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Corresponding Author: Prof. MICHELLE VAN RYN, PhD, MPH

Corresponding Author's Institution: Mayo Clinic College of Medicine

First Author: MICHELLE VAN RYN, PhD, MPH

Order of Authors: MICHELLE VAN RYN, PhD, MPH; Rachel R Hardeman, PhD, MPH; Sean M Phelan, PhD, MPH; Sara E Burke, BA; Julia Przedworski, BS; Michele L Allen,, MD; Diana J Burgess, PhD; Jennifer Ridgeway, MPP; Richard O White, MD; John F Dovidio, PhD

MAYO CLINIC

200 First Street SW
Rochester, Minnesota 55905
507-538-1191

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Guest Editors, Special Issue AACH 2013
Neil Shillabeer, Journal Manager
Courtesy of Arnstein Finset, PhD ,
Editor in Chief, Patient Education and Counseling
University of Oslo, P.O.Box 1111, Blinderm, 0317
Oslo, Norway

Dear Editor(s):

Thank you for the opportunity to revise this manuscript, "Predictors of 1st year medical students' attitudes' towards physician empathy in clinical encounters: A report from the CHANGES study" for consideration in the Special Issue of Patient Education and Counseling, AACH 2013. My co-authors and I thank the editor and reviewers for their feedback and believe that the manuscript has been much improved as a result

We address the editor and reviewers comments, point by point, below.

1) The editor suggested we use either the term 'disposition', or 'trait', but not both. We have removed reference to traits and instead consistently use the term 'disposition'.
2) We thank Reviewer 2 for the kind comments.
    a. Reviewer 2 remarked that s/he was surprised that "work on capabilities was not cited and this could add to the depth of the paper". We conducted a brief review of this theoretical construct and did not feel we could do it justice in and stay within the word limit.
    b. Reviewer 2 also pointed out that "the authors need to discuss the limitations of using surveys with predetermined questions vs. doing qualitative interviews as reasons". We agreed that this is an important point and so added the sentence ***"Last, the predictors of attitude towards empathy in doctor-patient encounters were limited to those included in the questionnaire; there may be many other important predictors that were not measured in this study"*** to the limitations section.
3) We thank reviewers 3 and 4 for their kind comments. We did not see a request for changes within these comments and hope we did not overlook any.
4) We made the requested editorial changes regarding section heading and references.

Thank you for your consideration. We look forward to your feedback.

Sincerely,

Michelle van Ryn
Professor of Health Services Research
Mayo Clinic College of Medicine
vanryn.michelle@mayo.edu

Highlights

- Understanding medical students' pre-existing beliefs and world-views is important because they have been shown to influence student responses to learning experiences.
- We examined the individual predictors of attitudes towards physician empathy among 4732 incoming 1st year students attending a stratified random sample of 49 US medical schools.
- Discomfort with uncertainty, close-mindedness, dispositional empathy, socio-political attitudes, self-concept and well-being all independently predicted first year medical students' attitudes towards the benefit of physician empathy in clinical encounters.
- One-size-fits-all approaches are unlikely to be sufficient.
- Curricula promoting empathy in new physicians may need to be tailored to the wide variety of medical students' pre-existing beliefs and world-views.

*technical revision
Click here to view linked References

Psychosocial predictors of attitudes towards physician empathy in clinical encounters among 4732 1st year medical students: A report from the CHANGES study.

Corresponding Author: Prof. MICHELLE VAN RYN, PhD, MPH
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None of the authors have any actual or potential conflict of interest including any financial, personal or other relationships with other people or organizations within three years of beginning the submitted work that could inappropriately influence, or be perceived to influence, their work.

Abstract

Objective

Medical school curricula intended to promote empathy varies widely. Even the most effective curricula leave a significant group of students untouched. Pre-existing student factors influence their response to learning experiences. We examined the individual predictors of first semester medical students' attitudes towards the value of physician empathy in clinical encounters.

Methods

First year students (n=4732) attending a stratified random sample of 49 US medical schools completed an online questionnaire that included measures of dispositional characteristics, attitudes and beliefs, self-concept and well-being.

Results

Discomfort with uncertainty, close-mindedness, dispositional empathy, elitism, medical authoritarianism, egalitarianism, self-concept and well-being all independently predicted first year medical students' attitudes towards the benefit of physician empathy in clinical encounters.

