When Comes Baby in the Baby Carriage?

Historical Changes in Three Dimensions of Age at Parenthood

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Abstract

The age of parents at the birth of their children may have profound implications for the subsequent life course of parents, the functioning of the family, and for child health and well-being. Using historical census data from the Integrated Public Use Micro Series, this research explore three dimensions of parental age: chronological age (Martin et al. 2009), social age (Mare and Tzeng 1989; Eliason et al. 2009), and relationship age (Bachu 1999) from the early 1900s until 2008. Little is known about long-term historical shifts in these dimensions of age, and to our knowledge, there has been no systematic investigation of their interdependence. This research addresses the transformation of family life by investigating historical change in three dimensions of parental age and the ways in which the dimensions are woven together.

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Introduction

The age of parents at the birth of their children may have profound implications the subsequent life course of parents, the functioning of the family, and for child health and well-being (Martin 2004). This research will explore three dimensions of parental age: chronological age (Martin et al. 2009), social age (Mare and Tzeng 1989; Eliason et al. 2009), and relationship age (Bachu 1999). Little is known about long-term historical shifts in these ages, and to our knowledge, there has been no systematic investigation of their interdependence. This research will address the transformation of family life by investigating historical change in three dimensions of parental age and the ways in which the dimensions are woven together.

After more than a decade of decline, the teen birth rate has recently increased (Martin et al. 2009). At the same time, the proportion of births to women over age 35 continues to increase (Hamilton et al. 2009). These trends lead to increasing variability in parental ***chronological age***. Trends in chronological age are accompanied by shifts in parental ***social age***—the placement of parenthood in the sequence of transitions to adulthood. A large body of research documents widespread change in patterns of transition to adulthood (e.g. Fussell and Furstenberg 2005). In the mid-twentieth century, those coming of age typically completed several transitions in a normative order and over a relatively short time: completion of school, moving out of the parental home, career acquisition, marriage and parenthood. Becoming adult now takes longer, the sequence of transition events is more variable, and transitions are increasingly reversed. A larger set of pathways to adulthood suggests increasing variability in the social age of parents.

Finally, the average length of parental relationships prior to the birth of a child is increasingly variable as well. We know that many children are born to single mothers, and recent research documents the complicated and dynamic relationships between biological and social parents (e.g. Hofferth et al, 2007). We know that children born to two residential parents do better on a range of outcomes (e.g. McLanahan and Sandefur 1994); the quality of the relationship between parents influences child well being (e.g. Booth and Amato 1994); and relationship quality varies with relationship duration (e.g. VanLaningham, Johnson and Amato 2000). Few studies, however, directly

consider ***relationship age***—how long parents have been together—in assessing parent, child, and family outcomes.

These three concepts of age—chronological, social, and relationship—are structurally related to one another. For example, on average teenage parenthood and late childbearing usually occur at very different social and relationship ages. This research will bring together the three concepts of age, analyze their trends over time, and empirically assess how they are structured.

Patterns and Trends in Parental Age

Contemporary trends indicate increasing variability in parental age, but looking further back in history can help us anticipate trends into the future and suggest potential implications for population health. First, understanding historical patterns in parental age can help us identify contextual circumstances that affect parental age and that may be repeated (e.g. periods of economic depression). Second, historical periods characterized by distinct conditions may yield different associations between parental age and outcomes for adults, their children, and their families. For example, societal resources are focused on children in periods of population growth (e.g. expanding public schools), so high birthrates could minimize the importance of parental age in shaping child outcomes as the larger society takes measures to equalize childhood experiences. However, if a population is aging, societal resources are often directed to the needs of older citizens, thereby heightening the importance of parents own characteristics, like age, in shaping child and family outcomes.

