

'I SIMPLY WANT TO KNOW WHY PEOPLE ARE THE WAY THEY ARE'

January 2014 – Meike Bartels cannot get enough of thinking about how *nature* and *nurture* together determine our happiness. Research on twins is helping the new professor of Genetics and Wellbeing to identify where happiness comes from.



By Anita Mussche

While putting the finishing touches on her dissertation in 2003, she suddenly realized she needed to revisit her research. As I was typing '25 percent of children have behavioural problems', I suddenly thought: but what about the other 75 percent? It's a lot like investigating smoking. Many studies look at why people smoke. I find it much more fascinating to look at why people don't start smoking in the first place!" Biological psychologist Meike Bartels was appointed University Research Professor of Genetics and Wellbeing at VU University Amsterdam as of 1 January 2014. Ever since her moment of insight in 2003, she no longer looks at why people face certain problems, but why they do not have those problems. She is researching how genetic and environmental factors influence happiness, and how happiness endures in the long term. The medical community will be able to use her results in the prevention of mental health problems.

HAPPY GENES, HAPPY ENVIRONMENT

Bartels has discovered that genetics is responsible for 40 percent of differences in happiness between people, but that 60 percent of these differences are due to environmental influences. We have not sequenced our happiness genes yet, but: "It fascinates me that people generally think that genetics is the complicating factor. Environmental influences are at least as difficult to identify. And to make things really complex, the answer is most likely to be found in the mix of genetics and environmental factors. This explains the mounting interest in this combination in the form of gene-environment interaction, gene-environment correlation and epigenetics: which environmental factors turn our genes on or off, and which modulate their activity? It is still a very large haystack. But the needles – and there are many needles for sure – are there waiting to be found!" Bartels is using the Dutch Twin Register (NTR) for her research. This register was started in 1987 by Professor Dorret Boomsma of VU University Amsterdam. More than 180,000 people are registered in the NTR, all of whom are members of multiple-birth families. In addition, more than 14,000 school-teachers with twins in their classrooms have participated in Bartels' research. Participants regularly fill in detailed questionnaires, which ask about happiness and wellbeing among other topics. The NTR is a rich source of data for biological

psychologists like Meike Bartels, who want to determine the extent to which people's behaviour and emotions are determined by the interplay of genes and their environment.

SCHOOL RESULTS AND FRIENDS

Since very large samples are required for researching the genetic variants that play a role in happiness, Bartels uses not only the NTR, but also databases that have been collected worldwide, and that can be mined based on questions about happiness. Data from more than 100,000 people in 40 different research groups have now been brought together for a meta-analysis. Furthermore, the researchers can also examine very small samples to detect differences in happiness. Recently she and one of her students have been studying a number of sixteen-year-old identical twins who scored differently on happiness questions. They conducted telephone interviews with the siblings that exhibited the most striking differences. The difference in their development in terms of happiness, despite their identical genes, could be ascribed primarily to their results at school and their friends.

"It is still a very large haystack. But the needles are there to be found"

ONE STEP FORWARD, TEN STEPS BACK

Bartels specializes in constructing complicated models for testing her hypotheses. The professor is not easily discouraged by all this complexity. "In scientific research, a single step forward always means ten steps back. If we show that in a large group of people happiness is associated with athletic pursuits, for example, we still do not know whether that's because of overlapping, underlying factors (such as genetic or environmental influences), whether there is a causal relationship, or a mix of both. That only makes it more interesting for me; it motivates me to continue the search. I never rest on my laurels once I've found an answer, because an answer always gives rise to new questions." The passage of time has provided ever more useful data. For example, her team recently discovered that twelve-year-old girls that exhibited problem behaviour following their parents' divorce already had behavioural problems at the age of three.

HAPPINESS TRAINING

Bartels is not under the illusion that she can make everyone happy if she manages to discover crucial preventative factors. "You could of course employ training courses to try to increase feelings of happiness among an entire population. Those courses would focus on consciousness-raising – happiness can usually be found in the details. But we do not yet have sufficient evidence that these kinds of training courses have a lasting effect. One size fits all, the same course for everyone, no, that simply won't work. We know that some people are simply less happy than others, and that some respond differently to the same coaching or training than others.



We would be better off putting our time and resources into studying what works best for whom. That is the best way to ultimately achieve real impact." The personal approach is also key to Bartels' research activities in the field of health and healthcare. It is generally held that exercise is healthy, but the vexing question is whether this applies to everyone. "Whether or not you exercise is largely determined by genetics. We will simply never get everyone up off the sofa and into the gym, even if membership were free. But the environment also plays a role in the overall dynamic. Parents have a major influence on their children's propensity to get regular exercise. If you want to improve the situation, then you could entrust schools with ensuring pupils' physical fitness. But that is easier said than done, because we also want to ensure that children have enough time for reading, writing and arithmetic." Bartels and her colleagues are discussing new research ideas arising from their results and from socially relevant issues. Bartels' interest was piqued when she learned of the study into

worldwide population scores on depression and happiness. "In the Netherlands we score high on the depression scale, but we are also in the top five when it comes to happiness. Scandinavian countries score low on depression and high on happiness, while England scores low on both. That cries out for further research!"

WHY STUDY TWINS?

Dizygotic twins share their age, background and environment, but genetically they are no more closely related than any other set of siblings: on average about half of their DNA is shared. Monozygotic twins, which come about when a single embryo splits, have the same genes. The trick is to find out in what ways monozygotic twins are more similar to each other than dizygotic twins. For example, Meike Bartels identified the extent to which a factor like happiness is determined by genetics, and to what extent by an individual's environment.

'DROP ME OFF AT THE AIRPORT'

Biological psychology was not Bartels' initial interest when she went to university. She had a clear fascination for hospitals, but after failing to be allocated a place in a medical programme three times, she opted to study pharmacology in Utrecht. "An academic advisor said to me: 'You are not interested in sick people.' I thought: he's right, I just want to know why people are the way they are." Following an interview with Professor Ko Orlebeke, she decided to study psychology at VU University Amsterdam, taking her degree a few years later.

Bartels finds research to be the best job in the world. "I often don't even think of it as work. Everything you see and hear around you gives rise to questions. I have a very inquisitive nature... too inquisitive to simply accept things at face value. I want to see evidence that is based on reliable data." More than anything Bartels enjoys observing the world around her. "I do not mind waiting; just drop me off at an airport or railway station. If you look around in places teeming people, you never doubt genetics. You see genetics at work every day, for example when you see a family walking down the street together. But it is also very complex. It is intriguing to see the different approaches people take to things. At school, everyone is taught the same material, but we all process it differently."

Read more about [Meike Bartels](#) on the website of EMGO+, Institute for Health and Care Research.