Conclusion

Students vary on their attitude towards the value of physician empathy when they start medical school. The individual factors that predict their attitudes towards empathy may also influence their response to curricula promoting empathic care.

Practice Implications

Curricula in medical school promoting empathic care may be more universally effective if students' preexisting attitudes are taken into account. Messages about the importance physician empathy may need to be framed in ways that are consistent with the beliefs and prior world-views of medical students.

All learners construct knowledge from an inner scaffolding of their individual and social experiences, emotions, will, aptitudes, beliefs, values, self-awareness, purpose, and more… if you are learning in a classroom, what you understand is determined by how you understand things, who you are, and what you already know.
-Peter Senge, Director of the Center for Organizational Learning at MIT

1. Introduction

There is a substantial body of empirical evidence that physician empathy improves interpersonal and technical quality of care, clinical outcomes and patient satisfaction.[1-13] In addition, interpersonal empathy can reduce racial bias and thus may protect against disparities in care.[14-16] These findings provide support for teaching medical student empathy as a valid part of medical school curricula. However, there is no consensus and little evidence regarding the most effective method of teaching empathy. Two systematic reviews of curricula aimed at promoting empathy in medical students found a wide range of approaches to both defining and teaching empathy.[17, 18] While both reviews concluded that it's possible to maintain and/or increase empathy during medical school, examination of the studies reviewed revealed that within each sample of students, despite an increase in average combined scores, there was considerable variation in the degree to which empathy levels changed.[17, 18] These studies suggest that even interventions with statistically significant main effects leave significant numbers of medical students untouched. Similarly, an intervention with resident physicians that was enthusiastically endorsed by the New York Times as an example of effective empathy training[19] influenced female participants but had no effect on the primary outcome among male participants.[20]

The fact that even the most successful interventions are not benefitting some subgroups suggests that a one-size-fits-all approach to increasing medical student empathy may not be sufficient. There has been little investigation into why some

students benefit from empathy promoting curricula while others do not. Educational research shows that prior attitudes and knowledge have a strong effect on current learning.[21] Thus, it is possible that pre-existing student characteristics affect the way they responded to curricula. There is evidence that learners may be alienated from the curricula or distort presented material if their prior knowledge or attitudes are at odds with curricula.[21-24] Individual dispositions may also influence responses to new information and perspectives.[21, 25-29] Thus, improving our understanding of the incoming medical student characteristics that predict attitudes towards the value of physician empathy in clinical encounters may be a first step in understanding differences in students' response to curricula during medical school. It may also provide insight into ways to design curricula that take individual differences into account and thus have a broader impact on medical students' attitudes towards, and skills at, providing empathic care.

The purpose of this study was to examine whether student dispositional factors, sociopolitical attitudes, self-concept, and well-being predicted incoming first semester medical students' (n=4732), attitudes towards physician empathy, independent of socio-demographic factors. Predictors were chosen because they have been shown to be associated with physician and trainees attitudes towards and provision of empathy and patient-centered care in prior studies. [25, 30-41]

2. Methods

2.1 Sample

This study uses baseline data collected as part of Medical Student Cognitive Habits and Growth Evaluation Study (CHANGES), a national longitudinal study of medical students who matriculated in US medical schools in the fall of 2010. CHANGES was designed to examine changes in medical students' well-being, experiences and attitudes between

their first year of medical school (baseline) and the end of their last year of medical school. This research study was approved by the Institutional Review Boards of Mayo Clinic, the University of Minnesota, and Yale University. We randomly selected 50 medical schools from strata of public/private schools and 12 regions of the country using *a sample proportional to strata size* methodology. One sampled school had highly unique characteristics (military school) that would have limited the generalizability of our study findings and was excluded, leaving a sample of 49 schools. Since there are no accurate and comprehensive lists of first-year medical students (MS1) available early-mid fall of their first year, we used several methods to ascertain as many of the 8594 MS1 attending the 49 schools as possible (see figure 1).

We ascertained and invited 6007 students (68% of all MS1 attending sampled schools) to participate in the web-based survey. We achieved an 81% response rate (55% of the entire pool of MS1), which is comparable to other published studies of medical students.[42] The sample had similar gender and race distributions to the population of all MS1 in study schools. Sample characteristics and characteristics of medical students in 2010, are shown in Table 1.

