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DETERMINANTS OF STUDENT PREFERENCES  
FOR TEACHING BEHAVIORS IN THE  
AMBULATORY SETTING

A Thesis Submitted to the  
Yale University School of Medicine  
in Partial Fulfillment of the Requirements for the Degree  
of Doctor of Medicine

by

Brian Richard Yablon

2007

## DETERMINANTS OF STUDENT PREFERENCES FOR TEACHING BEHAVIORS IN THE AMBULATORY SETTING.

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The purpose of this research was to examine the influence of demographic and cultural factors on learner preferences for teaching behaviors in the ambulatory internal medicine clerkship. To that end, 50 medical students at each of four US institutions (BU, Tufts, UMass, and Yale) and 50 British medical students at the University of Cambridge were invited to complete a survey on teaching behaviors in the ambulatory setting, evaluating items on two scales: one rating the behavior's importance, and one rating how highly the student recommended the behavior. Behaviors rated highly on both scales were considered "valued" by the student. Students' values of the teaching behaviors were compared by gender, race/ethnicity, age, institution, and country, with 15% maximum difference among groups and p-value <0.05 conferring significant value difference, 10-15% maximum difference with p-value <0.05 "near-significant," and 15% maximum difference with p ≥0.05 deemed "notable."

The aggregate US response rate to the survey was 82%, while the British response rate was 46%. Among four US schools, response rates varied from 64% to 98%. Significant differences were seen among groups of medical students in their values of ambulatory teaching behaviors, and distinct patterns emerged for gender, race, age, school, and country. Female students valued patient communication behaviors more than male students. Under-represented minority students valued orientation to the practice, patient care responsibility, and comfortable learning environment more than did white and Asian students. Older students valued give-and-take discussion with preceptors more than did younger students. Among the 4 medical schools, Yale students most valued a preceptor who delegated responsibility for patient care and responded to student needs, and least valued a preceptor who asked the student's probing questions. UMass students most valued patient autonomy. British medical students were less interested in functioning independently and more interested in being observed than the American students, and also placed less value on patient privacy.

Differences among student groups raise important questions about causes and consequences of these discordant values in the ambulatory setting. The variability among medical schools and between countries provides novel evidence for limits in the applicability of single-institution studies, thus suggesting a new methodological standard for the community of medical education researchers.

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To my patients—may I honor your dignity and serve you well, and may you keep me humble.

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**Introduction:***The Ambulatory Setting*

The ambulatory care setting has been a cornerstone of clinical training for hundreds of years, throughout the various incarnations of medical education. In fact, so essential to the training of future physicians did Abraham Flexner conclude was this environment that he declared “a school without a good clinic...suffers from a fatal organic lesion.”[1] Although hospital-based clerkships predominated in the second half of the 20<sup>th</sup> century, there has been a resurgence of interest in outpatient education for medical students.[2] Education in the ambulatory setting is centered around effective and efficient patient care, and it is inextricably linked to the relationship between preceptor and student.[2] Because of the prominence of this one-on-one dynamic, which contrasts both with the pre-clinical years and the inpatient wards, conventional teaching modalities are not necessarily applicable in the ambulatory environment.[3]

Compared with the inpatient wards, the flow of work in the ambulatory clinic is incredibly fast-paced. The time pressures of the ambulatory environment have a very real impact on teaching methods that has been explored in some depth. One of the goals of research in ambulatory education has been to improve the efficiency of teaching encounters in order to work within a limited timeframe. To that end, previous investigators created a five-step model of “microskills” for ambulatory teaching of residents, specifically designed to keep the teaching encounter to 5 minutes or less.[4] This model has been transplanted to medical students as well. A preceptor using the microskills method must first “get a commitment” to a diagnosis from the student, and then “probe for supporting evidence” with non-threatening, open-ended questions that

facilitate thinking out loud. In synthesizing explanations, the preceptor ought to “teach general rules” rather than focus on minutiae, and he or she should “reinforce what was done right” in the encounter before finally “correct[ing] mistakes” that may have been made.[4] Other teaching strategies have incorporated similar themes, and the most common methods distilled from the literature are: “orienting the learner, prioritizing learning needs, problem-oriented learning, priming, pattern recognition, teaching in the patient’s presence, limiting teaching points, reflective modeling, questioning, feedback, and teacher/learner reflection.”[5] A central drive in promoting such strategies is to equip faculty members with an arsenal of teaching methods to use in virtually any scenario, including even a “one-minute preceptor” encounter.[6]

Training preceptors to use these methods with their medical students has had both successes and limitations. In the absence of faculty development, most physicians are not “born teachers,” and they often are unsure of themselves in teaching encounters, falling back on methods they themselves disdained a generation before.[7] For example, many investigators have found a dearth of feedback from preceptors to students during the course of ambulatory rotations.[6, 8, 9] While this may partially be due to time constraints, another concerning cause of lack of feedback is the fact that faculty are not directly observing students’ clinical skills to an adequate degree.[10] A three-part faculty development seminar was demonstrated to improve the delivery of specific, rather than blanket, feedback to students, and also to increase the use of microskill techniques, particularly reinforcing what the student did well; perhaps unexpectedly, the seminar also resulted in increased rates of negative feedback to students.[6] Surprisingly, the students’ perceptions of their preceptors’ teaching were completely unaffected by the seminar, as

ratings were equally high before and after the faculty development course.[6] Another study found that after a three-workshop course aimed at promoting thinking in the outpatient setting, preceptors increasingly used behaviors that promoted thinking and learners employed higher order reasoning during encounters.[11] Two problems have arisen in many of these studies. The first is that the changes in faculty behavior are often very small, especially compared with the investment in development. The second is that even when improvement in teaching occurs after an intervention, its staying power has not been demonstrated. In light of these deficiencies, Holmboe observed that “brief faculty interventions without periodic reinforcement will not produce meaningful changes.”[10]

A fundamental limitation inherent in the teaching methods explored, and one recognized by the authors of the “microskills” approach, is that they do not take into account the psychological dynamic at play between the preceptor and the student.[4] An approach that places students on the same level as preceptors, or even on a higher plane, is called “learner-centered” education.[12] This type of educational philosophy represents a shift in metaphors from learning as a type of transmission from teacher to student to a dialogue between students and teachers.[13] As such, students are not mere empty vessels waiting to be filled with knowledge and skills, but the active and central participants in their own education.[3] While such a philosophy is not new by any means, its application to the field of medical education, a system steeped in tradition and hierarchy, is fairly novel. A group of medical education researchers at Case Western Reserve University developed a learner-centered model (SNAPPS) for students in outpatient clinics to use when they present cases to their preceptors. This model

encourages the student, after presenting a brief history and physical and analyzing a short differential diagnosis, to probe the preceptor about any questions he or she has before moving on to the management plan. At the end of the presentation, the student selects a topic related to the case for self-directed learning.[14] This learner-centered model was well received by students, who felt empowered and more capable when using it, as well as by preceptors, who were appreciative of the students' interesting questions and relieved to be in the role of facilitator instead of instructor.[14] A similar learner-centered approach was elaborated by a group of investigators who coined the term "microskills for students," and devised twelve such techniques that would help students be partners in the educational process by setting the agenda in ambulatory encounters, elucidating their learning goals, questioning their preceptors, and soliciting feedback.[15] Increased respect for the students' role in their own education is an important step, and one that necessitates "learner development" as an adjunct to faculty development in order to optimize educational encounters.

Overall, much has been learned from the learners in the ambulatory setting. In a study on the content of clinical teaching, conducted in the ambulatory clinic at Walter Reed Army Medical Center, the investigators surveyed students and interns immediately after learning encounters, and found that the learners most valued discussions of diagnosis and general management. The most frequent suggestion for improvement in learning encounters was "more time," although nearly half of the learners had no suggestions for improvement.[16] With regard to the practice environment, a survey of students participating in the ambulatory medicine clerkship at the Yale University School of Medicine found that students preferred the teaching in general internal medicine

practices to that in subspecialty practices. The same students most valued effective and available teachers, as well as the opportunity to independently evaluate a large and varied group of patients and to maintain continuity of care for those patients.[17] These findings were reproduced by investigators who surveyed all final year medical students and residents at all five medical schools in Ontario.[18] In terms of assessing differences between types of practice sites, particularly academic versus community practices, an extensive study of students completing an 8-week ambulatory clerkship in family medicine at Dartmouth Medical School found that students reported receiving more teaching at academic sites, although they reported performing more procedures and feeling more clinically competent at community-based practices.[19] As an overall assessment of student site preferences, Kernan and colleagues found, in unpublished data from a survey of students at four northeast medical schools, that students expressed significantly greater satisfaction with their ambulatory experiences in community based practices, solo practices, and staff model HMOs than they did in hospital clinics, although students generally gave high ratings to all sites.

Student preferences with regard to specific teaching behaviors of preceptors have also been examined. Most studies have confirmed the high value that students place on specific, timely feedback.[2, 8, 16, 17, 20] Many have also found that students want to be oriented to their sites early in the rotation and given a fair degree of autonomy in patient care.[2, 17, 18] On the other end of the spectrum, several studies have found that students are uncomfortable with the idea of presenting their findings or having their knowledge probed in front of patients.[2, 17, 18, 20] Although a reductive approach to teaching behaviors can provide much information, it is important to note the results of

one study, that even in the absence of most valued teaching behaviors, students still expressed that they were “very satisfied” with their preceptor encounters.[21] The patterns of preceptor behaviors that students do and do not value are difficult to generalize, and while many schemes have been attempted, a common theme seems to be the ability of the teacher and learner to form an effective mentoring relationship.

The ambulatory setting is modern medicine’s closest approximation to the apprenticeship model, and ideally it provides an opportunity for good mentorship.[2] A series of interviews conducted at the University of Sydney with students and preceptors after a two week general practice attachment found that students and GPs both perceived attitude towards patients to be the most important attribute of the GP’s behavior as a role model.[22] Based on this ethnographic research, “attitudes, approaches, and values” of the preceptor were highly influential for students.[22] These often intangible entities help to constitute the powerful hidden curriculum of medical school. The content of this curriculum is highly idiosyncratic, but it is intuitive that students will value different teaching and mentoring experiences based on the sum of life experiences that have shaped them. The interactions of students with their environment are of great importance to learner-centered education.

There is limited research on the interaction of educational and social culture in the ambulatory setting. Most of the existing research into student characteristics has examined the role of gender, but far less has looked at student race or student age. As most education research has examined aggregate data, there is the potential for inadvertently diluting the perspectives of different groups of students, most notably under-represented minorities and older students who have had diverse experiences

between undergraduate college and medical school. If these differences exist, and there is ample reason to believe that students' backgrounds will influence their values and expectations, they will go undetected in a "one size fits all" analysis.[23]

### *Women and Minorities in Medicine*

In many ways, trends in medical education mirror those in society at large. A particularly interesting facet of the relationship between society and medical education is the change in medical student demographics, and the question of whether this shift has influenced medical training. Medical schools are no longer comprised of the homogeneous white male student population of half a century past, and even faculty demographics have evolved to an extent, but there is by no means proportional representation of all groups.[24] The applicant pool for medical schools diversified from 1974 to 1999, for example, with a substantial rise in the proportion of women and Asian/Pacific Islander applicants; however, the number of underrepresented minority men—African-American, Mexican-American, Puerto Rican, Native American, Alaska Native—applying during the same time period dropped by 18%. [24] In fact, almost all of the increase in medical school enrollment of underrepresented minority students occurred between the 1950s and the 1970s, with minimal gains since.[25] Even at first glance, then, just as in society at large, it is evident that there remain disparities in representation, opportunities, and experiences among groups of medical students.

Substantial as they are, inequities in student representation pale in comparison to faculty demographics. Women are under-represented at all ranks of medical school faculty, and this is not attributable merely to lag time or pipeline effect, as evidenced by the fact that there was approximately the same representation of women among full

professors in 1998 as in 1978—10.5% versus 7%.<sup>[26]</sup> Ash et al found in a survey of 24 randomly selected medical schools that female faculty were not promoted as often as male colleagues; moreover, compensation for women was lower than that for men at each academic rank, and this gap widened with increasing seniority.<sup>[26]</sup> A study of the University of Arizona medical faculty confirmed these discrepancies, and had the added strength of using official salary data rather than self-reports.<sup>[27]</sup> Both of these studies showed a substantial gender gap after adjusting for possible confounders such as productivity and full-time versus part-time status.<sup>[26, 27]</sup> For racial and ethnic minorities, the same pattern emerges, with under-represented minorities comprising just 3% of medical school faculty compared with 22% of the U.S. population in 1996.<sup>[28, 29]</sup> When accounting for the fact that 40% of minority faculty work for 10% of the medical schools, the disparity becomes even starker.<sup>[28, 30]</sup> Like women, minorities are less likely to advance in the academic ranks even after adjusting for first authorship and NIH funding, and they spend a significantly longer time at assistant and associate professor levels before promotion when historically black medical schools are excluded from the analysis.<sup>[31]</sup> One 1989 study showed a 3 to 7 year lag in promotion from assistant to associate professor among under-represented minorities.<sup>[30]</sup>

Outside of the academic realm, medical careers of women and minority physicians in the U.S. are also significantly different from those of men and white physicians, respectively. According to the most recent GME census figures, women currently represent 76% of the obstetrics and gynecology residents and over 70% of the pediatrics residents in the U.S., but less than 30% of radiology and general surgery residents and less than 20% of plastic surgery, orthopedic surgery, and urology

residents.[32] The same census revealed similar discrepancies in the specialty choices of African-American and Hispanic residents, who were comparatively more likely than white residents to choose family practice and obstetrics and gynecology, but were significantly less represented in radiology, dermatology, and ophthalmology.[32]

A fascinating study at a single medical school highlights differences in practice patterns between African-American and white physicians while unearthing more disturbing and thought-provoking issues. Gartland and colleagues sent a questionnaire to all active African-American graduates of Jefferson Medical College since 1960, as well as to a gender and board-score-matched cohort of white classmates.[33] Practice patterns of the two groups of physicians were significantly different in terms of the populations they served, with African-American physicians three times more likely to practice in a socio-economically deprived area and four times more likely to practice in a physician shortage area.[33] In short, under-represented groups of physicians were far more likely to care for under-served groups of patients. The study delved further, though, looking into the medical school experiences of the physicians surveyed. The African-American physicians reported significantly greater dissatisfaction with the medical school social environment, including time spent as a student and interactions with faculty and administration, than their white classmates; this was despite equal satisfaction with the quality of their medical education, their careers, and their professional achievements.[33] Finally, the African-American and white physicians were equally inclined to recommend their medical school to prospective white and Asian students, but the African-American physicians were less inclined than white colleagues to recommend their medical school to prospective African-American or Hispanic students.[33]

Why are these data significant? There is a powerful and growing body of research demonstrating that the experience during all stages of training and practice of women and minority medical students and physicians is appreciably different from that of their white male counterparts. Women medical students report experiences on the wards of lacking mentors, being stereotyped or pigeonholed into interest in obstetrics and gynecology or pediatrics, and being mistaken for nurses by patients.[34] Perhaps unsurprisingly, the experiences of minority physicians are even more disheartening, as best revealed by a recent study. Nunez-Smith and colleagues conducted a series of interviews with 25 physicians of African descent in a variety of different fields and practice types in the six New England states.[35, 36] The greatest strength of this study is the depth and power of the anecdotes and impressions shared by the interviewees, experiences which cannot be nearly as effectively conveyed by paraphrasing or summary. By and large, the participating physicians lacked good mentors, felt “devalued and isolated, held to different performance standards, and cast into race-defined roles.”[36]

The researchers characterized five recurrent themes that pervaded the interviews:

“1) awareness of race permeates the experience of physicians of African descent in the health care workplace; 2) race-related experiences shape interpersonal interactions and define the institutional climate; 3) responses to perceived racism at work vary along a spectrum from minimization to confrontation; 4) the health care workplace is often silent on issues of race; and 5) these experiences can result in...‘racial fatigue,’ with personal and professional consequences for physicians.”[36]

When explaining why these issues have gone unaddressed, one family practitioner lamented that “society [has] figured out ways to systematically deny that racism exists. And that structure is in the medical institutions that train us. There is no way to have a discussion about it because it has been decided that it doesn’t exist.”[36]

The far-reaching disparities documented among women and minority physicians raise several important questions. The essential questions regarding the societal conditions that affect education from early childhood until medical school enrollment among different groups of students are beyond the scope of this paper, as is the question of society's obligation to address these conditions. Given the inequities detailed above, though, the role of medical schools in shaping these patterns and responding to them is indeed a critical issue, and one that medical education researchers can and should tackle in a variety of contexts.

