

# Medical Students' Attitudes in a PBL Curriculum: Trust, Altruism, and Cynicism

W. Patrick Roche III, MD, Allison P. Scheetz, MD, Francis C. Dane, PhD,  
David C. Parish, MD, MPH, and James T. O'Shea

## ABSTRACT

**Purpose.** Studies have shown that medical students become more cynical and less altruistic as they advance in training. However, these studies were conducted in traditional medical schools, and many used unvalidated tools. This study examined students' attitudes in a problem-based learning (PBL) curriculum using reliable and valid measures.

**Method.** Medical students and PGY-1 residents at Mercer University School of Medicine in Macon, Georgia, completed Wrightsman's Philosophies of Human Natures Scale (PHNS) in 1999 and 2000. Chronbach's alpha assessed internal reliability among subscales, and test-retest reliability coefficients confirmed acceptable reliability. For 114 students who completed both surveys, changes in PHNS scores were analyzed, with particular attention to the subscales of trustworthiness, altruism, and cynicism.

**Results.** Students assessed at the beginning of their

second year increased the extent to which they believed people are trustworthy and increased their beliefs in how altruistic people are. They also showed a significant decrease in cynicism. There was not a significant change in trustworthiness, altruism, or cynicism among the participants beyond first year. In general, female students held less cynical views about others and believed people to be more trustworthy.

**Conclusions.** Contrary to prior reports, this study found that more advanced trainees were not more cynical or less altruistic than their more junior counterparts. Indeed, a significant and positive change of attitudes among the participants during their first year of medical school refuted earlier reports. Thus, results of earlier studies and the effect of a PBL curriculum on attitudes of medical students need to be re-examined. *Acad. Med.* 2003;78:398-402.

Medicine is based on interactions between people. Good practitioners

*Dr. Roche is associate professor, Department of Family Medicine, Dr. Scheetz is associate professor, Department of Internal Medicine, Dr. Parish is professor, Department of Internal Medicine, and Mr. O'Shea is research analyst in the Department of Internal Medicine; all are at Mercer University School of Medicine, Macon, Georgia. Dr. Dane, who was professor, Department of Psychology, Mercer University, at the time of this study, is currently Finkbeiner Chair of Ethics, Saginaw Valley State University, University Center, Michigan.*

*Correspondence and requests for reprints should be addressed to Dr. Roche, Mercer University School of Medicine, Department of Family Medicine, 1550 College Street, Macon, GA 31207; telephone: (478) 301-5359; fax: (478) 301-2045; e-mail: (roche\_wp@mercer.edu).*

need to like people and want to help people. Other desirable characteristics include altruism and trustworthiness. In the first report of the Medical School Objectives Project published by the Association of American Medical Colleges, medical educators agreed that physicians should be altruistic and that altruism "must . . . underpin ethical and beneficent medical care."<sup>1</sup> However, during medical education, students go through a maturational process that some claim undermines any idealism they may have had upon entering.<sup>2</sup> Clinical training exposes students and residents to tremendous stresses: volumes of information, a cli-

mate of uncertainty, increasing levels of responsibility, intense competition that may foster noncooperation, and patient problems that cannot be solved because of social limits. Amidst this atmosphere, trainees go through a change that has been called "traumatic de-idealization."<sup>3</sup> In this setting, maintaining desirable physician character traits seems difficult. In fact, some educators note that students who enter medical school with compassion and altruism become more cynical. Over 40 years ago, Eron documented an increase in the "verbal expression of cynical attitudes from the first to the fourth year of medical

school.”<sup>4</sup> Since then, others have made the same empirical observation.<sup>5-7</sup> While not the opposite of altruism, high levels of cynicism are incompatible with altruistic behavior.<sup>8</sup> Surveys of medical students’ attitudes and of how they decline during medical school convinced many educators a generation ago that “traditional medical education . . . even brings about increased cynicism and loss of compassionate attitudes.”<sup>9</sup>

Therefore, in the past 20 years, most schools have made extensive curricular changes. These changes were based on the belief that special teaching programs are capable of changing students’ attitudes in the desired direction. Problem-based learning (PBL) and early introduction to clinical medicine are two such changes. In our school, all students learn the required basic sciences in a series of small-group tutorials—all using PBL. Furthermore, students begin learning clinical skills early in their first year, practicing first with standardized patients and later “coat-tailing” primary care doctors. While these are no longer innovative techniques, they are largely untested in their ability to improve students’ attitudes, or at least to stave off any decline of trust and altruism that might occur in medical school.

