

Early Experience with High-Risk Fathers: Puberty Changes in Daughters

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A new study shows that girls start to menstruate earlier when they experience biologically-disrupted homes (families in which the biological parents are separated or divorced) in early childhood. When a girl starts life with a high-risk father in the home, and then the family breaks up and that father leaves, her timing of puberty changes. She gets her first period about a year earlier than does either her older sister or other girls from disrupted families whose fathers do not display high-risk behavior.

Background

Fathers affect the physical and social environments of their children and, in turn, their timing of puberty. Part of this influence may be chemical: Fathers emit pheromones—airborne chemical signals that trigger behavioral and physiological responses in other members of the same species—that may alter the timing of sexual development in daughters. Animal research has shown that male pheromones have different effects on young females, depending on biological relatedness: Exposure to the pheromones of biological fathers appears to slow down puberty in girls, while exposure to the pheromones of unrelated adult males appears to speed it up.

The influence of pheromones may help explain why the break-up of biological families, especially when followed by the departure of the biological father from the home and subsequent entry of a stepfather, is linked to early puberty in girls—a known risk factor for teen pregnancy and an array of health problems in adolescence and adulthood. Specifically, girls whose parents get divorced and who then live without their biological fathers, or live with stepfathers, tend to start their periods earlier. Girls who grow up in intact families—with

both their mother and father—tend to start their periods later. At the same time, these changes in puberty are also influenced by the stresses associated with family disruption and change. Animal research suggests that the combination of pheromones and stress are most likely to accelerate puberty.

The evolutionary explanation is that children adjust their development to match the environments in which they live. In the world in which humans evolved, dangerous or unstable home environments meant a shorter lifespan. Going into puberty earlier in this context increased chances of reproducing and passing on your genes.

Despite the plausibility of this scenario, it could be wrong. Indeed, behavior geneticists have argued that the relationship

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between growing up in families without a resident father and early puberty in daughters lacks validity. This relationship, they say, is an artifact of genes for early puberty accumulating in non-resident father families. This accumulation may occur because mothers with genes for early puberty not only pass on those genes to their daughters but also tend to form less stable relationships with the fathers of their children. The result is that girls with genes for early puberty may be more likely to grow up without their fathers in the home.

What researchers are still trying to figure out, then, is whether growing up in a biologically-disrupted home without a resident father actually causes the timing of puberty to change. And if so, does girls' exposure to different types of fathers (normative vs. high risk) at different points in their childhood matter?



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About the Study

A recent study by Jacqueline Tither at the University of Canterbury and Bruce Ellis at the University of Arizona attempted to sort out these issues by comparing sisters in the same family. The study looked at what happens to a girl's sexual development when she experienced the following:

- the divorce or separation of her parents
- different amounts of her childhood living in a biologically-disrupted home, and
- different levels of exposure to fathers who showed deviant or antisocial behavior (i.e., high-risk fathers)

The study asked two questions:

- (1) Did the sisters' age of first menstruation vary depending on which sister lived with her father longer?
- (2) Did living longer with a certain type of father lead to differences in the sisters' timing of puberty?

To answer the first question, the researchers implemented a unique study design (see Text Box). Sixty-eight pairs of sisters from biologically-disrupted families, in which the father had moved out, were compared with 93 similar pairs of sisters from intact families. In the disrupted families, the younger and older sisters were

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about 5 and 12 years old, on average, when the parents split up. Sisters from the intact families had a similar gap between their ages.

Why did the researchers choose these two groups? They wanted to see whether living longer in a disrupted family—without dad—led the younger sister to get her period earlier than her older sister. Consider a typical sister pair. They have the same biological mother and father, but one was 5 and the other 12 when the parents broke up and the dad moved out. On the one hand, the younger sister spent more of her childhood (7 more years) in a disrupted family without her father in the home.

On the other hand, the older sister spent more of her childhood in an intact family with her father there. In other words, the sisters differed by 7 years in the amount of time they lived with their dad. Did that different length of exposure to their father lead to differences in when the two sisters got their first periods? The theory states that the younger sisters should get their periods first in the disrupted families but not in the intact families.

The second question came out of previous research, which suggests that a parent's personal characteristics can change the course of a child's development. For example, living with a father who displays high-risk behavior (e.g., a history of violence, depression, imprisonment) often creates bad results for children. The researchers wondered whether the impact of dads on their daughters' puberty might also depend on the amount of high-risk behavior that the dads engaged in.

Findings

The answer to whether a sister's age at first menstruation changes based on how long she lived with her father is: It depends on the type of father.

