Focusing: a new challenger for improving the empathy skills of medical students

Julian A. Nasello [a,b,*], and Jean-Marc Triffaux [a,c]

[a] Psychosomatic Medicine and Group Psychotherapy, Psychiatric Day Hospital « La Clé », Liège, Belgium;

[b] Department of Psychology, University of Liège, Liège, Belgium;

[c] Department of Psychiatry, Medical Psychology, University of Liège, CHU of Liège, Belgium.

* Corresponding author, email address: julian.nasello@gmail.com; postal address: Boulevard de la Constitution 153, 4020 Liège (Belgium)

A B S T R A C T

Objectives: Studies of empathy among medical students reported an alarming significant decline during medical education. Some authors identified the third year of education as the most problematic one: empathy decreased significantly when the curriculum was shifting to patient-care activities. Scientists have tried to address the means and methods for improving empathy skills (e.g., by improving communication abilities), but investigations on this topic are missing. Based on the Damasio's hypothesis and scientific studies, we assume that Focusing (i.e., an embodied practice where one attends to a bodily felt sense and uses it to understand the self and situations) would be significantly and positively linked to empathy.

Method: After their clinical internships, we selected third-year medical students (N = 121) and asked them to complete three questionnaires assessing empathy, Focusing, and social desirability.

Results: By controlling social desirability, findings confirmed that Focusing (especially the "having access to the felt body" component) was significantly and positively linked with empathy (i.e., Fantasy & Perspective-Taking), and positively predicted Fantasy, Perspective-Taking, and Empathic Concern.

Conclusions: These preliminary results suggest that the felt body plays a role in increasing empathy (mainly on cognitive empathy). Few scientific studies have described constructs that significantly promote cognitive empathy and empathic concern (a deeply anchored trait of empathy), which suggests new avenues of investigation.

Keywords

Empathy; Medical education; Embodiment; Prevention; Gender; Siblings.

1. Introduction

Empathy is a complex phenomenon, and understanding its application is crucial. Empathy is defined as "the ability to experience and understand what others feel without confusion between oneself and others",[1 p. 1146]. Empathetic reactions emerge early in life and continue to be shaped by experiences.[2] Therefore, we consider empathy as an adaptive orienting system that facilitates social interactions. Jean Decety subdivided this phenomenon into three main components: 1) affective sharing (i.e., "the capacity to share or become affectively aroused by others' emotional valence and relative intensity without confusion between self and other"); 2) empathic concern (i.e., "the motivation to caring for another's welfare"); and 3) perspective-taking (i.e., "the ability to consciously put oneself into the mind of another and understand what that person is thinking or feeling"). [2, p.1]

1.1. Empathy in future health care professionals

Empathy is a core characteristic of human life, and several authors have investigated the levels of empathy among health care professionals. They brought to light a striking decline of empathy among medical students,[3–5] and have shown that the empathy decline is highly influenced by being pressed for time.[6] Hojat et al. [4] and Newton et al. [7] have also identified other factors that play a significant role in this decline: 1) an increase in cynicism (i.e., the inclination to believe that people are motivated purely by self-interest);[7] 2) an ever-increasing student workload during training; 3) competitiveness; 4) and technology-driven therapeutics.[4] Furthermore, Nasello et al. [8] recently found that students presented different degrees of empathy depending on whether they are asked to answer by giving a general representation of themselves, in the presence of peers, or in the presence of patients; revealing that empathy is significantly modulated according to the population of reference (a phenomenon called "the intergroup empathy bias"). The empathy skills of health care professionals are essential to their patients. In clinical settings, scientific investigations have reported that professionals with high degrees of empathy are more accurate in their diagnoses, they positively influence their patients' engagement in their health care process, and they improve their patients' adherence to therapy.[9] Henceforth, finding the means to promote the empathy skills of future health care professionals would provide significant benefits for their medical practices. Nevertheless, is it possible to train someone in a characteristic such as empathy? Research investigations have positively answered this question. Bonvicini et al. showed that training in empathic communication produces significant improvements in physician empathic expression during patient interactions.[10] Evidence also supports the notion that empathy training induces functional plasticity at the neural level.[11] Moreover, Klimecki et al.[11] showed that compassion interacts strongly with empathy and represents a powerful coping strategy for preventing empathic distress (e.g., burnout). Lastly, a recent meta-analysis showed that empathy training is effective for improving empathy levels.[12]

1.2. Empathy and the felt body

Following Damasio's hypothesis,[13] mental states are understood within the framework of the interaction between the organism and its environment. In his works, Damasio gave special considerations to the body: he considered it as a fundamental component of mental representations. This phenomenon was called "embodiment" (i.e., a close bidirectional relationship between the body and mind which is influenced in various non-trivial ways).[14] Indeed, Damasio tried to bring together what was separated by Descartes' philosophy: the body and the mind.

