Current Psychology
https://doi.org/10.1007/s12144-021-01373-8

Personal values as early predictors of emotional and cognitive empathy among medical students

Stefano Ardenghi[1] · Giulia Rampoldi[2] · Marco Bani[1] · Maria Grazia Strepparava[1,3]

Accepted: 14 January 2021

Abstract
The present study contributes to the literature by examining the association between personal values (PVs), assessed with the Schwartz's Portrait Values Questionnaire, and empathy, assessed with the Davis' Interpersonal Reactivity Index, in a sample of first-year medical students. We also examined medical students' PVs profile and gender differences in terms of PVs. All participants ($N = 398$) were Italian, young (average age = 19.62 years, SD = 1.22), and unmarried; none had children. Zero-order correlations and hierarchical multiple regression models were performed to verify the association between PVs and empathy; in contrast, t-tests were run to explore gender differences in scoring on PVs. Benevolence and Universalism correlated positively with both the emotional and cognitive dimensions of empathy, whereas Power, Achievement, Hedonism, and Security were negatively associated with empathy. The three most important PVs in the whole sample were Benevolence, Self-Direction, and Universalism. Male medical students outscored their female counterparts on Power, Achievement, and Hedonism, whereas female students outscored the males on Benevolence, Universalism, Conformity, and Tradition. Our findings highlight the importance of fostering self-transcending PVs and discouraging self-enhancing PVs in medical students during the early years of medical school, as a means of supporting other-oriented responses such as empathy in future doctors.

Keywords Medical education · Undergraduate medical students · Empathy · Interpersonal Reactivity Index · Personal values · Portrait Values Questionnaire

Introduction

Empathy is a complex and multidimensional construct comprising two different domains: the emotional and the cognitive (Davis, 1983). The emotional domain involves appropriate affective arousal in response to the feelings and experiences of others (Hojat et al., 2001). The cognitive component emphasizes the drive to cognitively understand others' experiences and the desire to help them (Hojat et al., 2009). The cognitive domain of empathy is directly in line with the concept of theory of mind (Baron-Cohen, 2001), which is the ability to infer the mental states that underpin the actions of others.

✉ Maria Grazia Strepparava
mariagrazia.strepparava@unimib.it

[1] Department of Medicine and Surgery, University of Milano – Bicocca, Via Cadore 48, 20900 Monza, (MB), Italy

[2] Department of Human Sciences for Education, University of Milano – Bicocca, P.zza dell'Ateneo Nuovo 1, 20126 Milan, (MI), Italy

[3] ASST Monza, San Gerardo Hospital, Via Pergolesi 33, 20900 Monza, (MB), Italy

In the healthcare context, empathy has been studied in depth also because of its association with improvements in clinical outcomes (Canale et al., 2012; Hojat et al., 2011; Putrino, Tabullo, Mesurado, & de Minzi, 2018), patient satisfaction (Roter et al., 1997), patients' adherence to treatment (Kim, Kaplowitz, & Johnston, 2004), and patient-centeredness in undergraduate medical students (Ardenghi et al., 2019). Moreover, empathy is a protective factor against high psychological distress in medical students (Strepparava et al., 2017b), healthcare professionals (Salvarani et al., 2019), and healthcare students (Salvarani et al., 2020), being inversely correlated with burnout (Brazeau, Schroeder, Rovi, & Boyd, 2010; Hojat, Vergare, Isenberg, Cohen, & Spandorfer, 2015). Given this international clinical evidence, there is a growing interest in identifying the teaching strategies (Koblar, Cranwell, Koblar, Carnell, & Galletly, 2017) and the psycho-attitudinal variables, such as attachment style (Ardenghi, Rampoldi, Bani, & Strepparava, 2020a), dispositional mindfulness (Ardenghi et al., 2020b), personality (Hojat et al., 2005), and quality of life (Paro et al., 2014), that could help medical students increase empathy during their time at medical school.

Published online: 02 February 2021

Personal values (PVs) is one of the most promising research areas for detecting the psycho-attitudinal variables that might be correlated with medical students' empathy. PVs can be conceptualized as fundamental convictions that shape individuals' attitudes, behaviors, interests, and needs, defining what we consider to be or not to be right, good, moral, and desirable (Rokeach, 1973). According to Schwartz's Theory of Basic Human Values (Schwartz, 1994, 2012), individuals differ in how they prioritize a set of ten basic human values divided across four higher-order dimensions: Self-Transcendence (Benevolence and Universalism); Self-Enhancement (Power, Achievement, and Hedonism); Openness to Change (Self-Direction and Stimulation); and Conservation (Conformity, Tradition, and Security). The Self-Transcendence and Conservation dimensions generally reflect a *social* focus, whereas Self-Enhancement and Openness to Change dimensions are typically associated with a *personal* orientation (Schwartz & Rubel, 2005).

