

# Do empathy, perspective-taking, sense of power and personality differ across undergraduate education and are they inter-related?

Regina L. Toto · Lillian Man · Benjamin Blatt · Samuel J. Simmens ·  
Larrie Greenberg

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**Abstract** Empathy is desirable in all health care professionals in their interactions with patients and each other. Empathy in its cognitive (perspective-taking) and affective forms has been well-studied in the literature and in fact, is shown in most studies to decline during undergraduate and graduate medical education. Empathy has also been shown to be inversely proportional to one's sense of power (SOP) in the business literature. In addition, the relationship of empathy to personality traits has not been examined. This cross-sectional study of four cohorts of undergraduate medical students at a private mid-Atlantic medical school compares the empathy of first, second, third and fourth year medical students to see if there is a decline across the medical school experience. It also examines the relationship among empathy, SOP and personality type across the 4 years of medical school. Unlike in many previous studies, we found no decline in student empathy. We found no significant relationship between SOP and empathy. Finally, there were no significant differences in power perception and personality measures across all educational years surveyed.

**Keywords** Medical students · Empathy · Perspective-taking · Personality traits · Sense of power

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R. L. Toto · L. Man  
School of Medicine and Health Sciences, George Washington University School of Medicine and Health Sciences, Washington, DC, USA

B. Blatt · L. Greenberg (✉)  
CLASS Center/Medical Education, George Washington University School of Medicine and Health Sciences, Washington, DC, USA  
e-mail: Lgreenbe@gwu.edu

S. J. Simmens  
Epidemiology and Biostatistics, The George Washington University, Washington, DC, USA

## Introduction

The importance of empathy in clinical practice is emphasized by both the LCME and ACGME (ACGME 1999; AAMC 2005; Rider and Keefer 2006) and literature supports its role in improving patient outcomes (DiBlasi et al. 2011; Hojat 2007). Though difficult to precisely define, some authors describe empathy as having both cognitive and affective components. Shanafelt refers to the cognitive component of empathy as perspective-taking, the physician's ability to adopt the patient's perspective and to shape counseling and treatment recommendations accordingly (Shanafelt et al. 2005). Other authors refer to the affective component of empathy as empathic concern or sympathy: the physician's ability to feel warmth, compassion, and concern for others (Davis 1980; Halpern 2003; Hojat et al. 2009).

Considering the importance of both components of empathy to the practice of medicine, it is essential that medical schools create an educational climate that supports the development of empathy in medical students. To assess the success of medical schools in this endeavor, researchers have tracked student empathy throughout the four-year curriculum, using longitudinal and cross-sectional analyses. A number of controversies have emerged which have yet to be resolved. One unresolved issue is whether empathy changes/differs across the continuum of medical education. Some studies have found that empathy decreases during undergraduate medical education; others conclude that it remains unchanged. Two recent reviews specifically address this prospect of a change in empathy. One concludes that empathy may not decline but rather, response bias could account for the fall in empathy scores from years one to four (Colliver et al. 2010). The other finds mixed results, ultimately concluding that the predominance of evidence does support a decline in empathy during medical school (Neumann et al. 2011).

Less explored in the medical literature is how empathy interrelates with other elements of the medical student's psychological makeup, in particular sense of power and personality traits. Several psychology studies report that an individual's increased perception of power is associated with a decreased ability to adopt another person's perspective (Galinsky et al. 2006; Garden 2009) and suggest that an elevated sense of self-power may be linked to stereotyping others (Guinote 2007). Additionally, psychologists have found empathy to be positively related to emotional intelligence and the personality traits of open-mindedness and compliance with others, whereas it correlates negatively with aloofness (Munro et al. 2005). Though sense of power and personality traits have been linked to perspective-taking ability outside the realm of medicine, such relationships have yet to be explored in medical students.

In this study, we had two major objectives: (1) to assess whether medical students' self-reported empathic concern and perspective-taking differ across the continuum of undergraduate medical education and (2) to investigate whether power perception and personality traits correlate with empathic concern and perspective-taking.