At the same time, the embodiment phenomenon was being bolstered by the discovery of the mirror-neuron system by Rizzolatti, Gallese et al. [15–17] This discovery extended the body and mind connection to an interpersonal level. According to them, people model the behaviors or the mental states of others as intentional experiences because our neural system re-creates what others do and feel; and Gallese [18] called this an "embodied simulation." This phenomenon is involved in imitation/mimicry, which is considered as a crucial precursor of empathy.[19–21]

In terms of anatomy, Preston and de Waal [19] proposed the "Perception Action Model" to explain the role of mirror neurons and the complex neuroanatomy of empathy, involving the activation of several brain areas potentiated by internal and external cues (e.g., familiarity, similarity, learning, past experiences, saliency). In line with these findings, studies have shown that interoception is implicated in yielding empathy.[22,23] Interoception or "interoceptive awareness" corresponds to theattention devoted to physiological/corporal activation (e.g., heartbeat counting) and appears to display a functional interdependence with empathy. However, *per se*, interoception is not a full-blown practice in clinical settings. As a result, Aoki and Ikemi [24] proposed integrating a similar notion into therapy, Focusing (notably with the person-centered approach of Carl Rogers). Focusing is defined as an "embodied practice where one attends to a bodily felt sense and uses it in understanding the self and situations".[24] They divided Focusing into three attitudes: 1) being

aware of the felt sensation; 2) accepting and acting from the felt sensation; and 3) finding a comfortable distance from the felt sensation. The first aspect represents time devoted intentionally to what people are experiencing now. The person raises awareness of what s/he is feeling. The second aspect represents a match between the felt sensation and the actions or choices of one person (e.g., "what I am doing is congruent with what I am feeling"). The last aspect refers to a timeout interval, where the person distances himself/herself from the difficulty felt. Racine [25] proposed a different way to differentiate between the various aspects of Focusing: 1) paying attention to and trusting in the felt body; and 2) having access to the felt body, which is a combination of aspects 2 and 3 of the previous model. We focused our investigation on the Racine's approach.

For now, only scarce studies provided evidence on factors promoting cognitive and affective empathy. Based on the well-tried approach of Carl Rogers, Focusing is a practice that can be learned by therapists and patients. Given the theoretical frame mentioned above, we assumed that empathy and Focusing are significantly linked. Moreover, we hypothesized that Focusing would significantly and positively predict empathy levels. Indeed, by consciously modeling corporal experiences and by acting according to these signals, people would be more likely to understand others and to put themselves in others' shoes. To test these assumptions, we selected third-year medical students after their internships because, according to a longitudinal study,4 the significant decline in empathy occurs during this third year (when their training starts to include patient-care activities). According to Hojat et al.,[4] several factors explained the erosion of empathy in third-year medical students. For instance, there is a lack of role models, a gradual overreliance on technologies, the increasing time pressure, the promotion of physicians' emotional detachment, and affective distance. Hence, determining whether significant links between Focusing and empathy exist would promote new avenues of empathy research for medical education and other health care professions.

In parallel to the main hypotheses, we expected to find gender differences in empathy because it is well known that women present higher empathy scores than men.[5,26–29] Then, we explored whether siblings might contribute to the development of empathy skills. Currently, no research has yet been reported whether having siblings or not is linked to empathy levels. Therefore, we investigated whether the number of siblings significantly predicted empathy levels.

2. Method

2.1. Participants and procedure

Participants were medical students who voluntarily took part in this research (N = 133). We targeted students enrolled in their third year of medical studies at the University of Liège (Belgium)[1]. Twelve participants were excluded from the analyses (i.e., eleven were students from the second year of their bachelor's degree and one from the first year of a master's degree). The final sample was composed of 121 participants, of which 89 are women (M_{age} = 21.7; SD_{age} = 1.74), and 32 are men (M_{age} = 21.9; SD_{age} = 1.86), see Table 1 for more details. As previously mentioned, students in their third year of medical school were selected because, according to a longitudinal investigation, 4 the significant decline in empathy occurs during this third year, especially when their training starts to include patient-care activities. Therefore, following completion of their internships, students were invited to participate in an anonymous online survey on interpersonal reactions and the role of their bodily sensations. The approximate rate of participation was around 56 percent. They received their informed consent, then socio-demographical questions (i.e., gender,

[1] It is important to note that the medical school curriculum at the University of Liège (Belgium) consists of three years of bachelor and three years of master. In Belgium, students start their bachelor's degree at 18−20 years old and finish their master's at 23−25 years old. Since 1998, 48 European countries follow the Bologna Process (BP) in the field of higher education. BP introduces a three-cycle higher education system consisting of bachelor's, master's, and doctoral studies. The main purpose of the BP is to ensure mutual recognition of qualifications and to foster student exchanges between universities. For medical students, their clinical internships start in the third year of medical education.

age, and the number of brother(s) and sister(s)). Finally, they had to complete three questionnaires: 1) the Interpersonal Reactivity Index (IRI) assessing empathy[30]; 2) the Focusing Manner Scale (FMS) measuring Focusing[24]; and 3) the Short-Form of the Marlowe-Crowne Social Desirability Scale.[31] Table 1 displays descriptive statistics for all variables.

