

# The Devil is in the Third Year: A Longitudinal Study of Erosion of Empathy in Medical School

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## Abstract

### Purpose

This longitudinal study was designed to examine changes in medical students' empathy during medical school and to determine when the most significant changes occur.

### Method

Four hundred fifty-six students who entered Jefferson Medical College in 2002 (n = 227) and 2004 (n = 229) completed the Jefferson Scale of Physician Empathy at five different times: at entry into medical school on orientation day and subsequently at the end of each academic year. Statistical analyses were performed for the entire

cohort, as well as for the "matched" cohort (participants who identified themselves at all five test administrations) and the "unmatched" cohort (participants who did not identify themselves in all five test administrations).

### Results

Statistical analyses showed that empathy scores did not change significantly during the first two years of medical school. However, a significant decline in empathy scores was observed at the end of the third year which persisted until graduation. Findings were similar for the matched cohort (n = 121) and for the

rest of the sample (unmatched cohort, n = 335). Patterns of decline in empathy scores were similar for men and women and across specialties.

### Conclusions

It is concluded that a significant decline in empathy occurs during the third year of medical school. It is ironic that the erosion of empathy occurs during a time when the curriculum is shifting toward patient-care activities; this is when empathy is most essential. Implications for retaining and enhancing empathy are discussed.

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*Editor's Note: Commentaries on this article appear on pages 1174 and 1177.*

**M**edicine at its core is a human service profession. Cultivating humanistic values in general and enhancing interpersonal skills and empathy in particular are of paramount importance in any human service endeavor. Consistent with this notion, the Medical School Objectives Project of the Association of American Medical Colleges<sup>1</sup> includes enrichment of interpersonal skills and empathy among the educational objectives of undergraduate medical education. In a position paper, the American Board of Internal Medicine<sup>2</sup> recommended that humanistic values and empathy should be cultivated and assessed as an essential educational activity in graduate medical education.

Despite the consensus of professional organizations and medical education leaders on the importance of empathy in medical education and the practice of medicine, empirical research on empathy, including its development, and erosion is scarce. Consequently, sufficient attention has not been directed toward the enhancement of empathic skills for physicians-in-training.

Empirical research on empathy among medical students and physicians has been hampered not only by a conceptual confusion but also by the lack of a sound instrument to measure empathy specifically in the context of medical education and patient care. Without a valid measurement of empathy that is content-specific to patient care, it is not feasible to determine what factors lead to its enhancement or degradation among physicians-in-training.

literature.<sup>3(pp 3–15)</sup> Because of this conceptual ambiguity, empathy has been described as a notion that is difficult to define and hard to measure.<sup>4</sup>

Generally, some researchers have described empathy as a *cognitive* attribute,<sup>5,6</sup> which means it predominantly involves understanding another person's concerns. Others have described empathy as an *affective* or *emotional* characteristic,<sup>7,8</sup> which implies that it primarily involves feeling another person's pain and suffering. Yet, there is a third group that views empathy as both affective and cognitive.<sup>9,10</sup>

A clear conceptualization of empathy is critically important because conceptualization not only can serve as a guideline for an operational definition of the term but also can provide a framework for the development of a content-specific instrument for measuring empathy in the context of medical education and patient care. Also, strategies to enhance empathy can be more appropriately developed on the basis of a clear definition of the concept.

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### What Is Empathy?

Empathy is an ambiguous concept. Despite a lack of consensus about its definition, there are various descriptions or characterizations of the term in the

To clarify the conceptual ambiguity associated with empathy, based on an extensive review of relevant literature,<sup>3,11</sup> we defined empathy in the context of medical education and patient care as a predominantly *cognitive* (as opposed to affective or emotional) attribute that involves an *understanding* (as opposed to feeling) of patients' experiences, concerns, and perspectives combined with a capacity to *communicate* this understanding. An *intention to help* by preventing and alleviating pain and suffering is an additional feature of empathy in the context of patient care.

The key terms in this definition are italicized for two reasons: (1) to underscore their importance in the construct of empathy in the context of medical education and patient care, and (2) to make a distinction between empathy and sympathy, which have often been used interchangeably.

### Empathy versus sympathy

Sympathy, as opposed to empathy, is predominantly an affective or emotional attribute that involves intense feelings of a patient's pain and suffering. Despite the differences in conceptualization, the two notions are not entirely independent. One study reported a moderate correlation of 0.49 between measures of the two concepts, which can be translated into approximately a 25% overlap between the two.<sup>12</sup>

The interchangeable use of these two concepts may not cause a problem in the context of social psychology, but it is important to separate the two in the context of patient care. In social psychology, both empathy and sympathy can lead to a similar outcome (e.g., prosocial behavior), albeit for different behavioral motivations. For example, a prosocial behavior that is induced by empathic understanding is more likely to be elicited by a sense of altruism. A prosocial behavior that is prompted by sympathetic feelings, however, is more likely to be triggered by egoistic motivation to reduce personal distress.<sup>3</sup>

In the context of medical education and patient care, however, we must make a distinction between the two constructs because, in this context, they lead to different clinical behavior and patient outcomes.<sup>13</sup> An empathic physician would be more concerned about