The literature suggesting medical students’ attitudes decline, aside from predating many curricular changes in medical education, also has been criticized for flaws in “procedures, scales and inventories.”<sup>10</sup> Most studies published before 1990 used ad hoc scales without established research on reliability or validity. Moreover, they are faulted for improperly following rules of consent. On the other hand, Wrightsman’s Philosophies of Human Nature Scale (PHNS) includes assessments of both cynicism and altruism and has been repeatedly shown to be both reliable and valid.<sup>11</sup> The PHNS also differs from previous measurement instruments used in medical education in that the

items refer to people in general, rather than specifically to individuals in a medical school.

The purpose of our study was to explore, using a validated instrument, whether students’ attitudes changed with respect to trust, altruism, and cynicism, over the course of their medical education in a PBL curriculum. We report here the attitudinal changes from the initial two years of a longitudinal study.

## METHOD

### Study Design

We planned our study after meeting with a focus group of students representing each class in the school. The students were aware that their attitudes were changing and were interested to know how and why. We used a longitudinal, prospective cohort design in which medical students’ classes were surveyed annually during their medical education.

### Study Population

Our study population was 136 women and 103 men either enrolled in or recently graduated (PGY 1) from Mercer University School of Medicine, Macon, Georgia. All students were legal residents of the state of Georgia upon acceptance into our school; some relocated upon graduation. Students are recruited and encouraged to select a primary care specialty, and the school proclaims a mission to educate students who will become doctors in rural or underserved areas of this state. Our school accepts 56 students into each first-year class. Due to failure/repeat performance or matriculation, class sizes vary between 50 and 58 students.

### Procedures

After obtaining approval from our school’s institutional review board, we

surveyed students in each of the four classes enrolled at the school at the beginning of the 1999 and 2000 academic years. Additionally, in 2000, we surveyed graduates at the middle of PGY-1. One of us (either WPR or APS) introduced the students to the survey during the week of orientation. We used a uniform introduction, and each participant provided written consent. Initially in 1999, we encouraged participation by offering lunch or refreshments to each class. In 2000, we offered monetary compensation for repeating the survey, offering 20 dollars for second-time participants. Surveys were collected within one hour of distribution. To ensure confidentiality, all surveys were returned directly to the Department of Psychology. Two of us (JTO and FCD) merged and analyzed the data without allowing collaborators inside the medical school any awareness of which students had or had not participated.

### Instrument

Our survey instrument was the 84-item Philosophies of Human Nature Scale (PHNS), initially developed by Wrightsman. The validity and reliability of the scale have been repeatedly demonstrated in its 25 years of existence, and one of us (FCD) had had extensive experience using the survey. In addition to cynicism and altruism, the PHNS is used to measure trustworthiness, independence, strength of will and rationality, and the complexity and variability of human nature.<sup>8</sup>

Philosophies of human nature are attitudes about people in general—attitudes that emphasize the interpersonal qualities of people. The survey instrument is a series of attitude statements, each representing a commonly held opinion. Respondents indicate the extent of their agreement or disagreement with each statement by scoring a number on a scale from -3 to +3

(-3 = least agreement to +3 = most agreement). Example statements from the survey are (1) Most people would cheat on their income tax if they had a chance (cynicism); and (2) Most people do not hesitate to go out of their way to help someone in trouble (altruism).

### Statistical Analyses

We analyzed the data using standard statistical software. Mixed-model analyses of variance (ANOVAs) were employed. Where appropriate, a further ANOVA was used to test simple effect.