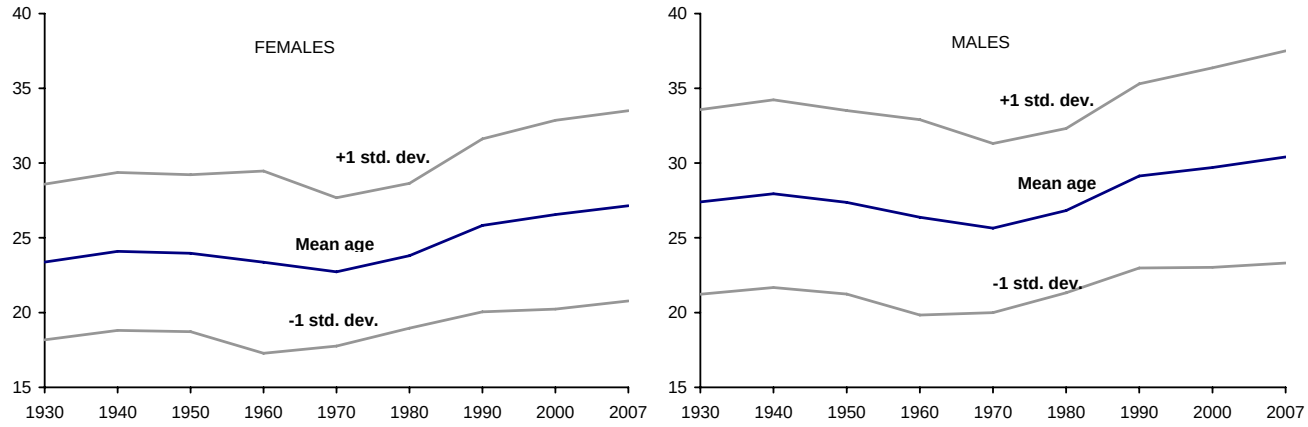
Chronological Age

The average age of mothers at the birth of their first child was 25.0 years in 2006. This is down from 25.2 years in 2005, marking the first decline in the mean age at first birth since the measure became available almost 50 years ago (Martin et al. 2009). It is too early to tell if this slight decline represents an anomalous year or a trend. Regarding variation, while women's modal age range for a first birth was 20 to 24 years in 2006, 20.9% of all first births were to teenage mothers and 23.8% were to women age 30 or over (Hamilton, Martin and Ventura 2009). The proportion of first births to teens

has increased slightly in recent years, while the proportion of first births to women 35 and over, while still small (8.1%), has increased about 150% since 1980 (Martin et al. 2009). Therefore, there is considerable and increasing variation.

Unfortunately, considerably less is published on fathers' age at the birth of their first child. The addition of males to the National Survey of Family Growth in 2002 has afforded some insight into this matter; fathers were 25.1 years old, on average, at the birth of their first child (Martinez, Chandra, Abma, Jones, and Mosher 2006). In 2006, birth rates were highest and about equal for men ages 25-29 and 30-34. Trend data for all births (not specifically first births), suggest increases in birth rates for men over age 30, but decreases in birth rates for men under age 25 since 1980. Like birth rates among women, an increase in teen births is noticeable in the most recent data (Martin et al. 2009). Using historical data from the census Integrated Public Use Micro Series (IPUMS), we show in Figure 1 the trend in mothers' and fathers' age at first birth from 1930 onward.

Figure 1. Age at birth of first child: United States, 1930-2007



The graphs show a slight increase in the mean age at first birth from 1930 to 1940, and then a gradual drop until 1970 when a more rapid increase ensued. The pattern is similar for men and women, although men's mean age is about two years later than women's. Furthermore, the *variation* in age at first birth has changed over time. In 1930, the standard deviation in age at first birth for women was about 5 years, but it dipped slightly in the 1970s to just under 5 years, and increased to 6.4 years by 2007. A similar pattern is evident for men. This indicates that in more recent decades, the dispersion in age at parenthood has increased.

Social Age

Existing data provide a clear picture of patterns and trends in chronological age of parenthood, but we know less about social age at first birth. Social age at parenthood refers to the placement of parenthood in the sequence of transitions to adulthood including school completion, leaving the parental home, career acquisition, and union formation. Hobcraft and Kiernan (1995) theorize about the normative order of social transitions prior to parenthood, and they suggest five "pre-conditions" that are important for the transition to parenthood: being in a partnership; having completed full-time education and training; having a home of one's own; being in employment with an adequate income; and a sense of security. This last pre-condition is less concrete than the other four. Taking the first four together, however, suggests that parenthood is last in the normative order of transition to adulthood events. That is: having a child shortly after completing all other transitions should be considered "on-time." Someone who has their first child before completing any, or even all, of the other transitions would be considered "early" in terms of sequencing regardless of their chronological age. Someone who has delayed parenthood until well after completing all other transitions would be considered "late."