*understanding* of the *kind* and *quality* of patients' experiences, whereas a sympathetic physician would be more concerned about *feeling* the *degree* and *intensity* (*quantity*) of patients' experiences.<sup>3</sup> Because of its cognitive nature, empathy in excess is always beneficial in patient–physician relationships. In contrast, because of its affective nature, an overabundance of sympathy can be detrimental in patient–physician relationships and can impede the neutrality that is necessary in clinical decision making, thus negatively influencing a physician's performance. Cognitively defined empathy always leads to personal growth, career satisfaction, and optimal clinical outcomes, whereas affectively defined sympathy can lead to career burnout, compassion fatigue, exhaustion, and vicarious traumatization.<sup>14</sup>

Indeed, it can be assumed that the relationship between empathy and positive outcomes is linear, meaning that the outcomes progressively become better as a function of an increase in empathy. In contrast, it can be assumed that the relationship between sympathy and clinical outcomes is like an inverted U shape (similar to that between anxiety and performance), meaning that sympathy to a limited extent can be beneficial, but excessive sympathy can be detrimental.

Another important implication for making a distinction between empathy and sympathy in medical education is the fact that affect and emotion (the prominent ingredients of sympathy) are less amenable to change, whereas cognition and understanding (the prominent ingredients of empathy) can be substantially enhanced by education. This implies that empathy can be taught, but sympathy is not easily amenable to change through education. Specific features of empathy and sympathy are summarized in Table 1. More detailed descriptions of those features are given elsewhere.<sup>3(pp 7–15,79–85)</sup>

### Measurement

To the best of our knowledge, before the development of the Jefferson Scale of Physician Empathy (JSPE), no psychometrically sound research instrument was available to measure empathy specifically among medical students, residents, and physicians. A few

research tools exist for measuring empathy in the general population,<sup>3(pp 63–74)</sup> but none is content-specific to medical education and relevant to patient care. Although they are not content-specific, three empathy-measurement instruments have been frequently used in medical education research. The Interpersonal Reactivity Index (IRI) was developed by Davis<sup>9</sup> and includes 28 items tapping both cognitive and emotional empathy. The IRI contains four scales: perspective taking, empathic concern, fantasy, and personal distress. A typical item (from the perspective taking scale) is, "I sometimes try to understand my friends better by imagining how things look from their perspective."

Another research tool is the Empathy Scale developed by Hogan<sup>15</sup> which includes 64 items. A typical item is, "I have seen some things so sad that I almost felt like crying." The third research tool is the Emotional Empathy scale developed by Mehrabian and Epstein<sup>16</sup> which includes 33 items intended to measure "emotional empathy." A typical item is, "It makes me sad to see a lonely stranger in a group." Mehrabian introduced a new 30-item instrument, the Balanced Emotional Empathy Scale (BEES),<sup>17</sup> to measure vicarious emotional empathy. A sample item is, "Unhappy movie endings haunt me for hours afterward." As indicated before, and reflected in the sample items, none of the aforementioned instruments feature content specific to medical education and patient care. With the exception of the BEES, extensive psychometric data have been published for the other three instruments.<sup>3(pp 66–69,72–73)</sup>

### The JSPE

Several years ago, a group of medical education researchers at Jefferson Medical College recognized a need for an instrument to measure empathy in the context of medical education and patient care. In response to this need, and on the basis of the above-mentioned, cognitively defined empathy and a comprehensive review of the literature, they developed the JSPE. Step-by-step procedures in the development of the JSPE and data in support of its validity and reliability are reported elsewhere.<sup>3(pp 87–115)</sup> The scale is brief and includes 20 items answered on a seven-point Likert-type scale (Strongly Agree = 7, Strongly Disagree = 1). To

**Table 1**  
**Specific Features of Empathy and Sympathy\***

Feature	Empathy	Sympathy
Contribution of learning	More significant	Less significant
Contribution of cognition	More significant	Less significant
Contribution of affects	Less significant	More significant
Contribution of innate or genetic factors	Less innate	More innate
Objectivity versus subjectivity	More objective	More subjective
Likelihood of accuracy	More accurate	Less accurate
Behavioral roots	Advanced	Primitive
Required efforts	More effortful	More effortless
Relation to clinician's performance	Linear	Inverted U shape
Reaction time	Nonspontaneous	Spontaneous
Patient's emotions	Appreciated without joining	Perceived by joining
Feeling felt	The kind and quality of the patient's feelings	The degree and quantity of the feelings
Brain processing area	Predominantly neocortex	Predominantly limbic system
Psychological regulatory process	Appraisal	Arousal
Psychophysiological state	Energy conserving	Energy consuming
Behavioral motivation	Altruistic	Egoistic
State of mind	Intellectual	Emotional
Effect on caregiver	Personal growth, career satisfaction	Exhaustion, fatigue, burnout
Typical expression to patient	I understand your suffering	I feel your pain
Key mental processing mechanism	Cognitive/intellectual/understanding	Affective/emotional/feeling

\* Source: Hojat M. *Empathy in Patient Care: Antecedents, Development, Measurement, and Outcomes*. New York, NY: Springer; 2007. © 2007 Reproduced with permission from Springer.

control for the “acquiescence” response style (a tendency to passively and consistently endorse “agree” [or “disagree”] responses to the test questions), 10 items are positively worded (directly scored) and 10 items are negatively worded (reverse scored). The JSPE has received broad attention and has been translated into 25 languages to date.