2.2 Data Collection and Integrity

Students identified as MS1 in any of the sampled schools were sent an email or letter with a link to the informed consent page. Those who consented were linked to an online questionnaire that they advanced through by answering questions placed on consecutive screens (pages). All students completed the survey during the first semester of their first year of medical school. Time spent on each page and total time to completion was recorded. If participants attempted to move to the next page with an unanswered question on the current screen, a warning popped up and they were directed back to the unanswered question. If they chose not to answer that question,

they had to click on a button to indicate their desire to skip the question. This protected participants' right to skip questions while eliminating any time-saving incentives for doing so. All students completed the survey during the first semester of their first year of medical school. After completing the measures, participants were direct to a different secure server where they provided their name and address to receive a $50.00 cash incentive. This allowed us to identify and eliminate duplicates. It also allowed us to confirm that our snowball-sampled respondents were MS1 at the school they identified. Last, responses were examined for indications of systematic response bias (e.g. clicking the same response option to move rapidly through the questionnaire). Invalid or incomplete questionnaires were omitted (n=32) so that the final analytic sample included 4732 respondents.

2.3 Measures

2.3.1 Dependent Variable

Medical students' attitude towards physician empathy in clinical encounters was assessed using the Jefferson Empathy Scale Student Version. [43-45] While this measure has been simply referred to as "empathy" in some prior studies, it measures *attitudes towards* the value of physician empathy in clinical encounters. In this measure, medical students were asked to rate their agreement on a 7-point scale from 1 ("strongly disagree") to 7 ("strongly agree") to statements such as "A physician who is able to view things from another person's perspective can render better care" and "Empathy is an important therapeutic factor in medical treatment." (Cronbach's alpha .88).

2.3.2. Independent Variables

2.3.2.1. Socio-demographic factors

Student gender and race and ethnicity were measured using standard socio-demographic questions. Medical student socio-economic status (SES) is difficult to characterize because they have left their family of origin and are adults yet are still in the student role. Their parents' income may or may not be available to them and their responses on questions about current income are difficult to interpret. Accordingly, we used two measures to assess SES. To obtain an estimate of SES of family of origin, we used student-reported parental highest educational attainment. Examination of the data revealed that there were meaningful differences between students' whose parents' highest educational level was high school or less vs. education beyond high school**.** As our second estimate, we used student self-report on student loan debt accumulated during undergraduate education. We created two categories for this variable – whether they had no student loan debt vs. any student loan debt, again on the basis of empirical observation of meaningful difference. Whether or not students had an undergraduate degree in the field of Science, Technology, Engineering, Mathematics (STEM) was assessed by asking students to "Please Indicate the major field of study for your undergraduate degree. Select all that apply". We categorized the following majors as STEM: Biological Sciences/ Life Sciences; Computer and Information Sciences; Engineering; Mathematics; Physical Sciences/ Technologies. All other majors were put in a single category. The majority of majors in this second category were in the social sciences and humanities.

2.3.2.2 Individual Disposition

Dispositional empathy was measured using the *Empathic Concern* subscale of the *Interpersonal Reactivity Index*.[46] This scale assesses the tendency to experience feelings of sympathy and compassion for others.[46] Participants responded to statements on a 7-point Likert-type scale ranging from 1 ("strongly disagree") to 7

(“strongly agree”) to statements such as "I often have tender, concerned feelings for people less fortunate than me." (Cronbach’s alpha .82)

Dispositional perspective-taking was measured using the *Cognitive Empathy* subscale of the *Interpersonal Reactivity Index*.[46] Participants responded to statements on a 7-point Likert-type scale ranging from 1 (“strongly disagree”) to 7 (“strongly agree”) to statements such as "Before criticizing somebody, I try to imagine how I would feel if I were in their place." (Cronbach’s alpha .83)

Discomfort with uncertainty was assessed with the 3-item *Discomfort with Ambiguity subscale* of the *Need for Closure scale. [47]* Participants responded to statements on a 7-point Likert-type scale ranging from 1 (“strongly disagree”) to 7 (“strongly agree”) to statements such as “I don’t like situations that are uncertain.” (Cronbach’s alpha .63).