Several studies (Balliet, Joireman, Daniels, & George-Falvy, 2008; Myyrya, Juujärvi, & Pesso, 2010; Silfver, Helkama, Lönnqvist, & Verkasalo, 2008) have reported a relationship between empathy and PVs in the general population. Specifically, this international literature has shown a positive relationship between empathy and the Self-Transcendence dimension; a negative correlation between empathy and the Self-Enhancement dimension; and a weak and inconstant negative relationship between empathy and the Openness to Change and Conservation dimensions (Balliet et al., 2008; Myyry & Helkama, 2001; Myyrya et al., 2010; Silfver et al., 2008). Moreover, according to the "empathy–altruism hypothesis" (Persson & Kajonius, 2016), individuals who prioritize compassionate PVs (e.g., Benevolence and Universalism) tend to exhibit higher levels of altruistic behavior, empathy, and happiness. Some studies (Duggan, Geller, Cooper, & Beach, 2006; Epstein, 1999) have also found that encouraging practitioners to be aware of their PVs can enhance their patient-centered disposition and reduce bias in their decision-making processes. Despite evidence of the relationship between PVs and empathic disposition, no published studies have investigated the association between medical students' PVs and their empathy levels. In the literature, medical and healthcare students' PVs have been found to be associated with moral development (Helkama et al., 2003), problem-solving (Altun, 2003), ethical decision-making (McCabe, Dukerich, & Dutton, 1992), year of study, and gender (Luciani et al., 2020). Focusing on undergraduate medical students, over the course of their studies this group tends to consider the PVs of benevolence, humanity, and idealism as less and less important (Becker & Geer, 1958; Pawelczyk, Pawelczyk, & Rabe-Jablonska, 2012) and those of cynicism, independence, and control more so (Borges & Hartung, 2010).

Gender differences in terms of PVs have been explored by several studies (Borg, 2019; Di Dio, Saragovi, Koestner, & Aubé, 1996; Ismail, 2015) that obtained inconsistent findings. The reasoning behind these gender differences has been explained by several theories (Betz, O'Connell, & Shepard, 1989; Eagly & Kite, 1987) concerned with gender socialization and social roles. These theories argue that men and women have developed different gender-specific PVs to meet societal expectations and to assume their social roles successfully. According to the traditional division of the social tasks between men – who traditionally are breadwinners that leave the house for work –, and women – who stereotypically stay at home to care for the babies –, men tend to pursue pleasure and obtain work success and social prestige through breaking rules and competition, whereas women are inclined to perform well, observe rules, and promote harmony within their salient interpersonal relationships (Ismail, 2015). In the healthcare context, female medical students appear to consider religious PV to be more relevant than do their male counterparts (Pawelczyk et al., 2012). Moreover, compared with their male counterparts, female physicians tend to consider universalism, ideology, friendship, and health as more important PVs (Neittaanmäki, Gross, Virjo, Hyppölä, & Kumpusalo, 1999).

Aims

In the literature, it is not yet established whether PVs and empathy are related among medical students. Also not known is if and to what extent this empirical relationship may exist since the beginning of the educational and training process. Moreover, no recent research has explored the differences in terms of PVs between genders in the medical student population. Having this information would help medical educators to provide tailored ethics education meant to foster empathy in medical students in their early years of study. Given that, the purposes of this study were the following:

1. to investigate medical students' PVs as predictors of empathy in their first year of medical school;
2. to assess the PVs of students at the beginning of medical school and to determine whether their gender affects them.

In light of the existing literature, we expected that: 1. Self-Transcendence and Self-Enhancement PVs would positively and negatively predict empathy, respectively; 2a. the most important PVs for medical students at the beginning of their studies would be Self-Transcendence PVs (Benevolence and Universalism); and 2b. female students, compared with male students, would obtain higher scores on Self-Transcendence PVs and lower ones on Self-Enhancement PVs (Power, Achievement and Hedonism).

Materials and Methods

Participants

The entire population of three consecutive cohorts of medical students in the first year of their educational course at the time of data collection was invited to participate in this study, with no exclusion criteria. Students were from one university in northern Italy and were approached after a scheduled class at the end of the second semester of their first year.

Procedure

The necessary permission for this study was obtained from the University Institutional Review Board. One of the researchers explained the rationale of the study to potential participants and, for the entire duration of the assessment, remained available to provide any further clarification the students might need. The researcher who administered the questionnaires was not one of the participating students' teachers. Students were informed that their responses would be anonymous, that participation was voluntary, and that they could withdraw at any point. Informed consent was obtained from all students who agreed to participate in the study. They received no monetary or academic credit compensation for participating. The recruitment of the students and the administration of the paper-and-pencil survey took about 30 min.

Measures

In accordance with Schwartz's Theory of Basic Human Values, the Portrait Values Questionnaire-40 (PVQ-40) (Schwartz et al., 2001) (Italian validated version: Capanna, Vecchione, & Schwartz, 2005) was used to assess the medical students' PVs. This 40-item, self-report questionnaire measures the ten basic human values; these can then be categorized into four contrasting, higher-order PVs sets: Self-Transcendence (Benevolence and Universalism) versus Self-Enhancement (Power, Achievement, and Hedonism); and Openness to Change (Self-Direction, Stimulation) versus Conservation (Conformity, Tradition, and Security). The questionnaire employs an implicit approach to measuring PVs: respondents are asked to compare themselves against each of 40 portraits, specifying how much each describes him/her on a 6-point Likert scale, from 1 ("not like me at all") to 6 ("very much like me"). To calculate the scores of the ten PVQ-40 scales, we computed the mean of the items that refer to each PV, whereas the score of each higher-order PV was obtained by calculating the mean of the corresponding PV scores. In this study, all the PVQ-40's factors demonstrated acceptable Cronbach's alpha values, ranging from .65 for the Tradition scale to .80 for the Achievement scale.