2.2. Instruments

Empathy was measured using the IRI [30] (French version [32]). The 28-item IRI is a self-reported questionnaire that measures four 7-item components of empathy. [32 p.43] The cognitive components of empathy are Fantasy (i.e., FS: "the people's propensity to get involved in fictional situations and to identify with fictional characters in books, movies, or plays") and Perspective-Taking (i.e., PT: "the ability to adopt another's perspective or point of view"), and the affective components of empathy are Personal Distress (i.e., PD: "the tendency to experience distress or discomfort in response to others' emotional distress") and Empathic Concern (i.e., EC "the respondents' tendency to experience feelings of concern or compassion for others"). Coefficient alphas are ranged from .60 to .78 for all domains.

Focusing was assessed by the Focusing Manner Scale (FMS). The FMS is a 25-item self-reported questionnaire.[24] Five items were reversed (i.e., items 4, 9, 19, 24, and 25). In our study, we focused on the two subscales proposed by Racine [25]: 1) paying attention to and trusting in the felt body (PATFB; 9 items: 7, 10, 11, 12, 14, 15, 16, 17, 20); and 2) having access to the felt body (HAFB; 6 items: 1, 2, 5, 18, 19, 22). Items from the PATFB subscale are, for example, "When choosing what to do on a day off, I trust my own feel of which options are best"; "I know I can trust what I sense inside"; or "Whatever my feelings, I tend to accept them as a reflection of how I am at a particular time." The six items that assess the HAFB subscale are, for example, "When I speak, I am confident that what I say comes from my feelings," "I try to match the words I say to how I feel

inside," and "I like to give myself the space to check out just how am I right now?". A total score is also calculated by summing up all responses (α = .68). Coefficient alphas are .60 for PATFB and .58 for HAFB.

We measured social desirability with the 13-item Short Form of the Marlowe-Crowne social desirability scale,[31] French version.[34] This short version assesses "the tendency of individuals to make themselves look good according to current cultural norms". [33 p.106] Reynolds [35] reported acceptable internal reliability. In our sample, the coefficient alpha is .51[2].

2.3. Statistical analyses

We performed partial correlations in order to measure the links between Focusing and empathy by controlling social desirability. A MANOVA was performed to display gender differences in empathy. Hierarchical regression analyses were also performed with empathy domains as dependent variables. The analyses were divided into three blocks of continuous predictors: (a) the controlled variable (i.e., social desirability), (b) the demographical variables (i.e., gender (coded 0 for women and 1 for men) and the total number of siblings), and (c) the predictors of interest (i.e., total Focusing or Focusing domains, and interaction variables between Focusing and gender). All statistical analyses were run by using version 24 of SPSS [36] and Jamovi computer software, version 1.1.9.0.37

3. Results

3.1. Correlations

[2] The coefficient alpha was surprisingly low. We performed a CFA and obtained acceptable fit indices (CFI = .89; TLI = .87; SRMR = .06; RMSEA = .025) for a one-factor model. According to Steiger (2007) and Hu & Bentler (1999), RMSEA and SRMR below or equal to .07 show a good model fit model.

The partial correlations (see Table 2) demonstrated significant links between total Focusing and the Perspective Taking component (PT: r_p = .21; p < .05) by controlling social desirability. The HAFB subscale from Focusing had especially significant and positive links with Fantasy (FS: r_p = .20; p < .05) and PT (r_p = .19; p < .05). No significant partial correlations were found between the PATFB subscale of Focusing and the empathy components (see Table 2). Significant and positive partial correlations were also found between the number of siblings and the Personal Distress dimension (PD: r_p = .24; p < .01). The number of brothers is associated with PD (r_p = .21; p < .05); and Empathic Concern (EC: r_p = .25; p < .01).

The MANOVA revealed gender differences (Λ = .91; F(4,116) = 2.94; p = .02) in empathy for PD (F(1,119) = 4.3; p = .04) and PT (F(1,119) = 6.8; p = .01), where women scored higher than men.

3.2. Regression analyses

Total Focusing and FS: the regression model for the FS component was not significant (F(5,115) = 1.18; p = .328). Total Focusing and PD: the regression model for the PD component was significant (F(5,115) = 1.17; p = .03; R^2 = .101). The significant predictor of PD was the total number of siblings (B = .54), which means that having a higher number of brothers and sisters predicts higher levels of PD. Total Focusing and PT: the regression model for the PT component was also significant (F(5,115) = 6.41; p = <.001; R^2 = .218). The significant predictors of PT were Total Focusing (B = .13) and Social Desirability (B = .54). Total Focusing and EC: the regression model for the EC component was significant (F(5,115) = 3.53; p = .005) and only SD was a significant predictor (B = .35). See Table 3 for details.