While scholars have not specifically investigated social age at parenthood, the literature on the sequencing of other transition processes affords some insight into the patterns of social age at parenthood. For example, with regard to union formation, increases in non-marital conceptions and births suggest that now two-fifths of all births are to unmarried mothers (Hamilton et al. 2009). However, at least half of these births are to women in cohabiting unions (Kennedy and Bumpass 2008; Mincieli et al. 2007), and cohabiting unions are shorter, on average than marriages (Osborne et al. 2007). Therefore, social age at parenthood *relative to union formation* may be decreasing.

Skirbekk, Kohler, and Prskawetz (2004) use exogenous variation in the age at school graduation that results from differences in birth month to show that a significant delay in first births in Sweden occurs for young women who have yet to graduate from school compared to their counterparts who are within two months of their age but have already graduated. Further, McLanahan (2004) reports that the median age of mothers is highest and increasing the fastest among women in the highest education quartile. Women who attain the highest levels of education are likely to be on professional

and managerial career paths that foster further postponement of childbearing. Thus, *relative to education and career establishment*, social age at parenthood may be increasing (see too Martin 2000 and Rindfuss, Morgan, and Offutt 1996). We know less about the sequencing of parenthood with other role transitions, such as leaving the parental home, or its sequence when all role transitions are considered. However a few studies identifying transition clusters or latent life pathways offer some insight.

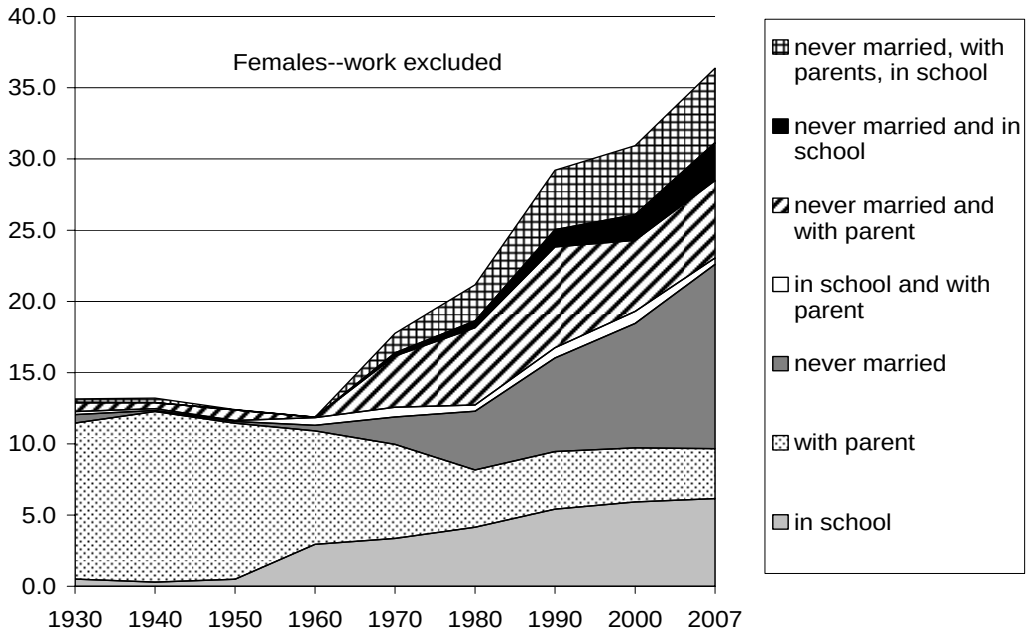
Scholars have identified a set of empirically derived pathways to adulthood or transition clusters by considering the timing and configuration of school, work, and family transitions (Mouw 2005; Sandefur et al. 2005; Osgood et al. 2005; Macmillan and Eliason 2004; Eliason et al. 2009; Macmillan and Copher 2005). While the specific transitions and patterns identified vary somewhat across studies, most find a limited set of three to six patterns. Typically, one pathway is characterized by a first transition to school completion, then full-time work participation and union formation occurring at about the same time, and then childbearing. This sequence can stretch from the late teens to the mid thirties. Some have found variation in the timing of parenthood after union formation; some couples have children shortly after marriage while others delay parenthood substantially (Eliason et al. 2009). Another common pathway is early transition to parenthood and union formation followed closely by full-time work. Here young adults are balancing work and family roles earlier than in the first pathway where transitions happen gradually and with greater spacing between them (Macmillan and Eliason 2004). A third pathway is early parenthood without marriage and low employment stability.