The emotional and cognitive dimensions of empathy were assessed using the Interpersonal Reactivity Index (IRI) (Davis, 1980) (Italian validated version: Albiero, Ingoglia, & Lo Coco, 2006). On this scale, participants are asked to indicate how much each item describes them on a 5-point Likert scale ranging from 0 ("does not describe me well") to 4 ("describes me very well"). Scale scores are calculated by summing the scores on all seven items. The two IRI dimensions that relate to emotional empathy are: 1) "Empathic Concern" (EC), which assesses feelings of sympathy and apprehension for the adversity experienced by others; and 2) "Personal Distress" (PD), which measures feelings of worry in anxiety-producing interpersonal situations. The two IRI dimensions that relate to cognitive empathy are: 3) "Perspective-Taking" (PT), which is the natural propensity to assume the psychological point of view of others; and 4) "Fantasy" (F), which reflects respondents' propensity to experience the feelings of fictional characters in cinematographic, literary and, as well, theatrical works. Since EC and PT are not only the most representative scales of each dimension but also the most relevant for our research purposes, we decided to exclude the PD and F dimensions from the assessment protocol. In this study, Cronbach's reliability coefficients alpha for EC and PT were .71 and .81, respectively.

Statistical Analysis

Before performing the analyses, we corrected for individual differences in the use of the PVQ-40 response scale for each PV. We obtained centered scores for each PV by subtracting each individual's mean score across all 40 items from each of the ten PV scores. For pursuing the first aim, our hypotheses concerning PVs as predictors of empathy among first-year medical students were tested by Pearson's zero-order correlations and hierarchical multiple regression analyses. First, we examined the data to check the absence of outliers and the assumptions of normality, linearity, homoscedasticity, and multicollinearity. We ran two separate hierarchical multiple regression analyses for each IRI dimension (EC and PT), adopting a two-step strategy with the "enter" method. In Step 1 of each regression model, gender was entered as a dichotomous variable (male = 1, female = 2) to control for the effect of potential confounding demographic factors. In Step 2, the higher-order PVs were entered to examine their unique contribution in the explanation of empathy dimensions. To avoid the problem of multicollinearity, we calculated two models, one for each dependent variable (IRI dimensions); in neither model did we use the opposing Schwartz's circumplex model value sets (Schwartz et al., 2001). That is, in Step 2 of Model 1, Self-Transcendence and Conservation were entered; conversely, in Step 2 of Model 2, Self-Enhancement and Openness to Change were entered. A statistically significant variation in the coefficient of

determination (ΔR^2) at Step 2 would mean that the entry of the PVQ-40 scales into the regression model explained additional variance of the IRI dimension above and beyond the effect of gender. In addition to ΔR^2, the standardized beta weights (β) of all independent variables were evaluated. For pursuing the second aim, descriptive analyses were conducted; gender differences in PVQ-40 scores were also determined using Student's t test analysis. Outcomes were considered significant at $p < .01$. Effect sizes were computed as Pearson's r for zero-order correlations, ΔR^2 for hierarchical multiple regressions, and Cohen's d for t-tests (Cohen, 1988). All computations were run using IBM SPSS statistical software version 24 for Mac.

Results

Demographic Characteristics and Descriptive Statistics for Study Variables

A total of 398 first-year medical students (88.4% of the entire population of first-year medical students at the time of data collection) opted to participate in the study. The responses to the questionnaires of all 398 were included in the statistical analyses. Participants included 207 females (52.0%) and 191 males (48.0%) aged between 18 and 33 years (mean = 19.62; SD = 1.22). All participants were Italian, were unmarried, and had no children. Table 1 presents descriptive statistics and correlation coefficients for PVQ-40 and IRI scores. For the overall sample, Benevolence was the most important PV, Self-Direction the second most important, and Universalism the third. At the other end, Power had the lowest mean-centered score and was the least important PV. The Pearson's zero-order correlations among PVQ-40 scores confirmed the theoretical structure of the circumplex model proposed by Schwartz et al. (2001): PVs on opposite sides of the model, on average, had negative correlations; in contrast, PVs that were part of the same higher-level dimension, on average, were positively correlated. As regards to the relationship between PVQ-40 and IRI scores, both EC and PT were positively related to Benevolence and Universalism but had negative correlations with Power, Achievement, Hedonism, and Security.

Association between Personal Values and Empathy Dimensions

The results of the hierarchical multiple regression analyses for PVQ-40 and IRI are reported in Table 2. With regard to the dependent variable EC, the results of Step 1 indicated that the proportion of variance accounted for EC with the first independent variable (gender) equaled 7.4%, which was significantly different from zero ($F_{(1, 396)} = 31.447$, $p < .001$).

Table 1 Descriptive statistics and zero-order correlations among PVQ-40 and IRI scores

Variable	1. Benevolence	2. Universalism	3. Power	4. Achievement	5. Hedonism	6. Self-Direction	7. Stimulation	8. Conformity	9. Tradition	10. Security	11. EC	12. PT	M	SD	Rank
1	–												.61	.59	1
2	.371**	–											.48	.65	3
3	−.486**	−.504**	–										−1.08	.95	10
4	−.464**	−.471**	.602**	–									−.06	.91	6
5	−.393**	−.400**	.314**	.311**	–								−.35	.92	8
6	−.023	.062	.089	.058	.044	–							.52	.58	2
7	−.120	−.070	.081	.050	.322**	.326**	–						−.03	.83	5
8	.141*	−.028	−.263**	−.349**	−.402**	−.424**	−.470**	–					.02	.68	4
9	.207**	.045	−.397**	−.497**	−.437**	−.399**	−.344**	.350**	–				−.69	.82	9
10	−.292**	−.338**	.076	.047	−.043	−.344**	−.415**	.190**	.010	–			−.18	.62	7
11	.504**	.428**	−.462**	−.293**	−.291**	−.054	−.071	.096	.124	−.175**	–		19.25	4.21	
12	.349**	.415**	−.333**	−.274**	−.213**	.053	−.056	.063	.024	−.196**	.387**	–	18.60	4.56	

EC Empathic Concern, *PT* Perspective Taking; * = $p < .01$, ** = $p < .001$.