Close-mindedness was assessed with the 7-item Close-mindedness subscale of the *Need for Closure scale. [47]* Participants responded on a 7-point Likert-type scale ranging from 1 (“strongly disagree”) to 7 (“strongly agree”) to statements such as: “Even after I have made up my mind about something, I am always eager to consider a different option”(reverse scored). (Cronbach’s alpha .65)

2.3.2.3. Sociopolitical Attitudes

Egalitarianism and Elitism were both measured using sub-scales of the *Social Dominance Orientation scale (SDO)*[48] which measures egalitarian and social justice beliefs. The egalitarianism scale includes items such as “We should do what we can to equalize conditions for different groups” and the Elitism scale includes items such as “If certain groups of people stayed in their place, we would have fewer problems.” (Cronbach’s alpha = 0.80 and 89, respectively).

Medical authoritarianism was assessed using The Medical Authoritarianism Scale.[49] Participants responded on a 7-point Likert-type scale ranging from 1 (“strongly

disagree") to 7 ("strongly agree") to statements such as: "Conscientious patients deserve better health care than those with self-inflicted problems" and "Those who contribute the most to society should get better health care." (Cronbach's alpha .88).

2.3.2.4. *Self-Concept*

Locus of Control was measured using the *Locus of Control* subscale of Pearlin's Mastery Scale.[50] The locus of control subscale assess respondents sense of control over events in their life. Students responded to a 7-item self-report measure ranging from 1 ("strongly disagree") to 7 ("strongly agree"). Sample items included "I have little control over the things that happen to me" and "What happens to me in the future mostly depends on me."(Cronbach's alpha .82).

Self-esteem was assessed using the Rosenberg Self Esteem Scale. [51]. Participants responded on a 7-point Likert-type scale ranging from 1 ("strongly disagree") to 7 ("strongly agree"). Sample questions included "I am able to do things as well as most other people" and "I feel I do not have much to be proud of." (Cronbach's alpha .79)

2.3.2.5 Well-Being

Fatigue, anxiety and depression symptoms were assessed using the extensively validated *Patient-Reported Outcome Measurement Information System (PROMIS) short form scales*.*[52, 53]* The response options for the *PROMIS scales* ranged from 1 (never) to 5 (Very Often). (Cronbach's alphas .88, .92 and .94 respectively)

2.4 Analyses

We examined the distribution of all independent and dependent variables. We then examined the bivariate relationship between independent (predictor) variables and the dependent variable, using the SPSS Complex Samples ANOVA for categorical independent variables and linear regression for continuous independent variables. For variables with significant bivariate relationships, we constructed models in which the

sets of independent variables were entered into a general linear model in consecutive blocks in the following order: socio-demographic factors, individual **disposition**, sociopolitical attitudes, self-concept, and well-being. The dependent variable had a modest (.15) but statistically significant association with the 7-item Marlowe-Crowne Social Desirability Scale.[54] Thus, this measure of social desirability bias was included in all multivariable analyses. Variables that were non-significant in each block were dropped when successive blocks were entered into the model. We used the SPSS Complex Samples procedure to take into account the sampling probability, stratification, and clustering in the two-stage design of the *CHANGES* survey. We obtained 95% confidence intervals and p-values for the model-estimated associations between each outcome and the independent variable. Statistical significance threshold was set *a priori* at alpha equal to 0.05.

Due to the skewed nature of the dependent variable, we also repeated the analyses using a recoded dependent variable (dichotomized into high and low scores using the median as a cut-point) and repeated the analyses using logistic regression. There were no differences in the patterns of results so the linear regression results are presented here.

3. Results

Table 2 presents the overall distribution of responses on the dependent variables and psychosocial predictors. Table 3 shows the bivariate relationship between the socio-demographic and psychosocial predictor variables and student attitude towards physician empathy in patient encounters. Unadjusted analyses of women and Black students depicted a more positive attitude towards physician empathy than men and white students respectively. We also found that South Asian students had less positive attitudes towards physician empathy than their white counterparts. Lower SES students

had more positive attitudes towards physician empathy than their higher SES counterparts. Older age was positively associated with attitudes towards physician empathy. Students who had a STEM undergraduate major had less positive attitudes than those with non-STEM undergraduate majors. Individual disposition, sociopolitical attitudes, self-concept and well-being measures were all associated with attitudes toward physician empathy in clinical encounters at statistically significant levels, with close-mindedness, dispositional empathy and dispositional perspective-taking—having the strongest unadjusted association.

