Puberty changes how adolescents remember peer faces

Together with voices, faces are the most important source of social information for humans, even prior to birth. What is equally important to know is how the kinds of information we pay most attention to in faces changes as we progress through different developmental stages. For example, in childhood finding your parent in a crowd and detecting variations in their facial expressions are critical skills for your survival. In contrast, as you become an autonomous adolescent, parent faces become less critical for survival and peer faces become the focus of new social goals. To understand how the brain changes to accommodate these demands on the face processing system, researchers Dr. Suzy Scherf (Associate professor of Psychology) and Giorgia Picci (graduate student) at Pennsylvania State University investigated how pubertal development influences the way adolescents actually *keep track of* faces; especially those of peers.

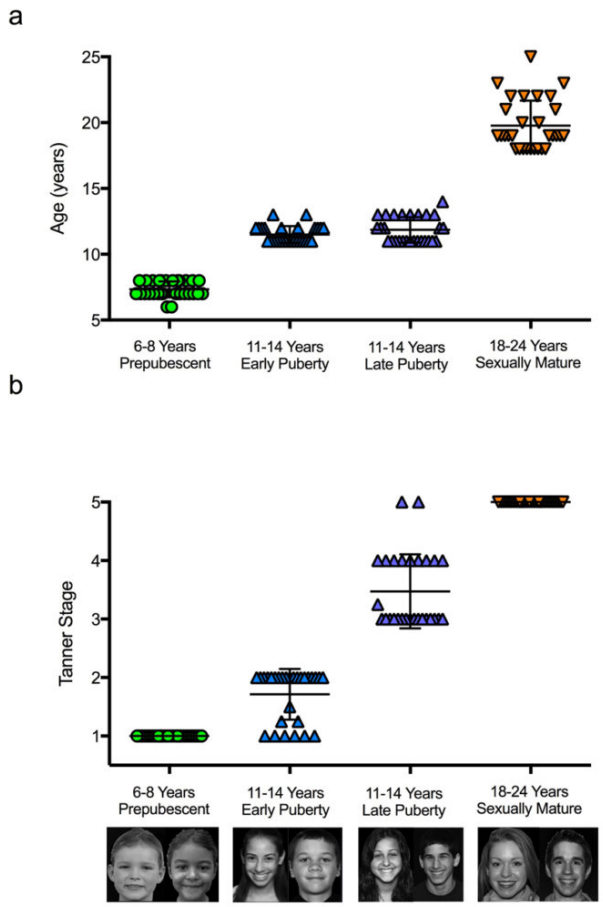

Fig. 1. (a) The age of each participant in each pubertal group is plotted with the mean and one standard error. The two adolescent groups have a mean age of 12 and are not statistically different. (b) The pubertal status of each participant in each of the four pubertal groups is plotted with the mean and one standard error. All four groups were significantly different in mean stage from each other, including the two adolescent groups. The images of the faces are example stimuli

from the experiment and also represent the pubertal stage of each participant group.

In the study, the researchers recruited 116 participants for the study, and separated them into four groups, depending on participants' stage of pubertal development. The groups included children who had not started puberty, adolescents in the earliest stages of puberty, adolescents in the later stages of puberty, and sexually mature young adults. Importantly, the adolescents were all the same age (12), therefore, differences in the way adolescents remembered faces were related to their pubertal status, not their age.

The researchers used an innovative experimental design to test whether participants were better at remembering faces from their own peer/pubertal group, or faces from other groups. Participants were required to remember faces from all four groups. In other words, the faces to be remembered looked just like the research participants in pubertal characteristics (Fig. 1). Because peer relationships become uniquely important during adolescence, Scherf and Picci hypothesized that during and throughout adolescence, teens would be better at remembering other adolescent faces, particularly those from their same pubertal status.

Results from the study show that before puberty, children are best at recognizing adult female faces, not peer faces. The researchers suggest that this pattern reflects children's need to keep track of their caregivers, who are typically adult females in the United States.

In contrast, as soon as adolescents transition into pubertal development, instead of being biased to remember adult faces, they become excellent at remembering peer faces. Importantly, adolescents are best at remembering peer faces that match their *own* pubertal status and this continues to be true as they progress through puberty. In other words, as they become more physically mature, their bias for peer faces matches this level of maturity (Fig. 2).

These results suggest that the biological process of puberty changes the way humans see the social world, and in particular, the kinds of faces they pay most attention to. This is some of the first evidence in humans that pubertal development changes face perception. In other words, the influx of pubertal hormones during adolescence likely *motivates* an increased interest in peers which may, in turn, lead to an enhanced ability to remember peer faces above all other kinds of faces.

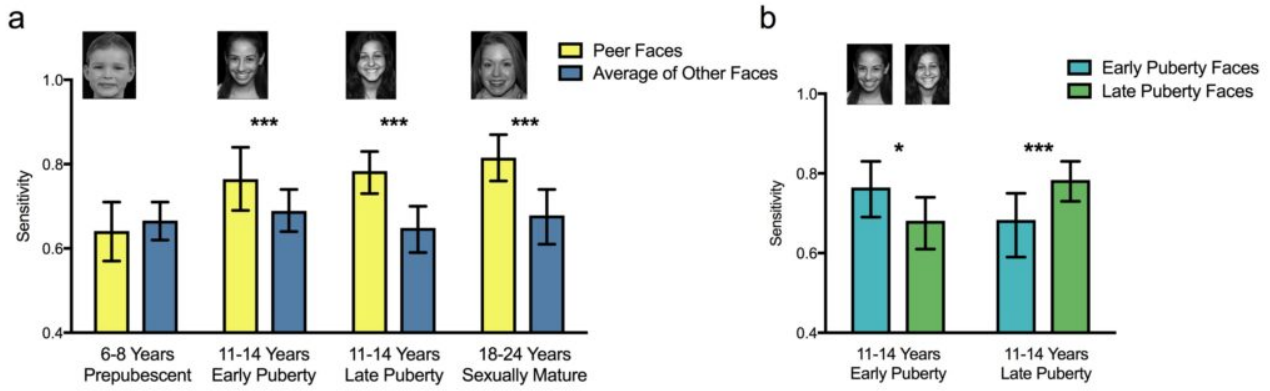

Fig. 2. (a) Early and late puberty adolescents as well as adults all evinced superior recognition of faces from their own pubertal group compared to faces from all other groups. Pre-pubertal children did not show this Peer Bias. (b) The Peer Bias is selectively tuned to one's own pubertal status during adolescence such that adolescents in the earlier stages of puberty have enhanced recognition for other early puberty adolescent faces compared to late puberty faces and vice versa in late puberty adolescents. Error bars indicate 95% confidence intervals.

Puberty not only induces dramatic physical changes to the body, but also changes how adolescents interact with the increasingly complex social world around them. This dynamic process likely facilitates adolescents' transition into adult social roles, like increasingly confiding and intimate friendships and romantic relationships with peers.

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Publication

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