## Methods

Participants in our cross-sectional study were students entering the first, second, and third years and completing the fourth year of medical education at The George Washington University Medical Center (GWU). Table 1 summarizes the demographics of the GWU students that we studied.

**Table 1** Demographic Information MS1, 2, 3, 4 Academic Year 2010–2011

Year entering GW	GW Avg GPA	Natl GPA	GW Average MCAT	National MCAT	GW Male versus Female	GW Avg Age	Natl Age
2010	3.69	3.67	VR-9.85; PS-10.23; BS-10.65; WS-P (31 P)	VR-9.9; PS-10.4; BS-10.8; WS-Q (31 Q)	F = 90 M = 87	23	F = 23 M = 24
2009	3.63	3.66	VR-9.62; PS-9.64; BS-10.22; WS-P (30 P)	VR-9.82; PS-10.27; BS-10.77; WS-P (31 P)	F = 103 M = 74	24	F = 23 M = 24
2008	3.64	3.61	VR-9.59; PS-9.73; BS-10.16; WS-P (30 P)	VR-9.4; PS-9.7; BS-10.12; WS-O (29 O)	F = 110 M = 67	23	F = 23 M = 24
2007	3.55	3.65	VR- 9.32; PS-9.60; BS-9.97; WS-P (29 P)	VR- 9.91; PS-10.29; BS-10.64; WS-P (31 P)	F = 108 M = 69	24.08	F = 23 M = 24

Addressing the potential impact of the GWU curriculum on students’ expression of empathy, there is a major focus on communication skills training in its 3-year longitudinal practice of medicine course. In this course students are presented with multiple modalities for enhancing their interpersonal skills, including exposure to role models, video encounter analysis, formative feedback from role plays with standardized patients and summative feedback from OSCEs (2 in years 1 and 2 respectively; 6 during each of the 6 year- 3 clerkships and an end-of-third year OSCE created by the Mid-Atlantic Consortium, a regional consortium of medical schools). They also experience humanities sessions in years 1 and 2 and in each clerkship, during which they write literature-based reflections.

We administered three instruments to survey participants: The Interpersonal Reactivity Index (IRI)–Perspective Taking and Empathic Concern subscales, Sense of Power Scale (SPS), and Ten-Item Personality Inventory (TIPI). The IRI is a 28-item instrument containing 4 separate 7-item subscales. In our study, we used only the perspective-taking (cognitive empathy) and empathic concern (affective empathy) subscales. They are scored on a 5-point scale anchored by “does not describe me well” (0) and “describes me very well” (4) (Davis 1980). The generalized version of the SPS, mainly used in business and psychology literature, asks participants to report their general beliefs about the power they have in their relationships with others. Participants were asked to rate their agreement with 8 items such as “In my relationships with others, I think I have a great deal of power,” on a scale from 1 (“Strongly disagree”) to 7 (“Strongly agree”). The scale shows high internal consistency with  $\alpha = .88$  ( $M = 5.16$ ,  $SD = .91$ ) (Anderson and Galinsky 2006). TIPI, an instrument with a ten-item personality scale demonstrated to have acceptable reliability and validity, was developed to efficiently assess personality traits (Gosling et al. 2003). The instrument assesses two items of each of the the ‘Big Five’ personality traits: agreeableness, extroversion, conscientiousness, emotional stability, openness to experiences. The instrument was designed for use when personality is not the primary focus of the research and when a brief measure, as opposed to an extensive personality test, is acceptable. Although it performs less well than traditionally longer personality tests, there

is acceptable test re-test reliability, self-other convergence, factor structure and relationships with relevant external criteria.

