

# The Making of an 8-Year-Old Woman

How do we understand early puberty?  
Through the prism of our times..

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By Lisa Belkin

he rustic, eclectic house on the farthest outskirts of Chapel Hill, N.C., is a kaleidoscope of contradictions. In the office, where important scientific research is done, the computer sits juxtaposed with a sewing machine. There is a file cabinet for journal articles and one for ribbons and beads. A large pane of the window was accidentally hit by a pebble a few months back, and because there has been no time to replace it, the shatterproof glass remains marbled and glittering, distorting the view.

It is somehow fitting that Marcia E. Herman-Giddens looks through that mottled glass every day, reflecting on the hodgepodge of a debate that her research has wrought. In a breakthrough scientific journal article published three years ago, she confirmed what many mothers of preteen daughters already suspected — that today's girls are growing up faster and entering puberty earlier than their mothers did. Since then, she has watched as all types of scientists — from endocrinologists and primatologists to psychologists and anthropologists — have scrambled to figure out why. Meanwhile, the musings of those scientists have gotten caught up in the times and taken on lives of their own.

"The 'why' is the important part," Herman-Giddens says as she sets up a slide projector and dims the lights. "We don't know anything if we don't know why." She takes the remote control in hand and runs through the prevailing theories.

Click. "Obesity. Our kids are getting too fat." This is the only cause on which researchers seem to agree — that heavier girls enter puberty earlier.

Click. "Cow's milk. If I say that too loud, the dairy industry will be on me, but there are a lot of powerful hormones in milk."

Click. "Estrogen simulators in the environment, chemicals and plastics, I'm not a biochemist, but. . . ." She pauses. "There are also some brand-new studies out saying that in households without biological

Photomontage by Gerald Slota



# 'It appears that the quality of the father-daughter relationship is the most important aspect of early family environment in relation to subsequent puberty.'

fathers, girls seem to go through puberty earlier. Wow, that one is really interesting."

Click. The last slide is of a jeans ad from a magazine. The female reproductive system is exquisitely sensitive to external influence, she says — as college women who room together know well, because their cycles often mysteriously fall into sync. "Can visual images also have a biological effect?" Herman-Giddens asks. "Does constant exposure to this sort of thing act as a premature trigger? I certainly think we need to find out."

Though the scientific method, with its emphasis on reproducible results, strives for purity, there rarely is such a thing. "Research does not always emerge from the laboratory; it emerges from the society" that surrounds that laboratory, says David Rosner, a professor of history and public health at Columbia. Rosner points to silicosis, a lung disease caused by the inhalation of sand. Little attention was paid to the disease in medical circles until the Depression, when unemployed sand-blasters started using silicosis "as a route to compensation." Soon there were hundreds of medical-journal articles on the subject, but by the 1940's, as employment picked up again, research into the disease had all but stopped.

Similarly, the current debate over the efficacy of mastectomy versus lumpectomy is in part a function of the women's rights movement and the consumer-patients' rights movement, says Dr. Barron H. Lerner, author of "The Breast Cancer Wars," to be published in the spring by Oxford University Press. Scientific research, he says, is always the result of "a multiple confluence of forces — growing medical knowledge plus political will, plus thinking you can get it funded because it's trendy."

In other words, what we know is limited by what we think to ask. Scientific hypotheses necessarily reflect a moment in time. The parade of possible triggers that Herman-Giddens clicks onto her wall is also a list of society's front-and-center concerns. Obesity. Pollution. Food additives. Divorce. Soft porn. If we weren't worried about these things, we wouldn't think to investigate them. Puberty research, like so much scientific research, is a mirror onto our fears.

At the same time, research often hijacks the researcher and heads in unexpected directions, which is what happened to Herman-Giddens more than a decade ago. Back then, she was a

physician's associate in charge of the child protection team at Duke University Medical Center. Her expertise was in abused and neglected children, and she was struck by how many very young patients, as young as age 7 or 8, were already sprouting breast buds and pubic hair.