Different versions of the JSPE are available: one for administration to medical students (S-Version), one for administration to physicians and other health professionals (HP-Version), and one for administration to students in any health profession fields other than medicine. These versions are similar in content with slight changes in wording to reflect students' orientation toward empathy in medical education (S-Version), or in other health profession education (HP-Version for Students), and behavioral tendencies toward

empathic engagement in patient care (HP-Version for physicians and other health professionals). For example, an item in the medical students' version that reads, “Patients feel better when their physicians understand their feelings,” reads as “Patients feel better when their health care providers understand their feelings” in the version for nonmedical health professional students and reads as “My patients feel better when I understand their feelings” in the HP-Version for physicians.

Evidence in support of the JSPE's construct validity,<sup>3,11,12</sup> criterion-related validity,<sup>12,18</sup> predictive validity,<sup>19</sup> internal consistency reliability,<sup>11,12</sup> and test-retest reliability<sup>11</sup> has been reported. Factor analysis of the JSPE in medical students<sup>3</sup> and physicians<sup>11</sup> resulted in three factors. The grand factor (prominent component) of the scale involves a construct entitled “perspective taking,” which is considered an important

ingredient of empathy. A related sample item from the S-version is, “Physicians' understanding of the emotional status of their patients, as well as that of their families, is one important component of the physician–patient relationship.” The second component of the JSPE, “compassionate care,” is considered an essential dimension of the patient–physician relationship. A related sample from the S-version item is, “Attention to patients' emotions is not important in history taking.” This is a negatively worded item which is reverse scored. The third component is the “ability to stand in patients' shoes,” which was a trivial factor because only two items had significant factor coefficients on this factor. A related sample item is, “Because people are different, it is difficult to see things from patients' perspectives” (a reverse scored item). A similar underlying construct of JSPE has emerged among students in

dental school,<sup>20</sup> nursing students,<sup>21</sup> Mexican medical students,<sup>22</sup> Japanese<sup>23</sup> and Korean<sup>24</sup> medical students, and Italian physicians.<sup>25</sup>

### Changes in empathy

Some anecdotal reports as well as empirical studies suggest that a drastic transformation in medical students' character occurs during their medical education. When they embark on the journey to become physicians, most students are enthusiastic, filled with idealism and a genuine intention to serve those in need of help.<sup>26,27</sup> It is ironic, though, that despite the students' initial intentions and medical school faculty's attempts to nurture human qualities, a cynicism develops progressively during their training.<sup>26–29</sup> For example, it has been reported that as many as three fourths of medical students become increasingly cynical about academic life and the medical profession as they progress through medical school.<sup>28</sup> It has also been found that 61% of medical residents reported becoming cynical during their postgraduate training.<sup>30</sup>

This cynical transformation was likened to the “battered child syndrome” and attributed to inappropriate treatment of medical students.<sup>27</sup> The metamorphosis has been described as “traumatic de-idealization”<sup>26</sup> and “dehumanization.”<sup>31</sup> It has been suggested that a “rehumanization” process is needed to retain and enhance empathy among physicians-in-training.<sup>32</sup>

Several empirical studies have shown a decline in empathy during undergraduate and graduate medical education. In a cross-sectional study, Chen and colleagues<sup>33</sup> reported a noticeable decline in empathy scores (measured by the JSPE) in third-year medical students as compared with their second-year counterparts. In another cross-sectional study with dental school students, Sherman and Cramer<sup>20</sup> noticed a significant decline in empathy (measured by the JSPE) in second-year students.

Two longitudinal studies have recently been published on the decline of empathy in medical school. Newton and colleagues<sup>34</sup> reported a drop in vicarious/emotional empathy (measured by the BEES)<sup>17</sup> during medical school. In another longitudinal study of medical

students, a significant decline was observed in scores of the JSPE, which was administered at the beginning and the end of the third medical school year.<sup>35</sup>

Research also indicates that empathy continues to decline during residency training. Bellini and Shea<sup>36</sup> used the IRI<sup>9</sup> with internal medicine residents and reported a significant drop in scores of the “Empathic Concern” scale of the IRI, but an increase in scores of the “Personal Distress” scale of the IRI, which is an indicator of emotional empathy in the general population. Mangione and colleagues<sup>37</sup> noticed a downward trend in empathy scores (measured by the JSPE) as residents progressed through different years of internal medicine residency training, but the differences did not reach the conventional level of statistical significance ( $P < .05$ ).

Although these studies generally suggest that an erosion of empathy occurs during medical education, it is important to discern exactly when and why the erosion of empathy occurs. This issue is of interest to medical educators because of its implications for timely educational intervention.