In the ambulatory environment, effects of gender have been studied by several investigators. A large cross-sectional survey of all the medical schools in Ontario showed that for most preceptor behaviors and site characteristics in the ambulatory setting, female students ranked them more important for learning than did male students, although the overall rank order of behaviors and characteristics was approximately the same across gender groups.[20] Several interesting studies have looked at gender-specific interactions between preceptors and students. In a community-based family medicine rotation at Dartmouth Medical School, the content of patient-centered teaching was different depending on whether the preceptor and student were both male, both female, or mixed gender.[37] Specifically, female students were more likely to observe a male preceptor taking a history or performing a physical exam than any other gender combination. Female-female preceptor-student pairs were more likely to perform a gynecologic exam for a female patient than any other gender combination, while male-male pairs were more likely to perform a cardiovascular exam. Further, with regard to feedback, female preceptors were much more likely to give feedback on skills to male

students than they were to female students, while male preceptors gave roughly equal amounts of feedback to both groups.[37] A study at a different institution found that female preceptors were more likely to give negative feedback to female students than to male students about their clinical skills, although its main conclusion was that most students generally receive very limited feedback.[38] Finally, a study at the Medical College of Wisconsin found that while the mean ambulatory clerkship grade for students in male-male and female-female pairs was the same, female students received significantly higher clerkship grades from male preceptors than male students did from female preceptors.[9] There has been only limited published research on the different attitudes and values of male and female students in the ambulatory setting, and no published research comparing the attitudes and values of majority and under-represented minority students in the ambulatory setting. It is important to study these potential differences because they may reveal previously unexplored assumptions in the education of students in the ambulatory setting.

### *Older Students in Medicine*

Minorities are not only ethnic and racial. Older students, who have had diverse career and life experiences prior to medical school, comprise a small but increasing portion of medical students in the United States.[39, 40] The percentage of medical school students at least 30 years of age at graduation increased from 19.8% in 1985 to 22.3% in 1995.[40] A national survey of primary care physicians looked at differences between older and younger medical graduates in their reasons for choosing careers.[40] Interestingly, the older students had decided earlier than the younger students that they were interested in being primary care providers, and the medical school socialization

process had less influence on their career decisions than those of the younger students.

These surveys seem to suggest a difference in attitudes and values between younger and older students.

A study at the University of Colorado administered a survey questionnaire to assess the attitudes and values of medical students, and divided the respondents into those under 30 years of age and those at least 30 years of age. The older students were significantly more likely to write responses to the open-ended questions on the survey, and their comments were substantially longer and more detailed than those of the younger students. They were more likely to feel that their lives before medical school had helped prepare them to be good doctors, and they had more investment in being “active learners.” Unfortunately, they were also more likely to feel disrespected on the wards by resident and attending physicians than their younger classmates. This interpersonal dynamic was predominantly noted in the inpatient and not the outpatient setting.[39] A study of the differences in values placed on teaching behaviors in the ambulatory environment between younger and older students has not yet been published, nor has replication of the University of Colorado data been attempted at other institutions.

#### *Institutional and Transnational Differences in Medicine*

There has been a predominance of single-institution studies in the medical education literature.[41] This has been particularly true in studies of the ambulatory setting, where research has almost entirely been conducted at one institution without replication at another.[42] To what extent the data from one institution can be applied to the curriculum of another is unclear, and is an issue that certainly merits further exploration. For example, in the cross-sectional Canadian survey discussed earlier,

students at one school (the University of Toronto) valued most preceptor behaviors and site characteristics more than the students at the rest of the Ontario schools. Although a couple of reasons for this difference were postulated, the extent to which uniformity or heterogeneity prevails among medical schools in terms of student attitudes and values is far from clear. Additionally, the current literature in mainstream medical education journals is rich with research from many different countries, including articles from the United States, Canada, Australia, and the United Kingdom that have already been cited in this introduction. The influence of the different educational systems and student populations in these countries, prior to and including medical school, on student values and expectations has not been studied to our knowledge.

**Purpose:**

The primary aim of this research is to shed light on the influence of demographic and cultural factors on learner preferences in order to improve learner-centered education in the ambulatory clerkship. A secondary aim is to compare these learner preferences across different United States medical schools, as well as between U.S. medical students and their counterparts in the United Kingdom. It was hypothesized that there would be notable differences among these subgroups in their values of teaching behaviors in the ambulatory setting based on personal, social, and cultural factors.

**Methods:**

This work is a continuation of survey research of third-year medical students and faculty preceptors in ambulatory internal medicine clerkships done by Kernan and colleagues over the last decade.[2, 17, 18, 21] Here follows a synopsis of their foundational work and methods. The researchers initially convened focus groups at three

New England medical schools between 1996 and 1998 in order to generate a comprehensive list of teaching behaviors valued by students. 94 behaviors were identified, of which 51 were recommended and rated as important by at least 75% of students and thus deemed “valued” by a pre-specified criterion.[18] Subsequently (from 1997 to 2000), a total of 22 faculty preceptors from four New England medical schools—Boston University (BU), Tufts University, University of Massachusetts (UMass), and Yale University—participated in seven small focus groups until an exhaustive list of teaching behaviors was generated. All investigators read the focus group transcripts and agreed on this final list, which incorporated 21 teaching behaviors not included on the students’ comprehensive list.[2]

In order to minimize redundancy, improve specificity, and create a mix of valued and non-valued behaviors, the 21 additional faculty-generated behaviors were added to a thinned list of 37 behaviors generated by the students to create a 58-item survey. The preceptor behaviors were grouped into 7 sections by general domain—“orientation” (6 behaviors), “creating a favorable learning environment” (8 behaviors), “overseeing the student’s experience” (4 behaviors), “orchestrating student-patient interactions” (6 behaviors), “teaching clinical skills” (18 behaviors), “teaching knowledge” (9 behaviors), and “feedback” (7 behaviors). These domains had been agreed upon by the consensus of study investigators during their foundational work.[18] The survey items were rated on two separate 5-category Likert scales. The first scale evaluated whether the respondent recommended preceptors use the behavior, with the following response choices: “yes, strongly,” “yes, somewhat,” “not sure,” “no, somewhat,” “no, strongly.” The second scale evaluated the importance of each behavior to the respondent, with the following

response choices: “extremely important,” “very important,” “somewhat important,” “not very important,” “not at all important.” A behavior was “valued” if a respondent both recommended its use and deemed it important; thus, a behavior was “valued” if and only if it was recommended “strongly” or “somewhat” and rated “extremely” or “very” important on both Likert scales. This method was used in order to be consistent and to facilitate comparisons with the investigators’ previous work.[2]

In 2002-2003, a group of 200 students and 200 faculty preceptors at the four New England medical schools detailed above were invited to complete the survey, which appears in Appendix A. Additionally, 50 students and 50 faculty preceptors from the University of Cambridge in the United Kingdom were also invited to complete the survey. The initial survey data were analyzed for concordance between the group of students and the group of preceptors among the U.S. respondents, but a subgroup analysis was not undertaken at that time.[2] All phases of the research were approved by Human Investigation Committees at each participating institution.

### **Data Analysis:**

To examine the effect of student characteristics on the valuation of specific teaching behaviors, my work stratified the survey data exclusively for the U.S. medical students according to student gender, race/ethnicity, age, and medical school, and then compared the aggregate U.S. medical student responses with those of British medical students at the University of Cambridge. For each of the 58 survey items, the percent of students in each subgroup valuing the behavior was compared—male vs. female, white vs. Asian vs. under-represented minority (URM), age 26 years or less vs. age 27 years or older, BU vs. Tufts vs. UMass vs. Yale, and American schools vs. the British school.

The subgroups were chosen based on the following criteria beyond the reasons elaborated in the introduction. Gender divisions are self-explanatory, and the group of students was fairly evenly divided between men and women. For race/ethnicity, under-represented minorities included African-American (“Black” in the original survey question) and Hispanic students; there were no American Indian/Alaskan Native students among the survey respondents. Hispanic students were not sub-categorized into under-represented (e.g. Mexican) and proportionally represented (e.g. Cuban) groups because these data were not available in the original survey. Students who designated their background as “other” or “mixed” were not included in the analysis. Asian-American students were removed from the under-represented minority respondents for three reasons—(1) they have traditionally been at least proportionally represented if not over-represented in U.S. medical schools[30], (2) they tend either to self-identify or to identify with the majority group rather than with under-represented minorities[23], and (3) they substantially outnumbered the African-American and Hispanic students in our sample, and thus had the potential to dilute out any information gleaned from under-represented minority students. It should be noted that this decision was made after an initial misunderstanding that Asian-American survey respondents had been classified as Native American/Alaska Native students, when in fact there were no such students. Age was chosen as a surrogate for “life experience” or other careers before medical school, and the age of less than 27 years for younger students was selected to approximate the group of students who matriculated to medical school immediately or soon after undergraduate college vs. the groups who had other significant experiences between college and medical school. This age cutoff also had the advantage of roughly equal numbers of students on

each side. Other age group divisions were discussed, including using a younger or older cutoff and using tertiles or quartiles, but these were eschewed in favor of the more straight-forward divalent cutoff of 27 years of age. The final two comparisons, medical school of attendance and country, are both self-explanatory.

As in the initial work done by Kernan et al, a behavior was defined as valued if the respondent rated it as “extremely” or “very” important and recommended it either “strongly” or “somewhat.” Educational significance was defined as a 15% difference between groups with a p-value < 0.05 based on the two-tailed homoscedastic student’s t-test for divalent comparisons. However, some differences that failed to meet one or the other of these criteria were also observed. A difference of “near-significant” educational import was recognized as one with a 10-15% difference between student subgroups and a p-value < 0.05. A behavior with value difference of at least 15%, but with p-value ≥ 0.05, was recorded as being “notable,” despite its statistical non-significance. All other behaviors were considered “non-significant.”

For the trivalent comparison of racial and ethnic groups, as well as the tetravalent comparison of the four American schools, a slightly different criterion was employed. A 15% difference between the subgroup of students that most valued a behavior and the subgroup that least valued it, in conjunction with a p-value less than 0.05, conferred educational significance, while a 10-15% maximum difference with p-value less than 0.05 was “near-significant,” and a maximum difference of at least 15% difference with p-value greater than or equal to 0.05 was recorded as “notable.” All other behaviors were considered non-significant.

## Results:

### *Descriptive Characteristics* (see Appendix B, Table 1 for full description)

Of the 200 American medical students invited to complete the survey, 163 (82%) responded. By contrast, among the 50 University of Cambridge students invited to complete the survey, only 23 (46%) responded. Data on the characteristics of non-respondents, apart from institution, are not known. Selected characteristics of the student survey respondents are displayed in Table 1 (abridged), while the full descriptive data are displayed in Appendix B, Table 1. For the students, these include medical school, age, gender, ethnic background, and practice type where the ambulatory clerkship took place.

Table 1 (abridged): Selected features of the student survey respondents.

Feature	U.S. Students (N=163)	U.K. Students (N=23)
<b>School</b>		
<b>Boston University</b>	43	0
<b>Tufts</b>	32	0
<b>UMass</b>	39	0
<b>Yale</b>	49	0
<b>Cambridge (UK)</b>	0	23
<b>Mean age (years) ± sd</b>	27 ± 3	23
<b>Female sex</b>	54%	44%
<b>Ethnicity</b>		
<b>White</b>	68%	74%
<b>Black</b>	5%	0%
<b>Hispanic</b>	5%	0%
<b>Asian</b>	19%	17%
<b>Other</b>	3%	9%

Among the students at American medical schools, Yale had the highest response rate (98%), BU and UMass had 86% and 78% response rate respectively, and Tufts had the lowest rate of response to the survey (64%). As noted above, Cambridge University

in the United Kingdom had a student response rate of 46%. The mean student age at each American medical school was  $27\pm3$  years, except at Yale where it was 26 years. The mean age of the British medical students was 23 years. The percent of American respondents who were female was 54%, while the percent of British respondents who were female was 44%. Among the respondents from the four American medical schools, the percent of students who were female gender was as follows—BU 40%, Tufts 59%, UMass 67%, and Yale 55%. The percent of students who self-identified as under-represented minorities (Black or Hispanic) was 10% among the American students, while none of the British students identified as these ethnicities. The percentages of student respondents at each U.S. institution who identified as under-represented minorities were as follows: BU 9%, Tufts 0%, UMass 5%, Yale 20%.

With regard to the type of practice where students worked, the plurality of American students (43%) were assigned to hospital clinics, while group practice (29%), community health center (10%), solo practice (9%), and staff model HMO (6%) were next most represented. By contrast, all but two of the 22 British students who responded to this question (91%) were assigned to group practices. Of the remaining two British students, one was at a solo practice and the other was at a community health center.

#### *Behaviors Valued Differently Among Subgroups*

Overall, for the 58 survey behaviors, 2 differed significantly in value across three subgroup comparisons, 7 differed significantly across two subgroup comparisons, 12 differed significantly with respect to one subgroup comparisons, and 37 showed no significant differences for any of the comparisons. The particular results from each set of

subgroup comparisons will now be discussed, with the tables showing all notable results but the text only elaborating on those that met the criteria for statistical significance.

#### Gender (see Appendix B, Table 2 for full results)

This subsection examines the role of gender differences among the 163 American students surveyed, 89 of whom (54%) were female. There were seven behaviors with notable differences that are shown in Table 2 (abridged) and discussed here; of these, 5 were more valued by women and 2 were more valued by men. Among the behaviors, 4 showed significant gender differences in value and 3 were near-significant by having a p-value less than 0.05 but only a 10-15% absolute difference. These 7 behaviors represented 4 of the 7 sections of the survey, although the majority of behaviors in each section did not approach significant gender differences; the overseeing the student's experience, teaching knowledge, and feedback sections showed no gender differences by any of our criteria.

Table 2 (abridged): Teaching behaviors valued differently by male and female students. Percent of male and female students who valued each of the behaviors, ranked according to absolute difference. **Bold=significant (15% difference AND p<0.05), Italics = approaches significance (15% difference OR p<0.05)**

Behavior	Males	Females	Absolute	p
	N=74	N=89	Difference	
<b>SIGNIFICANT DIFFERENCE</b>				
<b>Obtain consent from the patient for the student's participation.</b>	<b>33.8</b>	<b>55.2</b>	<b>21.4</b>	<b>0.007</b>
<b>Introduce the student to patients using the student's correct name.</b>	<b>33.8</b>	<b>54.5</b>	<b>20.7</b>	<b>0.008</b>
<b>Delegate responsibility to the student for telephone calls to patients (i.e., to check on treatment outcome or convey test results).</b>	<b>38</b>	<b>55.7</b>	<b>17.7</b>	<b>0.027</b>
<b>Early in the rotation, counsel the student on conducting a problem-focused patient encounter.</b>	<b>76.7</b>	<b>59.1</b>	<b>17.6</b>	<b>0.018</b>
<b>NEAR-SIGNIFICANT DIFFERENCE</b>				
<i>Create opportunities for the student to watch you communicate with patients.</i>	74	87.5	13.5	0.028
<i>Create opportunities for the student to educate patients.</i>	90.5	77.3	13.2	0.024
<i>Watch the student do focused components of the physical examination (e.g. knee examination) to determine his or her skill level and learning needs.</i>	82.4	93.2	10.8	0.034

The following 4 differences were significant. In terms of “orchestrating student-patient interactions,” the female students were 21.4% more likely to value “obtain[ing] consent from the patient for the student’s participation” than were the male students (55.2% compared with 33.8%). They were 20.7% more likely to value being “introduce[d]…to patients using the student’s correct name” in order to create a “favorable learning environment” (54.5% compared with 33.8%). Moreover, in the realm of “teaching clinical skills,” they were 17.7% more likely to value taking responsibility “for telephone calls to patients (i.e., to check on treatment outcome or convey test results)” than were their male counterparts (55.7% compared to 38%). The male students, on the other hand, indicated in the “orientation” section that they were 17.6% more likely to value being counseled by the preceptor early in the rotation “on conducting a problem-focused patient encounter” (76.7% compared to 59.1%).