Medical textbooks said that the onset of puberty occurred, on average, at age 11 in girls. That is the number used by pediatricians since 1969, when a British physician named James Tanner published his study of 192 girls living in an English children's home. Girls younger than 8, by these standards, would be considered "precocious" developers, so Herman-Giddens and her colleagues dutifully sent them off to endocrinologists for extensive and expensive work-ups. Rarely, she says, did one of those girls come back with a diagnosis of a harmful problem.

Why, then, were there so many early-developing girls in her clinic waiting room? Was early puberty perhaps more common among girls who were sexually abused? Once her eyes were opened to this possibility, Herman-Giddens began to notice that patients in the medical center's general pediatric population seemed to be developing earlier, too. She compiled a statistical analysis that found, in fact, that girls were entering puberty earlier. Even more striking was the fact that African-American girls were starting significantly earlier than white girls.

Herman-Giddens, collaborating with the American Academy of Pediatrics, followed that relatively small study of North Carolina girls with an extensive study of 17,000 girls across the country, and the results were the same: for white girls, the average age of onset of puberty, as measured by the appearance of breast buds, was 9.96 years, and for African-American girls, the age was 8.87 years. More specifically, close to one-third of African-American girls have started puberty between their 7th and 8th birthdays, and about 50 percent of that group has done so by their 9th birthdays.

Which means girls in otherwise normal health are entering puberty more than a full year earlier, on average, than was previously thought.

And this change, she warns, demands attention. "These are second-grade girls, some first-grade girls," she says, as she flashes a graph on the wall. "Is it going to keep getting lower? Are kids going to get to be 5 and 4 and 3? And is this supposed to be happening? I don't think so. I don't think that's what nature intended."

LAST SPRING, I SAT ON A COMMITTEE OF PARENTS from the local elementary school who

wanted to improve the quality of food in the cafeteria. We munched grapes and carrots and drank bottled water while discussing the fat content of chicken nuggets and the caffeine content of iced tea. Eventually, the conversation turned to milk, and someone said: "Organic milk is a must. You know, all those hormones in nonorganic milk are the reason for early puberty." Everyone nodded knowingly. None of the mothers could tell me how they "knew" this; they just knew.

There is nothing more powerful than conversation. A fact may appear first in a scientific journal, but it is on the playground or at the office coffee machine that it takes hold. Conversation is the reason why 40 years ago a plate of eggs and bacon looked healthy, 20 years ago it looked toxic and now in some low-carb circles it is healthy again. Conversation is why a glass of milk might not look as wholesome to you as it did to your mother.

The chatter about milk certainly preceded Herman-Giddens. It may have begun with T. Colin Campbell, a professor of nutritional biochemistry at Cornell University and president and C.E.O. of Paracelsian, a company that develops technologies that measure dioxin in the environment. Campbell was reared on a dairy farm in Northern Virginia, drinking milk straight from the cow. He loved the farming life, he says, adding that his doctoral thesis was about "how to grow animals more efficiently so we can eat more of them and drink more of their milk."

But years of research, he says, have convinced him that meat and dairy products create more health problems than they prevent. His earliest post-doctoral research was conducted in the Philippines, where he noticed that it was the few wealthy children, with access to a milk-laden Western diet, who were developing liver cancer. Then, in the early 1970's, he began a study that would eventually filter into the popular psyche and give milk a bad name. Spending eight years in rural China, he found that cancer rates were high in those regions where milk was a part of the diet and far less common in regions where villagers consumed no dairy products. The breast cancer rate in particular, he found, was only 8.7 per 100,000 women ages 35 to 64, as opposed to the United States, where it was 44 per 100,000.

Campbell now eats an entirely vegan diet, substituting soy cheese and rice milk for dairy products. Although the mothers at my nutrition meeting were concerned about added hor-

*Lisa Belkin, a contributing writer for the magazine, wrote about the child-free movement in July.*



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mones given to cows to produce extra milk, Campbell says his real concern is the nutritional makeup of the milk itself. Milk from any species, he says, is designed to make infants of that species grow. But what is good for a calf is not necessarily good for a human being. He says he believes that the nutrients naturally found in milk unnaturally stimulate reproductive and growth hormones in humans.

