



Abstract

The Influence of Body Processing in the Development of Empathy in Early Adolescence: A Preliminary Study [†]

Silvia Canino ^{1,*} , Simona Raimo ², Valentina Torchia ², Teresa Iona ² and Liana Palermo ²

¹ Department of Health Sciences, "Magna Graecia" University of Catanzaro, 88100 Catanzaro, Italy

² Department of Medical and Surgical Sciences, "Magna Graecia" University of Catanzaro, 88100 Catanzaro, Italy

* Correspondence: silvia.canino@studenti.unicz.it

[†] Presented at the 3rd International Electronic Conference on Brain Sciences (IECBS 2022), 1–15 October 2022; Available online: <https://iecb2022.sciforum.net/>.

Abstract: Mental representations in various bodily formats (e.g., somatosensory, interoceptive, motoric) have been suggested to play a pivotal role in social cognition. However, data on children and adolescents are lacking. This study aims to investigate whether individual differences in the sensing of the internal body state, in terms of interoceptive accuracy (IAcc) and sensibility (IS), and in the action-oriented (i.e., body schema) and non-action-oriented (i.e., visuo-spatial body map) body representations (BR) influence a core component of social cognition, namely empathy, during early adolescence. A total of 30 healthy teens (mean age 13.2 years) completed an empathy questionnaire, a heartbeat tracking task probing IAcc, an IS questionnaire including visceral and somatosensorial factors, and a computerized battery consisting of action-oriented and non-action-oriented BR tasks. The correlational analysis showed that as IAcc increased, empathy levels decreased, while as IS increased, empathy levels increased, especially when the visceral factor was taken into account. No association was found between action/non-action-oriented BR and empathy. These preliminary results suggest that teens with a higher sensibility towards visceral body changes also show a higher tendency to feel and understand another's emotional state. In contrast, teens with higher IAcc for cardiac signals show a lower empathy level, possibly due to a more stable body self-representation that prevents the self–other overlap necessary in some forms of empathy. As a corollary finding, the opposed relationship between these interoceptive dimensions and empathy confirms that IS and IA are two distinct constructs that can impact cognitive and affective abilities differently.

Keywords: interoception; body representation; empathy



Citation: Canino, S.; Raimo, S.; Torchia, V.; Iona, T.; Palermo, L. The Influence of Body Processing in the Development of Empathy in Early Adolescence: A Preliminary Study. *Biol. Life Sci. Forum* **2022**, *19*, 3. <https://doi.org/10.3390/IECBS2022-12936>

Academic Editor: Pierluigi Zoccolotti

Published: 30 September 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Supplementary Materials: The presentation material of this work is available online at <https://www.mdpi.com/article/10.3390/IECBS2022-12936/s1>.

Author Contributions: Conceptualization and methodology: L.P., S.C. and S.R.; formal analysis: L.P. and S.C.; investigation: S.C., V.T. and T.I.; writing—original draft preparation: L.P. and S.C.; writing—review and editing: S.R., V.T. and T.I.; supervision: L.P. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Calabria Region Ethical Committee, Catanzaro, Italy (protocol number 400, 18 November 2021).

Informed Consent Statement: All parents of participants signed written informed consent after the procedures had been fully explained to them and the teens expressed oral consent.

Data Availability Statement: Data are available on reasonable request from the corresponding authors.

Conflicts of Interest: The authors declare no conflict of interest.