#### Race/Ethnicity (see Appendix B, Table 3 for full results)

This subsection examines the role of racial/ethnic differences among the 163 American students surveyed, 109 (67%) of whom were white, 31 (19%) of whom were Asian/Pacific Islander, and 16 (10%) of whom were under-represented minorities (hereafter URM), including 8 Black students and 8 Hispanic students. It should be noted that 10 of the 16 URM students attended Yale and none of them attended Tufts. There were 18 behaviors with important differences that are discussed in Table 3 (abridged), 14 of which were most valued by the URM students, 4 of which were most valued by the Asian students, and none of which were most valued by the white students. All 18 behaviors differed in value by at least 15% between the groups rating them highest and

lowest. These 18 behaviors represented 5 of the 7 sections of the survey, including all 6 of the behaviors in the “orientation” section and half of the behaviors in the “overseeing the student’s experience” section; only the “teaching knowledge” and the “feedback” sections showed no notable racial/ethnic differences. Among these behaviors, 6 showed significant racial/ethnic differences in value by p-value, while 12 were notable though not statistically significant, having at least a 15% absolute difference but a p-value greater than 0.05. Only the statistically significant differences will be explicated here.

In the realm of orientation, two behaviors had value differences that were statistically significant. Interestingly, at least 75% of the URM students valued each of the 6 “orientation” behaviors, while none of the behaviors in this section were valued by 75% of the white students. Asian (80.6%) and URM students (75%) both valued being asked “early in the rotation...what specific experiences [they hoped] to have” far more than the white students (48.1%). Both groups of non-white students (93.8% of URM and 93.5% of Asian) also valued being asked “early in the rotation...to identify skills [they wanted] to develop” substantially more than the white students (74.3%), a 19% difference.

In terms of “creating a favorable learning environment,” only one difference was statistically significant. The URM and Asian students were more likely to value having their own “daily list of patients who will be seen by the student” than the white students, although fewer than half the students in any group (including only 37.5% of the URM students) valued this behavior. In the realm of “overseeing the student’s experience,” 2 of the 4 behaviors were valued differently based on race/ethnicity, although neither difference reached significance by p-value. Likewise, in the realm of “orchestrating

student-patient interactions,” 2 of the 6 behaviors differed in value along racial and ethnic lines, although neither attained a significant p-value.

Table 3 (abridged): Teaching behaviors valued differently by majority and minority students. Percent of racial/ethnic group who valued each of the behaviors, ranked according to maximum difference. **Bold= significant (15% difference and  $p < 0.05$ )**, plain text = notable (15% difference but  $p \geq 0.05$ ).

Behavior	White	Asian	Black/Hispanic (URM)	Max	p
	N=109	N=31	N=16	Diff	
<b>SIGNIFICANT DIFFERENCE</b>					
<b>Delegate responsibility to the student for ascertaining and interpreting test results.</b>	84	64.5	100	35.5	<b>0.007</b>
<b>Early in the rotation, ask the student what experiences he or she hopes to have.</b>	48.1	80.6	75	32.5	<b>0.002</b>
Create in advance a daily list of patients who will be seen by the student; do not just select patients from your list.	13.8	29	37.5	23.7	<b>0.024</b>
<b>Facilitate the student's sense of being the caregiver.</b>	68.5	90.3	81.3	21.8	<b>0.040</b>
<b>Early in the rotation, ask the student to identify skills he or she wants to develop.</b>	74.3	93.5	93.8	19.5	<b>0.021</b>
<b>Ask for the student's assessment and plan before giving your own formulation.</b>	96.3	96.8	81.3	15.5	<b>0.034</b>
<b>NOTABLE DIFFERENCE</b>					
Obtain consent from the patient for the student's participation.	43.5	35.5	68.8	33.3	0.088
Introduce the student to everyone who works in the practice.	56.9	54.8	81.3	26.5	0.157
Orient the student to the medical record.	66.1	61.3	87.5	26.2	0.169
Periodically ask the student if his or her personal learning goals are being met.	60.2	74.2	81.3	21.1	0.128
Give the student time to organize his/her thoughts before they present their findings.	73.4	83.9	93.8	20.4	0.122
Early in the rotation, counsel the student on conducting a problem-focused patient encounter.	61.5	76.7	81.3	19.8	0.123
Create opportunities for the student to educate patients.	88.1	74.2	93.8	19.6	0.093
Have the student observe you caring for patients so that you can role model what you want them to do in your practice.	67.9	73.3	87.5	19.6	0.259
Delegate responsibility to the student for telephone calls to patients (i.e., to check on treatment outcome or convey test results).	47.7	43.3	62.5	19.2	0.448
Periodically inquire about how the experience could be adjusted to better suit the student's needs.	57.4	74.2	68.8	16.8	0.199
Ask the student to do minor procedures, such as injections, tuberculin skin testing, and ECG interpretation.	89	83.9	100	16.1	0.243
Leave the student alone with the patient until he or she has completed his or her evaluation.	72.2	77.4	87.5	15.3	0.394

Finally, in the realm of “teaching clinical skills,” 6 of the 18 behaviors differed in value by at least 15% among the racial and ethnic groups, and 3 of these differences attained significance by p-value. The significant differences were as follows. 100% of the URM students, compared with 84% of the white students and 64.5% of the Asian students, valued being given “responsibility...for ascertaining and interpreting test results.” There were also two behaviors significantly valued most by the non-URM students. First, Asian students were most likely (90.3%) to value the preceptor “facilitat[ing] the student’s sense of being the caregiver,” compared with over 80% of the URM students and only 68.5% of the white students ( $p<0.05$ ). Second, both the Asian students and the white students (96.8% and 96.3%) were more likely than the URM students (81.3%) to value being asked for their assessment and plan before the preceptor gave his or hers, although over 80% of students across all groups valued this behavior.

#### Age (see Appendix B, Table 4 for full results)

This subsection examines the role of age differences among the 163 American students surveyed, 68 of whom (42%) were 27 years old or older and 95 of whom (58%) were younger than 27 years. There were 7 behaviors with reportable age differences, shown in Table 4 (abridged). Of these, 6 were more valued by older students and 1 was more valued by younger students. Among these behaviors, only 1 showed significant age differences in students’ values, while 6 were near-significant, with 10-15% absolute difference in value and significant p-values. These 7 behaviors represented 5 of the 7 sections of the survey, although the majority of behaviors in each of these sections did not reveal notable age differences. The 2 sections that showed total agreement between age groups were orchestrating student-patient interactions and feedback.

Table 4 (abridged): Teaching behaviors valued differently by older and younger students. Percent of students, by age group, who valued each of the behaviors, ranked according to absolute difference.

**Bold=significant (15% difference AND p<0.05), Italics = near-significant (10-15% difference, p<0.05)**

Behavior	Age≥27	Age<27	Absolute	p
	N=68	N=95	Difference	
<b>SIGNIFICANT DIFFERENCE</b>				
<b>Orient the student to the medical record.</b>	<b>54.4</b>	<b>74.7</b>	<b>20.3</b>	<b>0.007</b>
<i>APPROACHING SIGNIFICANCE</i>				
<i>Regularly teach physical examination techniques.</i>	97.1	83	14.1	0.005
<i>Create opportunities for the student to watch you manage difficult patient encounters.</i>	91.2	77.7	13.5	0.023
<i>Seek out the student to demonstrate physical findings on patients not seen by the student.</i>	100	87.2	12.8	0.002
<i>Encourage questions and respond to them tactfully.</i>	100	87.4	12.6	0.002
<i>Enable the student to see a mix of acute visit patients and non-acute visit patients.</i>	95.5	83.2	12.3	0.016
<i>Use questions to help students improve their understanding of particular issues.</i>	94.1	83.2	10.9	0.035

The one “orientation” behavior valued differently between older and younger students was “orient the student to the medical record.” This behavior was valued by 74.7% of the younger students, but only by 54.4% of the older students, a 20.3% difference (p<0.01). As such, it represents the only behavior in this section that achieved significance by both measures and the only behavior valued more by younger students than by older students. The remaining behaviors were all valued more by older students, with p-values less than 0.05, although none of the differences attained significance because the absolute difference between age groups was less than 15% for all of them.

#### Medical School (see Appendix B, Table 5 for full results)

This subsection examines the influence of the medical school attended on the value the American medical student respondents gave to different teaching behaviors. Of the 163 American students, 43 (26.4%) attended BU, 32 (19.6%) attended Tufts, 39 (23.9%) attended Umass, and 49 (30.1%) attended Yale. A substantial number of the 58 behaviors (10) reached significance both by p-value and by attaining a difference of at least 15% between the schools where they were most and least valued, while 2 other

behaviors had significant p-values and a 10-15% difference between the schools where they were most and least valued. Moreover, an additional 14 behaviors, while not significant, exhibited a greater than 15% difference between the school most and least valuing them. These 26 behaviors spanned all seven survey sections, and included the majority of items in the “orientation,” “overseeing the student’s experience,” and “teaching knowledge” sections, as well as approximately half the items in the “orchestrating student-patient interactions” and “teaching clinical skills” sections. The two sections where values were almost entirely congruent among the schools were “creating a favorable learning environment” (no behaviors reached significance, and only 2 of 8 approached it) and “feedback” (1 of 7 behaviors reached significance, and no others approached it). Among these 26 behaviors, 12 were valued most by Yale students and 11 were valued most by BU students; in contrast, only 4 and 3 behaviors were valued most by Tufts and Umass students, respectively (the sum is more than 26 because three behaviors were valued equally by at least two schools). Further, the Tufts students least valued 11 of the 26 behaviors, respectively, whereas the Yale, BU, and Umass students least valued only 4, 5, and 6 of the behaviors, respectively. The twelve behaviors with significant p-values that differed among schools are detailed in Table 5 (abridged), and the ten of these that differed by at least 15% are discussed below; however, the fourteen behaviors with value differences greater than 15% but without significant p-values are not shown in tabular form or explicated in this section for the sake of brevity.

As is evident from Table 5 (abridged), most of the significant value differences occurred or were augmented when one school was an outlier. In the realm of

“orientation,” the students at UMass were much less likely than any of the other students (and 44.8% less likely than the Yale students) to value being counseled early in the rotation on conducting “a problem focused patient encounter.” By contrast, in the realm of “orchestrating student-patient interactions,” the UMass students were much more likely than any of the other students (and 39.1% more likely than the BU students) to value “obtain[ing] consent from the patient for the student’s participation.”

Table 5 (abridged): Teaching behaviors valued differently at 4 U.S. medical schools. **Bold=significant ( $p<0.05$  and max difference  $\geq 15\%$ )**, *Italics = near-significant (10-15% difference, with  $p<0.05$ )* Percent valued at each institution ranked according to maximum percent difference.

Behavior	BU	Tufts	Umass	Yale	Max	p
	N=43	N=32	N=39	N=49	diff	
<b>SIGNIFICANT DIFFERENCE</b>						
<b>Early in the rotation, counsel the student on conducting a problem-focused patient encounter.</b>	74.4	68.8	38.5	83.3	44.8	<b>0.000</b>
<b>Obtain consent from the patient for the student’s participation.</b>	32.6	34.4	71.8	43.8	39.2	<b>0.001</b>
<b>Delegate responsibility to the student for telephone calls to patients (i.e., to check on treatment outcome or convey test results).</b>	35.7	33.3	43.6	71.4	38.1	<b>0.001</b>
<b>Introduce the student to everyone who works in the practice.</b>	46.5	53.1	56.4	75.5	29.0	<b>0.031</b>
<b>Facilitate the student’s sense of being the caregiver.</b>	83.7	68.8	55.3	83.7	28.4	<b>0.008</b>
<b>Hold preliminary discussions about diagnosis and treatment away from the patient.</b>	51.2	71.9	79.5	67.3	28.3	<b>0.047</b>
<b>Delegate responsibility to the student for the wrap-up discussion with the patient (for explaining the diagnosis and treatment, etc.).</b>	72.1	67.7	74.4	95.8	28.1	<b>0.007</b>
<b>Put students in the teaching role. Give them assignments to educate both of you.</b>	86	59.4	79.5	65.3	26.6	<b>0.029</b>
<b>Ask the student if there are aspects of the physical examination he or she wants to work on and then provide help.</b>	97.7	78.1	94.9	93.8	19.6	<b>0.013</b>
<b>When students do something well, tell them they did it well.</b>	100	90.6	82.1	85.7	17.9	<b>0.042</b>
<b>NEAR-SIGNIFICANT DIFFERENCE</b>						
<i>Assure that the student regularly interviews and examines patients on his or her own.</i>	88.4	100	97.4	100	11.6	<i>0.012</i>
<i>Challenge the student to explain choices he or she makes regarding diagnostic strategies or therapies.</i>	100	100	89.7	100	10.3	<i>0.005</i>

In the realm of “teaching clinical skills,” Yale students were far more likely than students from any of the other schools (and 38.1% more likely than the Tufts students) to

value taking “responsibility...for telephone calls to patients (i.e. to check on treatment outcome or convey test results).” Moreover, in the same section, 95.8% of the Yale students valued taking “responsibility...for the wrap-up discussion with the patient,” significantly more than any of the other students (and 28.1% more than the Tufts students). The Yale students were also significantly more likely than any of the other students (and 29.0% more likely than the BU students) to value being “introduce[d] to everyone who works in the practice” as part of their “orientation.” Both the Yale students and the BU students were equally likely (83.7%) to value “facilitat[ing] the student’s sense of being the caregiver” far more than the UMass students (55.3%), a 28.4% absolute difference. However, the BU students were far less likely than any of the other students (and 28.3% less likely than the UMass students) to value “hold[ing] preliminary discussions about diagnosis and treatment away from the patient” in the “orchestrating student-patient interactions” section.

The final three significant differences among schools in the value students placed on teaching behaviors were as follows. In the teaching knowledge section, the BU students were 26.6% more likely than the Tufts students to value “being put...in the teaching role...give[n] assignments to educate both” the preceptor and themselves. Although 78.1% of the Tufts students valued being asked if there were “aspects of the physical exam [they wanted] to work on and then provide[d] help” in the “overseeing the student’s experience” section, students from all of the other schools valued this behavior at well over a 90% rate, including 97.7% of the BU students (a 19.6% absolute difference). Finally, in the realm of feedback, although 82.1% of the UMass students

valued being told when they did something well, 100% of the BU students valued the same behavior, for a significant 17.9% difference.

#### Country (see Appendix B, Table 6 for full results)

This subsection examines the role of different country of medical school attended among the 186 students surveyed, 163 of whom (88%) were American and 23 of whom (12%) were British. There were 18 behaviors with reportable value differences between countries, displayed in Table 6 (abridged), and 11 of these showed significant differences in value by percent difference and p-value. Five behaviors notably had differences of at least 15% between groups, but were not statistically significant by p-value. Two other differences were near-significant, having p-values less than 0.05, but only a 10-15% difference between the country groups. These 18 behaviors represented 5 of the 7 sections of the survey, and the majority of behaviors in the “orchestrating student-patient interactions” either approached or reached significant differences. The two sections showing no differences between U.S. and U.K. students were “overseeing the student’s experience” and “feedback.” Of the 18 behaviors, only 4 were valued more by the British students than the American students. Even more impressively, of the 11 behaviors that significantly differed between groups by both measures, only one was valued more by the British students than the American students. These 11 statistically significant behavior differences are detailed below.

In the realm of orientation, 66.3% of the American students valued being “orient[ed]...to the medical record” compared with 43.5% of their British counterparts, a 22.8% difference. In the realm of creating a favorable learning environment, 78.5% of the American students, compared with 56.5% of the British students, valued being given

“time to organize [their] thoughts before they present[ed] their findings,” a 22% difference. Further, in the teaching knowledge section, the American students (73%) were more likely than the British students (47.8%) to value being put “in the teaching role...give[n] assignments to educate” the preceptor and themselves, a 25.2% difference.