The results of multivariate analyses are presented in Table 4. There are 5 models presented. Categories of variables were entered in successive blocks to show the impact on each set of predictors when other predictors were entered into the model. Block one examined the impact of socio-demographic factors independent of each other. When all socio-demographic predictors were entered into the model, Black race became non-significant, as did SES (student loan debt). All other socio-demographic factors that were significant in the bivariate analysis remained statistically significant predictors. When individual **disposition** variables were entered into the model the effects of age and SES (parents' highest degree) became non-significant. Negative predictors included discomfort with uncertainty (b= -.04; p<.001) and close-mindedness (b= -.11; p<.001) while the tendency to respond to others with empathic concern (b=.20; p<.001) and perspective-taking (b=.09; p<.001) were positive predictors of attitudes towards physician empathy in patient encounters. Model 3 shows that sociopolitical attitudes predicted attitudes towards physician empathy in the encounter independent of other variables. Students higher on medical authoritarianism (b= -.04; p<.001) and SDO elitism (b= -.03; p=.001) had more negative attitudes towards patient empathy and

those higher in egalitarianism had (b=.04; p<.001) more positive attitudes towards physician empathy in encounters.

Model 4 estimated the additional impact of self-concept. In that model only global self-esteem was significant (b=.07; p<.001). Other variables remained significant, but the direction of the relationship on discomfort with uncertainty changed. In Model 5, both global self-esteem and locus of control were significant and positive predictors. Higher levels of fatigue and anxiety symptoms were both associated with more positive attitudes towards physician empathy, but the relationship between depression symptoms and attitudes towards physician empathy was not statistically significant in the multivariate model. Given that fatigue, anxiety and depression symptoms were highly correlated in this sample; we also examined the impact of depression symptoms with anxiety and fatigue removed from the model. Depression symptoms remained non-statistically significant. Among significant predictors in Model 5, the strongest positive psychosocial factors were empathetic concern (b=.15; p<.001), perspective-taking (b=.07; p<.001), and global self-esteem (b=.07; p<.001). The strongest negative factors included three socio-demographic factors and one psychosocial factor: South Asian race relative to white race (b= -.10; p<.001), close-mindedness (b= -.08; p<.001), and male gender (b= -.06; p<.001).

4. Discussion and Conclusion

4.1 Discussion.

Individual disposition, sociopolitical attitudes, self-concept and well-being all independently predicted first year medical students' attitudes towards the benefit of physician empathy in clinical encounters. The relationship between these individual factors and attitudes toward the benefit of physician empathy among medical students when they start medical school suggests the possibility that these factors will also

influence student engagement with and benefit from medical school curricula focused on teaching students to provide empathic care. Understanding and starting from learners existing attitudes and knowledge is a central tenet of adult education and theory[21] and interventions that are tailored to individuals' existing views on the world are more effective than using a single approach to all learners.[55]

Dispositional factors affect the way individuals perceive themselves and interact with new information, people, and activities.[25, 56] In this study, students who arrived at medical school high on dispositional empathy (the tendency towards empathic concern) and dispositional perspective-taking (tendency to react to other by taking their view) had, as we might expect, a positive attitude towards physician empathy in clinical encounters. These findings are consistent with evidence that dispositional empathic concern and dispositional perspective-taking are associated with attitudes towards and provision of empathy among practicing physicians.[35] Students who are high on these dispositional factors will likely find curricula focused on promoting empathic care relatively comfortable and easy because it fits with their current outlook and response tendencies. They may have a similar worldview with the teachers and instructors delivering curricula on empathic care. Oh the other hand, students who are lower on these factors may find the behavioral requirements of providing empathic care much more challenging. They may find the concepts and perspectives covered in such curricula less familiar. The activities will require unfamiliar ways of responding and so may be more difficult for students low on dispositional empathy and/or perspective-taking than those higher on these dispositional attributes.

Close-mindedness and difficulty with uncertainty independently predicted more negative attitudes towards physician empathy in clinical encounters. Empathy involves perspective-taking – that is, the ability to see things from another's' point of view. Taking

on another's point of view requires willingness to consider new perspectives. By definition, people who are high on close-mindedness have low comfort with, and preference against, entertaining new and different ideas and perspectives.[47] Empathy training activities may be very uncomfortable and perhaps even highly anxiety-producing for students who are high on close-mindedness because they require the student to engage in processes that run counter to their dispositional preferences and response tendencies.

