

Genetic factor contributes to forgetfulness

March 21 2014



Dr. Sebastian Markett from the department for Differential and Biological Psychology of the University of Bonn examined variants of a gene affecting signal transmission within the brain's frontal lobes. Credit: Volker Lannert/Uni Bonn

Misplaced your keys? Can't remember someone's name? Didn't notice the stop sign? Those who frequently experience such cognitive lapses now have an explanation. Psychologists from the University of Bonn have found a connection between such everyday lapses and the DRD2 gene. Those who have a certain variant of this gene are more easily

distracted and experience a significantly higher incidence of lapses due to a lack of attention. The scientific team reports their results in *Neuroscience Letters*.

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Most of us are familiar with such everyday lapses; can't find your keys, again! Or you walk into another room but forgot what you actually went there for. Or you are on the phone with someone and cannot remember their name. "Such short-term memory lapses are very common, but some people experience them particularly often," said Prof. Dr. Martin Reuter from the department for Differential and Biological Psychology at the University of Bonn. Mistakes occurring due to such short-term lapses can become a hazard in cases where, e.g., a person overlooks a stop sign at an intersection. And in the workplace, a lack of attention can also become a problem—so for example when it results in forgetting to save essential data.

A gene "directing" your brain

"A familial clustering of such lapses suggests that they are subject to genetic effects," explained Dr. Sebastian Markett, the principal author and a member of Prof. Reuter's team. In lab experiments, the group of scientists had already found indications earlier that the so-called dopamine D2 receptor gene (DRD2) plays a part in [forgetfulness](#). DRD2

has an essential function in signal transmission within the frontal lobes. "This structure can be compared to a director coordinating the brain like an orchestra," Dr. Markett added. In this simile, the DRD2 gene would correspond to the baton, because it plays a part in dopamine transmission in the brain. If the baton skips a beat, the orchestra gets confused.

The psychologists from the University of Bonn tested a total of 500 women and men by taking a saliva sample and examining it using methods from molecular biology. All humans carry the DRD2 gene, which comes in two variants that are distinguished by only one letter within the genetic code. The one variant has C (cytosine) in one locus, which is displaced by T (thymine) in the other. According to the research team's analyses, about a quarter of the subjects exclusively had the DRD2 gene with the cytosine nucleobase, while three quarters were the genotype with at least one thymine base.

The scientists then wanted to find out whether this difference in the genetic code also had an effect on everyday behavior. By means of a self-assessment survey they asked the subjects to state how frequently they experience these lapses—how often they forgot names, misplaced their keys. The survey also included questions regarding certain impulsivity-related factors, such as how easily a subject was distracted from actual tasks at hand, and how long they were able to maintain their concentration.

Lapses can clearly be tied to the gene variant

The scientists used statistical methods to check whether it was possible to associate the forgetfulness symptoms elicited by means of the surveys to one of the DRD2 gene variants. The results showed that functions such as attention and memory are less clearly expressed in persons who carry the thymine variant of the gene than in the cytosine type. "The connection is obvious; such lapses can partially be attributed to this [gene](#)

[variant](#)," reported Dr. Markett. According to their own statements, the subjects with the thymine DRD2 variant more frequently "fall victim" to forgetfulness or attention deficits. And vice versa, the cytosine type seems to be protected from that. "This result matches the results of other studies very well," added Dr. Markett.

Carriers of the gene variant linked to forgetfulness may now find solace in the fact that they are not responsible for their [genes](#), and that this is just their fate....but Dr. Markett doesn't agree. "There are things you can do to compensate for forgetfulness; writing yourself notes or making more of an effort to put your keys down in a specific location—and not just anywhere." Those who develop such strategies for the different areas of their lives are better able to handle their deficit.

More information: Sebastian Markett, Christian Montag, Corinna Diekmann, Martin Reuter: Dazed and confused: A molecular genetic approach to everyday cognitive failure, *Neuroscience Letters*, [DOI: 10.1016/j.neulet.2014.02.052](#)

Provided by University of Bonn

Citation: Genetic factor contributes to forgetfulness (2014, March 21) retrieved 21 September 2024 from <https://medicalxpress.com/news/2014-03-genetic-factor-contributes.html>

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