In the past few years, Web sites like NotMilk.com and organizations like Mothers and Others for a Livable Planet have spread Campbell's word (although he is not officially associated with either organization). The colorful NotMilk site delights in describing milk as a glass of "pus with hormones and glue." Its creator, Robert Cohen, who calls himself the Not Milk Man, keeps a list of diseases on the site that he believes are caused by milk. Cohen says he has not read the Herman-Giddens study,

but in 1998, a year after that paper came out, he added the category of Early Sexual Maturity to his Web site.

There is nothing in Herman-Giddens's numbers that point to milk as a cause of early puberty. (She did suggest further study of other possible causes, like "hair products containing estrogen and placenta . . . and the increasing use of certain plastics and insecticides that degrade into substances that have estrogen-related physiological effects.") Nor does Campbell blame milk exclusively, saying the larger problem is "diets high in total fat and animal-based protein and low in dietary fiber and complex carbohydrate material."

But this lack of direct evidence has not kept groups like the Physicians' Committee for Responsible Medicine from warning of such a link and urging consumers not to drink milk, for this and other reasons. Says Amy Lanou, the

group's nutrition director, "If you accept that human breast milk has biological effects, you can't know that cow's milk is breast milk, but you can't accept that it also has biological effects." It also has not kept mothers like Wilson of Asheville, N. C., from putting her 10-year-old daughter on a dairy-free diet. "The diet doesn't have the body of a grown woman at the time she's 10."

"This is how myths start," says Ruth Fildes, director of nutrition for the American College of Nutrition and a registered dietitian. "There have always been hormones in milk. American girls have always had milk in their diets, so why would that cause a change in behavior all of a sudden. In fact, we're drinking less milk." (Peter Vitaliano, vice president of economic policy and market research for the National Dairy Producers' Federation, confirms that milk consumption is going down, but he adds, "The consumption of dairy products as a whole is going up very slightly" because Americans have significantly increased their consumption of cheese. While the Physicians' Committee for Responsible Medicine describes itself as a non-profit health organization, Kava describes themselves as an animal rights group" and points out that of the 100,000 members, only 5,000 are actually physicians. "There seems to be a certain delight in rebelling against things we've been told are bad for us," she adds. "What we need is solid scientific evidence.")

Herman-Giddens agrees up to a point. "They're fanatic and they're loud, but it doesn't mean they're wrong," she says of those who question milk. "I used to drink milk three times a day." She explains that her mother is 5-foot-2, wanted her to be tall, "so she made me drink lots of milk." Now 5-foot-7, Herman-Giddens says, "I don't drink milk anymore."

**A**cross the country, a group of researchers has been asking questions that have nothing to do with milk but everything to do with another possible cause of early puberty. They have gone house to house in places like Tennessee and Indiana asking mothers to talk to their daughters and relatives with young daughters whether the parents are living together, and if not, whether there is a live-in stepfather or boyfriend in the mother's life. The hypothesis is that these questions are known as the "absent father theory," and it has not yet filtered into the popular culture, perhaps because it is too loaded and too hard for us to believe.

Evolutionary psychologists believe that childhood shapes later reproductive behavior. Children growing up in homes where stepfathers and the parent-child bonds are weak see the world as a precarious place and their own survival as iffy. It would be in their Darwinian

interest to reproduce early and often, increasing the chance that some of their offspring would survive. Children reared in homes where stress is low and parent-child bonds are strong would, in contrast, feel protected and view the world as safe. They would respond by waiting until they were older before having their own children, emphasizing the quality of the relationship over the quantity of offspring.

About 10 years ago, researchers at several separate universities took that theory one step further and wondered whether humans respond to family circumstances not just behaviorally but also biologically. Using existing data designed to measure familial stress and strength of family relationships, they began to cross-reference that information with the ages that girls in the same data set first entered puberty. "Lo and behold," says Jay Belsky, one of those researchers and now a developmental psychologist at the University of London, "those girls who matured earlier were the same girls who had more distant family relationships." While that is not proof that one fact caused the second, Belsky says, "I always say, 'It's not inconsistent with the theory.' That's a cautious way of saying that it's consistent with the theory."