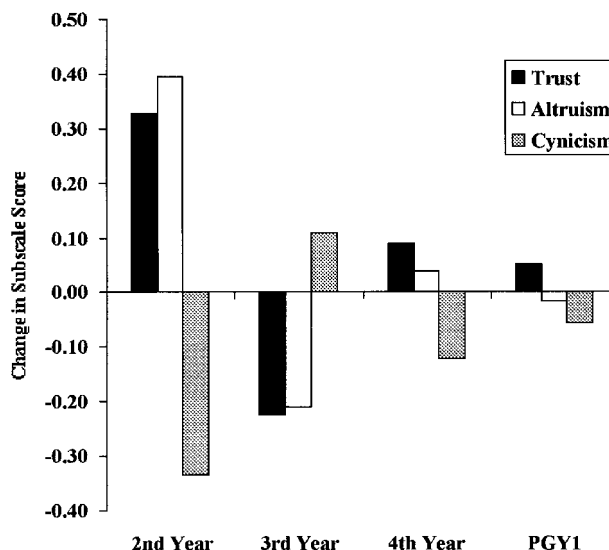
## RESULTS

In general, the participants did not hold particularly strong beliefs on any dimension; mean subscale scores tended to be close to zero (see Figure 1). Our participants were 239 medical school students and PGY-1 residents, of whom 103 (43.1%) were men and 136 (56.9%) were women. As is evident in Table 1, the majority of those who completed the PHNS in 1999 participated in the follow-up administration in 2000.

### Reliability

We used Chronbach's alpha to assess internal reliability for each subscale in each year of administration. In addition, for those who completed both administrations of the PHNS, test-retest reliability coefficients were computed. As is evident in Table 2, all reliability coefficients exceeded customary standards for acceptable reliability (.70). There is no evidence of differential reliability as a function of year of administration.

To investigate cohort effects more fully, a 3 (subscale)  $\times$  3 (status: first, second, and third years)  $\times$  2 (gender)  $\times$  2 (year of administration) ANOVA was completed on PHNS scores.



**Figure 1.** Attitude changes in medical student cohorts in year of training at second administration of the Philosophies of Human Nature Scales, Mercer University School of Medicine, Macon, Georgia, 1999–2000.

(Fourth-year students and PGY-1 residents were excluded from these analyses because of low frequencies for first administration in 2000 for fourth-year students and in both years for PGY-1 residents.) For this purpose, the only effects of interest were those involving year of administration, and none of the effects associated with this variable was significant (largest  $F = 1.49$ ,  $p = .23$ ). Therefore, the students who completed their first administration in 1999 did

not differ from those who completed their first administration in 2000.

### Change in Philosophies of Human Nature

Changes in PHNS scores were analyzed with a 3 (subscale)  $\times$  2 (administration: first versus second)  $\times$  4 (status)  $\times$  2 (gender) ANOVA; only the 114 participants who completed both administrations were included in this

**Table 1**

Participants	Year and Sequence of PHNS Administration	
	1999 First Administration	2000 Second Administration (% of First Administration)
First-year students	35	
Second-year students	42	35 (100)
Third-year students	47	35 (83)
Fourth-year students	27	34 (72)
First-year residents	0	20 (74)
Total	151	124 (82)

Table 2

Reliability Results as a Function of Subscale and Year of Administration of the Philosophies of Human Nature Scale (PHNS) to Medical Students and First-year Residents, Mercer University School of Medicine			
Subscale	1999 Alpha	2000 Alpha	Test-Retest
Trustworthiness	.79	.75	.72
Altruism	.84	.79	.68
Cynicism	.83	.75	.73

analysis. There was no main effect for gender,  $F(1, 106) = 0.38, p = .54$ , but there was a gender  $\times$  subscale interaction,  $F(2, 212) = 6.06, p < .003$ . On average, female students believed people to be significantly more trustworthy ( $p < .04$ :  $mean_F = .37$ ;  $mean_M = .04$ ) and were significantly less cynical about people ( $p < .004$ :  $mean_F = -.6$ ;  $mean_M = -.05$ ) than their male counterparts, but there was no difference in the extents to which female and male students believed people were generally altruistic ( $p > .09$ :  $mean_F = .35$ ;  $mean_M = .08$ ). Although some main effects and two-way interactions among the remaining variables were significant, they were superceded by a significant three-way interaction among subscale, administration, and status,  $F(6, 212) = 3.57, p = .0022$ . This interaction was further analyzed by performing separate one-way, repeated-measures ANOVAs in which subscale was the independent variable and change score (time 2 - time 1) was the dependent variable.

