NEUROBIOLOGICAL CORRELATES OF EMPATHY IN COUPLES: A STUDY OF CENTRAL AND PERIPHERAL MEASURES

Joana Coutinho¹, Patrícia Oliveira-Silva², Óscar Gonçalves¹,⁵, Kristin Perrone³ & Jean Decety⁴

¹Neuropsychophysiology Lab, Psychology School - Minho University;
²Faculdade de Educação e Psicologia - Universidade Católica Portuguesa;
³Department of Psychological Science, Ball State University, USA;
⁴Department of Psychiatry and Behavioral Neuroscience, University of Chicago, USA;
⁵Applied Psychology Bouvé College of Health Sciences Northeastern University
Harvard Medical School, Boston, USA

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Background: Empathy is one of the most studied constructs in psychology. An interpersonal context in which empathy appears to be critical is that of romantic relationships. Social neuroscience has clarified the neural basis of the different dimensions of empathy both at the central and pheripheral nervous system levels. For example previous evidence showed that not only the autonomic arousal per se but also the autonomic synchrony between spouses are markers of empathy. At the central level different brain areas have been linked with empathic processes.

Aims: This project aimed to explore the neural correlates of empathy in couples both at the peripheral and central nervous system level. Specific goals: 1) To characterize the autonomic (electrodermal (EDA) and cardiac activity) and neuroendocrine response (cortisol) in couples during an interactive task; 2) To test whether more empathic couples have higher levels of physiological synchrony; 3) To clarify the relationship between the patterns of connectivity of the Default Mode Network (DMN) and empathy 4) To analyse the brain areas involved in the self-other distinction during an empathy task.

Method: 32 couples (N = 64) in a committed relationship for at least one year performed a couple´s interaction task consisting in a structured discussion about the positive and problematic aspects of their relationship, while their cardiac and electrodermal activity was recorded using Biopac MP-150. Questionnaires of dyadic empathy and relationship satisfaction were administered to both spouses. The video-vignettes from this task were used to construct an fMRI paradigm in which each partner was asked to process his/her own feelings and those of his partner. A resting state acquisition was also performed.

Results: We found higher levels of heart rate and cortisol during the negative interaction condition whereas EDA was higher during the positive interactions. Physiological synchrony between spouses was higher in the negative interaction. At the central level we confirmed the association between both functional and effective connectivity of the DMN and dyadic empathy. Finally we found that brain areas such as insula and medial temporal regions were more active during the self condition whereas the supramarginal and fusiform gyrus were more active during the other condition.

Conclusions: Our results contributed for the understanding of the neural response during couple´s interactions and have important clinical implications.
Keywords: Empathy, Intimate relationships, Autonomic measures, Neuroimaging measures, Default Mode Network

Publications
Coutinho J, Oliveira-Silva P., Fernandes E., Correia D., Gonçalves O. F. & Tschacher W. (in revision) "Psychophysiological synchrony during verbal interaction in romantic relationships", Family Process

E-mail contact: joanafpc@gmail.com; joanacoutinho@psi.uminho.pt