With the publication of the Herman-Giddens data and the increased interest in causes of early puberty, researchers at Vanderbilt University, among others, set out to narrow Belsky's definition of "familial stress." To collect data, researchers visited the homes of subjects for several hours at a time, coding observed interactions between parent and child into such categories as "warm-positive" or "negative-coercive." The greater the level of positive, supportive interactions, the data showed, the later the girls, on average, entered puberty. More striking was the finding that "it was fathers more than mothers" who made the difference, says Bruce J. Ellis, one of the original researchers, who has since moved from Vanderbilt to the University of Canterbury in Christchurch, New Zealand, to continue this research. "It appears that the quality of the father-daughter relationship is the most important aspect of early family environment in relation to subsequent puberty."

At first glance, this seems to be a rare psychosocial result, in that it blames something on fathers instead of mothers. But Ellis and his colleagues go quite a bit further, saying that their data show that the absence of a biological father in a daughter's early life is associated with early puberty and that the presence of an unrelated male in a household, no matter how consistent, may speed it even more. He theorizes that this may all be because of pheromones, those mysterious secretions that can shape behavior.

"There's definitive evidence in humans that the female reproductive cycle is influenced by pheromones," he says. "And we know from experiments with prairie dogs and mice that animal puberty is influenced by pheromones."

When the biological prairie-dog father is present, he says, puberty is inhibited. And when a prepubescent mouse is exposed to the pheromones of an unrelated male, puberty begins.

Ellis stresses that his theory will remain unproved when it comes to humans. For ethical and practical reasons, he says, "you can't experiment like that with human girls, so we can't know and may never know what would happen if we did, but we can show that girls who interacted more with their biological fathers when they were 4 to 5 years old go into puberty later."

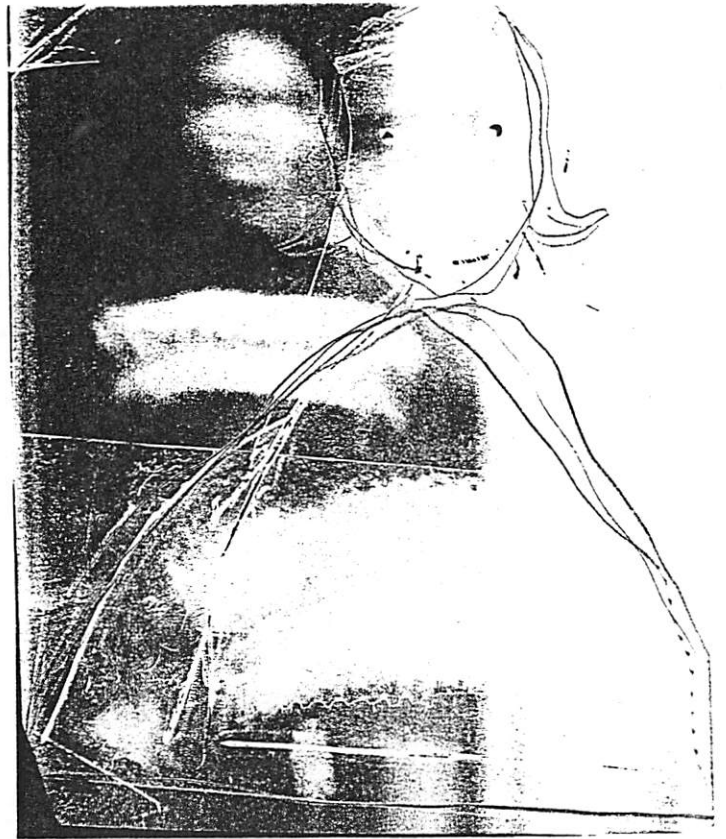
Belsky said his fear used to be that his work would be seized upon by "intolerant politicians," who would see in it proof that divorce and cohabitation were frowned upon by biology, or that it would be attacked by the African-American community, which would read into it the accusation that certain behavior is affecting the health of African-American girls.