We should keep in mind that two features are important in providing an appropriate answer to the aforementioned issue. First, we need a longitudinal (as opposed to a cross-sectional) research design to follow the same group of students in different stages of medical education to examine changes in each stage. Second, we need to use a psychometrically sound measure of cognitive empathy (not affective, reactive, vicarious, or emotional empathy, which are analogous to sympathy)<sup>3</sup> that is both content-specific and context-relevant to medical education and patient care.

The purpose of this study was to ascertain whether changes in empathy during medical school are systematic and progressive or disjointed without continuity. In particular, we addressed the following question: When do the most significant changes in empathy occur during medical school?

## Method

### Participants

Our total study cohort included the 456 students who entered Jefferson Medical

College in 2002 and 2004. This represents 100% of matriculants in these two classes. Of the total participants, 50% ( $n = 226$ ) were women, and 74% ( $n = 338$ ) were white, 21% ( $n = 95$ ) were Asian American, 3% were Latino ( $n = 12$ ), and 2% ( $n = 11$ ) were black.

### Instruments

We used the JSPE (S-Version) in this study. In addition, to examine the reasons for any changes in empathy, we asked participants to respond to the following open-ended statement at the end of each academic year at the time the JSPE was administered: “Please describe briefly events or experiences (e.g., personal, academic, role model, etc.) in the past year that have influenced (either positively or negatively) your views on the humanistic aspect of medicine (e.g., empathy toward patient, patient–physician relationship, etc.)”

### Procedures

This study, as part of the Jefferson Longitudinal Study of Medical Education (<http://jdc.jefferson.edu/jlsmc>), approved by the IRB of Thomas Jefferson University, was conducted during a six-year period between August 2002 and March 2008. In August 2002, the JSPE was administered to 227 students during the orientation program at the beginning of their first year of medical school and then readministered in 2003 at the end of their first academic year. Subsequently, the JSPE was readministered to this cohort three more times in medical school near the end of their second, third, and fourth years in 2004 through 2006.

In August 2003, a similar procedure was started for first-year students, but data collection on that cohort was suspended because of difficulties in scheduling all the test readministrations. Once again, in August 2004, the JSPE was administered to 229 first-year students at orientation and readministered four more times at the end of the each year through graduation in 2008.

Participation was voluntary, and supplying personal identification information such as names or student identification numbers was optional. Therefore, not all of the students identified themselves in all test administrations. Because of this, longitudinal data were analyzed for two groups of cohorts: The “matched cohort”

was the 121 students who identified themselves in all of the five test administrations, and the “unmatched cohort” (total  $n = 335$ ) was those who did not identify themselves in one or more of the five test administrations.

### Statistical analyses

We performed statistical analyses separately for the total study cohort, and for the matched and unmatched cohorts. We calculated descriptive statistics for comparisons of changes in empathy scores during medical school for both cohorts. In addition to descriptive statistics, we used inferential analyses (analysis of variance for repeated-measure design) to detect the statistical significance of changes in empathy scores in the matched cohort. We also used the  $t$  test to test the significance of the differences in pairwise comparisons. Also, when appropriate, we calculated the effect size estimates (e.g., Cohen  $d$ ) to examine whether statistically significant differences in empathy scores were also practically (clinically) significant.<sup>38</sup>

### Results

Findings are presented separately for the total study sample and the matched and unmatched cohorts.

#### Total participants

Descriptive statistics for the empathy scores in the five test administrations for the total participants are reported in Table 2. The number of observations in different years varies from 456 on the orientation day to 356 on Match Day at the end of the fourth year because of voluntary participation, leave of absence, and dual-degree programs. For the purpose of examining the stability of the pattern of changes in different groups, we

presented data separately for each entering class.

Data reported in Table 2 indicate that the mean empathy scores for entering classes in 2002 and 2004 were similar in each test administration, and results of the  $t$  test confirmed no statistically significant differences between the two sets of scores for the two classes. Therefore, we combined data for the two classes for final statistical analyses.

By comparing the empathy mean scores obtained in different years of medical school, we observed a consistent pattern of findings in each class and in the combined classes. Results consistently showed no substantial change in empathy between orientation (year 0) and the end of year 2. However, a considerable decline in mean empathy scores occurred in the third year of medical school. No significant trend toward improvement in empathy scores was observed in the fourth year. The decline in mean empathy score from year 0 to the end of year 3 is greater than one-half standard deviation unit (0.54), which is considered substantial and practically important.<sup>38</sup>

