than two in 1986, by planning status

Characteristic	Planning status		
	Wanted	Mistimed	Unwanted
% male	52.4	48.4	46.2
% firstborn*††	54.0	46.2	28.3
% weighing ≤5.5 lbs. at birth	6.3	5.1	8.3
% with indication of or having severe birth defects	2.6	4.3	3.3
Mother's age at the time of birth*	24.4	23.9	23.7
Mother's education (in yrs.)††	12.3	12.3	11.4
Mother's AFQT score††	69.3	67.9	57.6
Mother's self-esteem score*	79.1	77.3	77.1
Family income*††	\$23,582	\$21,555	\$13,838
Per capita family income*††	\$6,732	\$5,832	\$3,108
% with biological father present at the time of birth*††	90.8	77.1	52.4
% of mothers married*††	83.8	58.3	34.0
% of mothers employed before the birth††	62.1	61.4	40.2

*Multiple range test of difference between wanted and mistimed children is significant at $p < .05$. (In this and subsequent tables, the Student-Newman-Keuls test of significance was used.) †Multiple range test of difference between mistimed and unwanted children is significant at $p < .05$. ‡Multiple range test of difference between wanted and unwanted children is significant at $p < .05$.

wanted children, and are born to mothers who are younger and have lower levels of ability, self-esteem and education. Their mothers are considerably less likely than mothers of wanted children to be married, and are less likely to have been employed before the child's birth. Mistimed and unwanted children are relatively unlikely to be living with their biological father, and are raised in households with lower total and per capita income than wanted children. The proportions who were low-birth-weight and who had or were likely to have birth defects vary somewhat by planning status; however, these differences are not significant, probably because of the lack of statistical power in estimating these low proportions.

Developmental Resources

Table 4 (page 232) reveals that overall, the developmental resources provided to children younger than two do not differ significantly by planning status (top panel). However, when this comparison is repeated for children who were at least one year old in 1986 (middle panel), significant differences emerge. Unwanted children aged one or older receive fewer opportunities for skill development than do mistimed children, and mistimed children receive fewer such opportunities than wanted children. Unwanted children experience more authoritarian parenting

*The proportionate distribution of births by planning status does not vary significantly by the timing of the measurement of intendedness. In other words, for each racial or ethnic group, the proportion of mistimed or unwanted births among the mothers who reported planning status before the birth does not significantly differ from that among the mothers who reported planning status after the birth.

Table 4. Mean developmental resource scores for children younger than two in 1986, by planning status, 1986 and 1988 assessments

Resource	Planning status		
	Wanted	Mistimed	Unwanted
1986, ALL CHILDREN			
Total developmental resources	75.2	75.6	72.4
Opportunity for skill development	70.4	69.9	66.3
Positive mother-child relationship	80.3	81.0	79.3
Nonauthoritarian parenting style	79.9	81.5	76.7
1986, CHILDREN AGED ≥12 MOS.			
Total developmental resources†‡	76.5	76.5	70.2
Opportunity for skill development*†‡	72.3	69.8	65.4
Positive mother-child relationship	85.4	85.3	80.5
Nonauthoritarian parenting style†‡	71.8	74.5	64.7
1988			
Total developmental resources*†‡	79.4	76.0	70.4
Opportunity for skill development*†‡	77.6	74.5	66.9
Positive mother-child relationship†‡	78.7	76.2	69.4
Nonauthoritarian parenting style*†‡	81.6	77.4	75.1

*Multiple range test of difference between wanted and mistimed children is significant at $p < .05$.
 †Multiple range test of difference between mistimed and unwanted children is significant at $p < .05$.
 ‡Multiple range test of difference between wanted and unwanted children is significant at $p < .05$.

styles than those who were wanted or mistimed. These differences are partly reflected in the total resource score, as well.

Results of the 1988 assessments show that among preschoolers, unwanted children receive significantly lower levels of developmental resources of all types than wanted children. Mistimed children receive fewer opportunities for skill development and experience more authoritarian parenting styles than wanted children; they have more positive interactions with their mothers and more opportunities for skill development than unwanted children.*

The data do not permit an analysis of why the child's age mediates the association between planning status and developmental resources provided, but this finding probably is partly due to the difficulties in measuring infants' developmental resources. Additionally, the effects of planning status on mother-child interactions may become stronger as children grow older and their demands on family resources increase.