Focusing domains and FS: the regression model for the FS component was not significant (F(7,113) = 1.61; p = .140). However, the HAFB subscale predicted positively FS (B = .49). Focusing domains and PD: the regression model for the PD component was significant F(7,113) = 2.32; p =

.03; R^2 = .125). The significant predictor of this model was the total number of siblings (B = .57) and the interaction between gender and HAFB (B = -.69). This interaction means that being a man and getting higher HAFB scores tends to decrease PD. Focusing domains and PT: the regression model for the PT component was significant (F(7,113) = 4.56; *p* = <.001; R^2 = .22). The significant predictors of this model were the HAFB subscale (B = .36) and social desirability (B = .56). Focusing domains and EC: the regression model for the EC component was significant (F(7,113) = 3.45; *p* = .002; R^2 = .176). The significant predictors of this model were the HAFB subscale (B = .27) and the social desirability (B = .37). See Table 4 for details.

4. Discussion

4.1. Demographic predictors

As already found in the scientific literature,[5,26–29] our results showed significant gender differences in empathy (i.e., personal distress and perspective-taking). We explored whether the number of siblings predicted empathy levels. Interestingly, we found that this variable significantly predicted affective empathy (i.e., PD, and a tendency effect on EC). This result means that having a higher number of siblings predicts higher levels of personal distress and empathic concern. Partial correlations showed that the number of brothers was mainly responsible for these links. Therefore, having siblings (especially brothers) tend to predict more discomfort in response to the emotional distress of others and, paradoxically, more empathic concern for others. Studies have already suggested that parents play a crucial role in the development of their children's empathy skills, [38,39] but no research has investigated the role of siblings in the development of those skills. Only one research showed links between the quality of sibling relationships (the number of siblings was not investigated) and empathy in youth people (from 7 to 14 years old).[40] They reported that the children entertaining closer relationships with their siblings reported higher empathy levels.

4.2. The predicting effects of Focusing on empathy

The main goal of this research was to identify whether Focusing predicts empathy skills. More precisely, according to Damasio's hypothesis,[13] we assumed that Focusing would positively predict empathy, and our findings validated this hypothesis.

We found that Focusing significantly and positively predicted perspective-taking, and further investigations on Focusing domains demonstrated that "having access to the felt body" predicted in a significant and positive way Fantasy, Perspective-Taking, and Empathic Concern. The "having [explicit/conscious] access to the felt body" is an emotional, introspective mechanism reflecting a consistency between verbal descriptions of emotional states or states of mind and corporal sensations. It describes a conscious process by which people dedicate time to feeling, identifying, and describing rich and varied emotional states from psychological and bodily perspectives. These results are surprising for at least two reasons: 1) few scientific studies [41] described specific variables significantly promoting cognitive empathy (e.g., previous findings showed that medical students with higher mental well-being scores also had higher cognitive empathy); 2) Focusing presented a significant and positive link with Empathic Concern. Cliffordson [42] showed that empathy is hierarchically organized and described Empathic Concern as the core factor of empathy. Furthermore, she stated that "the content of this dimension [EC] overlaps to a great extent with both the PT and the FS aspects", [42, p. 56], which corresponds precisely to the predicted variables from our results. More recently, Briganti et al. [43] confirmed Cliffordson's theory by showing that Empathic Concern is at the basis of empathy.

A potential explanation of these results is that people seem to use their "corporal sense," or their conscious access to the felt body, to infer both their own attitudes and those of others. Our interpretation is based on several findings. First, Strack et al. [44] showed that people use their facial expressions as a source of implicit information to infer their attitudes. These authors showed that

the determinant of emotional experiences arises from the interaction between the emotional stimulus and the motor program. Second, studies have shown that empathy is linked with embodiment processes (e.g., people with higher empathy levels performed faster in recognition tasks).[45,46] In the same way, interoceptive awareness and empathy were reported to be closely related.[22,23] Third, studies on clinical populations revealed that people suffering from Autism Spectrum Disorders (ASD) present impairment of embodied cognition and a general lack of empathy.[18,47–49] Furthermore, several motor skill impairments are experienced by people who are suffering from ASD (for more details, see [50]): their physical motion perception of others appears to be altered; notably, this is observed mainly in mimicry experiments (and, as mentioned in the introduction section, imitation/mimicry plays a precursory role in empathy: see. [51,52]

Eigsti, [50, p. 3] explained that this is "because we unconsciously mimic the emotional movements of others, we unconsciously feel the emotions of others as we interact with them." We assume that the same mechanism occurs for affective empathy: we unconsciously mimic the emotional movements of others and unconsciously feel their emotions, and thus, we are more able to understand them. It seems that people with higher levels of Focusing are better in this process, probably because they are better trained. For cognitive empathy, the mechanism is slightly more complex, that is, because people have a clear idea of what they would feel (in their body and psychologically) if the same situation occurred to them, that they can take on the others' perspective appropriately.

5. Conclusions

These findings suggest new avenues of investigation because few scientific studies have described the means and methods to improve empathy. A recent study showed that empathy represents a protective factor of academic burnout for medical students, [53] showing the importance of empathy

skills for future professionals. Our findings suggest that Focusing tells us how corporal mechanisms might be involved in both affective and cognitive empathic processes.