#### Comparisons of the matched and unmatched cohorts

No significant gender difference was observed between the matched (54% women,  $n = 65$ ) and unmatched (48% women,  $n = 161$ ) cohorts ( $\chi^2_{(1)} = 1.4$ ,  $P = .24$ ). The matched cohort however, was underrepresented with regard to ethnic minority (e.g., blacks,  $n = 0$ ; and Latino,  $n = 1$  in the matched group) ( $\chi^2_{(3)} = 8.3$ ,  $P < .05$ ). Ethnic differences are unlikely to significantly influence the general findings, because no association has been found between ethnicity and

scores on the Jefferson Scale of Empathy.<sup>20,39</sup>

Summary results of statistical analyses for each matriculating class and combined classes for the matched cohort are presented in Table 3. Also, corresponding statistics for the unmatched cohort are presented in the table. The 121 students in the matched cohort represent 27% of the total participants; 75 were from the entering class in 2002 and 46 from the entering class in 2004. The pattern of changes in mean empathy scores during medical school for students in both classes and for the total matched cohort combined mirrors that of the unmatched cohort. Again, the substantial decline in empathy scores occurred in year 3, yielding an effect size of 0.64 (comparing the mean scores between year 0 and year 3), which is considered practically important.<sup>38</sup> By examining differences in empathy scores between year 0 and year 3, we noticed a decline in empathy among 73% of students in the matched cohort ( $n = 88$ ), indicating that erosion of empathy occurs in the majority of students but not in all of them.

As reported in Table 3, the results of analysis of variance showed that changes in empathy scores during medical school are statistically significant for the matched cohort in both classes and for the combined group. The post hoc mean comparison test confirmed that in all of the analyses reported in Table 3, the significant drop in empathy scores occurs in year 3 of medical school and remains low in year 4. Although decline in empathy in year 3 remained unchanged in year 4 for matriculants entering in 2004 (effect size = 0.05), there is a slight but statistically insignificant increase in mean empathy score in year 4 for

Table 2

#### Changes in Mean Empathy Scores During Four Years in Medical School of 456 Matriculants of Jefferson Medical College in 2002 and 2004, Philadelphia, Pennsylvania

Year	Matriculants of 2002			Matriculants of 2004			All participants		
	No.	Mean	SD	No.	Mean	SD	No.	Mean	SD
0 (orientation day)	227	114.5	10.0	229	115.8	10.0	456	115.1	10.0
End of year 1	198	114.9	10.9	201	116.2	116.2	399	115.5	11.1
End of year 2	208	115.2	11.4	167	115.0	115.0	375	115.1	11.0
End of year 3	154	108.5	11.4	185	109.6	109.6	339	109.1	11.8
End of year 4	178	109.6	13.2	178	108.5	108.5	356	109.1	14.1

\* Total number of students varies in different years as a result of their voluntary participation.

Table 3

**Changes in Mean Empathy Scores During Four Years in Medical School For the Matched and Unmatched Cohorts in all Five Test Administrations of 456 Matriculants of Jefferson Medical College in 2002 and 2004, Philadelphia, PA\***

Year	Matriculants of 2002 <sup>†</sup> (n = 75)		Matched cohort Matriculants of 2004 <sup>‡</sup> (n = 46)		Total matched cohort <sup>¶</sup> (n = 121)		Unmatched cohort Total (n = 335)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
0 (orientation day)	113.3	9.1	115.8	8.8	114.3	9.0	115.4	10.4
End of year 1	114.7	10.5	117.6	9.8	115.8	10.3	116.5	9.9
End of year 2	114.7	9.1	117.3	8.4	115.7	8.9	114.8	11.7
End of year 3	107.4	11.4	110.3	9.3	108.5	10.7	109.2	12.3
End of year 4	110.3	11.6	110.8	11.3	110.5	11.5	108.5	15.2

\* Data for the "matched cohort" were available for 121 students who identified themselves on the empathy scale in all of the five test administrations. The rest were included in the "unmatched cohort." No statistically significant differences on empathy scores were found between the matched and unmatched cohorts in each of the medical school years. Analyses of variance for repeated-measure design indicated significant differences among mean scores of empathy in different years, and post hoc mean comparison tests indicated that the declines in empathy scores in Year 3 and Year 4 were significantly lower than those in the previous years of medical school.

<sup>†</sup>  $F_{(4,296)} = 14.4; P < .001$ .

<sup>‡</sup>  $F_{(4,179)} = 11.7; P < .001$ .

<sup>¶</sup>  $F_{(4,479)} = 25.5; P < .001$ .

matriculants entering in 2002. This is also reflected in the total matched cohort. Figure 1 shows a graphical presentation of the changes in mean empathy scores for the matched and unmatched cohorts. As shown in the figure, the patterns of changes are very similar in the matched and unmatched cohorts.

