

“Toward a Genetics of Separation Anxiety: Social motivation in infant rats bred for high and low positive affect”

Paolo Iacobucci ^(1,2), Valentina Colonnello ^(1,2), Thomas Fuchs ⁽¹⁾, Laura D’Antuono ⁽²⁾, and Jaak Panksepp ⁽¹⁾

⁽¹⁾ *Department of VCAPP, College of Veterinary Medicine, Washington State University, Pullman, WA 99164-6351* ⁽²⁾ *Department of Psychology, University of Rome “Sapienza,” Via dei Marsi 78, 00185 Rome, Italy*

Strong efforts have been devoted to developing animal models of human emotional phenotypes. The study of ultrasonic vocalizations (USVs) has played a key role in investigating rats’ emotional responses, with 22 kHz indicating a negative affect and 50 kHz USVs accompanying a positive affective state. Human mood disorders have been correlated to negative affectivity without stressing the role of positive affects and their predictive value for coping styles. We investigated differences in infant social motivation in Low and High lines of rats selectively bred for differences in positive affect. The two lines underwent repeated isolations from their family. Infants were exposed to either familiar, unfamiliar, or neutral odor cues between the first and second isolation. All sessions were carried out at different temperatures, to discern whether the rate of USVs would also be affected by a physiological stressor. Low line called at higher rates than High line and their rate of vocalizations was stable over sessions. High line vocalized more during the second (odor exposure) and third (subsequent isolation) sessions. In addition, while Low line was not affected by the exposure to odors, vocalization rates in High line increased both during and after the exposure to social odors, but not in response to a control odor. Lines showed comparable susceptibility to a physical stressor. Thus, the lines selected for a positive phenotype during the prepubertal period differ also in separation anxiety responses in infancy, making our animal model a promising tool for the study of human affective disorders.