Table 2 Summary of hierarchical multiple regression analyses for high-order personal values predicting empathy dimensions

	EC			PT		
	β	R^2	ΔR^2	β	R^2	ΔR^2
Step 1		.074**			.009	
Gender	.271**			.097		
Model 1						
Step 2		.335**	.261**		.215**	.206**
Gender	.133*			−.016		
Self-Transcendence	.530**			.466**		
Conservation	.047			−.015		
Model 2						
Step 2		.221**	.147**		.128**	.119**
Gender	.145*			−.013		
Self-Enhancement	−.416**			−.392**		
Openness to Change	.024			.070		

EC Empathic Concern, *PT* Perspective Taking; * = p < .01, ** = p < .001.

The standardized regression coefficient indicates that female students scored significantly higher on EC than did male students. Gender remained a significant predictor of EC even after having entered the PVs into the regression models. In Step 2, the proportion of variance accounted for EC increased by 26.1% for Model 1 ($F_{(3,\ 394)} = 66.261$, $p < .001$) and 14.7% for Model 2 ($F_{(3,\ 394)} = 37.258$, $p < .001$). With regard to the dependent variable PT, the results of Step 1 indicated that gender did not contribute significantly to the prediction of PT ($F_{(1,\ 396)} = 3.758$, $p = .053$). In Step 2, the proportion of variance accounted for PT increased by 20.6% for Model 1 ($F_{(3,\ 394)} = 35.967$, $p < .001$) and 11.9% for Model 2 ($F_{(3,\ 394)} = 19.217$, $p < .001$). Self-Transcendence and Self-Enhancement each had a significant unique contribution to the explanation of EC and PT above and beyond the effect of gender. In particular, Self-Transcendence was positively associated with both EC and PT; higher scores of Self-Enhancement were negatively related to both EC and PT.

Gender Differences for Personal Values

As can be seen in Table 3, male medical students scored significantly higher than their female counterparts on Power, Achievement, and Hedonism. In contrast, female medical students showed higher levels of Benevolence, Universalism, Conformity, and Tradition than males.

Discussion

To the best of our knowledge, this is the first study to test the relationship between each of the ten Basic Human Values delineated in Schwartz's theoretical model (Schwartz, 1994, 2012) and both emotional and cognitive empathy among undergraduate medical students. We hypothesized that Benevolence and Universalism (Self-Transcendence PVs) would have a significant positive relationship with empathy.

Table 3 Gender differences for PVQ-40 values among first-year medical students

	Male			Female			t	p	d
	Mean	SD	Rank	Mean	SD	Rank			
Benevolence	.46	.59	2	.74	.56	1	−4.788	< .001	.49
Universalism	.36	.69	3	.59	.59	2	−3.628	< .001	.36
Power	−.85	.99	10	−1.29	.85	10	4.702	< .001	.48
Achievement	.15	.85	4	−.26	.91	7	4.633	< .001	.47
Hedonism	−.08	.88	6	−.59	.88	9	5.809	< .001	.58
Self-Direction	.51	.55	1	.53	.61	3	−.391	.696	–
Stimulation	.04	.83	5	−.09	.84	5	1.571	.117	–
Conformity	−.11	.67	7	.14	.68	4	−3.591	< .001	.37
Tradition	−.82	.81	9	−.58	.81	8	−2.986	.003	.29
Security	−.15	.64	8	−.20	.59	6	.867	.386	–

Conversely, we assumed that Power, Achievement, and Hedonism (Self-Enhancement PVs) would have a negative relationship with the empathy dimensions. Moreover, female medical students were expected to exhibit higher levels of self-transcending PVs than males, whereas male students were expected to score higher on self-enhancing PVs when compared with their female counterparts. Our results were largely consistent with the study hypotheses.

In our sample, comprised of a group of first-year medical students, our hypothesis of an association between Self-Transcendence PVs (Benevolence and Universalism) and empathy was confirmed. In particular, both Benevolence and Universalism were positively related to both the emotional and cognitive dimensions of empathy. These findings are in line with those found by previous research on a different population showing that individuals who prioritize compassionate PVs (e.g., Benevolence and Universalism) tend to exhibit higher levels of altruistic behaviors, empathy, and happiness (Smith, 2008). Since Self-Transcendence PVs, by definition, reflect concern for the well-being and protection of people and nature (Schwartz, 2012), medical students who value Benevolence and Universalism highly can be expected to be more inclined to respond to others emotionally and to consider others' perspectives.