Differences in **disposition** seemed to partially account for gender differences in attitude towards physician empathy. Consistent with prior studies,[57] men had a less positive attitude towards physician empathy in all of the multivariate models. However, the strength of this gender effect decreased (-.21 to -.09) when the individual disposition variables were entered into the model. This suggests that men's lower value on physician empathy may be partially, but not entirely due to differences in individual disposition.

Students' pre-existing sociopolitical attitudes also predicted attitude towards physician empathy in clinical encounters, with medical authoritarianism and elitism associated with more negative attitudes and egalitarianism more positive attitudes. This is consistent with studies showing lower empathy and patient-centeredness among people high in authoritarian and elitism sociopolitical attitudes.[58-60] Furthermore, there are studies showing that medical authoritarianism increases over the course of medical education[61, 62] while empathy decreases.[61, 63, 64] The causal relationship is unclear; empathy and authoritarianism may be independently affected by experiences in medical school. However, it's also possible that reduction in empathy is caused by changes in socio-political attitudes towards more authoritarian perspectives and this deserves more investigation.

The finding that global self-esteem and locus of control were associated with more positive attitudes towards physician empathy is consistent with prior studies showing higher empathy among individuals with stronger self-concept[65] and provides support for efforts to provide a more supportive and affirming medical school environment. Last, the finding that worse well-being, as assessed by fatigue and anxiety symptoms, independently predicted more positive attitudes towards physician empathy is of note and inconsistent with some prior studies showing a positive association between well-being and empathy.[32] [66-69] However, it may be consistent with studies showing a relationship between empathy and burnout, suggesting the possibility that the emotional labor or effort involved in responding empathically may cause additional wear and tear on medical students.[70, 71]

This study had several limitations and its results should be interpreted with caution. First, it is cross-sectional, and so causal direction is uncertain. In this case, the dependent variable is unlikely to be a cause of the independent variables. Nevertheless, an observed relationship between two variables, such as medical authoritarianism and attitudes towards physician empathy, does not necessarily mean that intervening to influence one variable will cause changes in the other. A second limitation involved our inability to ascertain and invite all MS1 in the school sample, creating potential sample bias. While that is generally more of a concern when estimating population characteristics than it is in estimating relationships between variable, it's possible that the results presented here do not generalize to those students who did not participate. However, we do have evidence regarding predictors of attitudes towards physician empathy in 55% of first year students in the 49 schools included in the sample. **Last, the predictors of attitude towards empathy in doctor-patient**

encounters were limited to those included in the questionnaire; there may be many other important predictors that were not measured in this study.

4.2 Conclusion

Students vary on their attitude towards the value of physician empathy when they start medical school. The individual factors that predict their attitudes towards empathy may also influence their response to curricula promoting empathic care.

4.3 Practice Implications

Students with a STEM background, lower dispositional empathy and perspective-taking, higher close-mindedness and discomfort with uncertainty may find the content, activities, and practices involved in curricula promoting empathy more challenging than their counterparts. Those who are low on dispositional empathy may need a longer exposure to the concepts and more time practicing empathic responding than those high on this characteristic. Students who are high on close-mindedness and/or difficulty with uncertainty may find the curricula more threatening and may need more support for change. Students' who are high on medical authoritarianism and elitism and low on egalitarianism sociopolitical attitudes may be more resistant to curricula promoting empathic care. Messages about the benefits and value of physician empathy may need to be framed in ways that are consistent with their beliefs and prior world-view.[72] Further research is needed to identify intervention strategies which either create general programming that is broad enough to appeal across a disparate set of student **dispositions**, or utilizes practical approaches to tailoring that individualizes the framing and appeal for particular students. For example, effective Instructors might describe empathy conceptually without introducing subjective-sounding language at first, and

attempt to ground its value in terms that might be more familiar to people with more authoritarian or non-egalitarian world-views.