Table 6 (abridged): Teaching behaviors valued differently by U.S. and U.K. students. Percent of students in each country who valued the behaviors, ranked according to absolute difference. **Bold=significant (15% difference and p<0.05).** Plain text=notable difference (15% difference, but  $p \geq 0.05$ ). *Italics = near-significant (10-15% difference with  $p < 0.05$ )*

Behavior	U.S.	U.K.	Absolute	p
	N=163	N=23	Difference	
<b>SIGNIFICANT DIFFERENCE</b>				
<b>For most patients, ask the student to present the history and physical examination (H&amp;P) in front of the patient.</b>	<b>12.5</b>	<b>47.8</b>	<b>35.3</b>	<b>0.000</b>
<b>Hold preliminary discussions about diagnosis and treatment away from the patient.</b>	<b>66.9</b>	<b>31.8</b>	<b>35.1</b>	<b>0.001</b>
<b>Facilitate the student's sense of being the caregiver.</b>	<b>74.1</b>	<b>39.1</b>	<b>35</b>	<b>0.001</b>
<b>Create opportunities for the student to educate patients.</b>	<b>85.9</b>	<b>54.5</b>	<b>31.4</b>	<b>0.000</b>
<b>If the student presents the H&amp;P in front of the patient, provide the student an opportunity to also talk to the preceptor away from the patient.</b>	<b>78.5</b>	<b>50</b>	<b>28.5</b>	<b>0.004</b>
<b>Put students in the teaching role. Give them assignments to educate both of you.</b>	<b>73</b>	<b>47.8</b>	<b>25.2</b>	<b>0.014</b>
<b>Orient the student to the medical record.</b>	<b>66.3</b>	<b>43.5</b>	<b>22.8</b>	<b>0.034</b>
<b>Delegate responsibility to the student for the wrap-up discussion with the patient (for explaining the diagnosis and treatment, etc.).</b>	<b>78.9</b>	<b>56.5</b>	<b>22.4</b>	<b>0.019</b>
<b>Give the student time to organize his/her thoughts before they present their findings.</b>	<b>78.5</b>	<b>56.5</b>	<b>22</b>	<b>0.021</b>
<b>Delegate responsibility to the student for telephone calls to patients (i.e., to check on treatment outcome or convey test results).</b>	<b>48.1</b>	<b>26.1</b>	<b>22</b>	<b>0.047</b>
<b>Delegate responsibility to the student for ascertaining and interpreting test results.</b>	<b>82.5</b>	<b>60.9</b>	<b>21.6</b>	<b>0.016</b>
<b>NOTABLE DIFFERENCE</b>				
Early in the rotation, counsel the student on conducting a problem-focused patient encounter.	67.3	47.8	19.5	0.067
Regularly watch the student perform critical tasks in history-taking and other patient communications.	58.3	77.3	19	0.087
Leave the student alone with the patient until he or she has completed his or her evaluation.	74.1	56.5	17.6	0.080
Create in advance a daily list of patients who will be seen by the student; do not just select patients from your list.	18.4	34.8	16.4	0.068
Obtain consent from the patient for the student's participation.	45.7	30.4	15.3	0.168
<b>NEAR-SIGNIFICANT DIFFERENCE</b>				
<i>Ask questions to lead the student to own diagnosis or treatment.</i>	<i>92.6</i>	<i>78.3</i>	<i>14.3</i>	<i>0.026</i>
<i>Question students about medical knowledge in front of patients.</i>	<i>7.4</i>	<i>21.7</i>	<i>14.3</i>	<i>0.025</i>

Five out of the six behaviors in the “orchestrating student-patient interactions” section are noted in Table 6 (abridged), including three of the five most disagreed-upon behaviors. These three behaviors all exhibited statistically significant differences. The largest difference for any behavior in the survey was in being asked “for most patients...to present the H&P in front of the patient.” Roughly half the British students (47.8%) valued this behavior compared with only 12.5% of the American students, a 35.3% difference; this was the only behavior valued more by British students that showed statistical significance. The second largest value difference was in “hold[ing] preliminary discussions about diagnosis and treatment away from the patient,” where 35.1% more American students (66.9%) than British students (31.8%) valued the behavior. Along the same lines, another behavior significantly more valued by the American students (78.5%) than the British students (50%) was if presenting “the H&P in front of the patient, [to] provide the student an opportunity to also talk to the preceptor away from the patient,” a 28.5% difference.

Among the behaviors in Table 6 (abridged) were seven of the 18 items in the “teaching clinical skills” section, five of which were value significantly differently by American and British students. All of the significantly different behaviors were valued more by the American students than the British. While 74.1% of the American students wanted the preceptor to “facilitate the student’s sense of being the caregiver,” only 39.1% of the British students valued this behavior, a 35% difference. American students (85.9%) were also 31.4% more likely to value “opportunities for the student to educate patients” than were the British students (54.5%). All three survey items involving delegating responsibility to the student were more valued by the American students than the British

students. These responsibilities were the wrap-up discussion (22.4% difference), telephone calls to patients to check on treatment outcome or convey test results (22.0% difference), and ascertaining and interpreting test results (21.6% difference). All five of the above differences had p-values less than 0.05.

**Discussion:**

This analysis of the value students place on teaching behaviors in the ambulatory setting reveals several interesting findings. Across all student characteristics examined, there was concordance of value for the majority of teaching behaviors. In particular, feedback was uniformly valued across all student subgroups. In all cases, though, a notable minority of behaviors was valued differently between subgroups of students, and the patterns of disagreement are informative, stressing that preceptors should not assume that all students want the same teaching modality.

*Gender*

Seven teaching behaviors were valued differently by men and women, with five of these behaviors being valued more by the women; these involved fostering good communication with patients. To illustrate, four of the five behaviors valued most by female students involved watching the preceptor communicate with patients, being introduced to the patient by their correct name, obtaining the patient's consent for the student's participation, and following up patient encounters with telephone calls to find out about treatment outcome or to give test results. In contrast, male students were more likely than female students to value being counseled on conducting a problem-focused interview and being given opportunities to educate patients. These male-valued behaviors are not only extremely concrete, but they also are designed to put the student in the driver's seat of the patient encounter, setting the agenda for and giving information to a passive patient. It has been observed that women tend to be more empathic and cooperative than men, who tend to focus more on issues of dominance and competition in interpersonal relationships, and perhaps women have much to teach future physicians

about these traits and skills that are so vital to relating to patients, particularly in generalist practice.[43] This is but one example of many that efforts to investigate differences in student satisfaction by gender (and race/ethnicity) can help to improve the medical school learning climate for all students.[23]

The one remaining behavior that showed gender differences was highly valued across the gender divide, and the absolute difference was the smallest of any of the seven behaviors. Female students were 10.8% more likely to value having their physical examination skills watched and commented upon than male students. While perhaps suggesting that female students are more open to being taught skills and constructively criticized than male students, the fact that this was the only behavior in its arena that approached significance and, as noted, the difference was small. Thus, despite the trend, no conclusions can be drawn from this last behavior difference.

#### *Race/Ethnicity*

Our findings indicate that race may have an important influence on student preferences for teaching behaviors. Six behaviors demonstrated educationally and statistically significant differences, while twelve others were notable though statistically non-significant. The most striking feature of these 18 behaviors is that none of them were most valued by the white students, while 14 were most valued by the under-represented minority (URM) students; by contrast, 10 of the behaviors were least valued by the white students, compared with only 1 of the behaviors being least valued by the URM students. The Asian students were often intermediate between the groups, but in a few cases were at the extremes, confirming that they had a unique pattern of values concordant neither with the URM or the white majority students.

The 18 behaviors valued differently across racial and ethnic lines can be divided in many ways, with some degree of overlap in any scheme. For the purposes of this discussion, the behaviors (whether significant or not) will be grouped into three categories: orientation and mentoring, autonomy in patient care, and creating a comfortable learning environment. First, with regard to orientation and mentoring, as indicated in the results section, all six of the orientation behaviors were valued differently across racial and ethnic groups. URM students most valued behaviors that facilitated their integration to the practice—meeting all of the staff, learning the medical record system, and observing the preceptor early in the rotation to promote role-modeling. They valued each of these behaviors far in excess of both the white students and the Asian students. Early in the rotation, both URM and Asian students also valued the other orientation behaviors substantially more than the white students—being asked what experiences they hope to have and skills they hope to learn, as well as being counseled on conducting a problem-focused interview.

The implication of these results is that URM students most value getting off to a good start in the practice on many levels. Unique among the URM students, as demonstrated by their value placed on being introduced to everyone working in the practice, was a level of sensitivity and respect for the ancillary staff not equally shown by their Asian and white classmates. Moreover, along with the Asian students, URM students openly desired early mentorship by the preceptor to a greater degree than did the white students.

The second group of behaviors valued differently across racial and ethnic groups dealt with autonomy and responsibility in patient care. URM students most valued

responsibility for obtaining and interpreting test results, as well as for making telephone calls to patients, significantly more than the white and Asian students. Moreover, 100% of the URM students valued doing minor procedures, all the more significant given the fact that the majority of URM students attended Yale, whose students least valued doing procedures. Although the URM students valued these concrete behaviors that allowed them to be the primary caregiver far more than either of the other groups, the Asian students (slightly more than the URM students and far more than the white students) most valued the abstract idea that the preceptor should “facilitate the student’s sense of being the caregiver.”

In clinical encounters, URM students were most likely to value opportunities to educate patients and to be left alone with the patient until completing their evaluation. They were also significantly more likely to value having a list of their own patients, instead of seeing patients from the preceptor’s list. However, the initiative displayed by the URM students was tempered by deference to both preceptor and patient, as illustrated by the following. The URM students were significantly less likely than the Asian or white students to value giving their own assessment and plan before the preceptor’s (although 80% of URM students still valued this behavior), perhaps indicating respect for the preceptor’s input or a desire to have the thought process for differential diagnosis and management role-modeled. Further, the URM students (like the female students) were far more likely to value patient consent for their participation than were their white or Asian counterparts, indicating a balance of their desire to be the primary caregiver with a desire for the patient to receive optimal, informed medical care.

The third category of behaviors valued differently by students across racial and ethnic groups was creating a comfortable learning environment, although none of these behaviors attained significant p-values. One type of behavior that creates a comfortable learning environment is periodically checking in with students to see how the rotation is progressing. Both the URM and the Asian students valued these checks to see if their learning goals were being met and if the experience could be changed to better meet their needs than the white students. The URM students also were 10% more likely than the Asian students and 20% more likely than the white students to value being given time to organize their thoughts before giving a patient presentation, a behavior that could decrease some of the pressure associated with giving presentations and improve the comfort of the learning environment.

The overarching trend in the analysis of racial and ethnic differences in teaching behaviors is that URM students value being welcomed into the practice, mentored, given substantial patient care responsibility (including performing procedures and following up continuity of care issues), and treated with respect in a comfortable learning environment. The fact that the URM students valued nearly every discordant teaching behavior more than the other groups of students also could indicate that they are generally more open to any attempt at good teaching, and that they desire an investment in their education from the preceptor. Fewer general conclusions can be drawn about the pattern of behaviors valued by white and Asian students, although most research to date in the ambulatory setting has studied aggregate student populations, and thus heavily weights the input of these students. A possible explanation for the unique pattern of values of the URM students is the fact, noted in the introduction, that these students are much more likely to

become primary care physicians in underserved communities, and they are aware that the ambulatory clinic is an ideal setting during their medical training to learn how to take care of patients in their future practices. Since the survey respondents were not polled about their career aspirations, however, this is not a provable hypothesis.

The most significant limitation to drawing conclusions from the survey results based on race and ethnicity is the extremely small sample size (n=16 for the URM students), which likely is the largest obstacle to statistical significance for behaviors valued most by URM students. Moreover, this small sample of URM students may or may not be truly representative. While the 16 URM students were lumped into one monolithic category, they represented “Black” and “Hispanic” students, each group likely with a variety of different backgrounds. Specifically, Yale (which the majority of URM students attended) takes several international students each year, and it is possible that a fair number of the URM students were also from other countries in Africa or Latin America, which could confound the results. Further, as briefly alluded to earlier, not all Hispanic students are classically categorized as URM students[24], but the specific ethnic backgrounds of the Hispanic students surveyed are unknown. All these considerations serve to attenuate the conclusions from this section.

#### *Age*

The differences in teaching behaviors valued by younger and older students were fewer and showed less significance than those seen across any of the other subgroup analyses. Of the 7 differences noted, only one was valued more by the younger students, and that behavior was also the only one that exhibited a 15% value. The younger students were more likely to value being oriented to the medical record than were the

older students, perhaps because of a greater familiarity among the older students with medical charts or with record-keeping in general from past experiences. Conversely, the older students were more interested in learning physical examination techniques, seeing physical findings on the preceptor's patients, and seeing a mix of patients with acute and non-acute issues. They also were more likely to value questioning the preceptor and being questioned by the preceptor to help in the understanding of particular issues.

If there is a pattern to the behaviors valued differently across age groups, it is that the older students are more comfortable finding their way on the rotation and using give and take discussion with the preceptor. These results would be consistent with the University of Colorado data that showed older students preferred to be active learners, and that they gave more articulate responses to open-ended survey questions than did younger students.[39] Another explanation for the behavior preferences of the older students is that, according to the national data, they are more likely to enter primary care professions and are more likely to have decided on primary care earlier in their medical training.[40] If the older students among the survey respondents were more inclined to go into primary care than the younger students, then that could drive them to want to see a broader array of patients and medical issues, and also to try to glean as much information and experience from their preceptors as possible. As with the URM students, though, this conclusion cannot be supported without knowledge of the career aspirations of the specific students surveyed. Further, the small numbers of behaviors that differed and the relatively small absolute differences in value are a pointed caveat to any conclusions drawn from these data. Finally, other information on the older students, such as the career paths they had taken before medical school and whether they had families of

their own, could potentially have provided more interesting information about the influence of life experiences prior to medical school on learning preferences.

### *Medical School*

Our findings indicate that the educational environment or learning culture at a medical school affects student preferences for teaching behaviors. Among the four medical schools, there was considerable variability in behaviors valued, with 26 of the 58 behaviors (45%) having value differences that at least approached significance and 10 of those behaviors reaching significance by both measures employed. The greatest disagreement was observed in the areas of orientation, oversight, and teaching knowledge. As noted in the results section, the Yale or BU students placed the highest value on the vast majority of the 26 behaviors, while the Tufts students placed the lowest value on almost half of them. Interestingly, the number of behaviors most valued by students at a particular school was directly related to the student response rate for that school. Specifically, Yale students had an extremely high response rate (98%) and the greatest number of behaviors most valued. It also happened to be the school where the principal investigator (WNK) was the faculty director of the ambulatory internal medicine clerkship, perhaps reflecting a greater level of institutional buy-in (or even a subconsciously perceived reward among students for participating and for responding favorably) and a resultantly greater number of student respondents and highly valued behaviors. Tufts had the lowest response rate (64%), and perhaps the same institutional factors that produced the low response rate resulted in lower marks for survey items among those who did choose to respond.

It is important to note the significant covariance of demographic data among the schools with respect to gender and race/ethnicity. UMass had 67% female students, while BU only had 40% female students, with Tufts and Yale intermediate with over 50% female students each. Further, Yale had 20% URM students, compared with fewer than 10% at any of the other schools and 0% at Tufts. There was no significant age variance across schools, with the mean age 27 years at BU, Tufts, and UMass, and 26 years at Yale. Some of the value differences in behaviors seen among the schools may be related to these characteristics; for example, Yale students most valued all four orientation behaviors that differed among schools, but part of this difference is accounted for by the comparatively greater number of URM students at Yale. Even in this case, though, given that only 20% of the Yale students were URM and the difference between Yale and the other schools was so pronounced with some of these orientation behaviors (such as role modeling and introducing the student to everyone in the practice), it seems that other factors are also at work.