Furthermore, our hypothesis of a negative correlation between Self-Enhancement PVs (Power, Achievement, and Hedonism) and empathy was confirmed: in our sample, medical students who scored higher on Power and Achievement showed lower levels of both emotional and cognitive empathy. In line with a previous study examining the relationship between Schwartz's PVs and individual differences in empathy among the general population (Persson & Kajonius, 2016), both Power and Achievement showed a significant and negative relationship with the emotional and cognitive dimensions of the IRI. Moreover, in line with previous studies (Balliet et al., 2008; Persson & Kajonius, 2016; Silfver et al., 2008), Hedonism in our study was negatively related to both empathy dimensions. It is not surprising that students who rate Power, Achievement, and Hedonism as more important are less concerned about others' experiences and less able to take others' viewpoints into account (see Baron-Cohen, 2001). These PVs reflect self-oriented motivations and convictions theoretically related to pursuing dominance and status over others and to seeking pleasure and gratification for oneself (Schwartz, 2012). An interesting finding was that in our sample, Security was significantly and negatively related to both the emotional and cognitive dimensions of empathy. This result is consistent with previous studies (Persson & Kajonius, 2016; Silfver et al., 2008) and with the structure of Schwartz's (2012) circumplex model. Since Security and Power are contiguous PVs, it becomes clear that the direction of their correlations with empathy dimensions was analogous. Moreover, since Security is one of those Conservation PVs that emphasize self-restriction, social order, and resistance to change, people with high scores on this PV could exhibit low levels of openness and curiosity to others. However, due to the lack of literature on this topic, more research is needed before any inferences can be made.

In our sample, we found the most important PVs to be Benevolence, Self-Direction, and Universalism, whereas the least important were Hedonism, Tradition, and Power. This finding is partially consistent with those of previous validation studies of the Italian versions of the PVQ (Capanna et al., 2005; Vecchione & Alessandri, 2017). Despite some slight differences in the PV profiles held by our study sample and the general Italian population, in each study Benevolence and Power took the first and the last rank, respectively. Medical students start out on their training describing themselves with PVs that are positively associated with empathy. Studies that have explored PVs in the medical education context (e.g., Borges & Hartung, 2010; Moyo, Shulruf, Weller, & Goodyear-Smith, 2019; Pawelczyk et al., 2012) are few in number and have used different theoretical frameworks, thereby impeding our ability to compare our findings. Nevertheless, a previous study (Borges & Hartung, 2010) reported that, at the beginning of the education process, undergraduate medical students appear to appreciate the PVs of humanitarianism, idealism, and benevolence, whereas cynicism, independence, and control are valued more at the end of their studies. Moreover, a recent study found that a group of Italian first-year nursing students exhibited a PVs profile similar to that shown by our sample (Luciani et al., 2020). These similarities in the PVs profile among medical and nursing students suggest that Benevolence, Universalism, and Self-Direction are those PVs that drive people to choose a degree course in the health professions. Consistent with our hypotheses, at the beginning of their studies, students willing to became doctors prioritize PVs based on protection and care for others (Schwartz, 2012). These self-transcending PVs have also been associated with professional values of altruism and equality that are common among helping professions (Moyo, Goodyear-Smith, Weller, Robb, & Shulruf, 2016). Moreover, medical students were also focused on Self-Direction which, according to the Schwartz's Theory of Basic Human Values (Schwartz, 2012), has been linked to the personal drive to pursue independent thought, action choosing, and exploration as well as the professional value of critical thinking (Moyo et al., 2016). It is not surprising that people with high levels of Self-Direction choose a profession that requires the capacity to make ethical and practical decisions and to deal with a wide variety of clinical settings.

Although male and female medical students are exposed to similar educational socialization promoting similar PVs and professional behaviors, in our study, early stereotypical and cultural-dependent gender differences in PV profiles could be observed (see also Neittaanmäki et al., 1999; Schwartz &

Rubel, 2005): male students scored higher on Self-Enhancement PVs (Power, Achievement, and Hedonism) while female students showed higher levels of Self-Transcendence (Benevolence and Universalism) and Conservation (Conformity and Tradition) PVs than their male counterparts. These gender differences in terms of PVs are consistent with those found in a sample of Italian undergraduate nursing students (Luciani et al., 2020), suggesting that gender differences in PVs among students could be explained in terms of their gender-role socialization. Since we found that gender differences in terms of PVs exist before the beginning of one's professional socialization, gender differences may reflect the different socialization of males and females in our Western-industrial culture (Betz et al., 1989). Males, who traditionally play dominant social roles (e.g., hunters, workers, soldiers, etc.), show higher scores on authority, social recognition, and pleasure than females. On the other hand, females, who traditionally assume the social role of caregivers, prioritize PVs linked to religion, equality, and to the well-being of individuals and the community (Di Dio et al., 1996). This early difference in our sample is interesting because it could signify also that males are drawn to medicine because it gives them the opportunity to enhance their own social status (Power) and for the good employment rates and wages (Achievement), while females who choose medical studies are concerned about the welfare, protection, and preservation of others (Benevolence and Universalism), with the intention to not harm others (Conformity) and respect the ideas of traditional culture and/or religion (Tradition).

Strengths and Limitations

The present study has some limitations that should be considered. In terms of design, it was a cross-sectional study involving a single-country group of north Italian undergraduate medical students. Therefore, we are unable to generalize our results. Future longitudinal and multicentric research, using larger samples from other years of study, degree courses, and academic institutions, should explore whether and to what extent the PVs of medical and healthcare students change over the course of their studies. Nevertheless, we used reliable and cross-culturally validated self-report instruments that are widely used in the context of medical education, thereby ensuring the statistical robustness of our results and offering the possibility of future national and international comparisons. The implementation of simulated patients, tutors, and supervisors specifically trained to assess levels of empathy could be a future methodological development of this study. Moreover, to the best of our knowledge, this is the first study to focus on differences between emotional and cognitive empathy in undergraduate medical students' PVs using a worldwide theoretical framework (Schwartz's Theory of Basic Human Values) – an approach that may permit future cross-professional and cross-cultural comparisons.