In an article entitled The Role of Empathy in Medicine: A Medical Student's Perspective[73], Elliot Hirsh writes: “Initially, it was somewhat difficult for me to understand the importance of these sessions. I appreciated our instructor's intentions but often felt that the material could have been more effectively presented. In retrospect, I was probably one of the milder critics of the course; a large number of students did not take the curriculum seriously, seeing it as a waste of time that could have been better spent studying. The challenge for medical educators is to present the information in a format that makes it relevant and actively engages the students.”(p 435-426). Understanding the factors that affect medical students’ attitudes towards physician empathy is a starting point for accomplishing this goal.

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Table

Table 1. Personal characteristics and comparison of respondents of Medical Student CHANGES survey, -Matriculating Student Questionnaire, and AAMC All Matriculates[1]

	Medical Student CHANGES Survey (n = 4732) 49 Schools	**Matriculating Student Questionnaire 2010 (n = 14,638) 131 Schools**	**AAMC All Matriculants 2010 (n = 18,665) 131 Schools**
	N (%)	N (%)	N (%)
Gender			
Male	2371 (50.1)	7597 (51.9)	9911 (53.1)
Race[a]			
Black	303 (6.4)	995 (6.8)	1325 (7.1)
Alaska Native, American Indian, Pacific Islander	114 (2.4)	278 (1.9)	168 (.9)
Asian	1159 (24.5)	3513 (24.0)	4162 (22.3)
White	3237 (68.4)	10349 (70.7)	12058 (64.6)
Unknown/other	95 (2.0)	468 (3.2)	1419 (7.6)
Ethnicity			
Hispanic / Latino	289 (6.1)	1186 (8.1)	1531 (8.2)

[1] Race totals and percentages do not total 100, as students were allowed to choose multiple race categories.

Table 2

Table 2: Univariate distribution of dependent variable and psychosocial predictors.

	Mean (s.d.)	Range	N
Dependent Variable			
Attitude towards physician	6.32 (0.63)	1-7	4676
Independent Variables: Psychosocial Predictors			
Individual Disposition			
Dispositional empathy	4.81 (0.91)	1-7	4607
Dispositional perspective-	5.27(0.92)	1-7	4608
Discomfort with uncertainty	4.81 (1.05)	1-7	4622
Close-mindedness	2.99(0.74)	1-7	4629
Sociopolitical Attitudes			
Egalitarianism	5.12(1.32)	1-7	4631
Elitism	1.76(1.07)	1-7	4634
Medical authoritarianism	2.50(1.34)	1-7	4660
Self-Concept			
Locus of Control	5.64 (0.93)	1-7	4676
Self-esteem	5.67(1.06)	1-7	4675
Well-Being			
Fatigue	4.00(0.77)	1-5	4732
Anxiety	4.00 (0.83)	1-5	4732
Depression	4.00 (0.83)	1-5	4732

Table 3

Table 3: Bivariate relationships between predictors and attitudes toward physician empathy in clinical encounters (Linear Relationships Adjusted for Complex Samples)

	Mean Score on DV	(SE)	Sig
Gender			.00
Men	6.22	0.016	
Women	6.43	0.009	
Race/Ethnicity			.00
White	6.33	0.012	ref
Black (vs. white)	6.41	0.036	.05
Hispanic (vs. white)	6.36	0.029	ns
East Asian (vs. white)	6.31	0.019	ns
South Asian (vs. white)	6.24	0.026	.00
Other race/ethnicity (vs. white)	6.37	0.058	ns
Highest Parental Degree			.00
Parent has post-high school education (vs. high school or less)	6.32	0.01	
High school or less	6.4	0.02	
Undergrad Major			.00
Did not have undergrad STEM major (vs STEM major)	6.38	0.012	
STEM Major	6.3	0.011	
Undergrad Student Loan Debt			.00
No Debt	6.31	0.011	
Has Undergrad Student Loan Dept	6.34	0.013	

	Bivariate Association	95% C.I.	Sig.
Age	0.014	0.009,0.019	.00
Discomfort with uncertainty	-0.021	-0.006,-0.037	.00
Close-mindedness	-0.25	-0.28,-0.23	.00
Dispositional Empathy/Empathic Concern	0.28	0.26,0.31	.00
Dispositional Perspective-taking	0.24	0.21,0.26	.00
Medical Authoritarianism	-0.13	-0.14,-0.11	.00
Elitism (SDO)	0.16	0.18,-0.17	.00
Egalitarianism (SDO)	-0.14	0.13,0.16	.00
Locus of Control	0.062	0.045,0.08	.00
Global Self-Esteem	0.089	0.072,0.11	.00
Fatigue	.033	0.013,0.053	.00
Anxiety	.022	0.004,0.041	.02
Depression	-.036	-0.058,-0.015	.00