As an example of how these institutional factors affect value differences, no other student characteristic can explain why the students at UMass were at least 30% less likely than students at any other school (38.5% compared with 68.8-83.3% at the other schools) to value being counseled early in the rotation on conducting a problem-focused patient encounter. Something unique to the UMass curriculum most likely accounts for this difference, either that the students are already comfortable conducting problem-focused interviews by the time they start their ambulatory clerkship or that the UMass students do not prioritize the problem-focused visit. Conversely, no other student characteristic can explain why the UMass students were 28-39% more likely to value obtaining the

patient's consent for their participation than the students at any other school. In fact, the UMass students valued this behavior far more than did female students and slightly more than did URM students (particularly impressive given that only 5% of the UMass student respondents were from an URM). Perhaps the UMass students are taught to always ask for patient consent before beginning an encounter, or perhaps some other element of their curriculum heightens students' sensitivity to this issue. A potential explanation for the UMass findings is that the one of the school's central missions is "to increase the number of primary care physicians practicing in underserved areas of the state" of Massachusetts.[44] This medical school may do more to train students in problem-focused encounters earlier in their medical education, and students who are sensitive to the comfort and dignity of the patient may self-select their attendance at such a primary care focused school.

The Yale students' values contrast sharply with those of the UMass students. Yale students overwhelmingly valued behaviors involving student autonomy in patient care, wanting to take responsibility for the wrap-up discussion and any follow-up telephone calls to patients far more than students at any of the other schools. Along with students at BU, they most valued the sense of being the caregiver and wanted to be left alone with the patient until completing their evaluation. Finally, the Yale students were most likely to value the preceptor checking in to see if their learning goals were being met and if the experience could be adjusted to better suit their needs. While the greater number of URM students at Yale could account for some of the value placed on checking in, a plausible reason for the sum total of these observations is that students at Yale are accustomed to "the Yale System" of pre-clinical education, which emphasizes "student

freedom, flexibility, and individual responsibility.”[45] Thus, either by self-selection into their medical school or by specific aspects of the curriculum that promote these values, Yale students seem to place high priority on autonomy. Interestingly, however, the Yale students’ value of autonomy did not carry over to procedures, which they were least likely to value doing. This is particularly significant given the fact that URM students (the majority of whom were at Yale) most valued doing procedures; thus, the white and Asian students at Yale valued doing minor office procedures far less than their counterparts at other schools. Perhaps this reflects a lack of primary care emphasis in the Yale curriculum in favor of research, and a concomitantly smaller portion of Yale graduates entering primary care fields compared with the other institutions. This is especially likely since Yale is unique among the four US medical schools with its lack of either a family practice rotation or an affiliated family medicine residency program.[46]

Another interesting result is that the Yale students were less likely than students at any of the other schools to value having their knowledge probed by the preceptor and, along with the Tufts students, were less likely than students at BU or UMass to value having assignments to teach the preceptor. This could be accounted for based on the autonomy argument, or based on another aspect of the “Yale System,” namely that there is “no formal grading or class rank in the two pre-clinical years.”[45] Given the lack of graded tests in the preclinical years and the emphasis on a collaborative learning environment, the Yale students may be put off by preceptors questioning their knowledge and giving them assignments, or they may be unsure of themselves since they have had less practice with these learning modalities during the first two years of medical school.

UMass and Yale, at the extremes, demonstrate the ways in which divergent medical school philosophies and curricula can be associated with divergent student values, although they do not help to separate cause from effect. The high variability of student values among the four medical schools surveyed raises the question of to what extent single-institution education research in the medical education literature should be applied, and serves as a cautionary note for applying the standards of one school to another. This is particularly important given that all four medical schools surveyed were in the northeastern United States, and thus regional differences were not detected.

UMass was the only public school of the four surveyed, so whether other state medical schools with primary care missions have similar student values would be interesting to study. Of note, a large body of extremely well designed and executed research in the ambulatory setting has been conducted through the Uniformed Services University of Health Sciences and the Walter Reed Army Medical Center.[16, 47-49] In light of the findings of the present research on inter-institution variability, the self-selection of students and residents into these programs and the influence of military culture should certainly raise questions about the applicability of studies conducted in these settings to other medical school and residency environments. A final important point to make about the high degree of variability among medical schools is that it either implies that there are many different “right ways” of teaching and learning in different contexts or it implies that medical educators and students are still largely unsure of the behaviors that best promote learning. This would serve as confirmation that current clinical education is not particularly evidence-based, and could benefit from a focused, multi-institutional research agenda aimed at defining and optimizing learner outcomes.

*Country*

Our findings demonstrate a substantial interaction between the country where students attend school and their preferences for teaching behaviors. Between the United States and the United Kingdom, there were eleven significant differences in student values of teaching behaviors, and seven others that were notable but not strictly significant. The overwhelming majority of behaviors were valued more by the American medical students than the British students. Two of the differences (orienting the student to the medical record, creating a separate list of patients for the student to see) seemed to represent idiosyncratic qualities of the different health care systems and the fact that nearly all the British students worked in group practices, while more of the American students worked in hospital-based clinics. However, many of the value differences revolved around interactions with patients. In particular, British students were far more comfortable presenting the H&P in front of the patient than their American counterparts (47.8% compared with 12.5%). They were also somewhat more comfortable having their knowledge questioned in front of patients (21.7% of British students compared with just 7.4% of American students), despite not generally valuing preceptor questions more than the American students. The American students, on the other hand, valued holding preliminary discussions about diagnosis and treatment away from the patient and having opportunities to discuss the patient's case with the preceptor outside the examination room.

It could be argued from the above observations the American students respect patient privacy and autonomy more than the British students. This position would be bolstered by the fact that American students also valued obtaining consent from the

patient for their participation more than the British students (45.7% compared with 30.4%). However, this last difference is skewed in favor of the American students by the 72% of UMass students who valued obtaining consent; when the UMass students are excluded, only 37.5% of the remaining American students valued obtaining consent. Regardless, whether it is out of respect for patients or out of a desire not to showcase gaps in their knowledge and skills in front of these patients, the American students seem to place higher value than the British students on separating patient care from teaching, or at least on creating separate, private spaces where these different enterprises can occur. The British students, by contrast, tend to see patient encounters themselves as the central teaching venue.

A further important difference between the American and British medical students in this survey was that the American students placed consistently higher value on autonomy and responsibility in patient care than did the British students. Philosophically, the American students, 35% more than the British students, desired that the preceptor facilitate their sense of being the caregiver. Concretely, the differences were manifested by the American students valuing opportunities to educate the patient, as well as valuing responsibility for conducting the wrap-up discussion, making follow-up telephone calls, and ascertaining and interpreting test results, far more than their British peers. Further, the American students valued having time to organize their thoughts before presenting and being given assignments to teach the preceptor far more than did the British students. All of these behaviors are empowering, making the learner more a caregiver and partner with the preceptor than a subordinate, and this empowerment seems much more important to American students than to British students.

There seems to be a trade-off with these empowering behaviors, however, and that is, namely, the opportunity to be observed. The British students were less likely than the American students to want to be left alone with the patient until completing their evaluation, and were more likely to value having their history-taking skills and other communications watched by the preceptor. As many critics of American medical education have lamented the lack of faculty observation of students[10], and thus the insufficient basis for feedback and skill-building, it could be fruitful to examine whether British medical students are indeed observed more frequently and given more feedback during their clinical years than American medical students. If so, and if observation is deemed desirable, perhaps elements of the British medical education system that facilitate this behavior could be incorporated into American medical training.

The general trends observed from this across-the-pond analysis are that British students are far more comfortable than American students with a strong, traditional preceptor who dictates the flow of patient care and the appropriate forum for teaching. In contrast to the American students, British students do not feel the need to be the boss, and they expect to be observed and critiqued by their preceptors. While it could be postulated that these differences are a result of the fact that the British medical students were comparatively younger than the American medical students, this is most likely not the case since the same pattern of difference was not observed between older and younger American medical students. A more likely explanation is socio-cultural, that the British educational system is more rigid and hierarchical than the American educational system prior to and including medical school, that teaching behaviors are traditional (teacher-centered) rather than learner-centered or patient-centered, and that British students have

more reverence and respect for the expertise of primary care physicians than do American students. This potential difference in the esteem of community practitioners in each country could be a reflection of the substantial differences in the structures of the health care systems in the two countries.

Interesting as they are, the comparisons between American and British students in the ambulatory setting must be footnoted with the observation that Cambridge medical students and preceptors (unlike students and preceptors at the four U.S. medical schools) were not included in the focus groups that produced the teaching behaviors in the survey. As explained well by Morrison in the British Medical Journal,

“Students who are not committed to an evaluation may provide poor information. They need to feel ownership for an evaluation by participating in its development. The importance of obtaining the information and the type of information needed must be explicit. Usually the results of an evaluation will affect only subsequent cohorts of students, so current students must be convinced of the value of providing data.”[50]

The British students' survey response rate was only 46%, significantly lower than the lowest American school response rate, and extrapolating the trend observed from the American medical schools, a school with a low response rate would be expected to place lower value on the bulk of survey behaviors. Given the lack of participation by the British students in the development of the survey battery, and the lack of clear motivation for their completion of the survey itself, these differences are certainly understandable. Additionally, a greater portion of British student respondents than American respondents were male and white, the groups of students who placed the lowest values on teaching behaviors among the U.S. respondents. Thus, all of these factors, in tandem with the small sample size, limit the conclusions that can be drawn about the different values American and British students place on teaching behaviors in the ambulatory setting.

### *Strengths and Limitations*

This analysis of teaching behaviors valued in the ambulatory setting has several strengths. The surveyed behaviors were entirely generated by students and preceptors at the American institutions studied, thus creating an investment among these schools in the process and results of the research. Further, the 82% aggregate student response rate at these American medical schools was sufficiently high to lend itself to meaningful interpretation of the data. The analysis also employed a novel idea, which was to examine, specifically in the ambulatory setting, the variability of student values based on demographic characteristics, institutional affiliation, and country. While such research has been conducted and analyzed with regard to gender and medical school (for example, in the Canadian study by Schultz and colleagues [20]), none to date has examined the influence of race or age, nor has it compared responses across different countries to the same survey battery. The teaching behaviors surveyed, because of their large number, lent themselves to grouping by type, which allowed patterns to be more accurately observed and decreased the likelihood of occasional statistical flukes being included in these broader trends. Where it overlaps prior research, this study confirms previous findings (e.g. with respect to gender), and where it enters uncharted territory it introduces several ideas into the medical education discourse about the patterns of teaching behaviors valued by under-represented minority students and older students, groups that have previously been marginalized in such analyses. Finally, this study opens a dialogue about the high degree of variability of student preferences for teaching behaviors among medical schools, as well as between U.S. and U.K. medical schools, and it forces a

rethinking of the limits inherent in and the broader relevance of many single-institution methodologies in education research.

This research also has significant limitations, many of which have been addressed earlier in the discussion with regard to conclusions that can be drawn for particular subgroup comparisons based on the data. As with any survey-based study, the results are only as meaningful as the questions asked and the investment of the participants. Additionally, a retrospective survey can address issues of preference, but not the dynamic issues of what is actually happening in preceptor-student interactions in the ambulatory setting. This is true both because of recall bias and because our particular survey instrument was not attempting to delve into such information. Observational studies and real-time polling are methods much better-equipped to tackle the question of what truly happens in the ambulatory clinic. Finally, student values and preferences for or against a teaching behavior are important to understand for many reasons, but they do not necessarily serve as a surrogate for the effectiveness of those teaching behavior.

A statistical limitation of the research was the lack of formal multivariate analysis. In order to clarify the interactions of many characteristics, multivariate analysis had been discussed. Before data analysis was initiated, however, the descriptive characteristics of the students were known from the previous study. Because of the small size of some subgroups—especially the low numbers of underrepresented minority students and British medical students—we decided that the utility of multivariate analysis was dubious, and it was therefore not performed. Without such an analysis, it is not permissible to conclude strictly that differences observed across multiple subgroups are due to one or another particular factor. Nevertheless, the vast majority of behaviors that were valued

discordantly (38 of 44) only differed across one or two subgroups, and the few whose discordance may have been falsely attributed were discussed earlier in this section. Moreover, the pattern of discordant behaviors was unique for each subgroup comparison, providing a subjective measure of validity despite the lack of statistical rigor. Finally, a Bonferroni correction of p-values could have been applied (especially for comparisons across multiple subgroups) to decrease the likelihood of Type I errors, but this was not done because of the concomitant increase in the likelihood of Type II errors that would have resulted. As this research was intended to shed light on potential differences among groups, it was deemed more valuable to generate a larger number of testable hypotheses for further investigators to examine than to omit possibly relevant results.

The relatively narrow scope of this analysis places a further limit on its significance. After discussion about whether to examine value differences among subgroups of preceptors surveyed based on gender, race, institution, or teacher training we decided not to examine these preceptor characteristics in order to limit the scope of the analysis. Clearly, however, teaching and learning in the ambulatory setting is a two-way street, and analyzing faculty values is as important as examining student values in optimizing education and communication. Moreover, there were great disparities in the preceptor demographics, with only 37% female and 2.9% URM preceptors among the U.S. respondents (and only 16% and 0% among the British preceptor respondents). Thus, analysis of value differences among these subgroups could be particularly illuminating, as could further interview series with female and URM students on the importance of finding mentors of similar backgrounds who can help them navigate their clinical years and advise them on career paths.

The final limitation to this research is philosophical and ethical. It is important to state clearly that none of the survey results speak to the root causes of the value differences observed. Interestingly, a path analysis examining clinical medical students in the UK found that women were more responsive to the learning environment and more accepting of feedback than men, similar to results suggested by the present study; however, many of these gender-specific responses were observed in studies of younger schoolchildren, as well.[51] Far more likely than a genetic basis for these observations is the explanation that gender roles and behaviors are patterned by societal expectations. To illustrate, a study of women's performances on two Graduate Record Exam-like math tests separated by a verbal section showed that the women's math scores declined when the verbal section's essay claimed that there were genetically-caused sex-related differences in mathematical ability. Moreover, the women's math scores also declined if the verbal section's essay contained gender stereotypes unrelated to mathematical ability, indicating that the nonspecific stereotype primed the women to be affected by the latent math stereotype. By contrast, if the verbal section's essay claimed that there were no gender differences in mathematical ability, or if it acknowledged gender differences in mathematical ability but attributed them to differential experiences instead of genetics, the women's math scores were unaffected.[52] This was a very elegant, very sobering demonstration that transcended the realm of gender, illustrating more generally the power of stereotypes to unconsciously shape people's behavior and performance, and to perpetuate self-fulfilling prophecies.

It is conceptually difficult to research differences in the experiences of people based on their background characteristics, because the very act of analysis forms and

segregates groups based on the presumptions of homogeneity within each group and divergence between the groups. The results that are obtained from such an analysis are meant to help understand something about the groups, be it to confirm or to change a preconception, but because the new understanding is a generalization, a synthesis, it is also a stereotype. While the goal of this survey research has been to shed light on trends and to improve communication in medical education, it is important to try to avoid inadvertently creating or perpetuating stereotypes with this data, and not to cast students into roles defined by gender, race, or any other characteristic.

### **Conclusion:**

While our research demonstrates differences among groups of students in their learning preferences, an antidote to stereotyping based on this information is communal and personal reflection to unveil and challenge our assumptions. In the education research community, this is accomplished by soliciting and welcoming input from a diverse group of investigators, in order to hear perspectives that may have previously fallen on deaf ears. This involves setting research agendas that examine the experiences of marginalized and under-represented groups, as well as working at a policy level to rectify inequities that are observed. At the level of individual interactions in the ambulatory setting, this is facilitated through meaningful discussion at the start of the rotation between preceptor and student, where each first tries to understand the other as a fellow human being and a partner in the educational process, and to clearly communicate goals and expectations. Such a reflective, humanistic, and learner-centered approach to ambulatory education has the power to combat stereotypes and improve communication while simultaneously optimizing the quality of medical training.