Conclusions

Our study suggests that, at the beginning of their medical training, medical students scored higher precisely on those PVs (Benevolence and Universalism) found to be associated with empathy. However, the literature indicates that medical schools tend to highlight and promote self-oriented biomedical PVs (e.g., Power and Achievement), encouraging students to adopt self-interested behaviors as opposed to empathic expressions (Maio, Pakizeh, Cheung, & Rees, 2009; Sheldon, Nichols, & Kasser, 2011). Given that PVs can be modified during medical training (Borges & Hartung, 2010), improving the awareness of medical students and their teachers of the PVs the former prioritize could be useful in promoting teaching strategies (Strepparava, Bani, & Rezzonico, 2017a) that support and foster over time the PVs associated with desired, patient-centered professional behaviors and attitudes, such as empathy. For instance, medical humanities, defined as an interdisciplinary teaching method that includes human sciences, social sciences, and the arts (Rampoldi, Colombo, Ardenghi, & Strepparava, 2020), may be employed in the pre-clinical curriculum to align students' PVs and priorities with those of their future profession (Volpe, Hopkins, Van Scoy, Wolpaw, & Thompson, 2019). Moreover, Schwartz's Theory of Basic Human Values may be a valuable theoretical paradigm for medical educators who are eager to provide teaching interventions to promote and sustain the empathic attitude of their students during the early years of medical school.

Authors' Contributions Project direction and research supervision: MGS; Research design: SA, MGS; Data collection and analysis: SA; Manuscript draft: SA; Results interpretation: SA, GR, MB, MGS; Writing review and editing: SA, GR, MB, MGS. All authors discussed the results and commented on the manuscript.

Funding Open Access funding provided by Università degli Studi di Milano - Bicocca. Progetto 2016-ATE-0607 (Ateneo Bicocca), "Psychological variables in selection and training in medicine (Variabili psicoattitudinali nella selezione e formazione degli studenti di medicina)".

Data Availability The data that support the findings of this study are available from the corresponding author upon reasonable request.

Code Availability Not applicable.

Compliance with Ethical Standards

Conflicts of Interest/Competing Interests The authors declare that they have no conflict of interest.

Ethics Approval This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of the University of Milano - Bicocca (21-07-2016; No. 0039927/16).

Consent to Participate Informed consent was obtained from all individual participants included in the study.

Consent for Publication Not applicable.

References

Albiero, P., Ingoglia, S., & Lo Coco, A. (2006). Contributo all'adattamento italiano dell'Interpersonal reactivity index. [a contribution to the Italian validation of the interpersonal reactivity index]. *Testing Psicometria Metodologia, 13*(2), 107–125.

Altun, I. (2003). The perceived problem solving ability and values of student nurses and midwives. *Nurse Education Today, 23*(8), 575–584.

Ardenghi, S., Rampoldi, G., Pepe, A., Bani, M., Gritti, P., & Strepparava, M. G. (2019). Assessing patient-centeredness among medical students: The Italian translation and validation of the patient-practitioner orientation scale. *BPA – Applied Psychological Bulletin, LXVII*(285), 51–61. https://doi.org/10.26387/bpa.285.5.

Ardenghi, S., Rampoldi, G., Bani, M., & Strepparava, M. G. (2020a). Attachment styles as predictors of self-reported empathy in medical students during pre-clinical years. *Patient Education and Counseling, 103*(5), 965–970. https://doi.org/10.1016/j.pec.2019.11.004.

Ardenghi, S., Rampoldi, G., Pepe, A., Bani, M., Salvarani, V., & Strepparava, M. G. (2020b). An exploratory cross-sectional study on the relationship between dispositional mindfulness and empathy in undergraduate medical students. *Teaching and Learning in Medicine*, 1–10. https://doi.org/10.1080/10401334.2020.1813582.

Balliet, D., Joireman, J., Daniels, D., & George-Falvy, J. (2008). Empathy and the Schwartz value system: A test of an integrated hypothesis. *Individual Differences Research, 6*(4).

Baron-Cohen, S. (2001). Theory of mind and autism: A review. *International review of research in mental retardation, 23*(23), 169–184.

Becker, H. S., & Geer, B. (1958). The fate of idealism in medical school. *American Sociological Review, 23*(1), 50–56.

Betz, M., O'Connell, L., & Shepard, J. M. (1989). Gender differences in proclivity for unethical behavior. *Journal of Business Ethics, 8*(5), 321–324.

Borg, I. (2019). Age-and gender-related differences in the structure and the meaning of personal values. *Personality and Individual Differences, 138*, 336–343.

Borges, N. J., & Hartung, P. J. (2010). Stability of values during medical school. *Medical Teacher, 32*(9), 779–781. https://doi.org/10.3109/01421591003692706.

Brazeau, C. M. L. R., Schroeder, R., Rovi, S., & Boyd, L. (2010). Relationships between medical student burnout, empathy, and professionalism climate. *Academic Medicine, 85*, S33–S36. https://doi.org/10.1097/ACM.0b013e3181ed4c47.

Canale, S. D., Louis, D. Z., Maio, V., Wang, X., Rossi, G., Hojat, M., & Gonnella, J. S. (2012). The relationship between physician empathy and disease complications: An empirical study of primary care physicians and their diabetic patients in Parma, Italy. *Academic Medicine, 87*(9), 1243–1249. https://doi.org/10.1097/ACM.0b013e3182628fbf.

Capanna, C., Vecchione, M., & Schwartz, S. H. (2005). La misura dei valori. Un contributo alla validazione del portrait values questionnaire su un campione italiano. [the measurement of values: A contribution to the validation of the portrait values questionnaire on an Italian sample]. *Bollettino di Psicologia applicata*, 246, 29.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed). L. Erlbaum Associates.