In conclusion, in order to approach the decline of empathy among medical students from the perspective of prevention, the priority for the upcoming decades would be to propose empathy modules during the medical school curriculum (e.g., by giving modules on communication skills, embodied practices promoting corporal awareness, and by proposing Balint groups).

However, this study presents several limitations. First, our sample represents a specific population of third-year medical students working towards their bachelor's degree. Therefore, we need to be cautious about extrapolating these results to all medical students or, more broadly, to the general population. Second, the Focusing Manner scale presented acceptable psychometric properties. Improvements in this tool and the development of other scales should be future priorities. Third, the prediction effects of Focusing on empathy levels were slight. However, the empathy components that were significantly predicted by Focusing represent deeply anchored personality traits (especially EC). Therefore, finding modulators of these empathy dimensions is of high interest and might have a widespread application in education. Also, the experimental design was correlational, which does not allow for causality inferences.

Lastly, we need to consider these results as preliminaries, and further studies are needed to investigate these effects. Nevertheless, giving the importance of empathy skills for (future) health care professionals, the interest in finding factors that improve empathy should remain a priority for future research.

Ethical considerations

The research meets all applicable standards with respect to the ethics of experimentation and research integrity proposed by the Declaration of Helsinki. All students voluntarily participated in

this anonymous study and gave their consent in the online survey. This study is inserted into the continuity of a larger project of research investigating empathy among medical students which was approved by the "Hospitalo-Facultaire" ethical committee of Liège (Belgium) (reference: 2017/179).

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Declaration of Competing Interest

The authors report no declarations of interest.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.ctim.2020.102536.

References

1. J Decety, C Lamm. Human empathy through the lens of social neuroscience. Scientific World Journal. 2006;6:1146–1163. doi:10.1100/tsw.2006.221.
2. J Decety. The neural pathways, development and functions of empathy. Curr Opin Behav Sci. 2015;3:1–6. doi:10.1016/j.cobeha.2014.12.001.
3. D Chen, R Lew, W Hershman, J Orlander. A cross-sectional measurement of medical student empathy. J Gen Intern Med. 2007;22:1343–1348. doi:10.1007/s11606-007-0298-x.

4. M Hojat, M J Vergare, K Maxwell, et al. The devil is in the third year: A longitudinal study of erosion of empathy in medical school. Acad Med. 2009;84:1182–1191. doi:10.1097/ACM.0b013e3181b17e55.

5. J M Triffaux , S Tisseron, J A Nasello. Decline of empathy among medical students: Dehumanization or useful coping process? L'Encephale. 2019;45:3–8. doi:10.1016/j.encep.2018.05.003.

6. R Pederson. Empirical research on empathy in medicine: A critical review. Patient Educ Couns. 2009;76:307–322. doi:10.1016/j.pec.2009.06.012.

7. B W Newton, L Barber, J Clardy, et al. Is there hardening of the heart during medical school? Acad Med. 2008;83:244–249. doi:10.1097/ACM.0b013e3181637837.

8. J A Nasello, M S Triffaux , J M Triffaux. The intergroup empathy bias among incoming medical students. Med Educ Online. 2018;23:1527625. doi:10.1080/10872981.2018.1527625.

9. J Halpern. From detached concern to empathy: Humanizing medical practice. Oxford: Oxford University Press; 2001.

10. Ka Bonvicini, Mj Perlin, Cl Bylund, et al. Impact of communication training on physician expression of empathy in patient encounters. Patient Educ Couns. 2009;75:3–10. doi:10.1016/j.pec.2008.09.007.

11. O M Klimecki, S Leiberg, M Ricard, T Singer. Differential pattern of functional brain plasticity after compassion and empathy training. Social Cognitive and Affect Neuroscience. 2014;9:873–879. doi:10.1093/scan/nst060.

12. E T van Berkhout, J M Malouff. The efficacy of empathy training: A meta-analysis of randomized controlled trials. J Couns Psychol. 2016;63:32–41. doi:10.1037/cou0000093.

13. A R Damasio. Descartes' error: Emotion, reason, and the human brain. New-York: A Grosset/Putnam Books; 1994.

14. A Körner, F Strack. Embodiment: reflective and impulsive processes. In: G Hauke, A Kritikos, eds. Embodiment in psychotherapy. Springer, Cham; 2018.

15. G Rizzolatti, R Carmada, L Fogassi, et al. Functional organization of inferior area 6 in the macaque monkey: II. Area F5 and the control of distal movements. Exp Brain Res. 1988;71:491–507.

16. V Gallese, L Fadiga, L Fogassi, G Rizzolatti. Action recognition in the premotor cortex. Brain. 1996;119:593–609. doi:10.1093/brain/119.2.593.

17. G Rizzolatti, L Craighero. The mirror-neuron system. Annu Rev Neurosci. 2004;27:169–192. doi:10.1146/annurev.neuro.27.070203.144230.

18. V Gallese. Intentional attunement: A neurophysiological perspective on social cognition and its disruption in autism. Brain Res. 2006;1079:15–24. doi:10.1016/j.brainres.2006.01.054.