**References:**

1. Greenberg, L.W., *Evolution of undergraduate education in ambulatory settings: historical models*. Pharos Alpha Omega Alpha Honor Med Soc, 1995. **58**(4): p. 13-7.
2. Kernan, W.N., et al., *Disagreement between Students and Preceptors Regarding Teaching Behaviors for Ambulatory Care Settings*. 2006.
3. Hewson, M.G., *Clinical teaching in the ambulatory setting*. J Gen Intern Med, 1992. **7**(1): p. 76-82.
4. Neher, J.O., et al., *A five-step "microskills" model of clinical teaching*. J Am Board Fam Pract, 1992. **5**(4): p. 419-24.
5. Heidenreich, C., et al., *The search for effective and efficient ambulatory teaching methods through the literature*. Pediatrics, 2000. **105**(1 Pt 3): p. 231-7.
6. Salerno, S.M., et al., *Faculty development seminars based on the one-minute preceptor improve feedback in the ambulatory setting*. Journal of General Internal Medicine, 2002. **17**(10): p. 779-87.
7. Yonke, A.M., *The art and science of clinical teaching*. Med Educ, 1979. **13**(2): p. 86-90.
8. Holmboe, E.S., et al., *Feedback and the mini clinical evaluation exercise*. J Gen Intern Med, 2004. **19**(5 Pt 2): p. 558-61.
9. Wang-Cheng, R.M., et al., *Effect of student and preceptor gender on clinical grades in an ambulatory care clerkship*. Academic Medicine, 1995. **70**(4): p. 324-6.
10. Holmboe, E.S., *Faculty and the observation of trainees' clinical skills: problems and opportunities*. Academic Medicine, 2004. **79**(1): p. 16-22.
11. Connell, K.J., et al., *Measuring the promotion of thinking during precepting encounters in outpatient settings*. Academic Medicine, 1999. **74**(10 Suppl): p. S10-2.
12. Ludmerer, K.M., *Learner-centered medical education*. New England Journal of Medicine, 2004. **351**(12): p. 1163-4.
13. Tiberius, R.G., *Metaphors Underlying the Improvement of Teaching and Learning*.
14. Wolpaw, T.M., D.R. Wolpaw, and K.K. Papp, *SNAPPS: a learner-centered model for outpatient education*. Acad Med, 2003. **78**(9): p. 893-8.
15. Lipsky, M.S., C.A. Taylor, and R. Schnuth, *Microskills for Students: Twelve Tips for Improving Learning in the Ambulatory Setting*.
16. O'Malley, P.G., et al., *What learners and teachers value most in ambulatory educational encounters: a prospective, qualitative study*. Academic Medicine, 1999. **74**(2): p. 186-91.
17. Kernan, W.N. and P.G. O'Connor, *Site Accommodations and Preceptor Behaviors Valued by 3rd-Year Students in Ambulatory Internal Medicine Clerkships*. Teaching and Learning in Medicine, 1997. **9**(2): p. 96-102.
18. Kernan, W.N., et al., *Effective teaching for preceptors of ambulatory care: a survey of medical students*. The American Journal of Medicine, 2000. **108**(6): p. 499-502.

19. Carney, P.A., et al., *Ambulatory care education: how do academic medical centers, affiliated residency teaching sites, and community-based practices compare?* Academic Medicine, 2004. **79**(1): p. 69-77.
20. Schultz, K.W., et al., *Medical Students' and Residents' preferred site characteristics and preceptor behaviours for learning in the ambulatory setting: a cross-sectional survey.* BMC Med Educ, 2004. **4**: p. 12.
21. Kernan, W.N., E. Holmboe, and P.G. O'Connor, *Assessing the teaching behaviors of ambulatory care preceptors.* Academic Medicine, 2004. **79**(11): p. 1088-94.
22. Lublin, J.R., *Role modelling: a case study in general practice.* Medical Education, 1992. **26**(2): p. 116-22.
23. Robins, L.S., et al., *A predictive model of student satisfaction with the medical school learning environment.* Academic Medicine, 1997. **72**(2): p. 134-9.
24. Hall, F.R., et al., *Longitudinal trends in the applicant pool for U.S. medical schools, 1974--1999.* Academic Medicine, 2001. **76**(8): p. 829-34.
25. Petersdorf, R.G., *Not a choice, an obligation.* Academic Medicine, 1992. **67**(2): p. 73-9.
26. Ash, A.S., et al., *Compensation and advancement of women in academic medicine: is there equity? [see comment].* Annals of Internal Medicine, 2004. **141**(3): p. 205-12.
27. Wright, A.L., et al., *Gender differences in academic advancement: patterns, causes, and potential solutions in one US College of Medicine.* Academic Medicine, 2003. **78**(5): p. 500-8.
28. Lewis-Stevenson, S., et al., *Female and underrepresented minority faculty in academic departments of family medicine: are women and minorities better off in family medicine?* Family Medicine, 2001. **33**(6): p. 459-65.
29. Peterson, N.B., et al., *Faculty self-reported experience with racial and ethnic discrimination in academic medicine.* Journal of General Internal Medicine, 2004. **19**(3): p. 259-65.
30. Petersdorf, R.G., et al., *Minorities in medicine: past, present, and future.* Academic Medicine, 1990. **65**(11): p. 663-70.
31. Fang, D., et al., *Racial and ethnic disparities in faculty promotion in academic medicine. [see comment].* JAMA, 2000. **284**(9): p. 1085-92.
32. Brotherton, S.E. and S.I. Etzel, *Graduate Medical Education, 2005-2006.* JAMA, 2006. **296**(9): p. 1154-1169.
33. Gartland, J.J., et al., *African American and white physicians: a comparison of satisfaction with medical education, professional careers, and research activities.* Teaching & Learning in Medicine, 2003. **15**(2): p. 106-12.
34. Childers, L., *Aren't You a Nurse?, in The New Physician.* 2006. p. 34-36.
35. Betancourt, J.R. and A.E. Reid, *Black physicians' experience with race: should we be surprised? [comment].* Annals of Internal Medicine, 2007. **146**(1): p. 68-9.
36. Nunez-Smith, M., et al., *Impact of race on the professional lives of physicians of African descent. [see comment].* Annals of Internal Medicine, 2007. **146**(1): p. 45-51.
37. Carney, P.A., et al., *Differences in ambulatory teaching and learning by gender match of preceptors and students.* Family Medicine, 2000. **32**(9): p. 618-23.

38. O'Hara, B.S., et al., *Gender and preceptors' feedback to students*. Academic Medicine, 2000. **75**(10): p. 1030.
39. Kick, S., L. Adams, and A. O'Brien-Gonzales, *Unique issues of older medical students*. Teaching & Learning in Medicine, 2000. **12**(3): p. 150-5.
40. Xu, G., J.J. Veloski, and B. Barzansky, *Comparisons between older and usual-aged medical school graduates on the factors influencing their choices of primary care specialties*. Academic Medicine, 1997. **72**(11): p. 1003-7.
41. Regehr, G., *Trends in medical education research*. Academic Medicine, 2004. **79**(10): p. 939-47.
42. Bowen, J.L. and D.M. Irby, *Assessing quality and costs of education in the ambulatory setting: a review of the literature*. Academic Medicine, 2002. **77**(7): p. 621-80.
43. Elks, M.L., *Gender issues and generalism in medicine*. Academic Medicine, 1996. **71**(12): p. 1281-4.
44. UMass Medical School Website. [cited; Available from: <http://www.umassmed.edu/som/index.aspx>].
45. Yale Medical School Website. [cited; Available from: [http://www.med.yale.edu/omca/students/yale\\_system.htm](http://www.med.yale.edu/omca/students/yale_system.htm)].
46. American Academy of Family Physicians Website. [cited; Available from: <http://www.aafp.org/residencies/>].
47. Berbano, E.P., et al., *The impact of the Stanford Faculty Development Program on ambulatory teaching behavior*. Journal of General Internal Medicine, 2006. **21**(5): p. 430-4.
48. Denton, G.D., et al., *A time and motion study of the effect of ambulatory medical students on the duration of general internal medicine clinics*. Teaching & Learning in Medicine, 2005. **17**(3): p. 285-9.
49. Pangaro, L., *A new vocabulary and other innovations for improving descriptive in-training evaluations*. Academic Medicine, 1999. **74**(11): p. 1203-7.
50. Morrison, J., *ABC of learning and teaching in medicine: Evaluation*. BMJ, 2003. **326**(7385): p. 385-7.
51. de Saintonge, D.M. and D.M. Dunn, *Gender and achievement in clinical medical students: a path analysis*. Medical Education, 2001. **35**(11): p. 1024-33.
52. Dar-Nimrod, I. and S.J. Heine, *Exposure to scientific theories affects women's math performance*. Science, 2006. **314**(5798): p. 435.

**Appendix A: Survey Questionnaire**

The following 12 pages contain the survey that was administered to U.S. and U.K. medical students and preceptors about behaviors in the ambulatory setting. The survey was initially administered in 2002-2003, and the only changes that have been made to it for this publication are in the page layout and format.

























## Appendix B: Tables

The following 16 pages contain Tables 1-6 in full form, while their abridged versions appear in the text of the results section. The information contained in the tables is indexed below.

**Table 1:** Descriptive data of the survey respondents

**Table 2:** Value of behaviors according to student gender

**Table 3:** Value of behaviors according to student race/ethnicity

**Table 4:** Value of behaviors according to student age

**Table 5:** Value of behaviors according to U.S. medical school of attendance

**Table 6:** Value of behaviors according to country of medical school of attendance

































## **SECTION A. BACKGROUND QUESTIONNAIRE**

**INSTRUCTIONS:** Please complete the following background questions by checking (✓) the box corresponding to your answer.





3. Describe the practice at which you clerked (student) or worked (faculty/teacher).  
[Students: describe only the site at which you spent the most time.]

Solo Practice	<input type="checkbox"/>	Staff Model HMO	<input type="checkbox"/>
Group Practice	<input type="checkbox"/>	Other	<input type="checkbox"/>
Hospital Clinic	<input type="checkbox"/>		
Community Health Center	<input type="checkbox"/>		

4. What is your age? \_\_\_\_\_ Years

5. What is your ethnic background?

White, not of Hispanic origin	<input type="checkbox"/>	Asian/Pacific Islander	<input type="checkbox"/>
Black, not of Hispanic origin	<input type="checkbox"/>	Mixed	<input type="checkbox"/>
Hispanic	<input type="checkbox"/>	Other	<input type="checkbox"/>
American Indian/Alaskan Native	<input type="checkbox"/>		

6. What is your gender? Male  Female

7. **STUDENTS ONLY:** (Faculty - Skip to # 8)

A. What is your year in medical school?

- |       |                          |
|-------|--------------------------|
| 1     | <input type="checkbox"/> |
| 2     | <input type="checkbox"/> |
| 3     | <input type="checkbox"/> |
| 4     | <input type="checkbox"/> |
| 5     | <input type="checkbox"/> |
| Other | <input type="checkbox"/> |

B. How many weeks did you spend on any internal medicine or general practice clerkships prior to this rotation?

- |       |                          |
|-------|--------------------------|
| 1     | <input type="checkbox"/> |
| 2     | <input type="checkbox"/> |
| 3     | <input type="checkbox"/> |
| 4     | <input type="checkbox"/> |
| 5     | <input type="checkbox"/> |
| Other | <input type="checkbox"/> |

C. During your ambulatory rotation, were you asked to present your history and physical examination in the presence of the patient?

- |                                      |                          |
|--------------------------------------|--------------------------|
| Yes, for almost every patient        | <input type="checkbox"/> |
| Yes, for more than 1/2 patients      | <input type="checkbox"/> |
| Yes, but for fewer than 1/2 patients | <input type="checkbox"/> |
| No                                   | <input type="checkbox"/> |

D. In your teaching practice, was your preceptor or GP teacher also supervising other learners?

- |   |                          |
|---|--------------------------|
| Yes, supervising residents/PRHOs or fellows/GP registrars | <input type="checkbox"/> |
| Yes, supervising other students                           | <input type="checkbox"/> |
| No  | <input type="checkbox"/> |

E. In your teaching practice, was your preceptor or GP teacher seeing patients on his/her own while teaching you?

Yes, always  No   
Yes, some of the time

---

F. Please rate your overall satisfaction with your recent ambulatory internal medicine/primary care experience.

Very Unsatisfied   
Moderately Unsatisfied   
Just Satisfied   
Moderately Satisfied   
Very Satisfied

---

G. Please indicate your level of satisfaction with the amount of time your preceptor or GP teacher had to engage you in teaching about individual patients.

Very Unsatisfied   
Moderately Unsatisfied   
Just Satisfied   
Moderately Satisfied   
Very Satisfied

---

H. Did you do at least one home visit during your ambulatory or general practice rotation?

Yes   
No

---

8. **FACULTY/GP Teachers ONLY:** (Students - Skip to Section B)

A. Please describe your faculty appointment at your medical school.

Part time   
Full time   
No appointment

B. For how many years have you been teaching students in your practice?

Years

C. Have you ever attended a seminar, workshop, or course on teaching in your practice?

Yes

No

D. Do you routinely receive special monetary compensation specifically to teach students in your practice?

Yes

No

## **SECTION B. SURVEY QUESTIONS**

**INSTRUCTIONS:** Listed in the left-hand column are teaching behaviors of ambulatory preceptors/teachers. For each teaching behavior, first indicate if you recommend it. Before going on to the next behavior, rate how important the same item is for student learning. Check the boxes corresponding to your responses. You may indicate that an item is not important even if you recommend it strongly.













TEACHING BEHAVIOR	DO YOU RECOMMEND PRECEPTORS USE THE BEHAVIOR?					HOW IMPORTANT IS THE BEHAVIOR TO LEARNING?				
	Yes, Strongly	Yes, Somewhat	Not sure	No, Somewhat	No, Strongly	Extremely Important	Very Important	Somewhat Important	Not Very Important	Not at All Important
57. If a student does something wrong, tell him or her how to do it right. On the next occasion when the student does it correctly, complement him or her.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58. Give feedback during or after individual patient visits, not just during special sessions outside clinic hours.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### **SECTION C. FINAL QUESTIONS**

INSTRUCTIONS: For each statement listed in the left-hand column, please indicate whether or not you agree with it. Put a check in the box corresponding with your response.

STATEMENT	TO WHAT EXTENT DO YOU AGREE OR DISAGREE WITH THE STATEMENT?				
	Strongly Agree	Somewhat Agree	No Opinion	Somewhat Disagree	Strongly Disagree
59. It is preferable to present the history and physical to the preceptor/GP teacher in the presence of the patient rather than away from the patient.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60. Preceptors/GP teachers should avoid questioning students in front of patients about general medical knowledge.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
61. After patient encounters, preceptors/GP teachers should ask the student, "How do you feel about that encounter?"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
62. The ambulatory setting is an excellent place to teach interviewing skills.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
63. Return patients and urgent visit patients are more appropriate for students than new patients.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**STATEMENT****TO WHAT EXTENT DO YOU AGREE OR  
DISAGREE WITH THE STATEMENT?**

	Strongly Agree	Somewhat Agree	No Opinion	Somewhat Disagree	Strongly Disagree
64. Preceptors/GP teachers should emphasize the teaching of interviewing skills.	<input type="checkbox"/>				
65. Preceptors/GP teachers should never criticize a student in front of a patient.	<input type="checkbox"/>				
66. It is important for the student to have an opportunity to speak with the preceptor/GP teacher away from the patient.	<input type="checkbox"/>				
67. It is important for the student to have his or her own schedule of patients to be seen in any given clinic session.	<input type="checkbox"/>				

**THE END****Thank You**

If you would like a summary of the results of this survey or a copy of the prior publication from this project, please indicate this below and provide your name and address.

It will be detached to preserve the anonymity of your responses.

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ Summary of this survey Copy of prior publication

[Original 5/2/02]

[Revised 3/26/07]

Table 1: Selected features of the student and preceptor survey respondents.

<b>Feature</b>	<b>U.S. Students (N=163)</b>	<b>U.K. Students (N=23)</b>	<b>U.S. Preceptors (N=138)</b>	<b>U.K. Preceptors (N=32)</b>
School				
Boston University	43	0	39	0
Tufts	32	0	32	0
U Mass	39	0	31	0
Yale	49	0	36	0
Cambridge (UK)	0	23	0	32
Mean age (years) ± sd	27 ± 3	23	45 ± 8	43
Female sex	54%	44%	37%	16%
Ethnicity				
White	68%	74%	83%	91%
Black	5%	0%	1%	0%
Hispanic	5%	0%	1%	0%
Asian	19%	17%	13%	3%
Other	3%	9%	2%	6%
Practice type				
Solo	9%	5%	8%	?
Group	29%	91%	36%	?
Hospital	43%	0%	20%	?
Community Health Center	10%	5%	2%	?
Staff Model HMO	6%	0%	1%	?
Other	3%	0%	0%	?
Year precepting (mean)	N/A	N/A	9 ± 6	7
Teacher training				
Yes	N/A	N/A	74%	100%
No	N/A	N/A	26%	0%
Faculty Appointment				
Part-time	N/A	N/A	44%	9%
Full-time	N/A	N/A	40%	0%
None	N/A	N/A	16%	91%
Stipend for teaching				
Yes	N/A	N/A	30%	94%
No	N/A	N/A	70%	6%

\*Table adapted from Kernan et al.