We administered the IRI, TIPI, and SPS instruments to the first, second, and third year students during their respective orientations preceding the 2010–2011 academic year. All data was collected anonymously. Two of us (RT and LM) read a standardized description of the research project to each group of participants before distributing the instruments. Each participant manually completed the instruments and we collected the data to preserve confidentiality. Fourth year students, who were not on campus at the beginning of the school year, voluntarily completed the same instruments online in May 2011. They received an email containing the same standardized description of the research project that we read to students in other classes. The fourth year students' responses automatically uploaded into a private form visible only to researchers. As this group of students was asked to complete the instruments on their own time while off-campus, an incentive (\$15 Starbucks gift card) was offered to the first fifty respondents with the goal of maximizing the fourth year class's response rate. This study design was approved by the IRB of our institution.

We compared students' scores on each instrument using Analysis of Covariance. We included student gender and age as covariates as statistical control variables because of the possibility that changes on across education year may be confounded with either age related maturation or differences across years in the gender ratio. Results are presented as adjusted means for each scale score. Analyses were conducted using SAS 9.3. Because there are eight outcome measures, Analysis of Covariance global  $p$  values were considered statistically significant using  $\alpha = .0065$ , based on the Bonferroni procedure. Significant results using this criterion were followed by unadjusted pairwise tests on the adjusted means, using the logic of the Fisher protected  $F$  procedure. We estimated correlations among measures and age by performing Spearman correlations for all groups combined.

## Results

A total of 460 trainees responded to the surveys with an overall response rate of 73 %. The response rates were: beginning MS1's, 98 %; beginning MS2's, 87 %; beginning MS3's, 65 %; and mid-year MS4's, 42 %.

As seen in Table 2 the adjusted means for empathic concern and perspective-taking are very similar for all groups, with the exception of the MS4 group. Empathic concern and perspective-taking each were higher in the MS4 group than in groups in other years of medical education ( $p \leq .01$  for all comparisons with the MS4 group). There were no statistically significant differences in power perception and personality measures across all educational years surveyed (Table 2).

Empathic concern and perspective-taking correlated moderately ( $r = .40, p < .0001$ ). Empathic concern correlated positively with Agreeableness ( $r = .33, p < .0001$ ) and to a small extent with Openness to Experience ( $r = .23, p < .0001$ ). Perspective-taking was very similar to empathic concern in regard to correlations with the personality measures. (Table 3) Although both empathic concern and perspective-taking correlated positively with perception of power, these correlations were very low in magnitude ( $r = .13, p = .005$ , and  $r = .12, p = .01$ , respectively). There were statistically significant gender differences, after controlling for age, on four of the eight student characteristics studied (Table 4). Female students had higher means on empathic concern and described themselves as more agreeable, conscientious, but less emotionally stable than the male students.

**Table 2** Mean values of empathy, perspective-taking, perceptions of power, and personality by year of medical education, adjusted for gender and age

Scale	1st Year (N = 155)	2nd Year (N = 128)	3rd Year (N = 95)	4th Year (N = 72)	<i>p</i> value <sup>c</sup>
Empathy <sup>a</sup>	3.17	3.08	3.11	3.39	.002
Perspective taking <sup>a</sup>	2.75	2.85	2.80	3.30	.0001
Power <sup>b</sup>	5.23	5.17	5.12	5.35	.27
Extraversion <sup>b</sup>	4.85	4.87	4.79	5.10	.62
Agreeableness <sup>b</sup>	5.40	5.42	5.61	5.43	.49
Conscientiousness <sup>b</sup>	6.05	5.94	6.07	6.05	.65
Emotional stability <sup>b</sup>	5.09	5.19	5.25	5.14	.81
Openness to experience <sup>b</sup>	5.57	5.61	5.56	5.36	.63

<sup>a</sup> Possible range of scores is 0–4

<sup>b</sup> Possible range of scores is 1–7

<sup>c</sup> Global ANCOVA test of differences across the four groups. Based on Bonferroni correction, *p* values were considered statistically significant if less than .00625

**Table 3** Spearman correlations of power and personality measures with empathy and perspective-taking (N = 458)

	Empathy	Perspective taking
Power	.13**	.12*
Extraversion	.10*	-.02
Agreeableness	.33***	.32***
Conscientiousness	.10*	.09
Emotional stability	.01	.16***
Openness to experience	.23***	.20***

\* *p* < .05

\*\* *p* < .01

\*\*\* *p* < .001

Perception of power means were nearly identical for the female and male students. Older students tended to score slightly higher on empathic concern ( $r = .10, p = .04$ ) and perspective-taking ( $r = .16, p = .0005$ ), but there was no significant correlation of age with power perception or the personality measures.