Table 5 presents the results of multivariate regression models predicting the effects of planning status on developmental resources provided to the child. When the gross effects of planning status are estimated using data for children aged 1–2 in 1986 (not shown), planning status is found to be a significant predictor of opportunities provided for skill development and nonauthoritarian parenting style. Net of

*The effects of planning status on developmental resources do not vary with the timing of the reporting of intendedness: Mistimed and unwanted preschoolers receive fewer developmental resources, whether their planning status was ascertained before or after their birth. The effects of planning status are not significant when compositional differences are accounted for, regardless of the timing of its reporting.

other family characteristics, such as family income, however, planning status does not significantly predict the developmental resources provided. This finding supports the interpretation that planning status reflects a mother's expectations regarding her ability to provide a favorable environment to her child.

Results from data on preschoolers in 1988 suggest that the gross effects of planning status on all three types of developmental resources are large and significant (not shown). However, when

relevant family characteristics are controlled for, the net effect of planning status is significant only for the measure of parenting style. Table 5 shows that a mistimed child is more likely to experience authoritarian parenting than a wanted child, even when background characteristics are controlled for, although this net effect is small. Additional analyses (not shown) reveal no differential effects of planning status by sex.

Planning Status and Development

Table 6 provides selected mean developmental outcome scores assessed in 1986 and 1988 for the study children by their planning status. The 1986 cognitive, motor and social development scores do not differ significantly by planning status. However, mistimed and unwanted children were rated significantly higher than wanted children on the fearfulness scale (30–34, compared with 27), and mistimed children were rated significantly lower on the positive affect scale (70, compared with 73).

Results of the 1988 assessments demonstrate that among preschoolers, verbal memory is not associated with planning status; the temperament and behavioral problem scales in the 1988 assessments also show no significant differences by planning status. However, PPVT-R scores, measuring receptive vocabulary, are significantly lower among mistimed and unwanted children than among those who were wanted (91, 83 and 95, respectively). Differences in the aspects of cognitive ability that verbal memory and PPVT-R assessments measure may explain the difference between the outcomes: Receptive vocabulary is likely to be influenced by the child's home environment and interactions with significant

adults. Verbal memory, on the other hand, is derived from an assessment of general ability⁴⁰ and is regarded as a dimension of cognition that enables learning.

Table 7 (page 234) shows the results of multivariate analyses of the 1986 temperament scale scores and the 1988 PPVT-R scores. The models included maternal and child characteristics that are associated with planning status and the outcome being analyzed, as well as the developmental resource measures. It is expected that when compositional differences are controlled for, the effects of planning status will not be significant. This is true for both the fearfulness and the positive affect scales.

Race and ethnicity indicators show very large, significant effects on infants' temperament. Because the psychometric properties of the temperament scales may vary across racial and ethnic groups,⁴¹ however, separate models were estimated for children of each race or ethnicity. The results (not shown) diverged somewhat from those presented in Table 7. Among white infants, unintendedness appears to have a significant positive association with fearfulness and a significant negative association with positive affect. These results, however, may have been due to uncontrolled differences in maternal well-being, as reflected in mothers' reports on child temperament.

The association between planning status and preschoolers' 1988 verbal development also becomes nonsignificant when developmental resources and compositional differences among the children are taken into account. This finding supports the hypothesis that the effects of planning status are partly mediated by the resources provided to the child. During the period when verbal development is a key factor in school readiness, mistimed and unwanted children experience deficits in opportunities for skill development in their family environment, leading to deficits in verbal competence. The effect of planning status is also mediated by the differences in the characteristics of the mothers (selection factor) and in family environment.

Discussion

This study is distinguished from its predecessors in two important ways. First, intendedness was measured during the pregnancy or soon after the birth, not retrospectively, after the child's characteristics became evident. Second, the mediators of the association between planning status and child development are specifically accounted for. In addition, the longitudinal assessments provide outcome

Table 5. Coefficients of regression models predicting the effects of planning status on developmental resource scores, 1986 and 1988 assessments