Davis, M. H. (1980). A multidimensional approach to individual differences in empathy. *JSAS Catalog of Selected Documents in Psychology, 10*, 85.

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology, 44*(1), 113–126. https://doi.org/10.1037/0022-3514.44.1.113.

Di Dio, L., Saragovi, C., Koestner, R., & Aubé, J. (1996). Linking personal values to gender. *Sex Roles, 34*(9–10), 621–636.

Duggan, P. S., Geller, G., Cooper, L. A., & Beach, M. C. (2006). The moral nature of patient-centeredness: Is it "just the right thing to do"? *Patient Education and Counseling, 62*(2), 271–276.

Eagly, A. H., & Kite, M. E. (1987). Are stereotypes of nationalities applied to both women and men? *Journal of Personality and Social Psychology, 53*(3), 451–462.

Epstein, R. M. (1999). Mindful practice. *JAMA, 282*(9), 833–839.

Helkama, K., Uutela, A., Pohjanheimo, E., Salminen, S., Koponen, A., & Rantanen-VA¨ NTSI, L. (2003). Moral reasoning and values in medical school: A longitudinal study in Finland. *Scandinavian Journal of Educational Research, 47*(4), 399–411.

Hojat, M., Louis, D. Z., Markham, F. W., Wender, R., Rabinowitz, C., & Gonnella, J. S. (2011). Physicians empathy and clinical outcomes for diabetic patients. *Academic Medicine, 86*(3), 359–364. https://doi.org/10.1097/ACM.0b013e3182086fe1.

Hojat, M., Mangione, S., Nasca, T. J., Cohen, M. J. M., Gonnella, J. S., Erdmann, J. B., Veloski, J., & Magee, M. (2001). The Jefferson scale of physician empathy: Development and preliminary psychometric data. *Educational and Psychological Measurement, 61*(2), 349–365. https://doi.org/10.1177/00131640121971158.

Hojat, M., Vergare, M., Isenberg, G., Cohen, M., & Spandorfer, J. (2015). Underlying construct of empathy, optimism, and burnout in medical students. *International Journal of Medical Education, 6*, 12–16. https://doi.org/10.5116/ijme.54c3.60cd.

Hojat, M., Vergare, M. J., Maxwell, K., Brainard, G., Herrine, S. K., Isenberg, G. A., Veloski, J., & Gonnella, J. S. (2009). The devil is in the third year: A longitudinal study of Erosion of empathy in medical school. *Academic Medicine, 84*(9), 1182–1191. https://doi.org/10.1097/ACM.0b013e3181b17e55.

Hojat, M., Zuckerman, M., Magee, M., Mangione, S., Nasca, T., Vergare, M., & Gonnella, J. S. (2005). Empathy in medical students as related to specialty interest, personality, and perceptions of mother and father. *Personality and Individual Differences, 39*(7), 1205–1215. https://doi.org/10.1016/j.paid.2005.04.007.

Ismail, H. (2015). Gender differences in personal values: A business perspective. *International Journal of Commerce and Management, 25*(4), 687–698. https://doi.org/10.1108/IJCoMA-10-2013-0104.

Kim, S. S., Kaplowitz, S., & Johnston, M. V. (2004). The effects of physician empathy on patient satisfaction and compliance. *Evaluation & the Health Professions, 27*(3), 237–251. https://doi.org/10.1177/0163278704267037.

Koblar, S., Cranwell, M., Koblar, S., Carnell, B., & Galletly, C. (2017). Developing empathy: Does experience through simulation improve medical-student empathy? *Medical Science Educator, 28*(1), 31–36. https://doi.org/10.1007/s40670-017-0488-z.

Luciani, M., Rampoldi, G., Ardenghi, S., Bani, M., Merati, S., Ausili, D., Strepparava, M. G., & Di Mauro, S. (2020). Personal values among undergraduate nursing students: A cross-sectional study. *Nursing Ethics, 27*(6), 1461–1471. https://doi.org/10.1177/0969733020914350

Maio, G. R., Pakizeh, A., Cheung, W.-Y., & Rees, K. J. (2009). Changing, priming, and acting on values: Effects via motivational relations in a circular model. *Journal of Personality and Social Psychology, 97*(4), 699–715.

McCabe, D. L., Dukerich, J. M., & Dutton, J. E. (1992). Values and ethical decision-making among professional school students: A study of dental and medical students. *Professional Ethics, A Multidisciplinary Journal, 1*(3/4), 117–136.

Moyo, M., Goodyear-Smith, F. A., Weller, J., Robb, G., & Shulruf, B. (2016). Healthcare practitioners' personal and professional values. *Advances in Health Sciences Education, 21*(2), 257–286.

Moyo, M., Shulruf, B., Weller, J., & Goodyear-Smith, F. (2019). Effect of medical students' values on their clinical decision-making. *Journal of Primary Health Care, 11*(1), 64–74. https://doi.org/10.1071/HC18055.

Myyry, L., & Helkama, K. (2001). University students' value priorities and emotional empathy. *Educational Psychology, 21*(1), 25–40.

Myyrya, L., Juujärvi, S., & Pesso, K. (2010). Empathy, perspective taking and personal values as predictors of moral schemas. *Journal of Moral Education, 39*(2), 213–233. https://doi.org/10.1080/03057241003754955.