19. S D Preston, F B M de Waal. Empathy: Its ultimate and proximate bases. Behav Brain Sci. 2002;25:1–72.

20. T L Chartrand, J L Lakin. The antecedents and consequences of human behavioural mimicry. Annu Rev Psychol. 2013;64:285–308. doi:10.1146/annurev-psych-113011-143754.

21. M Stel, R Vonk. Mimicry in social interaction: Benefits for mimickers, mimickees, and their interaction. Br J Psychol. 2010;101:311–323. doi:10.1348/000712609X465424.

22. J Ernst, G Northoff, H Böker, et al. Interoceptive awareness enhances neural activity during empathy. Hum Brain Mapp. 2013;34:1615–1624. doi:10.1002/hbm.22014.

23. G G Gallup, S M Platek. Cognitive empathy presupposes self-awareness: Evidence from phylogeny, ontogeny, neuropsychology, and mental illness. Behav Brain Sci. 2002;25:36–37. doi:10.1017/S0140525X02380014.

24. T Aoki, A Ikemi. The focusing Manner Scale: Its validity, research background and its potential as a measure of embodied experiencing. Pers Exp Psychother. 2014;13:31–46. doi:10.1080/14779757.2013.870925.

25. S. Racine. Echelle des attitudes de Focusing (EAF): traduction française et validation de la Focusing Manner Scale (FMS-A.A.) [Exigence partielle, Thèse de Doctorat en Psychologie] Retrieved from: Université du Québec à Chicoutimi https://constellation.uqac.ca/4638/2017

26. M L Hoff man Sex differences in empathy and related behaviors. Psychol Bull. 1977;84:712–722.

27. D Jolliffe, D P Farrington. Development and validation of the basic empathy scale. J Adolesc. 2006;29:589–611. doi:10.1016/j.adolescence.2005.08.010.

28. M Schulte-Rüther, H J Markowitsch, N J Shah, et al. Gender differences in brain networks supporting empathy. Neuroimage. 2008;42:393–403. doi:10.1016/j.neuroimage.2008.04.180.

29. A Carré, N Stefaniak, F D'Ambrosio, et al. The Basic Empathy Scale in Adults (BES-A): Factor structure of a revised form. Psychol Assess. 2013;25:679–691. doi:10.1037/a0032297.

30. M H Davis. Measuring individual differences in empathy: Evidence for a multidimensional approach. J Pers Soc Psychol. 1983;44:113–126. doi:10.1037//0022-3514.44.1.113.

31. R Ballard. Short forms of the marlowe-crowne social desirability scale. Psychol Rep. 1992;71:1155–1160. doi:10.2466/pr0.1992.71.3f.1155.

32. A L Gilet, N Mella, J Studer, et al. Assessing dispositional empathy in adults: A French validation of the Interpersonal Reactivity Index (IRI). Canadian Journal of Behavioral Sciences. 2013;45:42–48. doi:10.1037/a0030425.

33. D G Mick. Are studies of dark side variables confounded by the socially desirable responding? The case of materialism. J Consum Res. 1996;23:106–119. doi:10.1086/209470.

34. S Verardi, D Dahourou, J Ah-Kion, et al. Psychometric properties of the marlowe-crowne social desirability scale in eight african countries and Switzerland. J Cross Cult Psychol. 2009;41:19–34. doi:10.1177/0022022109348918.

35. W M Reynolds. Development of reliable and valid short forms of the Marlowe-Crowne social desirability scale. J Clin Psychol. 1982;38:119–125. doi:10.1002/1097-4679(198201)38:13.0.CO;2-I.

36. IBM Corp Released 2016. IBM SPSS statistics for windows, version 24.0. Armonk, NY: IBM Corp; 2016.

37. The Jamovi Project Jamovi (version 1.1.9.0). Computer software. Jamovi; 2019. Retrieved from: https://www.jamovi.org.

38. N Eisenberg, A S Morris, B McDaniel, T L Spinrad. Moral cognitions and prosocial responding in adolescence. In: R M Lerner, Steinberg, eds. Handbook of adolescent psychology: vol. 1, individual bases of adolescent development. Hoboken, NJ: Wiley; 2009:229–265. 3rd ed.

39. M L Hoffman. Empathy and moral development: Implications for caring and justice. New York, NY: Cambridge University Press; 2001.

40. C Bun Lam, A R Solmeyer, S M McHale. Sibling relationships and empathy across the transition to adolescence. J Youth Adolesc. 2012;41:1657–1670. doi:10.1007/s10964-012-9781-8.

41. T D Shanafelt, C West, X Zhao, et al. Relationship between increased personal well-being and enhanced empathy among internal medicine residents. J Gen Intern Med. 2005;20:559–564. doi:10.1111/j.1525-1497.2005.0108.x.

42. C Cliffordson. The hierarchical structure of empathy: Dimensional organization and relations to social functioning. Scand J Psychol. 2002;43:49–59. doi:10.1111/1467-9450.00268.