### Discussion

The results of our cross-sectional study, representing a snapshot in time examining four classes of medical students, suggest that both cognitive and affective empathy do not differ across the first three years of undergraduate education at our large, urban, mid-Atlantic medical school. MS4’s self-perceptions of empathy, unlike those of MS4s in most other studies, revealed statistically greater empathy and perspective-taking. The results also suggest that self-reported power perception and personality traits do not differ significantly among students at different levels of medical education. Lastly, recognizing the complex inter-relationships between empathy, perspective-taking, personality types and sense of power, our results did confirm the expected correlation between perspective-taking and empathy, the former measuring the cognitive and latter the affective types of empathy.

**Table 4** Mean values of empathy, perspective-taking, perceptions of power, and personality by gender, adjusted for year of medical education and age

Scale	Females (N = 264)	Males (N = 186)	<i>p</i> value <sup>c</sup>
Empathy <sup>a</sup>	3.86	2.99	.0001
Perspective taking <sup>a</sup>	2.99	2.86	.02
Power <sup>b</sup>	5.23	5.20	.63
Extraversion <sup>b</sup>	4.95	4.85	.43
Agreeableness <sup>b</sup>	5.68	5.23	.0001
Conscientiousness <sup>b</sup>	6.24	5.81	.0001
Emotional stability <sup>b</sup>	4.91	5.40	.0001
Openness to experience <sup>b</sup>	5.56	5.51	.49

<sup>a</sup> Possible range of scores is 0–4

<sup>b</sup> Possible range of scores is 1–7

<sup>c</sup> Based on Bonferroni correction, *p* values were considered statistically significant if less than .00625

Many longitudinal studies do support a decline in empathy across the continuum. In 2010, Colliver and colleagues reviewed eleven such studies that reported declines of both cognitive and affective empathy (Colliver et al. 2010). This review noted that most of the studies had a decrease in response rates (19–34 %) over years such that response bias could reasonably account for the observed empathy score declines (Colliver et al. 2010). Presenting a different picture is the work of Hojat and colleagues. They disagree with Colliver’s conclusions on psychometric grounds (Hojat et al. 2010). Further, in their 2009 study (Hojat et al. 2009), published after Colliver’s review and the largest study to date, they found a decline in cognitive empathy in the third year of medical education. Finally, Neumann’s 2011 review examines five studies *not* included in Colliver’s review and concludes that empathy probably does decline in medical school based on the predominance of evidence—especially the evidence from longitudinal studies (Neumann et al. 2011). If studies reporting a decline are accurate, a number of factors may be causative, such as a hierarchical learning climate, non-professional role-modeling by residents and faculty, a focus on the content of medicine with little attention to the psychosocial and humanistic factors, and the hidden curriculum, which incorporates many of the issues above. Encouraging research suggests that empathy-enhancing interventions can be successful in maintaining and improving empathy in medical students (Batt-Rawden et al. 2013).

Neumann’s 2011 review also raises the important issue of response bias analysis, noting that in most studies, response bias remains unexamined. One longitudinal study that *did* conduct a non-response analysis found no decline in affective or cognitive empathy across the continuum (Quince et al. 2011). In our study, we did not conduct a non-response analysis for our lowest responders, the MS4s, as they were close in time to their graduation and not always on campus, making their response less likely.