Bruce Ellis says that while "there is a positive message here — fathers are important and can have a positive influence on daughters' lives" — he is aware that "some people would disagree and construe any research demonstrating the importance of fatherhood as supporting conservative ideologies."

The outrage these researchers fear, however, has not materialized. So far, their work has been met mostly with silence. Belsky and Ellis each published their results in respected peer-reviewed journals, and yet it has not made a huge splash in the academic world. "Ours is not a popular theory," Belsky says. "It is treated like a biological determinism theory, and that gives it a bad name among some people. They think we're saying biology is destiny here, but this is a theory of nature, not nurture."

Whatever they are saying, it is not taking hold on the playgrounds or at P.T.A. meetings or in the research papers of other developmental scholars. The fact remains that while research tends to mirror our fears, we can't always handle what is learned. The absent-father hypothesis is "a theory that makes us look inward, and we don't tend to like to do that," Herman-Giddens says. "We like to point fingers at something simple, but we don't like to make complicated changes in our lives."

MARY WOLFF'S OFFICE IS A CLUTTERED SPACE in Mount Sinai Medical Center in New York. If



her windows were clean, they would look out on the Hispanic community of northern Manhattan, where the girls she has been studying live. There is a simple solution to the problem of early puberty, she says: "Have your daughters play soccer."

In other words, keep them active and at a healthy weight. Wolff, a professor of community and preventive medicine at Mount Sinai, is one of a group of researchers who believe that puberty is "strongly associated with obesity." The pendulum of parental concern is constantly swinging, and for years we worried that our children were starving themselves to look like Kate Moss. That took our attention away from the fact that while anorexia is a very real problem for many girls, too many of our children are too fat. They are watching too much television, eating too much junk food and spending too little time running around outside. As a result, the percentage of children ages 6 to 11 who are considered overweight nearly doubled during the past 20 years.

Weight has long been known to affect the female reproductive system. Underweight girls tend to menstruate late, if at all, and overweight girls do so early. The reason, says Dr. Paul Kaplowitz, a pediatric endocrinologist at the Virginia Commonwealth University School of Medicine, is possibly the protein leptin, which is produced by the body's fat cells and which is also required for normal reproductive function. "It's not the only factor required for puberty," he says, "but it may be permissive in that you need a certain level to allow puberty to happen."

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Wolff, like most of the researchers in this area, started out doing something else — in her case, studying breast cancer, specifically the reason for different rates of the disease among different ethnic groups. Along the way, she observed that Hispanic girls enter puberty later than African-American girls, and her current research is about why this is so. Her hypothesis is that the Hispanic diet includes more plant-based foods.

Dr. Catherine S. Berkey, a biostatistician at Harvard Medical School, has in turn focused much of her work on adolescent health, which led her to research obesity and puberty. Earlier this year, she published a study showing that diet and body size as early in life as age 1 or 2 are predictors of the onset of puberty.

But obesity causes all sorts of other bad things too — diabetes and heart disease, for example, not to mention social problems — and that knowledge hasn't resulted in a change in eating habits, so confirmation of a link between obesity and early puberty probably won't make a difference, either. Both Herman-Giddens and Campbell point to the school cafeteria as the best example of the fact that society does not respond quickly to complicated lifestyle change, no matter how compelling the scientific evidence.

"I think it's outrageous that schools have sold out to the soda companies," Herman-Giddens says.

"School lunches are disgusting and abominable," Campbell says. "Everything we know contradicts what is sold on a school lunch tray." What is the use of all this data, he wonders, if "no one listens."

**M**ost of the slides in Herman-Giddens's tray are ads from magazines. As she flashes through the photos, she cuts back and forth through time.

Click. McCall's magazine, November 1950: a youngster, all white lace and frills, advertises "Five Gifts for Small Partygoers." She is probably 12 years old, Giddens says, "but she still looks like a little girl."