43. G Briganti, C Kempenaers, S Braun, et al. Network analysis of empathy items from the interpersonal reactivity index in 1973 young adults. Psychiatry Res. 2018;265:87–92. doi:10.1016/j.psychres.2018.03.082.

44. F Strack, L L Martin, S Stepper. Inhibiting and facilitating conditions of the human smile: A nonobtrusive test of the facial feedback hypothesis. J Pers Soc Psychol. 1988;54:768–777. doi:10.1037/0022-3514.54.5.768.

45. C D Frith, U Frith. The neural basis of mentalizing. Neuron. 2006;50:531–534. doi:10.1080/17470910701577020.

46. K Jospe, A Flöel, M Lavidor. The interaction between embodiment and empathy in facial expression recognition. Soc Cogn Aff ect Neurosci. 2018;13:203–215. doi:10.1093/scan/nsy005.

47. G Silani, G Bird, R Brindley, et al. Levels of emotional awareness and autism: An fMRI study. Soc Neurosci. 2008;3:97–112. doi:10.1080/17470910701577020.

48. A Klin, W Jones, R Schultz, F Volkmar. The enactive mind, or from actions to cognition: Lessons from autism. Philosophical Transaction of the Royal Society of London. Series B, Biological Sciences. 2003;358:345–360. doi:10.1098/ rstb.2002.1202.

49. T Charman, J Swettenham, S Baron-Cohen, et al. Infants with Autism: An investigation of empathy, pretend play, joint attention, and imitation. Dev Psychol. 1997;33:781–789.

50. I M Eigsti. A review of embodiment in autism Spectrum disorders. Front Psychol. 2013;4:224. doi:10.3389/fpsyg.2013.00224.

51. M Iacoboni. Understanding others: imitation, language, and empathy. In: S Hurley, N Chater, eds. Perspectives on imitation: from neuroscience to social science: vol. 1. Mechanisms of imitation and imitation in animals. Cambridge, MA, US: MIT Press; 2005:77–99.OOF

52. L Fadiga, L Fogassi, G Pavesi, G Rizzolatti. Motor facilitation during action observation: A magnetic stimulation study. J Neurophysiol. 1995;73:2608–2611. doi:10.1152/jn.1995.73.6.2608.

53. Kilic R., Nasello J.A., Melchior V., & Triffaux J.M. (In press). Academic burnout among medical students: A challenge for education and public health. Submitted for publication.

Table 1. Descriptives.

Variable	Gender	N	Mean	Median	SD	Min	Max
Age	Women	89	21.7	21	1.71	19	35
	Men	32	21.9	21	1.86	20	30
Nbr Br	Women	89	0.955	1	0.916	0	4
	Men	32	0.625	0	0.907	0	4
Nbr Sr	Women	89	1.02	1	0.929	0	5
	Men	32	0.969	1	0.967	0	4
Tot Siblings	Women	89	1.98	2	1.43	0	8
	Men	32	1.59	1	1.24	0	5
FS	Women	89	25.9	26	4.58	15	35
	Men	32	24.5	24.5	4.54	15	34
PD	Women	89	20	20	3.53	13	29
	Men	32	18.4	18	3.91	11	31
PT	Women	89	25.9	26	3.60	17	34
	Men	32	24.1	24.5	2.77	18	29
EC	Women	89	27.6	28	3.07	20	34
	Men	32	26.5	27	3.13	20	32
PATFB	Women	89	27.6	28	3.34	20	36
	Men	32	28.4	29.0	3.31	22	34
HAFB	Women	89	16.9	17	2.73	11	24
	Men	32	17.8	18	2.63	13	23
Tot Foc	Women	89	70.2	71	6.71	54	87
	Men	32	72.9	72.5	6.71	60	86
SD	Women	89	6.65	7	2.11	2	11
	Men	32	6.34	6.00	2.21	2	12

Note. General descriptive table of demographic variables. *Abbreviations*: Nbr Br = Number of brothers; Nbr Sr = Number of sisters; Tot Siblings = the Total number of Siblings; FS = Fantasy; PD = Personal Distress; PT = Perspective Taking; EC = Empathic Concern; PATFB = *Paying Attention to and Trusting in the Felt Body*; HAFB = *Having Access to the Felt Body*; Tot Foc = Total scores of Focusing; SD = Social Desirability.

Table 2. Partial correlation table.

Names	FS	PD	PT	EC
PATFB	,12	,01	,10	,12
HAFB	,20*	-,04	,19*	,15
Total Foc	,09	-,16	,21*	,03
Tot Siblings	-,02	,24**	-,03	,17
Nbr Br	,11	,21*	,11	,25**
Nbr Sr	-,14	,15	-,14	,01

Abbreviations: FS = Fantasy; PD = Personal Distress; PT = Perspective Taking; EC = Empathic Concern; PATFB = Paying Attention to and Trusting in the Felt Body; HAFB = Having Access to the Felt Body; Tot Foc = Total scores of Focusing; Tot Siblings = the Total number of Siblings; Nbr Br = Number of brothers; Nbr Sr = Number of sisters. *: p <, 05; **: p <, 01. The controlled variable was social desirability.

