The Open University

Evolution and the human family
Why are families getting smaller?

Ruth:
Another puzzle that's arisen during the course of the last century is that we're actually stopping reproducing generally quite a long time before we hit menopause, and also even starting reproducing quite late. So family size has gone down to really quite small numbers, at least in the western world, and in fact that's a trend that's now beginning to happen all over the world, so it's a global trend. And speaking as an evolutionary anthropologist, that is a bit of a puzzle because if we're all about maximising fitness, maximising inclusive fitness or reproductive success then why would we have such small families.

Rissa:
It's interesting to note that this decline in fertility is happening fastest in urban areas. That's not surprising when you consider that a shortage of affordable housing, the transitory nature of many communities and a lack of family support make the rearing of children a costly business.

Ruth:
As a behavioural ecologist, I think the most obvious explanation would be that children are just becoming much more costly because children now need to be well educated, they need to have housing which has got very expensive, we're not necessarily living with our families so we don't have the grand-paternal/maternal support that we used to have. Older children are at school so they can't help us raise younger children, so we're doing it more on our own. And the level of investment now required through education and being competitive in the job market is so high that individuals are going for quality over quantity.

Rissa:
So for parents there seems to be trade-off: do you spread your resources more thinly over a larger number of children, or do you have fewer children and invest more in each one? One way to explore this problem is to study the effects of family structure on parental care and see what impact this has on a variety of outcomes for children. Mace and her colleagues looked at data collected from over thirteen thousand UK children and their families. They looked at how much time both the mother and her partner spent in certain key care activities during the first 10 years of a child's life. How did family size affect the degree of parental care and what impact did this have on children?

Ruth:
We did recently do an analysis of UK children to look at whether having lots of siblings did have any measurable effect on various child outcomes, and this was looking at a cohort of children who've only just reached their teenage years, so we don't know the long term effects, but one of the things we were able to do with this particular cohort study was we were able to look across a range of measures, so we could look at physical height, we could look at how you did in school tests, we could look at how much time your parents spent with you, and that kind of data is actually rather rare.

We found lots of effects of having siblings, including the more siblings you had the slightly shorter you were, and the big one was the more siblings you had the less time your parents could spend with you, so there's definitely still competition for parental resources, even in the western world where we're all relatively wealthy and no-one's dying of starvation or anything like that. But resources such as time spent with children, money, and something even that's relating to physical height is still limited by having a large family.

Rissa:
One might imagine that families on a higher income would have more children since they have more resources to invest. But the picture isn't that simple.

Ruth:
There is a bit of a puzzle that when we do studies on, for want of a better word, traditional societies, we normally find there's some kind of relationship between resources and reproductive success. So wealthier households will have more children or more children will survive, or wealthier men might have more wives and therefore have more children. And that's what you would expect from a kind of behavioural ecology perspective. But when you look in most western countries, or countries that have switched over to having small family sizes, you very often find that the relationship between wealth and reproductive success or family size has disappeared, or it may even be negative.

That's something of a puzzle, although one thing we did find in the study of UK children is that even though wealthy families weren't necessarily having any more children than poor families, they were investing more in each child. So it seems to be the level of investment that's going up rather than the quantity of children that's going up.

Rissa:
In fact, Mace's own research has shown that children of such families benefited from several advantages working in synergy.

Ruth:
One of the things that came out of this study was certain children seemed to have all the luck. In other words, if you had parents who were wealthy they were more likely to be well educated, they were more likely to spend more time with you, even on measures that don't cost any money like reading your child a bedtime story. If you had a mother who was a high investor you were more likely to have a father who was a high investor. So the overall effect could be that a lot of these children from the kind of higher socioeconomic status and higher educated parents were getting a lot more investment on a range of measures.

Rissa:
If parental investment is a key influence in a child's future success, and if the ability to invest effectively in children can be passed on from parents to their offspring, could it be that these factors are driving the fertility rate ever downwards? After all, in biological evolution, there are examples where intense competition, for mates, for instance, can lead to evolution of elaborate or extreme behaviours. It's a process called runaway selection.

Ruth:
If parental investment is helping your children compete in the modern world it may be that our levels of parental investment are just going up and up and up. We're just trying to be better than everybody else, trying to give your child an edge over all other children. Biologists talk about runaway sexual selection, by which they mean the trait concerned gets evolved to be more and more elaborate, and you almost wonder whether parental investment might not be undergoing some kind of runaway parental investment; as those around you invest more and more, then in order for your child to be competitive you yourself are investing more and more and more, and that helps you find mates who are higher investors and the whole process seems to go on and on and on. So rather than having more and more children, we're having a small number of children but investing more and more in them as time goes on.