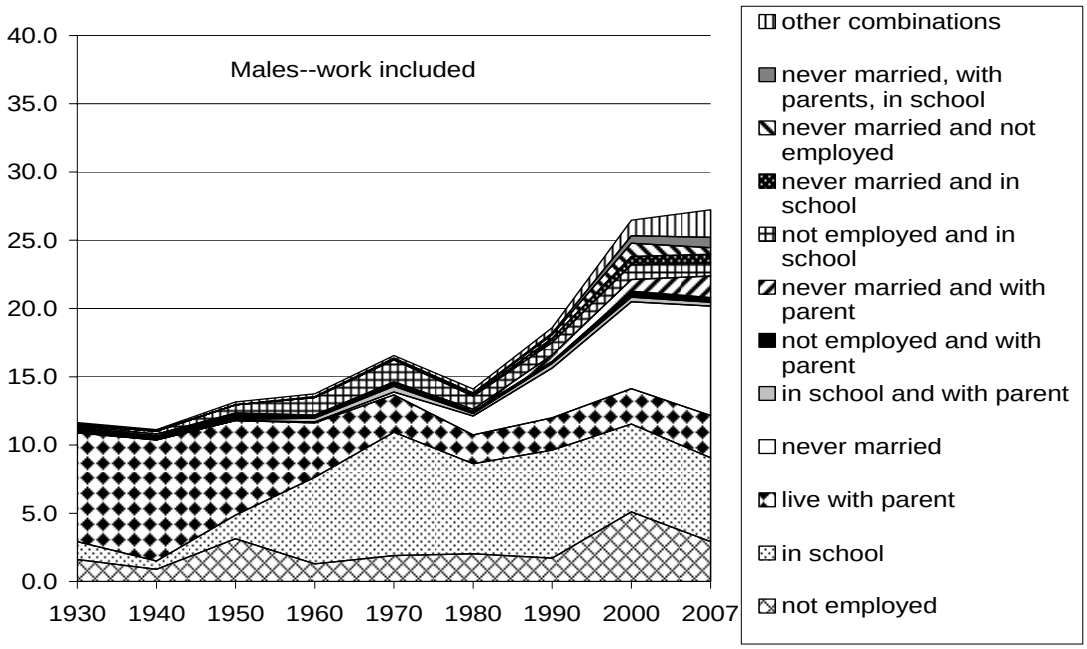
Thus, advances in this area of research suggest that parenthood is typically placed in one of three places in the sequence of transitions. For some, it is the first or second transition event (after school completion); in terms of social age, those adhering to this pattern would be early parents. For another group, parenthood happens around the same time as union formation and the transition to work; those following this pattern would be considered to have middle or on-time sequencing of parenthood. Finally, for others parenthood is the last transition event and sometimes considerably later than the prior transition; these would be considered late parents in terms of social age.

Figure 2 shows the percent of women and men who registered various statuses when they had their first child. These statistics, tabulated from IPUMS, demonstrate the change in sequencing of parenthood with other statuses. Status combinations are constructed from four available statuses: in school, married, living with parents, and employed (for men). Note that IPUMS data records point-in-time statuses, not completed transitions. For the "in school" status, for example, it is not clear if respondents who are not in school have completed schooling, or are temporarily out of school.

Our preliminary analyses exclude work status for women because of the tremendous increase in women's labor force participation and the changing relationship between women's labor force participation, marriage, and childbearing. The analysis we plan to conduct for PAA will incorporate women's labor force participation as an indicator of social age in a way that acknowledges the difference in historical context that shapes its meaning and relationship with other family formation behaviors over time.

Figure 2: Percent with status combinations at the time of first birth





These graphs show an increasing array of transition combinations at the time of first birth for both men and women. Most of the increase in variability occurred starting in 1960 and 1970. Until then most women were married, out of their parents' home, and not in school when they had their first child. In fact between 1930 and 1970, 87 to 88 percent of all women who became mothers fit this profile. Starting in 1960, however, the percent of women who had this profile at the birth of their first child began to decline as more women started their childbearing while still in school, not married, and/or living with a parent. By 2007, only 63 percent of women fit the aforementioned profile of childbearing while married, not in school, and living independently.