Predictor	1986†			1988		
	Opportunity for skill development (N=865)	Positive mother-child relationship (N=831)	Nonauthoritarian parenting style (N=831)	Opportunity for skill development (N=1,228)	Positive mother-child relationship (N=1,217)	Nonauthoritarian parenting style (N=1,196)
Planning status						
Mistimed	-0.821	0.506	2.187	-1.158	-0.441	-3.081*
Unwanted	0.058	1.943	-4.703	-2.756	-1.058	-1.259
Background characteristic						
Black	-6.229*	-3.041	-0.132	-5.491*	-5.873*	-2.090
Hispanic	-5.629*	-2.221	6.903*	-7.583*	-2.621	1.554
Mother employed before the birth	1.174	4.117*	-0.264	2.595	1.652	1.123
Maternal AFQT score	0.079*	0.156*	0.137*	0.200*	0.112*	0.201*
Maternal self-esteem score	0.044	0.044	-0.109	0.114	0.076	0.084
Per capita family income‡	0.327*	0.505*	0.782*	0.223	0.622*	0.240
Biological father present at the time of birth	3.531*	2.403	-1.535	1.255	2.203	4.195*
r ²	.24	.13	.06	.23	.12	.12

*p<.05. †Children aged ≥12 months. ‡Expressed in thousands of dollars. Note: The models used in this table and in Table 7 also included dummy variables indicating male children and low-birth-weight infants, and variables measuring the child's age in months, the child's birth order and the mother's age at the time of the birth.

measures at two points in time, allowing a comparison of the effects of planning status on child development in infancy and in preschool years.

Most analyses of unintended pregnancy and childbearing (such as those using information from the National Survey of Family Growth) rely on retrospective data.* Respondents are asked to recall, sometimes many years after the pregnancy, their pregnancy intentions at the time of conception. The results of retrospective studies may be affected by recall error and by the possibility that women will redefine planning status because of their child's characteristics and their changing family circumstances.

By contrast, a large proportion of women in this sample reported planning status during their pregnancy. Hence, these reports are relatively unlikely to have been influenced by the observed characteristics

of the child. On the other hand, pregnant women may rationalize their pregnancy. This will result in an underestimate of the extent of unintendedness and blurring of the differences between wanted and unwanted or mistimed children.

In quantitative models, maternal characteristics are often linked to child outcomes directly, although these characteristics may affect child development indirectly, through their impact on the family environment. The models used in this study include measures of the proximate determinants of child development (i.e., developmental resources provided in the family environment), so that direct and indirect effects of planning status can be estimated.

The findings revealed that planning status is significantly associated with the resources provided for skill development after one year of age. By preschool age, mistimed and unwanted children receive fewer

differences that appear to be very strong when examined bivariately diminish or disappear when relevant attributes of the family environment are controlled for. To interpret this finding, one must closely examine the characteristics that mediate the association between planning status and developmental resources. If these are characteristics that the mother cannot change, then the observed association is due to compositional differences in the characteristics of the mothers who have unintended births. If, however, these characteristics are not fixed, planning status may be an expression of the mother's expectation regarding her ability to provide a favorable family environment to her child.

While race or ethnicity and maternal ability mediate the association between planning status and developmental resources, other characteristics of the family (such as income, maternal employment and the presence of the father) also influence this association, indicating that maternal expectations regarding these circumstances contribute to the definition of the planning status of a birth. Only one developmental resource has a significant independent association with planning status: Mistimed preschoolers experience less-favorable parenting styles than wanted preschoolers.

The analyses revealed few significant developmental effects of planning status. Assessments of children's early motor and cognitive development did not differ by planning status. (Similarly, a study in Czechoslovakia revealed no cognitive im-

Table 6. Mean developmental outcome scores for children younger than two in 1986, by planning status, 1986 and 1988 assessments

Outcome	N	Planning status		
		Wanted	Mistimed	Unwanted
1986				
Motor and social development	1,241	101.9	102.3	103.0
Knowledge of body parts	719	6.4	6.3	6.1
Memory for location	646	99.8	100.2	101.7
Fearfulness*‡	718	26.5	30.3	34.3
Positive affect*	718	73.1	70.0	70.0
1988				
Verbal memory	950	97.9	98.9	99.8
PPVT-R*†‡	930	94.7	90.8	82.6
Compliance	1,000	74.1	73.2	72.2
Attachment	1,000	68.0	67.2	67.9
Behavioral Problems Index	527	105.0	105.2	107.4

*Multiple range test of difference between wanted and mistimed children is significant at p<.05. †Multiple range test of difference between mistimed and unwanted children is significant at p<.05. ‡Multiple range test of difference between wanted and unwanted children is significant at p<.05. Note: Fearfulness, positive affect, compliance and attachment scores are percentiles; knowledge of body parts is a raw score on a scale of 0-10; all other scores are standard scores with means of 100 and standard deviations of 16.

opportunities for skill development, have less-positive interactions with their mothers and experience more authoritarian parenting styles than wanted children. The poorer psychometric quality of these measures for very young infants or the homogeneity of maternal behavior toward very young infants, regardless of planning status, may explain the apparent lack of differences in developmental resources provided to infants younger than one year old.