Table 3. Total Focusing: hierarchical regression analyses

Variables	Final B	*F*	*df*	*p*	R^2	ΔR^2
FS						
Step 1: Controlled variable		0.03	1,119	.719	.001	-
SD	.03			.885		
Step 2: Demographical variables		0.749	3,117	.525	.018	.018
Gender	12.8			.219		
Tot Siblings	-.11			.731		
Step 3: Predictors of interest		1.17	5,115	.328	.048	.03
Tot Foc	.13			.073		
Tot Foc ✻ Gender	-.20			.166		
PD						
Step 1: Controlled variable		0.724	1,119	.397	.006	-
SD	.10			.528		
Step 2: Demographical variables		3.66	3,117	**.014**	.086	.08
Gender	3.77			.642		
Tot Siblings	.54			**.024**		
Step 3: Predictors of interest		1.17	5,115	**.03**	.101	.015
Tot Foc	-.04			.444		
Tot Foc ✻ Gender	-.07			.543		
PT						
Step 1: Controlled variable		15.4	1,119	**<.001**	.115	-
SD	.54			**<.001**		
Step 2: Demographical variables		7.52	3,117	**<.001**	.162	.047
Gender	-0.46			.949		
Tot Siblings	-.08			.714		
Step 3: Predictors of interest		6.41	5,115	**<.001**	.218	.056
Tot Foc	.13			**.011**		
Tot Foc ✻ Gender	-.02			.826		

Variables	Final B	*F*	*df*	*p*	R^2	ΔR^2
EC						
Step 1: Controlled variable		9.02	1,119	**.003**	.07	-
SD	.35			**.007**		
Step 2: Demographical variables		4.79	3,117	**.003**	.109	.039
Gender	9.83			.146		
Tot Siblings	.33			.093		
Step 3: Predictors of interest		3.53	5,115	**.005**	.133	.024
Tot Foc	.07			.145		
Tot Foc ✻ Gender	-.15			.113		

Note. This table displays all hierarchical regression analyses. *Abbreviations*: FS = Fantasy; PD = Personal Distress; PT = Perspective Taking; EC = Empathic Concern; SD = Social Desirability; Tot Siblings = the Total number of Siblings; Tot Foc = Total scores of Focusing.

Table 4. Focusing domains: hierarchical regression analyses.

Variables	Final B	*F*	*df*	*p*	R^2	ΔR^2
FS						
Step 1: Controlled variable		0.130	1,119	.719	.001	-
SD	.08			.680		
Step 2: Demographical variables		0.749	3,117	.525	.019	.018
Gender	9.28			.266		
Tot Siblings	-.12			.698		
Step 3: Predictors of interest		1.61	7,113	.140	.09	.072
PATFB	.05			.760		
HAFB	.49			**.020**		
PATFB ✻ Gender	-.03			.923		
HAFB ✻ Gender	-.57			.198		
PD						
Step 1: Controlled variable		0.724	1,119	.397	.006	-
SD	.07			.663		
Step 2: Demographical variables		3.66	3,117	**.014**	.086	.08
Gender	6.98			.287		
Tot Siblings	.57			**.018**		
Step 3: Predictors of interest		2.32	7,113	**.03**	.125	.04
PATFB	.06			.659		
HAFB	.08			.613		
PATFB ✻ Gender	.14			.622		
HAFB ✻ Gender	-.69			**.048**		

Variables	Final B	*F*	*df*	*p*	R^2	ΔR^2
PT						
Step 1: Controlled variable		15.4	1,119	**<.001**	.115	-
SD	.56			**<.001**		
Step 2: Demographical variables		7.52	3,117	**<.001**	.162	.047
Gender	-3.04			.604		
Tot Siblings	-.14			.508		
Step 3: Predictors of interest		4.56	7,113	**<.001**	.220	.059
PATFB	-.07			. 586		
HAFB	.36			**.014**		
PATFB ∗ Gender	.29			.237		
HAFB ∗ Gender	-.41			.189		
EC						
Step 1: Controlled variable		9.02	1,119	**.003**	.07	-
SD	.37			**.004**		
Step 2: Demographical variables		4.79	3,117	**.003**	.109	.039
Gender	7.49			.164		
Tot Siblings	.33			.084		
Step 3: Predictors of interest		3.45	7,113	**.002**	.176	.067
PATFB	.07			.516		
HAFB	.27			**.047**		
PATFB ∗ Gender	.03			.891		
HAFB ∗ Gender	-.53			.064		

Note. This table displays all hierarchical regression analyses. *Abbreviations*: FS = Fantasy; PD = Personal Distress; PT = Perspective Taking; EC = Empathic Concern; SD = Social Desirability; Tot Siblings = the Total number of Siblings; PATFB = *Paying Attention to and Trusting in the Felt Body*; HAFB = *Having Access to the Felt Body*.