Table 2: Percent of male and female students who valued each of 58 teaching behaviors, by survey question number.

**Bold=significant (15% difference AND p<0.05), Italics = near-significant (10-15% difference, p<0.05)**

No.	Behavior	Males N=74	Females N=89	Absolute Difference	p
<b>SECTION I: ORIENTATION</b>					
1	Early in the rotation, ask the student what experiences he or she hopes to have.	54.1	60.9	6.8	0.379
2	Early in the rotation, ask the student to identify skills he or she wants to develop.	75.7	83	7.3	0.252
3	Introduce the student to everyone who works in the practice.	59.5	58	1.5	0.846
4	Orient the student to the medical record.	66.2	65.9	0.3	0.967
5	Have the student observe you caring for patients so that you can role model what you want them to do in your practice.	69.9	69.3	0.6	0.940
<b>6</b>	<b>Early in the rotation, counsel the student on conducting a problem-focused patient encounter.</b>	<b>76.7</b>	<b>59.1</b>	<b>17.6</b>	<b>0.018</b>
<b>SECTION II: CREATING A FAVORABLE LEARNING ENVIRONMENT</b>					
7	Encourage students to ask questions throughout the rotation.	95.9	93.2	2.7	0.444
8	Give student time to organize his/her thoughts before they present their findings.	77	79.5	2.5	0.698
9	Create in advance a daily list of patients who will be seen by the student; do not just select patients from your list.	14.9	21.6	6.7	0.272
10	Look for learning opportunities for the student. For example, if a patient needs a procedure, have the student do it.	94.6	87.5	7.1	0.121
<b>11</b>	<b>Introduce the student to patients using the student's correct name.</b>	<b>33.8</b>	<b>54.5</b>	<b>20.7</b>	<b>0.008</b>
12	Initiate teaching discussions.	93.2	89.8	3.4	0.434
13	Set a regular time to meet with the student to review patients and give feedback.	76.7	71.6	5.1	0.461
14	Encourage questions and respond to them tactfully.	90.5	94.3	3.8	0.360
<b>SECTION III: OVERSEEING THE STUDENT'S EXPERIENCE</b>					
15	Periodically inquire about how the experience could be adjusted to better suit the student's needs.	62.2	62.1	0.1	0.990
16	Ask the student if there are aspects of the physical examination he or she wants to work on and then provide help.	89.2	94.3	5.1	0.240
17	Periodically ask the student if his or her personal learning goals are being met.	64.9	63.2	1.7	0.828
18	Enable the student to see a mix of acute visit patients and non-acute visit patients.	86.5	89.7	3.2	0.535
<b>SECTION IV: ORCHESTRATING STUDENT-PATIENT INTERACTIONS</b>					
19	Leave the student alone with the patient until he or she has completed his or her evaluation.	79.7	69	10.7	0.121
<b>20</b>	<b>Obtain consent from the patient for the student's participation.</b>	<b>33.8</b>	<b>55.2</b>	<b>21.4</b>	<b>0.007</b>
21	Before each patient encounter, give the student a specific time limit for completing the history and physical examination.	32.4	26.4	6	0.404

No.	Behavior	Males N=74	Females N=89	Absolute Difference	p
22	For most patients, ask the student to present the history and physical examination (H&P) in front of the patient.	15.3	9.2	6.1	0.239
23	If the student presents the H&P in front of the patient, provide the student an opportunity to also talk to the preceptor away from the patient.	79.7	77.3	2.4	0.705
24	Hold preliminary discussions about diagnosis and treatment away from the patient.	59.5	72.7	13.2	0.074
<b>SECTION V: TEACHING CLINICAL SKILLS</b>					
25	Create opportunities for the student to educate patients.	90.5	85.2	5.3	0.306
26	<i>Watch the student do focused components of the physical examination (e.g. knee examination) to determine his or her skill level and learning needs.</i>	82.4	93.2	10.8	0.034
27	Watch the student do the visit/consultation closure.	64.9	72.1	7.2	0.325
28	Regularly watch the student perform critical tasks in history-taking and other patient communications.	64.9	52.3	12.6	0.106
29	Assure the student regularly interviews and examines patients on his or her own.	93.2	98.9	5.7	0.059
30	Guide the student in devising a plan of care and caring for the patient; avoid replacing the student or just telling the student what to do.	95.9	97.7	1.8	0.514
31	Ask the student to do minor procedures, such as injections, tuberculin skin testing, and ECG interpretation.	89.2	89.8	0.6	0.904
32	Delegate responsibility to the student for the wrap-up discussion with the patient (for explaining the diagnosis and treatment, etc.).	78.1	79.3	1.2	0.850
33	<b>Delegate responsibility to the student for telephone calls to patients (i.e., to check on treatment outcome or convey test results).</b>	38	55.7	17.7	0.027
34	Delegate responsibility to the student for ascertaining and interpreting test results.	83.6	81.4	2.2	0.721
35	Ask for the student's assessment and plan before giving your own formulation.	94.6	95.5	0.9	0.801
36	Ask questions to lead the student to his or her own diagnosis or treatment.	93.2	92	1.2	0.790
37	Challenge the student to explain choices he or she makes regarding diagnostic strategies or therapeutics.	100	95.5	4.5	0.065
38	Regularly teach physical examination techniques.	87.7	89.8	2.1	0.674
39	<i>Create opportunities for the student to watch you communicate with patients.</i>	74	87.5	13.5	0.028
40	<i>Create opportunities for the student to educate patients.</i>	90.5	77.3	13.2	0.024
41	Seek out the student to demonstrate physical findings on patients not seen by the student.	89	95.5	6.5	0.123
42	Facilitate the student's sense of being the caregiver.	79.5	69.3	10.2	0.145
<b>SECTION VI: TEACHING KNOWLEDGE</b>					
43	Ask questions to probe the student's knowledge.	78.4	73.9	4.5	0.503
44	Use questions to help students improve their understanding of particular issues.	86.3	89.8	3.5	0.497

No.	Behavior	Males N=74	Females N=89	Absolute Difference	p
45	Put students in the teaching role. Give them assignments to educate both of you.	77	69.3	7.7	0.272
46	When a student incorrectly answers a question, don't leave the discussion there, but direct the student to the correct answer.	94.5	95.5	1	0.786
47	Question students about their medical knowledge in front of patients.	10.8	4.5	6.3	0.129
48	Take time during or immediately after each patient visit to ask if the student has questions or to make a teaching point.	90.5	86.2	4.3	0.396
49	Help students identify uncertainty and formulate questions relating to patients.	83.6	85.2	1.6	0.771
50	Reserve time outside the clinic sessions to discuss patients with the student.	66.2	55.8	10.4	0.179
51	Choose reading assignments that are relevant, that influence patient care or educate other caregivers.	74.3	70.1	4.2	0.553

## SECTION VII: FEEDBACK

52	When students do something well, tell them they did it well.	89.2	89.8	0.6	0.904
53	In feedback, do not stop at global criticisms. Be specific and directive, citing alternative ways of doing the pertinent skill.	90.5	97.7	7.2	0.047
54	Give the student an honest assessment of whether he or she falls short of any performance goal.	95.9	95.5	0.4	0.878
55	Follow negative criticism with action to help the student improve his or her performance.	90.5	96.6	6.1	0.111
56	After telling the student of a skill, knowledge area, or attitude he or she needs to improve, help the student to improve.	93.2	94.3	1.1	0.777
57	If a student does something wrong, tell him or her how to do it right. On the next occasion when the student does it correctly, compliment him or her.	78.1	87.5	9.4	0.111
58	Give feedback during or after individual patient visits, not just during special sessions outside clinic hours.	81.1	89.8	8.7	0.114

Table 3: Percent of students by race/ethnicity who valued each of 58 teaching behaviors, by survey question number.  
**Bold=significant (15% maximum difference AND p<0.05), Italics = notable (15% difference but p≥0.05)**

No.	Behavior	White N=109	Asian N=31	URM N=16	Max Diff	p
<b>SECTION I: ORIENTATION</b>						
1	<b>Early in the rotation, ask the student what specific experiences he or she hopes to have.</b>	48.1	80.6	75	32.5	<b>0.002</b>
2	<b>Early in the rotation, ask the student to identify skills he or she wants to develop.</b>	74.3	93.5	93.8	19.5	<b>0.021</b>
3	<i>Introduce the student to everyone who works in the practice.</i>	56.9	54.8	81.3	26.5	0.157
4	<i>Orient the student to the medical record.</i>	66.1	61.3	87.5	26.2	0.169
5	<i>Have the student observe you caring for patients so that you can role model what you want them to do in your practice.</i>	67.9	73.3	87.5	19.6	0.259
6	<i>Early in the rotation, counsel the student on conducting a problem-focused patient encounter.</i>	61.5	76.7	81.3	19.8	0.123
<b>SECTION II: CREATING A FAVORABLE LEARNING ENVIRONMENT</b>						
7	Encourage students to ask questions throughout the rotation.	92.7	100	93.8	7.3	0.301
8	<i>Give student time to organize his/her thoughts before they present their findings.</i>	73.4	83.9	93.8	20.4	0.122
9	<b>Create in advance a daily list of patients who will be seen by the student; do not just select patients from your list.</b>	13.8	29	37.5	23.7	<b>0.024</b>
10	Look out for learning opportunities for the student. For example, if a patient needs a procedure, have the student do it.	88.1	96.8	93.8	8.7	0.311
11	Introduce the student to patients using the student's correct name.	47.7	35.5	43.8	12.2	0.480
12	Initiate teaching discussions.	90.8	93.5	93.8	3	0.846
13	Set a specific, regular time to meet with the student to review patients and give feedback.	74.3	73.3	81.3	8	0.818
14	Encourage questions and respond to them tactfully.	90.8	96.8	93.8	6	0.534
<b>SECTION III: OVERSEEING THE STUDENT'S EXPERIENCE</b>						
15	<i>Periodically inquire about how the experience could be adjusted to better suit the student's needs.</i>	57.4	74.2	68.8	16.8	0.199
16	Ask the student if there are aspects of the physical examination he or she wants to work on and then provide help.	91.7	90.3	100	9.7	0.459
17	<i>Periodically ask the student if his or her personal learning goals are being met.</i>	60.2	74.2	81.3	21.1	0.128
18	Enable the student to see a mix of acute visit patients and non-acute visit patients.	88	93.5	87.5	6	0.666

No.	Behavior	White N=109	Asian N=31	URM N=16	Max Diff	p
<b>SECTION IV: ORCHESTRATING STUDENT-PATIENT INTERACTIONS</b>						
19	Leave the student alone with the patient until he or she has completed his or her evaluation.	72.2	77.4	87.5	15.3	0.394
20	Obtain consent from the patient for the student's participation.	43.5	35.5	68.8	33.3	0.088
21	Before each patient encounter, give the student a specific time limit for completing the history and physical examination.	25	38.7	37.5	13.7	0.244
22	For most patients, ask the student to present the history and physical examination (H&P) in front of the patient.	14.2	12.9	0	14.2	0.277
23	If the student presents the H&P in front of the patient, provide the student an opportunity to also talk to the preceptor away from the patient.	78	80.6	81.3	3.3	0.921
24	Hold preliminary discussions about diagnosis and treatment away from the patient.	66.1	64.5	75	10.5	0.747
<b>SECTION V: TEACHING CLINICAL SKILLS</b>						
25	Create opportunities for the student to educate patients.	88.1	74.2	93.8	19.6	0.093
26	Watch the student do focused components of the physical examination (e.g. knee examination) to determine his or her skill level and learning needs.	89	80.6	93.8	13.2	0.340
27	Watch the student do the visit/consultation closure.	66.4	71	75	8.6	0.734
28	Regularly watch the student perform critical tasks in history-taking and other patient communications.	59.6	51.6	56.3	8	0.722
29	Assure that the student regularly interviews and examines patients on his or her own.	97.2	90.3	100	9.7	0.146
30	Guide the student in devising a plan of care and caring for the patient; avoid replacing the student or just telling the student what to do.	96.3	96.8	100	3.7	0.739
31	Ask the student to do minor procedures, such as injections, tuberculin skin testing, and ECG interpretation.	89	83.9	100	16.1	0.243
32	Delegate responsibility to the student for the wrap-up discussion with the patient (for explaining the diagnosis and treatment, etc.).	78.5	74.2	87.5	13.3	0.574
33	Delegate responsibility to the student for telephone calls to patients (i.e., to check on treatment outcome or convey test results).	47.7	43.3	62.5	19.2	0.448
34	<b>Delegate responsibility to the student for ascertaining and interpreting test results.</b>	84	64.5	100	35.5	0.007
35	<b>Ask for the student's assessment and plan before giving your own formulation.</b>	96.3	96.8	81.3	15.5	0.034
36	Ask questions to lead the student to his or her own diagnosis or treatment.	94.4	87.1	87.5	7.3	0.303
37	Challenge the student to explain choices he or she makes regarding diagnostic strategies or therapeutics.	96.3	100	100	3.7	0.409
38	Regularly teach physical examination techniques.	89.8	87.1	93.8	6.7	0.774
39	Create opportunities for the student to watch you manage difficult patient encounters.	78.7	93.5	87.5	14.8	0.136
40	Create opportunities for the student to watch you communicate with patients.	78.7	87.1	87.5	8.8	0.457

No.	Behavior	White N=109	Asian N=31	URM N=16	Max Diff	p
41	Seek out the student to demonstrate physical findings on patients not seen by the student.	92.6	90.3	100	9.7	0.460
42	<b>Facilitate the student's sense of being the caregiver.</b>	<b>68.5</b>	<b>90.3</b>	<b>81.3</b>	<b>21.8</b>	<b>0.040</b>

## **SECTION VI: TEACHING KNOWLEDGE**

43	Ask questions to probe the student's knowledge.	78	67.7	81.3	13.6	0.440
44	Use questions to help students improve their understanding of particular issues.	86.2	87.1	100	13.8	0.288
45	Put students in the teaching role. Give them assignments to educate both of you.	72.5	67.7	81.3	13.6	0.617
46	When a student incorrectly answers a question, don't leave the discussion there, but direct the student to the correct answer.	93.6	96.8	100	6.4	0.479
47	Question students about their medical knowledge in front of patients.	9.2	3.2	0	9.2	0.265
48	Take time during or immediately after each patient visit to ask if the student has questions or to make a teaching point.	86.2	93.5	100	13.8	0.173
49	Help students identify uncertainty and formulate questions relating to patients.	82.6	87.1	93.8	11.2	0.467
50	Reserve time outside the clinic sessions to discuss patients with the student.	59.8	61.3	68.8	9	0.791
51	Choose reading assignments that are relevant, that influence patient care or educate other caregivers.	71.3	71	75	4	0.950

## **SECTION VII: FEEDBACK**

52	When students do something well, tell them they did it well.	88.1	93.5	93.8	5.7	0.578
53	In feedback, do not stop at global criticisms. Be specific and directive, citing alternative ways of doing the pertinent skill.	94.5	93.5	93.8	1	0.977
54	Give the student an honest assessment of whether he or she falls short of any performance goal.	96.3	93.5	93.8	2.8	0.754
55	Follow negative criticism with action to help the student improve his or her performance.	91.7	93.5	100	8.3	0.479
56	After telling the student of a skill, knowledge area, or attitude he or she needs to improve, help the student to improve.	93.6	93.5	100	6.5	0.579
57	If a student does something wrong, tell him or her how to do it right. On the next occasion when the student does it correctly, compliment him or her.	88	87.1	100	12.9	0.330
58	Give feedback during or after individual patient visits, not just during special sessions outside clinic hours.	81.5	87.1	93.8	12.3	0.397

\*Note: 2 students did not identify ethnicity on the survey. 5 others who responded "mixed" or "other" were not included.