Table 4

Table 3: Predictors of Attitude towards Physician Empathy in Patient Encounters

Predictor	Model 1: Socio-Demographic			Model 2:Added Individual Disposition			Model 3: Added Socio-Political Attitudes			Model 4: Added Self-Concept			Model 5: Added Well-being		
	b	95% Confidence Interval (Lower ,Upper)	Sig.	b	95% Confidence Interval (Lower, Upper)	Sig.	b	95% Confidence Interval (Lower, Upper)	Sig.	b	95% Confidence Interval (Lower, Upper)	Sig.	b	95% Confidence Interval (Lower, Upper)	Sig.
(Intercept)	6.18	(6.04, 6.32)	.00	4.93	(4.72, 5.15)	.00	5.06	(4.88, 5.23)	.00	4.60	(4.37, 4.82)	.00	4.41	(4.17, 4.66)	.00
Men	**-.21**	(-.25, -.18)	.00	**-.10**	(-.12, -.07)	.00	**-.06**	(-.09, -.03)	.00	**-.07**	(-.10, -.04)	.00	**-.06**	(-.09, -.03)	.00
Black (vs. white)	**.03**	(-.03, .08)	NS												
Hispanic (vs. white)	**.02**	(-.05, .08)	NS												
East Asian (vs. white)	**-.01**	(-.06, .03)	NS												
S. Asian (vs. white)	**-.08**	(-.14, -.02)	.01	**-.11**	(-.16, -.05)	.00	**-.11**	(-.16, -.07)	.00	**-.10**	(-.15, -.05)	.00	**-.10**	(-.15, -.05)	.00
Other race/ethnicity (vs.	**.06**	(-.06, .18)	NS												
Age	**.01**	(.01, .02)	.00	**.00**	(.00, .01)	NS									
Parent education> -	**-.08**	(-.14, -.02)	.01	**-.04**	(-.10, .02)	NS									
NOT STEM major	**.05**	(.02, .07)	.00	**.05**	(.02, .07)	.00	**.04**	(.02, .06)	.00	**.05**	(.02, .07)	.00	**.04**	(.02, .07)	.00
Has Loan Debt	**-.01**	(-.04, .02)	NS												
Discomfort with				**-.04**	(-.02, -.05)	.00	**-.04**	(-.03, -.06)	.00	**-.05**	(-.03, -.06)	.00	**-.04**	(-.03, -.06)	-.00
Close-mindedness				**-.11**	(-.13, -.08)	.00	**-.09**	(-.12, -.07)	.00	**-.08**	(-.11, -.06)	.00	**-.08**	(-.11, -.06)	.00
Dispositional Empathy/				**.20**	(.18, .22)	.00	**.16**	(.14, .18)	.00	**.15**	(.13, .17)	.00	**.15**	(.13, .17)	.00
Dispositional				**.09**	(.07, .11)	.00	**.08**	(.06, .10)	.00	**.08**	(.06, .10)	.00	**.07**	(.05, .09)	.00
Medical							**-.04**	(-.05, -.02)	.00	**-.03**	(-.05, -.02)	.00	**-.03**	(-.05, -.02)	.00
Elitism (SDO)							**-.03**	(-.05, -.01)	.00	**-.03**	(-.05, -.01)	.00	**-.03**	(-.05, -.01)	.00
Egalitarianism (SDO)							**.04**	(.03, .06)	.00	**.04**	(.03, .05)	.00	**.04**	(.03, .06)	.00
Locus of Control										**.01**	(.00, .03)	.07	**.03**	(.01, .04)	.00
Global Self-Esteem										**.07**	(.05, .09)	.00	**.07**	(.05, .09)	.00
Fatigue Symptoms													**.03**	(.00, .05)	.03
Anxiety Symptoms													**.04**	(.02, .06)	.00
Depression Symptoms													**-.01**	(-.03, .01)	NS

Figure

Figure 1: *Medical Student CHANGES* study participant recruitment flowchart