Press release

Viewers of pornography have a smaller reward system

Study shows a connection between consumption and brain structure

Ever since pornography appeared on the Internet, it has become more accessible than ever before. This is reflected in pornography consumption, which is on the rise globally. But what effect does the frequent consumption of pornography have on the human brain? A joint study by the Max Planck Institute for Human Development and the Psychiatric University Hospital Charité at St Hedwig Hospital is looking at just that question.

Pornography is a social taboo. Few will admit to its use, yet the market is enormous. In pre-Internet societies, pornography often had to be procured secretly. Today it can be viewed discreetly and directly on a home computer with just a few clicks. Pornography sites rank high among the list of most-visited websites in Germany, often attracting more visits than major media and retail sites.

But what effect does the consumption of pornographic material have on the human brain? Berlin-based researchers Simone Kühn and Jürgen Gallinat looked into the matter. The scientists studied 64 adult men aged 21 to 45. The subjects were first asked about their current consumption of pornography. For example: “Since when have you been using pornographic material?” and “For how many hours a week on average do you view it?” Then, with the help of magnetic resonance imaging, the researchers recorded brain structure and brain activities while the subjects were viewing pornographic images.

The evaluation found a connection between the number of hours the subjects spent viewing pornographic material per week and the overall volume of grey matter in their brains, with a negative correlation between pornography use and the volume of the striatum, an area of the brain that makes up part of the reward system. The more the subjects were exposed to pornography, the smaller the volume of their striatum. “This could mean that regular consumption of pornography dulls the reward system, as it were,” says Simone Kühn, lead author of the study and scientist in the developmental psychology research area at the Max Planck Institute for Human Development.

Moreover, while the subjects were viewing sexually stimulating images, the level of activity in the reward system was significantly lower in the brains of the frequent and regular users of pornography than in seldom and irregular users. “We therefore assume that subjects with high pornography consumption require ever stronger stimuli to reach the same reward level,” says Simone Kühn. This is consistent with the findings on the functional connectivity of the striatum to other brain areas: high pornography consumption was found to be associated with diminished communication between the reward area and the prefrontal cortex. The prefrontal cortex, together with the striatum, is involved in motivation and appears to control the reward-seeking drive.
The researchers believe that the findings on the connectivity between the striatum and other brain areas can be interpreted in two ways: either the decreased connectivity is a sign of experience-dependent neuronal plasticity, i.e. an effect of pornography consumption on the reward system, or alternatively, it could be a precondition that determines the level of pornography consumption. The researchers think that the first interpretation is the more likely explanation. "We assume that frequent pornography use leads to these changes. We're planning follow-up studies to demonstrate this directly," adds Jürgen Gallinat, co-author of the study and psychiatrist at the Psychiatric University Hospital Charité at St Hedwig Hospital.

Background Information

Original Publication

Max Planck Institute for Human Development
The Max Planck Institute for Human Development was founded in 1963 in Berlin and is an interdisciplinary research institute dedicated to the study of human lifespan development and education. The Institute is part of the Max Planck Society, a leading organization for basic sciences in Europe.

Contact:
Max Planck Institute for Human Development
Public Relations Department
Kerstin Skork
Phone: 030-82406-211
E-Mail: skork@mpib-berlin.mpg.de

Nicole Siller
Phone: 030-82406-284
E-Mail: siller@mpib-berlin.mpg.de

Further information:
www.mpib-berlin.mpg.de
www.mpg.de