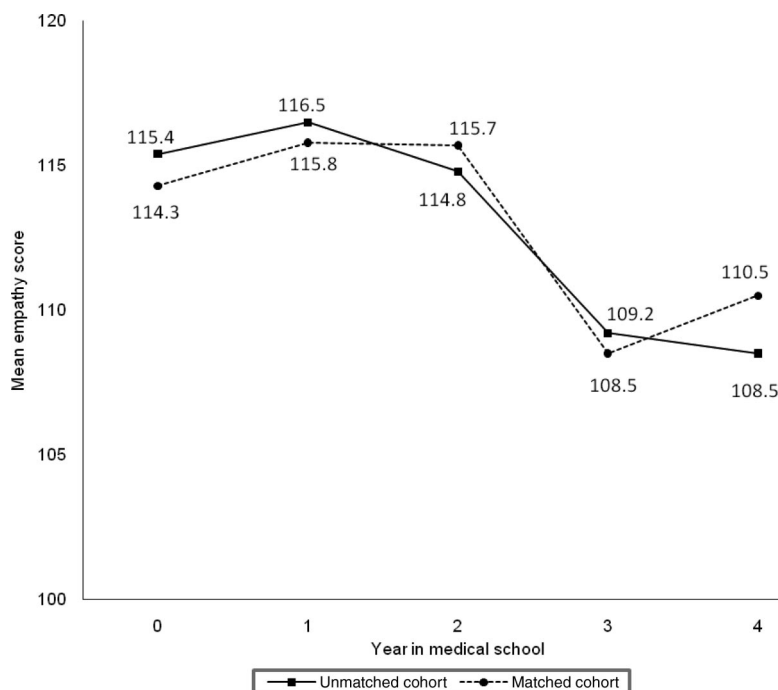
#### Gender differences

We compared changes in empathy scores during medical school for men ( $n = 56$ ) and women ( $n = 65$ ) in the matched cohort. Results are depicted in Figure 2. As shown in the figure, women consistently outscored men in every year

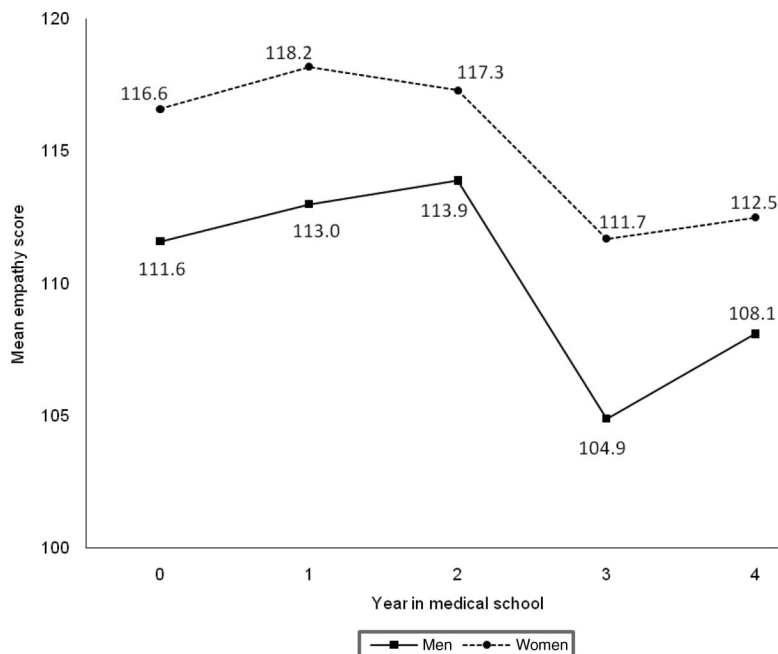
of medical school. Gender differences in all of the test administrations were statistically significant ( $P < .05$ , by  $t$  test). As shown in Figure 2, although the pattern of change in empathy scores for women paralleled that of men, the effect size estimates of these changes varied from a low of 0.37 (in year 2) to a high of 0.79 (in year 3). The effect size of the decline in empathy between year 0 and year 3 was much larger for men ( $d = 0.79$ ) than for women ( $d = 0.56$ ).

#### Differences across specialties

Changes in empathy scores were compared for 85 graduates in the matched cohort who pursued their residency training in "people-oriented" specialties (e.g., family medicine, internal medicine, pediatrics, emergency medicine, psychiatry, obstetrics-gynecology) and 36 who pursued their training in "technology-oriented" specialties (e.g., anesthesiology, pathology, radiology, surgery, orthopedic surgery, etc.). Results appear in Figure 3. As shown in the figure, those who pursued people-oriented specialties consistently scored higher in all years of medical school than did their counterparts who pursued technology-oriented specialties. However, the difference in empathy scores between the two groups became statistically significant starting from year 2 of medical school ( $P < .05$ , by  $t$  test). The effect size estimates of



**Figure 1** Changes in mean Jefferson Scale of Physician Empathy (JSPE) scores in different years of medical school for the matched cohort ( $n = 121$ ), who identified themselves at all five administrations of the JSPE, and the unmatched cohort ( $n = 335$ ) at Jefferson Medical College, Philadelphia, Pennsylvania, 2002–2008.