Click. Village Voice, March 2000: "Party Girls," says the ad for an escort service, showing "Chrissy and Little Sister Heather" wearing only stars on their nipples. The actual models are probably 18, given pigtailed to look

like "children," Herman-Giddens says, "but the point is children may see this. It gives the message, We want our children sexualized."

Click. A 7-Up ad from the 1950's: girls in pink taffeta ready for the prom. "Back then children looked like children."

Click. An ad for today's prom dresses: the outfit is slit up to here and down to there. The teenager wearing it rests her hand on a shirtless male model. "No one can look at these ads and say this is nice and healthy and the way I want my children to grow up."

Marcia Herman-Giddens's view of the world is a constant back-and-forth between how things are and how they used to be. She describes standing in line recently with her 12-year-old granddaughter when "I happened to notice that her eye level is exactly on the level with *Cosmopolitan* magazine. The headlines were '10 Ways to Drive Your Man Wild in Bed,' and my granddaughter was standing there, reading, looking at this half-naked woman. I'm thinking to myself, I wonder what in God's name is going through this child's mind. It's in their face, all the time, literally."

Considering the various theories has led her to develop a hypothesis of her own. "If you watch somebody cut a grapefruit from across the room, you're going to salivate," she says, "which is just one example of how what you see can have a biological effect on your body. We worry about what all the violence is doing to children. Well, what about all the sex? While we're doing all this research, we ought to be researching that."

True, she says, it sounds far-fetched, but no more so than the idea that the physical absence or presence of a father can influence the daughter. And she knows that, like fatty foods, racy media are something Americans are loath to give up. But research is valuable, even if it doesn't lead to change, she says, noting that the real challenge of such a study is finding a control — a group of children who have not grown up surrounded by billboards advertising underwear. "Perhaps Amish children," she muses, "or Mennonites."

More practically and immediately, she is in the earliest stages of developing an extensive study that would pin down the timing of puberty in boys. At the moment, there is no definitive data on this subject, nothing that tells us if male development has accelerated, too.

If it has, that leads to more questions and more research. Could that be a reason for the seeming spate of violence committed by

younger and younger boys? And if the age of puberty for boys has not accelerated and is still where studies put it, at about 12 years old, is this because the male reproductive system is less easily influenced by such triggers as nutrition, obesity and graphic imagery? Or does it mean, instead, that those are not really the cause, or not the only cause, of early female puberty, requiring science to look elsewhere?

Questions like these are more than familiar to Joan Jacobs Brumberg, a professor of history at Cornell University and the author of "Fasting Girls: The History of Anorexia Nervosa." Every disease or disorder, she says, has its own biography, and the story of anorexia is one in which treatment parrots changing times. In the 1870's, it was considered a "nervous" disorder, hence its name, and was fought with high-calorie feeding. In the 1920's, the hormonal theory gained popularity, because that was a time when medicine in general was infatuated with hormones. World War II brought talk of psychoanalytic treatment. Today, researchers wonder about the effects of the reed-thin models in the media, as well as why the disorder affects girls more than boys and whether psychopharmacological medications are the answer.

"Science in and of itself has some culture imbedded in it," Brumberg says. "How could it be otherwise?"

So where does that leave the rest of us who are not scientists but who are trying to figure out how the shifting, unsettling and sometimes downright contradictory results of all this research fits into our lives? Are we building our children's bones when we give them milk or are we fast-forwarding their biology? Are we providing a stable home life when we remarry — or adopt a child or bear one by a sperm donor — or are we creating hormonal confusion?

And if scientists disagree on so much of this, how are we supposed to decide?

We have two choices, neither one of which excludes the other. We can take the philosophical approach and view science with skepticism rather than disdain, remembering that each conclusion is just a momentary stop in the march of history. Or we can take the practical road and cling fiercely to the word "moderation." That means doing what feels right at the moment, keeping our ears open for evidence that it is not right and understanding that there is a good likelihood that we are somehow getting it wrong. ■