By the beginning of their second year, the students had increased the extent to which they believed people are trustworthy [ $F(1, 31) = 9.04, p = .0052$ ;  $M_1 = -.09, M_2 = .22$ ] and increased their beliefs in how altruistic people are [ $F(1, 31) = 11.94, p = .0016$ ;  $M_1 = -.11, M_2 = .37$ ]. Cynicism also decreased significantly during the first year [ $F(1, 31) = 5.88, p = .0213$ ;  $M_1 = .12, M_2 = -.27$ ].

Compared with their first-year scores, second-year students held significantly more positive philosophies of human nature.

Beliefs of third-year students were not significantly different from those demonstrated at the start of their second year. There was no significant change exhibited for trustworthiness [ $F(1, 31) = 3.17, p = .08$ ;  $M_1 = .32, M_2 = .00$ ], altruism [ $F(1, 32) = 2.47, p = .13$ ;  $M_1 = .38, M_2 = .19$ ], or cynicism [ $F(1, 31) = 0.58, p = .45$ ;  $M_1 = -.48, M_2 = -.27$ ]. Similarly, fourth-year students exhibited no change in trustworthiness [ $F(1, 31) = 0.72, p = .40$ ;  $M_1 = -.03, M_2 = .05$ ], altruism [ $F(1, 32) = 0.13, p = .72$ ;  $M_1 = -.04, M_2 = .05$ ], or cynicism [ $F(1, 31) = 1.30, p = .24$ ;  $M_1 = .00, M_2 = -.08$ ]. The same pattern of no change held for PGY-1 residents: trustworthiness [ $F(1, 31) = 0.12, p = .74$ ;  $M_1 = .51, M_2 = .59$ ], altruism [ $F(1, 31) = 0.01, p = .93$ ;  $M_1 = .48, M_2 = .41$ ], cynicism [ $F(1, 31) = 0.10, p = .75$ ;  $M_1 = -.73, M_2 = -.83$ ].

Thus, the subscale  $\times$  administration  $\times$  status interaction, summarized in Figure 1, occurred because students' philosophies of human nature changed during the first year of medical school only. While the change was positive, subscale scoring was such that views about the trustworthiness and altruistic tendencies of people became more positive but cynical beliefs about people became more negative (less cynical).

## DISCUSSION

Although attitudinal changes have been documented repeatedly in longitudinal studies of medical students, we are not aware of any research inside a strict PBL format. Moreover, many earlier studies have been flawed either by design or by use of an invalid survey instrument. In our prospective cohort study using the PHNS, we found significant changes of students' attitudes after they completed their first year of medical school. After one year in a PBL curriculum, the students had increased feelings that people are trustworthy and altruistic, and a decreased belief about cynicism. Beyond second year, we documented no significant change over time in the students' attitudes. These findings are, of course, different from those in previous studies in which less reliable measures of cynicism were employed.

While we would like to attribute these findings to a PBL curriculum, we recognize our method was different from those used in prior studies of students' attitudes in medical education, and therefore our study may not be comparable. The PHNS measures attitudes in general, attitudes that "seem to be learned early, held widely, and changed with difficulty."<sup>11</sup> Applying this instrument in any school, even one using more traditional methods to educate students, may not show differences in students' attitudes from year to year. Although there have been several recent reports of the negative impact of medical education on humanistic dimensions of doctoring,<sup>2,12,13</sup> whether medical students' feelings about basic human nature change in any curriculum is questionable.

In our study, we concentrated on students' feelings about trustworthiness, altruism, and cynicism. While not measuring students' personal characteristics, the PHNS does show validity in measuring attitudes. In tracking these attitudes for just one year, we

found it interesting that they did not deteriorate over the clinical years of medical school. Even more intriguing, perhaps, is that attitudes among our students improved during the first year. This lessening of cynicism is contrary to opinions expressed in the focus group held before our study was started in 1999, and begs the question of the importance of small-group learning in the development of attitudes of medical students. A 1994–95 survey among medical students from traditional and nontraditional schools in Canada led the authors to conclude that the PBL curriculum “fosters better teacher–student relationships during the pre-clinical years” than the traditional model.<sup>13</sup> Preclinical faculty perceived as supportive of students may have much to do with the acquisition of “caring competence” by those students, and this could explain the improvement of students’ attitudes after the first year in our school.