Some planning status

*For an exception, see: J. C. Abma and F. L. Mott, "Determinants of Pregnancy Wantedness: Profiling the Population from an Interventionist Perspective," paper presented at the annual meeting of the Population Association of America, Pittsburgh, May 1-3, 1990.

Table 7. Coefficients of regression models predicting the effects of planning status on child developmental outcomes, 1986 and 1988 assessments

Predictor	1986 (N=718)		1988 (N=930)
	Fearfulness	Positive affect	PPVT-R
Planning status			
Mistimed	1.553	-1.773	-0.476
Unwanted	1.841	-0.489	0.319
Developmental resource			
Opportunity for skill development	-0.034	0.151*	0.243*
Positive mother-child relationship	-0.008	0.026	0.063*
Nonauthoritarian parenting style	0.034	0.023	0.075*
Background characteristic			
Black	7.133*	-4.853*	-8.817*
Hispanic	3.601	-0.435	-6.647*
Mother employed before the birth	-1.060	-1.813	-1.056
Maternal AFQT score	-0.159*	0.026	-0.116*
Maternal self-esteem score	0.037	0.083	-0.040
Biological father present at the time of birth	4.966*	-0.958	2.241
Per capita family income†	0.177	-0.349*	0.109
r ²	.18	.10	.39

*p<.05. †Expressed in thousands of dollars.

pacts of unwantedness in early childhood.⁴²) However, mothers' ratings of temperament were less favorable for mistimed and unwanted infants than for wanted infants. At preschool ages, the planning status differences in temperament were small and nonsignificant. It must be noted that the temperament measures, reported by the mother, are likely to be influenced by her emotional well-being as well as by the child's.

Receptive vocabulary was less developed among mistimed and unwanted preschoolers than among their wanted counterparts. The analyses indicate that these effects of planning status are mostly mediated by the developmental resources provided to the children and other differences in family environment. Unintended children's relative disadvantage with respect to opportunities for skill development, positive interactions with their mothers and parenting styles partly accounts for their poorer receptive vocabulary skills at preschool ages. In addition, determinants of lower developmental resources indirectly contribute to the lower levels of receptive vocabulary development. For example, low family income is associated with fewer resources, and the anticipation of low income is probably one reason mothers define births as unintended.

Many developmental outcomes did not differ significantly by planning status. This result indicates both the children's resilience and the mothers' ability to buffer the negative impacts of family circumstances that they expected to be unfavorable. However, one must bear in mind that the study sample consists of children born

to mothers in their mid-20s. As such, it does not represent an important group of mistimed and unwanted children: those born to adolescent women. Older mothers may be better able than teenagers to compensate for unintendedness.

Three factors put mistimed and unwanted children at developmental risk: First, their mothers' characteristics are associated with developmental risks. For example, these children are more likely than others to be born to minority mothers, and their mothers tend to have relatively little education and low levels of ability. Second, they experience a less-favorable family environment. For example, they are more likely than wanted children to be living without their biological father and to experience economic disadvantage. Third, relatively few developmental resources are available to unintended children.

Clearly, both the mother and the child experience hardship when an unintended pregnancy is brought to term. Since less-educated, minority and lower income women have a higher proportion of unintended births than women with more favorable backgrounds, this finding has important policy implications. First, the results of these analyses underscore the impact of declining levels of knowledge and effective use of contraceptives, particularly in view of the fact that unintended births have increased since the 1980s because of less-effective contraceptive use and reduced accessibility of induced abortion.⁴³ Second, the findings point to the importance of family circumstances as factors in the observed differences between wanted, mistimed and unwanted children. Some of these circumstances may be remedied by programmatic interventions. For example, parenting education, income supplementation and employment services may help alleviate some negative family circumstances that lead to the developmental disadvantages experienced by unintended children.

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