Interestingly, the responding MS4’s scored significantly higher in empathy than all other groups surveyed. Two other recent studies report higher MS4 self-reported empathy, one demonstrating a significant difference (Hojat et al. 2002; Roh et al. 2010). Strong conclusions, however, cannot be drawn from our data since our MS4 response rate was only 42 %. Also, we treated them differently than all other study groups by surveying them electronically at the end of their academic year and offering an incentive. These

differences, as well as the low response rate of the MS4's, may have significantly biased our results. Nonetheless, the possibility of an MS4 increase in empathy that has now been suggested by three studies warrants further investigation. If accurate, our MS4 results remain consistent with the conclusion that empathy and perspective-taking may not decline across undergraduate medical education.

Finally, in trying to explain our results we were unable to differentiate any demographic characteristics in our students as compared to students in other US medical schools. In addition, there have been no curricular changes in this period that would have explained why our data differed from published results which support decline in empathy with time. The focus of our curriculum on communication skills is likely similar to other medical data necessary to make this comparison are not readily available.

An individual's sense of power may or may not coincide with their control over resources, positive authority, or status in the eyes of others and has been surprisingly poorly studied in sociology and social psychology (Anderson and Galinsky 2006). The authors did not observe a change in the sense of power during undergraduate medical education. This may seem counterintuitive, given the expectation that one's perception of power would increase along with rising through the ranks of medical education. As Stratton points out, however, medical students in the third year and beyond may actually feel disempowered by the need to constantly adapt to new groups of people and the "unstructured" learning environment on the wards (Stratton et al. 2008; Allen et al. 2008). Our results differed from other studies outside the realm of medicine (Galinsky et al. 2006; Garden 2009) which report a inverse correlation between the two. Our study, in fact, revealed a very low magnitude positive correlation between sense of power and empathy.

Like power, self-reported personality traits did not differ significantly between students at each level of education. The personality trait of Agreeableness moderately correlated with empathic concern, the affective component of empathy ( $r = .33$ ), a finding consistent across several studies; Openness to Experience correlated with empathy to a lesser degree ( $r = .23$ ) (Munro et al. 2005; Chibnall et al. 2009). These correlations reinforce findings that empathy plays an important role in the development of prosocial behavior and moral reasoning as part of personality formation (Del Barrio 2004).

Gender, generational and age differences have been recognized as important in empathy studies: women have greater empathy than men, middle-aged adults have more empathy than older and younger peers, and a growing decline in empathy in millennials seems to exist for unknown reasons (Hojat et al. 2009; Neumann et al. 2011; O'Brien et al. 2012). These differences have not been explored in medicine and represent an area for study.

Our study has several important limitations. First, we treated the MS4 group differently than the rest: we surveyed them online rather than in person, and did so at the end of their academic year whereas we surveyed all other groups in the beginning of their respective academic years. This different treatment yielded a 42 % response rate, introducing the possibility of significant response bias. It is possible that students who highly valued empathy were most likely to make the effort to respond to an on-line empathy survey, resulting in our finding of increased mean empathy scores. Second, there are important limitations in study design. The cross-sectional approach we used provides a snap shot of students' empathy at one point in time, emphasizing differences across classes whereas, a longitudinal approach would provide a more accurate assessment of the change in empathy during medical school. Third, we collected data using self-report questionnaires. Self-reported data may not accurately reflect students' actual empathetic behavior toward patients. Nonetheless, two studies that do compare self-report with standardized patient assessment of empathy demonstrate a positive correlation suggesting that self-report may

be a reliable predictor of patient assessment of empathy (Roh et al. 2010; Marteau et al. 1991). Finally, our study involves one large, private, urban medical center on the East Coast; therefore our results may not be generalizable to other medical schools.

Future studies concerning medical student empathy should ideally be multi-institutional, and should better address response bias. Given the current emphasis on competency-based education, it seems logical to move beyond self-report and to use standardized or real patients as the primary measure of student empathic concern and perspective-taking. One such study, which compared third year students' OSCE scores at the beginning and end of their academic year, found no empathy decline (Chen et al. 2007). If a decline in empathy is definitively established through studies employing patient assessment, there will be a need to implement measures to counteract it and encourage the empathy of future physicians. At present, however, because of multiple conflicting studies, this matter remains unsettled.

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