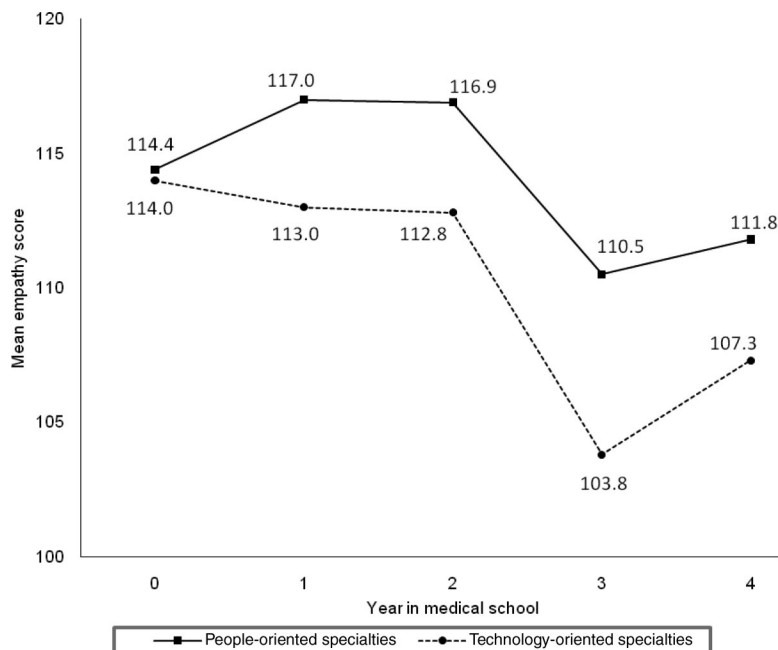
**Figure 2** Changes in mean Jefferson Scale of Physician Empathy (JSPE) scores in different years of medical school for 56 men and 65 women who identified themselves at all five administrations of the JSPE (“matched cohort”) at Jefferson Medical College, Philadelphia, Pennsylvania, 2002–2008.

differences in empathy scores between the two groups varied from a low of 0.05 (in year 0) to a maximum of 0.75 (in year 3). The effect size of the decline in empathy from year 0 to year 3 was more than double for those who chose technology-oriented specialties ( $d = 1.01$ ) compared with their

counterparts in people-oriented specialties ( $d = 0.44$ ).

**Discussion**

The results of this study showed a significant decline in mean empathy



**Figure 3** Changes in mean Jefferson Scale of Physician Empathy (JSPE) scores in different years of medical school for 85 respondents pursuing people-oriented specialties and 36 respondents pursuing technology-oriented specialties who identified themselves at all five administrations of the JSPE (“matched cohort”) at Jefferson Medical College, Philadelphia, Pennsylvania, 2002–2008.

scores in the third year of medical school. The patterns of decline were similar for men and women and for those who pursued their medical training in people-oriented and technology-oriented specialties. Consistent with previous findings, our results showed that women obtained a higher mean empathy score than men,<sup>11,12,40</sup> and those in the people-oriented specialties outscored their counterparts in technology-oriented specialties.<sup>11,40</sup>

It is interesting to note, however, that the magnitude of the decline, measured by the effect size estimates, was larger for men compared with women, and for those who pursued technology-oriented careers compared with their counterparts in people-oriented specialties. The aforementioned findings suggest that those with lower empathy scores at the beginning of medical school (e.g., men and students interested in technology-oriented specialties) lost more empathy during medical school than others with relatively higher empathy scores at the baseline. This pattern of finding suggests that there are “at-risk” medical students who are more vulnerable to losing their sense of empathy.

What happens in the third year of medical school that hardens “the human heart by which we live”<sup>41(p 5)</sup> and generates a noise that obscures the signal of empathic connection? The erosion of empathy in medical school can be attributed to several factors, including lack of role models, a high volume of materials to learn, time pressure, and patient and environmental factors. In addition, students’ gradual overreliance on computer-based diagnostic and therapeutic technology limits their vision for the importance of human interactions in patient encounters. Changes in the market-driven health care system that have a ripple effect on medical education, combined with the belief that a controlled clinical trial is the royal road to advances in medicine, can also lead to a false idea that empathy is outside the realm of evidence-based medicine and, thus, has no importance in the education of physicians-in-training or in the practice of medicine.

In addition, modern medical education promotes physicians’ emotional detachment, affective distance, and clinical neutrality<sup>42–44</sup> as emphasized through a focus on the science of

medicine and a benign neglect of the art of patient care. Students can easily misinterpret these lessons as an endorsement of avoiding interpersonal engagement in patient care. Thus, this educational approach contributes to an erosion of empathy among medical students, residents, and practicing physicians. Lack of role models,<sup>45,46</sup> an intimidating educational environment, negative educational experiences,<sup>47,48</sup> partial sleep deprivation,<sup>49</sup> and perception of “belittlement and harassment” in medical school<sup>50</sup> have also been described as factors contributing to the atrophy of compassion among physicians-in-training.

Although these unfavorable factors can influence a great majority of medical students, our findings that empathy did not decline for some students (a minority of 27%) suggest that there may be certain protective factors that defuse the harmful influences. Further research is needed to investigate the protective factors that neutralize the erosion of empathy.

When analyzing the content of students’ responses to the open-ended question asking about experiences that altered their views on the patient–physician relationship, we found several common themes. Students noted that the behavior of their superiors affected their own experiences: “At an affiliated hospital ... a particular attending is notorious for vulgar humor and unprofessional attitudes. So many times he made my jaw drop by the comments,” and “resident and attending negative attitudes set the style in which we will act.” Another student reflected that “we are always being reminded to keep a professional distance, but some doctors take it too far.” Such comments reflect the negative impact of inappropriate role models. The effect of inappropriate role models, however, is not negative for all students. For example, a student wrote, “I learn [what to do] from ‘good’ docs and I learn what not to do from ‘bad’ ones!”

