

**PRESS RELEASE FROM
NEUROPSYCHOPHARMACOLOGY
(<http://www.nature.com/npp>)**

**This press release is copyrighted to the journal *Neuropsychopharmacology*.
Its use is granted only for journalists and news media receiving it directly from the Nature Publishing Group.**

*** PLEASE DO NOT REDISTRIBUTE THIS DOCUMENT ***

EMBARGO:

**1700 London time (BST) / 1200 US Eastern Time Monday 07 October 2013
0100 Japanese time / 0300 Australian Eastern Time Tuesday 08 October 2013**

Wire services' stories must always carry the embargo time at the head of each item, and may not be sent out more than 24 hours before that time.

Solely for the purpose of soliciting informed comment on this paper, you may show it to independent specialists - but you must ensure in advance that they understand and accept the embargo conditions.

A PDF of the paper mentioned on this release can be found in the Academic Journals section of <http://press.nature.com>.

Warning: This document, and the Academic Journal paper to which it refers, may contain information that is price sensitive (as legally defined, for example, in the UK Criminal Justice Act 1993 Part V) with respect to publicly quoted companies. Anyone dealing in securities using information contained in this document or in advanced copies of *Nature's* content may be guilty of insider trading under the US Securities Exchange Act of 1934.

PICTURES: While we are happy for images from *Neuropsychopharmacology* to be reproduced for the purposes of contemporaneous news reporting, you must also seek permission from the copyright holder (if named) or author of the research paper in question (if not).

HYPE: We take great care not to hype the papers mentioned on our press releases, but are sometimes accused of doing so. If you ever consider that a story has been hyped, please do not hesitate to contact us at press@nature.com, citing the specific example.

PLEASE CITE *NEUROPSYCHOPHARMACOLOGY* AND THE *NEUROPSYCHOPHARMACOLOGY* WEBSITE AS THE SOURCE OF THE FOLLOWING ITEM. IF PUBLISHING ONLINE, PLEASE CARRY A HYPERLINK TO <http://www.nature.com/npp>

[Smoking throughout pregnancy may contribute to emotional problems in children *PODCAST*](#)

DOI: 10.1038/NPP.2013.273

Smoking throughout pregnancy may have long-term effects on brain development and contribute to emotional problems in young children, according to a study published in *Neuropsychopharmacology*.

Up to 25% of women in the U.S., Denmark and Sweden report smoking during pregnancy, despite associations of prenatal tobacco exposure with negative behavioral and cognitive outcomes. Prenatal exposure to cigarettes is thought to alter brain structure, but little is known about how brain development is affected, or if the behavioral problems observed are mediated by these differences in brain morphology. Hanan El Marroun and colleagues assessed brain morphology along with behavioral and emotional functioning of 113 children aged 6-8 years old whose mothers reported smoking in a range from one cigarette a day to more than nine cigarettes per day during pregnancy. 17 of these mothers stopped smoking when they discovered they were pregnant, while 96 continued smoking throughout pregnancy. This was compared to 113 unexposed controls. The results suggest that children whose mothers continued smoking have smaller total brain volumes, with smaller cortical gray and

white matter volumes in particular, and exhibit more emotional problems, such as depressive symptoms and anxiety. The authors show that a reduction in the superior frontal cortex specifically, a brain area implicated in the regulation of mood states, was correlated with mood problems in the children whose mothers continued smoking.

The authors suggest that the mechanisms through which tobacco might affect brain development include dysfunctional neuronal migration and lack of oxygen to the fetus due to narrowing of blood vessels. The results emphasize the importance of preventing and reducing cigarette smoking during pregnancy.

Author contact:

Hanan El Marroun (Erasmus MC, Rotterdam, The Netherlands)

Tel: +31 10 7034275; E-mail: h.marrounel@erasmusmc.nl

Editorial contact:

Natalie Marler (*Neuropsychopharmacology*, Brentwood, TN, USA)

Tel: +1 615 324 2371; E-mail: nmarler@acnp.org

Listen to the related podcast from *Neuropsychopharmacology*:

http://www.nature.com/multimedia/podcast/npp/npp_10072013.mp3

PRESS CONTACTS

For media inquiries relating to embargo policy for the journal Neuropsychopharmacology:

Rachel Twinn, *Nature* London

Tel: +44 20 7843 4658; E-mail: r.twinn@nature.com

From North America and Canada

Neda Afsarmanesh, *Nature* New York

Tel : +1 212 726 9231; E-mail: n.afsarmanesh@us.nature.com

From Japan, Korea, China, Singapore and Taiwan

Eiji Matsuda, *Nature* Tokyo

Tel: +81 3 3267 8751; E-mail: e.matsuda@natureasia.com

About Nature Publishing Group (NPG)

Nature Publishing Group (NPG) is a publisher of high impact scientific information in print and online. NPG publishes journals, online databases and services across the life, physical, chemical and applied sciences.

Focusing on the needs of scientists, *Nature* (founded in 1869) is the leading weekly, international scientific journal. NPG publishes a range of Nature research journals and *Nature Reviews* journals, and a range of prestigious academic and partner journals including society-owned publications. Online, nature.com provides over 8 million visitors per month with access to NPG publications and services, including news and comment from *Nature*, and the leading scientific jobs board *Naturejobs*.

Scientific American is at the heart of NPG's consumer media division, meeting the needs of the general public. Founded in 1845, *Scientific American* is the oldest continuously published magazine in the US and the leading authoritative publication for science in the general media. Together with scientificamerican.com and 14 local language editions around the world it reaches over 5 million consumers and scientists. Other titles include *Scientific American Mind* and *Spektrum der Wissenschaft* in Germany.

Throughout all its businesses NPG is dedicated to serving the scientific community and the wider scientifically interested general public. Part of Macmillan Science and Education, NPG is a global company with principal offices in London, New York and Tokyo, and offices in cities worldwide including Boston, San Francisco, Washington DC, Buenos Aires, Mexico City, Sao Paulo, Cairo, Dubai, Delhi, Mumbai, Hong Kong, Shanghai, Melbourne, Osaka, Seoul, Barcelona, Madrid, Basingstoke, Heidelberg, Munich and Paris. For more information, please go to www.nature.com.