Neittaanmäki, L., Gross, E. B., Virjo, I., Hyppölä, H., & Kumpusalo, E. (1999). Personal values of male and female doctors: Gender aspects. *Social Science & Medicine, 48*(4), 559–568.

Paro, H. B. M. S., Silveira, P. S. P., Perotta, B., Gannam, S., Enns, S. C., Giaxa, R. R. B., Bonito, R. F., Martins, M. A., & Tempski, P. Z. (2014). Empathy among medical students: Is there a relation with quality of life and burnout? *PLoS One, 9*(4), e94133. https://doi.org/10.1371/journal.pone.0094133.

Pawelczyk, A., Pawelczyk, T., & Rabe-Jablonska, J. (2012). Medical students hierarchy of values and sense of responsibility. *Teaching and Learning in Medicine, 24*(3), 211–214. https://doi.org/10.1080/10401334.2012.692264.

Persson, B. N., & Kajonius, P. J. (2016). Empathy and universal values explicated by the empathy-altruism hypothesis. *The Journal of Social Psychology, 156*(6), 610–619. https://doi.org/10.1080/00224545.2016.1152212.

Putrino, N., Tabullo, Á., Mesurado, B., & de Minzi, M. C. R. (2018). Are there differences in health professionals' empathy due to academic and clinical experience? *Current Psychology*, 1–8. https://doi.org/10.1007/s12144-018-9980-x.

Rampoldi, G., Colombo, M., Ardenghi, S., & Strepparava, M. (2020). La difficile integrazione delle Medical Humanities nella formazione medica italiana: Un problema di definizione? *Medicina Historica, 4*(1), 202–204.

Rokeach, M. (1973). *The nature of human values*. The Free Press.

Roter, D. L., Stewart, M., Putnam, S. M., Lipkin, M., Stiles, W., & Inui, T. S. (1997). Communication patterns of primary care physicians. *JAMA, 277*(4), 350–356.

Salvarani, V., Ardenghi, S., Rampoldi, G., Bani, M., Cannata, P., Ausili, D., Di Mauro, S., & Strepparava, M. G. (2020). Predictors of psychological distress amongst nursing students: A multicenter cross-sectional study. *Nurse Education in Practice*, 102758.

Salvarani, V., Rampoldi, G., Ardenghi, S., Bani, M., Blasi, P., Ausili, D., Di Mauro, S., & Strepparava, M. G. (2019). Protecting emergency room nurses from burnout: The role of dispositional mindfulness, emotion regulation and empathy. *Journal of Nursing Management, 27*(4), 765–774. https://doi.org/10.1111/jonm.12771.

Schwartz, S. H. (1994). Are there universal aspects in the structure and contents of human values? *Journal of Social Issues, 50*(4), 19–45. https://doi.org/10.1111/j.1540-4560.1994.tb01196.x.

Schwartz, S. H. (2012). An overview of the Schwartz theory of basic values. *Online Readings in Psychology and Culture, 2*(1). https://doi.org/10.9707/2307-0919.1116.

Schwartz, S. H., Melech, G., Lehmann, A., Burgess, S., Harris, M., & Owens, V. (2001). Extending the cross-cultural validity of the theory of basic human values with a different method of measurement. *Journal of Cross-Cultural Psychology, 32*(5), 519–542.

Schwartz, S. H., & Rubel, T. (2005). Sex differences in value priorities: Cross-cultural and multimethod studies. *Journal of Personality and Social Psychology, 89*(6), 1010–1028. https://doi.org/10.1037/0022-3514.89.6.1010.

Sheldon, K. M., Nichols, C. P., & Kasser, T. (2011). Americans recommend smaller ecological footprints when reminded of intrinsic American values of self-expression, family, and generosity. *Ecopsychology, 3*(2), 97–104.

Silfver, M., Helkama, K., Lönnqvist, J.-E., & Verkasalo, M. (2008). The relation between value priorities and proneness to guilt, shame, and empathy. *Motivation and Emotion, 32*(2), 69–80.

Smith, T. W. (2008). Loving and caring in the United States: Trends and correlates of empathy, altruism, and related constructs. In B. Fehr, S. Sprecher, & L. G. Underwood (Eds.), *The Science of Compassionate Love (pp. 79–119)*. Wiley-Blackwell. https://doi.org/10.1002/9781444303070.ch4.

Strepparava, M. G., Bani, M., & Rezzonico, G. (2017a). New issues in cognitive counseling: Counseling skills in health care. In L. Nota & S. Soresi (Eds.), *Counseling and coaching in times of crisis and transition: From research to practice* (pp. 28–43). New York: Routledge.

Strepparava, M. G., Bani, M., Zorzi, F., Mazza, U., Barile, F., & Rezzonico, G. (2017b). Does the severity of psychopathology of Italian students receiving counselling services increase over time? A 5-year analysis and a comparison with a clinical and non-clinical sample. *Clinical Psychology & Psychotherapy, 24*(6), O1448–O1454. https://doi.org/10.1002/cpp.2096.

Vecchione, M., & Alessandri, G. (2017). Un contributo alla validazione italiana del Portrait Values Questionnaire-Revised (PVQ-R). *Giornale Italiano di Psicologia, 44*(1), 159–180.

Volpe, R. L., Hopkins, M., Van Scoy, L. J., Wolpaw, D. R., & Thompson, B. M. (2019). Does pre-clerkship medical humanities curriculum support professional identity formation? Early insights from a qualitative study. *Medical Science Educator, 29*(2), 515–521. https://doi.org/10.1007/s40670-018-00682-1.