This positive effect on attitudes during the first year was never erased as the students moved from second to third year, third to fourth year, or fourth year to graduation, a finding that agrees with Peters, who reported the long-term effects of the New Pathway (a PBL curriculum) at Harvard. In this randomized controlled trial, she noted that even almost ten years after graduation, the New Pathway graduates had more humanistic outlooks than did their peers who had gone through the traditional curriculum.<sup>14</sup>

As we have noted, our study population was limited to students and recent graduates of a medical school designed to produce primary care physicians for one Southeastern state. Our student body may be different from others because our school may attract students with more altruistic qualities, in concert with the school’s stated mission. Attitudes might be

significantly different in schools with broader missions. Prior studies have been done in larger schools among students from different regions of the country. Future studies might be conducted at schools with different curricula and missions, and in different geographic areas.

In addition, our findings had a notable gender gap: Women held less cynical views about others and believed people are more trustworthy. Since our participants were 57% female, one could argue the preponderance of women kept a negative trend from showing up, but this was not apparent on multivariate analysis. Dr. Bernard Lown once lamented that the influx of women into medicine did not actually humanize medical care, as once was hoped. He now feels the very converse is happening, as women, competing with a male-dominated order, must “androgenize” to succeed.<sup>15</sup> Our data do not support this opinion, and ongoing surveillance and broader study seem necessary.

We conclude from the present data that more advanced medical students and graduates of our school are not more cynical or less altruistic than their more junior counterparts. Indeed, some significant turn in the positive direction occurred over the first year of our study, during the participants’ first year of medical school. Whether this represents a change in medical students’ attitudes in general, an increase in the proportion of women attending medical school, or a difference produced by the PBL curriculum, however, remains to be seen from later years in our longitudinal study and upon replication of this research at schools without a PBL curriculum.

The authors thank Ms. Jennifer Rayhill for her assistance in preparing the manuscript. Funding for this project was provided through a grant from the Clinical Research Center, Medical Center of Central Georgia, Macon.

## REFERENCES

1. Medical School Objectives Project Writing Group: Learning objectives for medical student education—guidelines for medical schools: Report I. *Acad Med.* 1999;74:13–8.
2. Coulehan J, Williams P. Vanquishing virtue: the impact of medical education. *Acad Med.* 2001;76:598–605.
3. Kay J. Traumatic de-idealization and the future of medicine. *JAMA.* 1990;263:572–3.
4. Eron LD. The effect of medical education on attitudes: a follow-up study. *J Med Educ.* 1958;33:25–33.
5. Christie R, Merton RK. Procedures for the sociological study of the value climate in medical schools. *J Med Educ.* 1958;33:125–53.
6. Gordon LV, Mensh IN. Values of medical students at different levels of training. *J Educ. Psychol.* 1962;53:48–51.
7. Rezler AG. Attitude changes during medical school: a review of the literature. *J Med Educ.* 1974;49:1023–30.
8. Wrightsman LS. Assumptions about Human Nature: A Social–Psychological Approach. 1st ed. Monterey, CA: Brooks/Cole, 1974.
9. Cavazos L. Medical students’ attitudes: whose responsibility? *J Med Educ.* 1983;58:156–7.
10. Kopelman L. Cynicism among medical students. *JAMA.* 1983;250:2006–10.
11. Wrightsman LS. Assumptions about Human Nature: Implications for Researchers and Practitioners. 2nd ed. Newbury Park, CA: Sages, 1992: 11.
12. Maheux B, Beaudoin C, Berkson L, Cote L, Des Marchais J, Jean P. Medical faculty as humanistic physicians and teachers: the perceptions of students at innovative and traditional medical schools. *Med Educ.* 2000;34:630–4.
13. Clever SL, Edwards KA, Feudtner C, Braddock III CH. Ethics and communication: does students’ comfort addressing ethical issues vary by specialty team? *J Gen Intern Med.* 2001;16:559–62.
14. Peters AS, Greenberger-Rosovsky RG, Crowder C, Block SD, Moore GT. Long-term outcomes of the New Pathway program at Harvard Medical School: a randomized controlled trial. *Acad Med.* 2000;75:470–9.
15. Bernard Lown, MD, Professor Emeritus, Cardiology, Harvard University School of Medicine, personal communication with WPR, 1/15/02.