- As predicted, more time living without a dad in the home led to earlier puberty. That is, younger sisters in biologically-disrupted families reached puberty earlier than their older sisters did. No such trend emerged in biologically-intact families.
- However, this finding was moderated by the amount of deviant or antisocial behavior displayed by the dads. Specifically, younger sisters only reached puberty

A Unique Quasi-Experimental Design

The study design examined the influence of fathers on daughters' puberty, independent of possible genetic factors and of environmental conditions that are shared by entire families, such as poverty or religion.

- The researchers compared sisters with the same biological parents who grew up in the same home. In previous studies, girls who lived without a father were compared to girls who lived with both parents. These girls differed not only in whether or not they lived with their father. They also differed in genetic risks, race, religion, socioeconomic status, and everything else that differs between families. Therefore, if previous studies found a link between growing up without a father in the home and early puberty, researchers still would not know what caused the early puberty. It could be any factor linked to living in non-resident father families.
- To handle these shared environmental influences, the investigators of this study compared sisters who grew up in the same home. These sisters had the same religion, socioeconomic status, and other features that are shared within families. To control for genetic influences, the researchers studied full biological sisters who differed in age (birth order). Scientific evidence shows that birth order has nothing to do with genetic risk. That is, there is no known reason to expect that older sisters, as a group, are more at risk for certain genes than their younger sisters are. For example, imagine 100 families that have four children and a genetic risk for alcoholism. On average, the 100 firstborns of each family will have the same genetic risk for alcoholism as the 100 secondborns, and so on.

earlier if they had been exposed in childhood (typically the first 5 years of life) to a high-risk father, and then that father moved out of the house.

- These younger sisters got their first periods about a year early, compared to their older sisters or other younger sisters from disrupted families whose fathers did not display high-risk behaviors.
- In other words, the reason these girls got their periods earlier was not because they lived for different amounts of time with any father. They reached puberty earlier because they lived for different amounts of time with a certain type of father when they were young.

Limitations

Although this research highlights the role of high-risk fathers in regulating the sexual development of their daughters, limitations should be noted. Foremost among them was the small sample size, which could have generated unreliable parameter estimates. The study also relied on recall of earlier life events, and these family memories could have been biased by time and life

experiences. These limitations provide important directions for future research.

A Comparison: International Adoption Studies

Research on girls from developing countries adopted into wealthy Western families sheds light on this study's finding. These girls regularly experience neglect, abuse, disease, and poor nutrition before they are adopted. Yet they experience much earlier puberty than children do from the same countries of origin or their host countries. Further, girls who are older when they are adopted (i.e., more than 2 years old) experience puberty at even younger ages.

The adoption studies indicate that, under very high stress conditions, girls' bodies "shut down," and their growth is stunted. However, when the stressor is removed by being adopted into stable families with plenty of food and social support, something happens to these girls. Their bodies seem to respond to a window of reproductive opportunity. Similar to the effect of a high-risk father leaving the home, they speed up puberty, as if to take advantage

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of the dramatically improved situation. Some researchers say this phenomenon occurs only during a “sensitive time period” in development. Girls in early to middle childhood who transition from a very stressful to a much less stressful home environment may experience an important acceleration of puberty.

Implications for Practitioners

Parents and clinicians need to know that stressors such as divorce and exposure to high-risk fathers put girls at increased risk during sensitive periods in their development. Girls’ experiences can result, on average, in the speeding up of puberty by almost one year. That one-year acceleration increases girls’ risk of breast cancer by 5%. It also makes it more difficult for them to manage the challenges of adolescence.

This research offers insight into the debate over what type of parenting gives children the most advantages in life. Is “perfect” parenting better for kids than “good enough” parenting is? In this study, when a father functioned in the normative range,

the amount of time his daughter lived with him had little effect on her first menstruation. Only time spent with a father who showed deviant or antisocial behavior, followed by his absence, put the daughter at risk for earlier puberty.

More important than the presence or absence of a father is his behavior. It is not enough simply to have a cardboard cut-out of a father sitting on the couch. What he does in the family is critical. ■

This article summarizes the following report: Tither, J. M., & Ellis, B. J. (2008). Impact of fathers on daughters’ age at menarche: A genetically and environmentally controlled sibling study. *Developmental Psychology*, 44, 1409-1420.

For an overall review of the effects of fathers, pheromones, and stress on girls’ pubertal development, see: Ellis, B.J. (2004). Timing of pubertal maturation in girls: An integrated life history approach. *Psychological Bulletin*, 130, 920-958.