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**PRESS RELEASE**

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**INTERACTION WITH OUTSIDERS INCREASES EMPATHY FOR THEM**

Within any population — but especially in our multicultural societies — hostility, bullying, or interpersonal conflict often emerge from a sense that members of another group, especially if recently immigrated or in the minority, are strange, different, or untrustworthy. Feelings of bias or prejudice may even develop into considering ‘outgroups’ as less human — especially during war or societal strife involving acts of cruelty, pain, or human suffering. A range of bias and conflict situations are thought by many researchers to arise from a lack of empathy or compassion for members of communities considered outgroups.

Ongoing research led by the University of Zurich is revealing that we can easily learn to feel empathy towards strangers, especially members of outgroups. Today (10 July) at the FENS Forum of Neuroscience in Berlin, **Dr Philippe Tobler** shared neural and behavioural findings showing that we can learn from positive interactions with members of another group by increasing our empathy towards others’ pain. Speaking at a symposium on brain mechanisms for social cognition, Dr Tobler detailed how just a few favourable experiences with an outgroup member can generate greater empathy towards people of that community.

These changes in brain activity characterise a form of ‘social learning,’ a lifelong process considered key to enculturation and building personal relations, noted Dr Tobler, Associate Professor of Neuroeconomics and Social Neuroscience at the University of Zurich’s Department of Economics. By constantly perceiving, noting, understanding, and anticipating others’ experiences and actions, we influence and modify our own behavior. The underlying brain mechanisms can be affected by important social attributes of another person, such as group membership.

Empathy — the experience of understanding others’ feelings and situation from their point of view — is considered by scientists to be a significant component of social life. Numerous scholars and leaders worldwide actively work to increase empathy between groups of people, based on lay evidence that empathy can be built by positive intergroup and interpersonal connection. But the brain mechanisms behind these positive changes were still unclear. “This may partly explain why we lack reliable approaches to cultivate and support empathy between communities,” noted Dr Tobler. Knowing how pervasive insufficient empathy can be, how strongly outgroup members can be affected, and how negatively society can be impacted, he and his colleagues decided to investigate whether empathy toward outgroups could be learned, and how positive learning experiences might influence empathy-related brain processes.

To examine this, the team created a learning assessment with 40 men. Half received help from members of their own social group; the other half received help from a member of an outgroup. Participants expected to receive painful shocks to the backs of their hands, but were also told that a member of their own or another group could pay money to spare them pain, Dr Tobler specified. Participants were also asked to subjectively rate how they felt about the ingroup or outgroup members before and after the experience.

The researchers measured brain activity while participants observed pain in a person from their own or from the outgroup, both before and after the ‘costly help’ experiences. Initially, seeing an

outgroup member's pain generated a weaker empathic brain response in the participant than if a member of one's own group experienced pain. But just a few positive experiences with an outgroup member offering 'costly help' predicted subsequent increases in participants' empathy responses, even if pain was then inflicted to another person from the outgroup. The stronger the positive experience with the outgroup member, the more the brain's empathy responses increased, Dr Tobler reported.

The study uncovered the complex neural interplay between empathy and learning. "We found that when individuals learn that others provide costly help, they can indeed overcome negative biases," he summarised. These successful changes include increasing neural empathy for physical pain experienced by outgroup members, which correlated with a more general propensity to feel empathy.

What causes the brain to reshape its responses? The outgroup empathy changes are related to learning signals in the anterior insula, a brain area responsive to both social and individual pain, Dr Tobler explained. Indeed, the insula has been linked modulating 'social emotions' such as empathy for the pain of others; and in perceiving physiological body states, such as pain or hunger. The study shows that the learning signal in the insula is correlated to feeling more connected with an outsider who provided a surprisingly positive experience, he said. The results also indicate that in turn, these new positive emotions with a specific outgroup member then predict increased empathy with other outgroup members too.

The findings — showing how flexible our reactions towards outsiders can be — indicate how easily our brain functions can be reshaped by experiences, and how 'plastic' or malleable our brain's learning mechanisms around social and individual pain processing are. Although the phenomenon of empathic reactions has been widely documented, it had not previously been clarified on a neural learning basis.

This research area represents a major step forward in uncovering the complex learning processes influencing social and individual pain processing, the interaction between brain activity and psychological functioning, and the insula's particular role in these processes and interactions.

Dr Tobler believes that positive learning experiences could offer viable pathways towards overcoming group-related social biases. Noting that relatively few favourable interactions with a person originally perceived to be an outsider are needed to generate major brain changes, he hopes this research can aid development of simple positive social interaction strategies that could be implemented widely. Enabling scholars, leaders, and communities to transform 'us-them' feelings may reduce longstanding prejudice and lead to more open environments and inclusive connections.

A related area of social learning Dr Tobler's team are currently studying are the brain processes involved in social pain modulation, which are also poorly understood. His team is investigating how group membership — as a key social context factor — might also shape perceptions of one's personal pain relief, behaviorally and neurally, through positive interactions with members of another group. This area of their research is yet unpublished.

Additionally, Dr Tobler and colleagues may consider future research investigating brain mechanisms involved in outgroup members' experiences leading to more positive attitudes towards ingroups, and ingroup members' experiences leading to less positive attitudes towards their ingroup.

**END**

**Symposia S39:** Neural mechanisms for social cognition in monkeys and humans

**Abstract:** Group effects on neural mechanisms for social learning

**Contact**

**FENS Press Office and all media enquiries:**

Elaine Snell, Snell Communications Ltd, London UK (*English language*)

tel: +44 (0)207 738 0424 or mobile +44 (0)797 395 3794

email: [Elaine@snell-communications.net](mailto:Elaine@snell-communications.net)

Barbara Ritzert, ProScience Communications, Pöcking, Germany (*German language*)  
tel: +49 8157 9397-0 or mobile +49 151 12043311  
email: [ritzert@proscience-com.de](mailto:ritzert@proscience-com.de)

#### **NOTES TO EDITORS**

**Associate Professor Philippe Tobler**, Department of Economics, University of Zurich  
<http://www.econ.uzh.ch/en/people/faculty/tobler.html>

**The 11th FENS Forum of Neuroscience**, the largest basic neuroscience meeting in Europe, organised by FENS and hosted by the German Neuroscience Society will attract more than 7,000 international delegates. The Federation of European Neuroscience Societies (FENS) was founded in 1998. With 43 neuroscience member societies across 33 European countries, FENS as an organisation represents 24,000 European neuroscientists with a mission to advance European neuroscience education and research. <https://forum2018.fens.org/>

#### **Further Reading**

How learning shapes the empathic brain. PN Tobler, G Hein, JB Engelmann, M Vollberg.  
*Proceedings of the National Academy of Sciences of the USA*. 2016, 113 (1) 80-85.

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