In addition, patient-care realities, such as overly demanding patients, lack of appreciation, malpractice issues, restrictions on caregivers’ autonomy imposed by hospital guidelines, and insurance regulation, contribute to fading enthusiasm in some, but not all, medical students. For example, one student recalled “a patient who was very difficult ... was very bitter and verbally abusive to

the hospital staff.” Further, “It is difficult to have empathy for people who don’t take care of themselves.” One participant recalled “a trauma patient who gladly told us he’s living off compensation money he was granted in a medical malpractice case.” As another student stated, “I’m convinced it’s easier to be a doctor in rural third world countries, without all the malpractice, insurance, and reimbursement worries of the USA.” It is difficult to maintain an empathetic patient–physician relationship when “attendings have repeatedly said medicine is business.”

Fear of making mistakes, a demanding curriculum, time pressure, sleep loss, and a hostile environment have all been described by some students as factors that changed their views about patient–physician relationships. As one student wrote, “I have felt overwhelmingly tired and unempathetic at times—It is the feeling where, upon walking into a patient’s room, I am thinking more about getting through the encounter expeditiously than about making a connection with the patient. AND, I have always considered myself an empathetic person.” One student illustrated the point facetiously: “I am too sleepy to render a sufficient answer” while another revealed that “it is hard to care 100% about some patients’ stories when you are tired and have a ton of people to see.” Simply put, “I think having too little time and being too busy destroys empathy.” Further, “It is difficult to walk in every patient’s shoes when you see so many patients in such a short time frame.” Stressful training and practice environments place heavy, unrealistic demands on many students. “I think that physicians today are under so much external pressure—liability, insurance, etc.—that the patient becomes secondary.” Reflecting on the nature of the training environment, one student stated, “I was constantly reminded of the hierarchy of medicine and how it was not the student’s job to speak up even if in defense of patients’ best interest. The bureaucratic side of medicine overshadowed the human, empathic side.” When students perceive from their training experiences that the “humanistic side of medicine is too soft and a waste of time . . . I worry that over time I will be ‘molded by the system’ into this idea.”

It is interesting to note that such decline in empathy was not observed in cross-sectional studies of medical students in Japan<sup>23</sup> or Korea<sup>24</sup> (both studies used the JSPE). The inconsistent cross-cultural findings can be explained by cultural factors, curricular differences, educational experiences, role models, caregivers’ autonomy, hospital guidelines, health insurance regulations, and the tradition of the patient’s utmost respect for the physician.

It is important to note that our findings may be limited by the fact that our study sample was from one private medical school, and the matched cohort represented only 27% of the total cohort. These limitations, however, are somewhat mitigated by the fact that our medical school is similar to other large private medical schools in the United States in regard to its four-year curriculum, composition of student body, attrition rate, and career choices.

In addition, our findings that changes in mean empathy scores for the matched cohort mirrored those for the rest of the cohort suggest that the statistically significant results found in the matched cohort can be applicable to the total study participants as well. Of course, generalization of our findings can be enhanced by replicating this study in other medical schools in the United States and abroad.

## Conclusions

The escalation of cynicism and atrophy of idealism has long been recognized as part of students’ socialization in medical school and their adaptation to a professional role.<sup>51</sup> This downward trend has also been observed in the ethical erosion of medical students during their clinical training.<sup>52</sup> Hafferty<sup>53(p 18)</sup> described this transformation as a form of “socialized amnesia” in which some medical students unwittingly acquire the unempathic quality they pledge not to adopt in the Socratic Oath. The unfortunate trend of the erosion of empathy in medical students reminds us of a gloomy remark by Novak<sup>54</sup> that empathy in medical education often fades away like an endangered species. To prevent extinction of this valuable human quality, we need to make profound changes in medical education by developing targeted educational programs at the



undergraduate, graduate, and continuing medical education levels.

There are different approaches that can be implemented in medical schools to retain and enhance empathy. For example, the following 10 approaches have been described<sup>55</sup> to enhance empathy in medical education: improving interpersonal skills, analyzing audio- or video-taped encounters with patients, being exposed to role models, role-playing (aging game), shadowing a patient (patient navigator), experiencing hospitalization, studying literature and the arts, improving narrative skills, watching theatrical performances, and engaging in the Balint method of small-group discussion. It is also important to pay attention to the importance of role models, patients, and the environment in which care is given. Students should be reminded of the effect of these extrinsic factors on the quality of care they will render to their patients. Sometimes simple interventions such as not exposing students to disrespectful patients at the beginning of their clinical training could be helpful in retaining students' empathic orientation toward patient care.

Profound changes to enhance empathy during medical education should be considered by leaders in medical education as a mandate, not an option, if the public is to be served in the best possible manner.<sup>55</sup> Most of us in medical education advocate empathy, but the effect of simply advocating empathy without embracing it and living with it, and without implementing targeted programs to enhance it, is analogous to singing a lovely song only in one's own mind without others ever enjoying it!<sup>55</sup> Tangible changes in medical education outcomes can be made by actual implementation of targeted programs, not by simply advocating good ideas.

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