For men, from 1930 to 1960, 90 percent had their first child while married, not in school, working, and living independently from their parents. Starting in 1960, however, the percent of men who fit this profile decreased as men began combining school with parenthood, initiating parenthood without marriage, and assuming an array of other role combinations in conjunction with parenthood. By 2007, the percent of men who assumed the transition profile that was most prevalent from 1880 to 1960 had dropped to 75 percent. While the proportion in different role combinations for women increased more dramatically from the middle of the 20th century onward, these graphs show that both men and women have experienced an increase in the number of combinations, and an increase in the proportion of

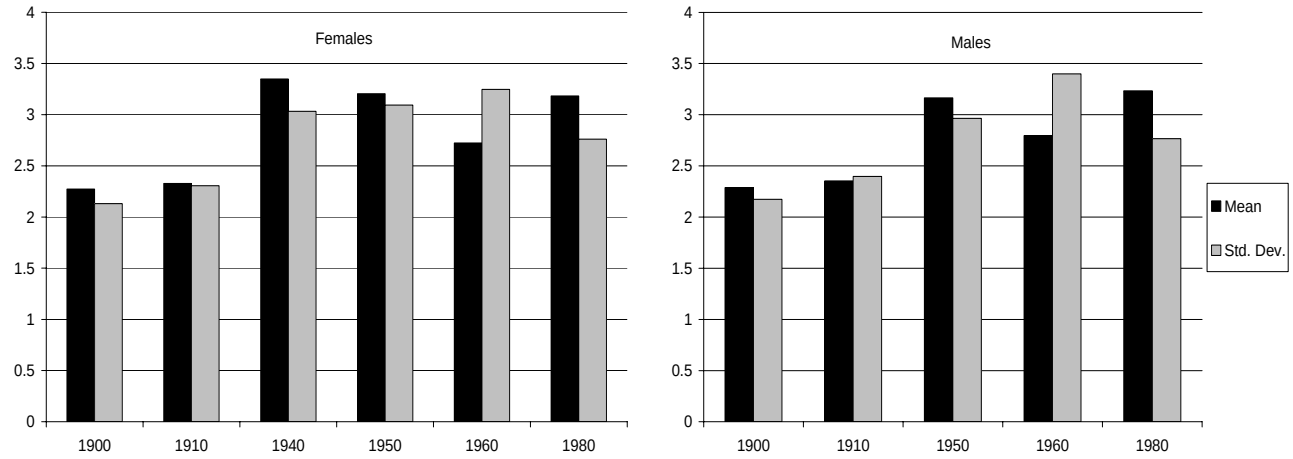
people experiencing different combinations at the time they became parents. This suggests increasing variability in social age at parenthood.

Relationship Age

Of all three conceptions of parental age, we know the least about relationship age. Calculating the duration of parents' relationships prior to a child's birth is a complex task, since recent cohorts of children are born into an increasingly variable set of parental arrangements including married biological or adoptive parents, cohabiting biological parents, dating biological parents, the combination of one biological and one social parent, or the presence of only one biological parent. Manning's (1995) research on the duration of marriage before first birth indicates that on average, first births occur just over two years into a marital relationship and there is little difference if the couple cohabited prior to marriage. However, this study was based on data from the late 1980s. The types and timing of union formation and the timing of parenthood have changed considerably since then. Research from the Fragile Families Study and its embedded qualitative study, Time, Love, and Cash among Couples with Children, suggests that first births may happen sooner in nonmarital relationships than in marriage (Edin et al. 2007). This finding, however, can be generalized only to low-income couples. These studies highlight the fact that relationship duration to first birth varies by type of relationship; however they do not provide us with a representative picture of the current full distribution or relationship age at parenthood.

Using IPUMS data, we can assess relationship age for the period 1900 to 1980. Figure 3 graphs the mean and standard deviation in duration between marriage and first birth for men and women. Marriage is used as a proxy for relationship formation, although we recognize that many couples have children outside of marriage or begin their relationships as cohabitations prior to marriage. Moreover, these trends have increased in recent decades. As noted above, Manning (1995) finds similar durations to first birth among those who cohabit prior to marriage and those who marry without prior cohabitation, indicating that for those with cohabitation experience prior to marriage, the total duration of their residential union is longer at first birth.

Figure 3: Duration between marriage and first birth



These graphs show that mean duration between marriage and first birth has increased for both males and females since 1900, although there was a decline of about 6 months in 1960 during the height of the marriage boom. As the mean relationship duration increased, so too did its variability. The standard deviation in the mean relationship duration for women went from 2.2 years in 1900 to 3.4 years in 1960 before declining to 2.8 years in 1980. This may be a result of overall declines in childbearing within marriage. That is, as non-marital childbearing increased, those who had children within marriage became a more homogeneous group with less variability in timing of childbirth—relationship age in Figure 3 is shown only for those who had children in marriage. Before the PAA, we plan to track this trend into more recent years where we expect to see even more variability due to women's employment patterns and the rise of ART. To do this we will investigate supplementing our IPUMS analysis with data from the 1990s and 2000s from the National Survey of Family Growth (NSFG). In addition, we will explore using other data to account for relationship age in marital *and* non-marital relationships over time. In summary, our preliminary analysis using the IPUMS data indicates that there has been considerable change in the mean and variation in parents' chronological, social, and relationship ages at the birth of their first child.

Next Steps

For the PAA, we plan to build upon the preliminary analysis we present above. Specifically, we plan to: 1) extend the time frame of the analysis and supplement IPUMS data with other data to provide

a more complete picture of relationship age over time and in different types of parental relationships; 2) address specific historical contexts that substantially shape age at parenthood (e.g. women's labor force participation); 3) empirically test whether the changes in the mean and variation in parental age over time are significant; and 4) analyze the inter-related nature of the three dimensions of age.

To extend our historical lens, we will utilize data as far back as 1850 (the first census sample available in IPUMS) and as far forward as 2008 (the latest ACS sample that will be available by the PAA). As noted, to understand changes in relationship age past 1980 and in non-marital as well as marital relationships, we will supplement IPUMS analysis with data from the NSFG. To address specific historical contexts, we will examine the three dimensions of age at parenthood with an overlay of significant historical events or phenomenon related to becoming parents. This will allow us to better understand if and how changes in the dimensions of parental age co-occur with particular historical contexts.

To empirically test whether or not changes in the mean and variation in parental age over time are statistically significant, we will include calendar year in each model and investigate a variety of functional forms: $Age_i = f(year_i) + \varepsilon_i$, where *f(year$_i$)* is some flexible function we will estimate from the data that determines how mean age changes over calendar year and $\varepsilon_i \sim N(0, \sigma^2)$. Restricted cubic spline representation of the functional effect of year will be investigated. Preliminary examination of the data indicates that substantially simpler models may adequately model the data and linear, quadratic and cubic trends in calendar year will be explored. Of equal importance, however, is whether the variability in each dimension of age is changing over time. We will assess this using descriptive statistics, calculating the variance of age at each calendar year. Formally, this hypothesis can be addressed by altering the variance term in the normal linear model above to $\varepsilon_i \sim N(0, \sigma^2 \exp(year_i \phi))$. The extended linear regression seeks to model the potentially heteroskedastic data. The parameter ϕ is an estimate of how the variance of age increases or decreases each year. For instance, if ϕ=0 the variability is constant across calendar time; if ϕ>0 the variability increases across calendar time. Alternative model forms will be explored, to allow for the possibility that the increase in variability is only

apparent in the most recent years, through indicator terms (i.e., I(year>1980)). All models will be fit using SAS proc nlmixed, which will easily accommodate the altered variance term.

Finally, chronological, social, and relationship age at parenthood are inter-related and likely vary together across time. For example, because many transitions take longer to complete now than in the past (e.g. finishing schooling), one who completes all other transitions prior to parenthood will be of an older chronological age now than their counterpart in an earlier cohort who also sequenced parenthood last of all the transitions. The two would be of the same social age for parenthood (on-time), however. Likewise, if some couples wait longer to have children in part because they are finishing schooling or beginning a career, their relationship age is also extended prior to becoming parents. We will carefully conceptualize how the three dimensions of age should be inter-related at the theoretical level, and we will examine how trends in the three ages map on to one another.

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