Table 4: Percent of older and younger students who valued each of 58 teaching behaviors, by survey question number.  
**Bold=significant (15% difference AND p<0.05), Italics = near-significant (10-15% difference, p<0.05)**

No.	Behavior	Age≥27 N=68	Age<27 N=95	Absolute Difference	p
<b>SECTION I: ORIENTATION</b>					
1	Early in the rotation, ask the student what specific experiences he or she hopes to have.	58.8	57.4	1.4	0.861
2	Early in the rotation, ask the student to identify skills he or she wants to develop.	83.8	76.8	7	0.274
3	Introduce the student to everyone who works in the practice.	55.9	61.1	5.2	0.508
4	<b>Orient the student to the medical record.</b>	<b>54.4</b>	<b>74.7</b>	<b>20.3</b>	<b>0.007</b>
5	Have the student observe you caring for patients so that you can role model what you want them to do in your practice.	70.6	69.1	1.5	0.844
6	Early in the rotation, counsel the student on conducting a problem-focused patient encounter.	69.1	66	3.1	0.672
<b>SECTION II: CREATING A FAVORABLE LEARNING ENVIRONMENT</b>					
7	Encourage students to ask questions throughout the rotation.	97.1	91.6	5.5	0.151
8	Give student time to organize his/her thoughts before they present their findings.	76.5	80	3.5	0.588
9	Create in advance a daily list of patients who will be seen by the student; do not just select patients from your list.	22.1	15.8	6.3	0.308
10	Look out for learning opportunities for the student. For example, if a patient needs a procedure, have the student do it.	89.7	91.6	1.9	0.683
11	Introduce the student to patients using the student's correct name.	41.2	48.4	7.2	0.360
12	Initiate teaching discussions.	89.7	92.6	2.9	0.511
13	Set a specific, regular time to meet with the student to review patients and give feedback.	74.6	73.7	0.9	0.893
14	<i>Encourage questions and respond to them tactfully.</i>	100	87.4	12.6	0.002
<b>SECTION III: OVERSEEING THE STUDENT'S EXPERIENCE</b>					
15	Periodically inquire about how the experience could be adjusted to better suit the student's needs.	62.7	61.1	1.6	0.833
16	Ask the student if there are aspects of the physical examination he or she wants to work on and then provide help.	91	92.6	1.6	0.714
17	Periodically ask the student if his or her personal learning goals are being met.	71.6	58.9	12.7	0.097
18	<i>Enable the student to see a mix of acute visit patients and non-acute visit patients.</i>	95.5	83.2	12.3	0.016
<b>SECTION IV: ORCHESTRATING STUDENT-PATIENT INTERACTIONS</b>					
19	Leave the student alone with the patient until he or she has completed his or her evaluation.	76.1	72.6	3.5	0.618
20	Obtain consent from the patient for the student's participation.	44.8	46.3	1.5	0.846

No.	Behavior	Age≥27 N=68	Age<27 N=95	Absolute Difference	p
21	Before each patient encounter, give the student a specific time limit for completing the history and physical examination.	35.8	24.2	11.6	0.109
22	For most patients, ask the student to present the history and physical examination (H&P) in front of the patient.	13.4	11.8	1.6	0.762
23	If the student presents the H&P in front of the patient, provide the student an opportunity to also talk to the preceptor away from the patient.	76.5	80	3.5	0.588
24	Hold preliminary discussions about diagnosis and treatment away from the patient.	66.2	67.4	1.2	0.873

## SECTION V: TEACHING CLINICAL SKILLS

25	Create opportunities for the student to educate patients.	83.8	87.4	3.6	0.521
26	Watch the student do focused components of the physical examination (e.g. knee examination) to determine his or her skill level and learning needs.	91.2	86.3	4.9	0.340
27	Watch the student do the visit/consultation closure.	75	64.5	10.5	0.156
28	Regularly watch the student perform critical tasks in history-taking and other patient communications.	61.8	55.8	6	0.446
29	Assure that the student regularly interviews and examines patients on his or her own.	94.1	97.9	3.8	0.207
30	Guide the student in devising a plan of care and caring for the patient; avoid replacing the student or just telling the student what to do.	97.1	96.8	0.3	0.937
31	Ask the student to do minor procedures, such as injections, tuberculin skin testing, and ECG interpretation.	88.2	90.5	2.3	0.637
32	Delegate responsibility to the student for the wrap-up discussion with the patient (for explaining the diagnosis and treatment, etc.).	77.9	79.6	1.7	0.803
33	Delegate responsibility to the student for telephone calls to patients (i.e., to check on treatment outcome or convey test results).	55.2	43	12.2	0.127
34	Delegate responsibility to the student for ascertaining and interpreting test results.	82.1	82.8	0.7	0.908
35	Ask for the student's assessment and plan before giving your own formulation.	97.1	93.6	3.5	0.318
36	Ask questions to lead the student to his or her own diagnosis or treatment.	94.1	91.5	2.6	0.528
37	Challenge the student to explain choices he or she makes regarding diagnostic strategies or therapeutics.	98.5	96.8	1.7	0.486
38	<i>Regularly teach physical examination techniques.</i>	97.1	83	14.1	0.005
39	<i>Create opportunities for the student to watch you manage difficult patient encounters.</i>	91.2	77.7	13.5	0.023
40	<i>Create opportunities for the student to watch you communicate with patients.</i>	88.2	76.6	11.6	0.060
41	<i>Seek out the student to demonstrate physical findings on patients not seen by the student.</i>	100	87.2	12.8	0.002
42	Facilitate the student's sense of being the caregiver.	76.5	72.3	4.2	0.554

No.	Behavior	Age≥27 N=68	Age<27 N=95	Absolute Difference	p
<b>SECTION VI: TEACHING KNOWLEDGE</b>					
43	Ask questions to probe the student's knowledge.	76.5	75.8	0.7	0.920
44	<i>Use questions to help students improve their understanding of particular issues.</i>	94.1	83.2	10.9	0.035
45	Put students in the teaching role. Give them assignments to educate both of you.	76.5	70.5	6	0.399
46	When a student incorrectly answers a question, don't leave the discussion there, but direct the student to the correct answer.	97.1	93.7	3.4	0.325
47	Question students about their medical knowledge in front of patients.	7.4	7.4	0	0.997
48	Take time during or immediately after each patient visit to ask if the student has questions or to make a teaching point.	94	84.2	9.8	0.056
49	Help students identify uncertainty and formulate questions relating to patients.	82.4	84.2	1.8	0.753
50	Reserve time outside the clinic sessions to discuss patients with the student.	67.2	55.3	11.9	0.130
51	Choose reading assignments that are relevant, that influence patient care or educate other caregivers.	75	70.2	4.8	0.502
<b>SECTION VII: FEEDBACK</b>					
52	When students do something well, tell them they did it well.	89.7	89.5	0.2	0.962
53	In feedback, do not stop at global criticisms. Be specific and directive, citing alternative ways of doing the pertinent skill.	94.1	94.7	0.6	0.864
54	Give the student an honest assessment of whether he or she falls short of any performance goal.	94.1	96.8	2.7	0.398
55	Follow negative criticism with action to help the student improve his or her performance.	94.1	92.6	1.5	0.709
56	After telling the student of a skill, knowledge area, or attitude he or she needs to improve, help the student to improve.	97.1	91.6	5.5	0.151
57	If a student does something wrong, tell him or her how to do it right. On the next occasion when the student does it correctly, compliment him or her.	92.6	85.1	7.5	0.141
58	Give feedback during or after individual patient visits, not just during special sessions outside clinic hours.	85.3	84	1.3	0.828

\*Note: 1 student did not provide age.

Table 5: Percent of students at 4 U.S. medical schools who valued each of 58 teaching behaviors, by survey question number.  
**Bold = significant (15% max diff AND p <0.05), Italic = near-significant or notable (15% maximum difference OR p <0.05).**

No.	Behavior	BU N=43	Tufts N=32	UMass N=39	Yale N=49	Max diff	p
<b>SECTION I: ORIENTATION</b>							
1	Early in the rotation, ask the student what specific experiences he or she hopes to have.	60.5	54.8	59	57.1	5.7	0.967
2	<i>Early in the rotation, ask the student to identify skills he or she wants to develop.</i>	76.7	68.8	82.1	87.8	19.0	0.194
3	<b>Introduce the student to everyone who works in the practice.</b>	<b>46.5</b>	<b>53.1</b>	<b>56.4</b>	<b>75.5</b>	<b>29.0</b>	<b>0.031</b>
4	Orient the student to the medical record.	60.5	62.5	66.7	73.5	13.0	0.574
5	<i>Have the student observe you caring for patients so that you can role model what you want them to do in your practice.</i>	62.8	62.5	66.7	83.3	20.8	0.104
6	<b>Early in the rotation, counsel the student on conducting a problem-focused patient encounter.</b>	<b>74.4</b>	<b>68.8</b>	<b>38.5</b>	<b>83.3</b>	<b>44.8</b>	<b>0.000</b>
<b>SECTION II: CREATING A FAVORABLE LEARNING ENVIRONMENT</b>							
7	Encourage students to ask questions throughout the rotation.	95.3	90.6	92.3	95.9	5.3	0.736
8	Give student time to organize his/her thoughts before they present their findings.	76.7	75	74.4	85.7	11.3	0.528
9	Create in advance a daily list of patients who will be seen by the student; do not just select patients from your list.	20.9	21.9	7.7	22.4	14.7	0.267
10	Look out for learning opportunities for the student. For example, if a patient needs a procedure, have the student do it.	95.3	93.8	87.2	87.8	8.1	0.466
11	<i>Introduce the student to patients using the student's correct name.</i>	41.9	46.9	56.4	38.8	17.6	0.389
12	Initiate teaching discussions.	93	96.9	82.1	93.9	14.8	0.107
13	<i>Set a specific, regular time to meet with the student to review patients and give feedback.</i>	83.3	62.5	82.1	67.3	20.8	0.088
14	Encourage questions and respond to them tactfully.	95.3	93.8	87.2	93.9	8.1	0.506
<b>SECTION III: OVERSEEING THE STUDENT'S EXPERIENCE</b>							
15	<i>Periodically inquire about how the experience could be adjusted to better suit the student's needs.</i>	55.8	56.3	61.5	70.8	15.0	0.435
16	<b>Ask the student if there are aspects of the physical examination he or she wants to work on and then provide help.</b>	<b>97.7</b>	<b>78.1</b>	<b>94.9</b>	<b>93.8</b>	<b>19.6</b>	<b>0.013</b>
17	<i>Periodically ask the student if his or her personal learning goals are being met.</i>	65.1	50	64.1	72.9	22.9	0.220
18	Enable the student to see a mix of acute visit patients and non-acute visit patients.	88.4	87.5	87.2	89.6	2.4	0.986

No.	Behavior	BU N=43	Tufts N=32	UMass N=39	Yale N=49	Max diff	p
<b>SECTION IV: ORCHESTRATING STUDENT-PATIENT INTERACTIONS</b>							
19	<i>Leave the student alone with the patient until he or she has completed his or her evaluation.</i>	81.4	65.6	69.2	77.1	15.8	0.378
20	<b>Obtain consent from the patient for the student's participation.</b>	<b>32.6</b>	<b>34.4</b>	<b>71.8</b>	<b>43.8</b>	<b>39.2</b>	<b>0.001</b>
21	Before each patient encounter, give the student a specific time limit for completing the history and physical examination.	30.2	31.3	28.2	27.1	4.2	0.976
22	For most patients, ask the student to present the history and physical examination (H&P) in front of the patient.	9.8	15.6	12.8	12.5	5.8	0.903
23	If the student presents the H&P in front of the patient, provide the student an opportunity to also talk to the preceptor away from the patient.	76.7	78.1	79.5	79.6	2.9	0.987
24	<b>Hold preliminary discussions about diagnosis and treatment away from the patient.</b>	<b>51.2</b>	<b>71.9</b>	<b>79.5</b>	<b>67.3</b>	<b>28.3</b>	<b>0.047</b>
<b>SECTION V: TEACHING CLINICAL SKILLS</b>							
25	Create opportunities for the student to educate patients.	86	81.3	84.6	89.8	8.5	0.744
26	Watch the student do focused components of the physical examination (e.g. knee examination) to determine his or her skill level and learning needs.	93	87.5	89.7	83.7	9.3	0.562
27	Watch the student do the visit/consultation closure.	69.8	71	61.5	72.9	11.4	0.700
28	<i>Regularly watch the student perform critical tasks in history-taking and other patient communications.</i>	69.8	56.3	51.3	55.1	18.5	0.337
29	Assure that the student regularly interviews and examines patients on his or her own.	88.4	100	97.4	100	11.6	0.012
30	Guide the student in devising a plan of care and caring for the patient; avoid replacing the student or just telling the student what to do.	97.7	100	92.3	98	7.7	0.254
31	Ask the student to do minor procedures, such as injections, tuberculin skin testing, and ECG interpretation.	88.4	100	92.3	81.6	18.4	0.060
32	<b>Delegate responsibility to the student for the wrap-up discussion with the patient (for explaining the diagnosis and treatment, etc.).</b>	<b>72.1</b>	<b>67.7</b>	<b>74.4</b>	<b>95.8</b>	<b>28.1</b>	<b>0.007</b>
33	<b>Delegate responsibility to the student for telephone calls to patients (i.e., to check on treatment outcome or convey test results).</b>	<b>35.7</b>	<b>33.3</b>	<b>43.6</b>	<b>71.4</b>	<b>38.1</b>	<b>0.001</b>
34	Delegate responsibility to the student for ascertaining and interpreting test results.	74.4	86.7	81.6	87.8	13.4	0.352
35	Ask for the student's assessment and plan before giving your own formulation.	95.3	96.8	92.3	95.9	4.5	0.824
36	Ask questions to lead the student to his or her own diagnosis or treatment.	100	87.1	92.3	89.8	12.9	0.147
37	<i>Challenge the student to explain choices he or she makes regarding diagnostic strategies or therapeutics.</i>	100	100	89.7	100	10.3	0.005
38	<i>Regularly teach physical examination techniques.</i>	95.3	87.1	94.9	79.6	15.7	0.055

No.	Behavior	BU N=43	Tufts N=32	UMass N=39	Yale N=49	Max diff	p
39	Create opportunities for the student to watch you manage difficult patient encounters.	88.4	87.1	76.9	81.6	11.5	0.501
40	Create opportunities for the student to watch you communicate with patients.	88.4	83.9	82.1	73.5	14.9	0.313
41	Seek out the student to demonstrate physical findings on patients not seen by the student.	93	93.5	94.9	89.8	5.1	0.824
<b>42</b>	<b>Facilitate the student's sense of being the caregiver.</b>	<b>83.7</b>	<b>68.8</b>	<b>55.3</b>	<b>83.7</b>	<b>28.4</b>	<b>0.008</b>

## SECTION VI: TEACHING KNOWLEDGE

43	Ask questions to probe the student's knowledge.	76.7	84.4	76.9	69.4	15.0	0.486
44	Use questions to help students improve their understanding of particular issues.	95.3	90.6	79.5	85.7	15.8	0.157
<b>45</b>	<b>Put students in the teaching role. Give them assignments to educate both of you.</b>	<b>86</b>	<b>59.4</b>	<b>79.5</b>	<b>65.3</b>	<b>26.6</b>	<b>0.029</b>
46	When a student incorrectly answers a question, don't leave the discussion there, but direct the student to the correct answer.	100	90.6	92.3	95.9	9.4	0.230
47	Question students about their medical knowledge in front of patients.	4.7	0	12.8	10.2	12.8	0.152
48	Take time during or immediately after each patient visit to ask if the student has questions or to make a teaching point.	95.3	87.5	84.6	85.4	10.7	0.395
49	Help students identify uncertainty and formulate questions relating to patients.	88.4	71.9	84.6	85.7	16.5	0.253
50	Reserve time outside the clinic sessions to discuss patients with the student.	62.8	53.3	61.5	61.2	9.5	0.859
51	Choose reading assignments that are relevant, that influence patient care or educate other caregivers.	67.4	64.5	71.8	81.6	17.1	0.311

## SECTION VII: FEEDBACK

<b>52</b>	<b>When students do something well, tell them they did it well.</b>	<b>100</b>	<b>90.6</b>	<b>82.1</b>	<b>85.7</b>	<b>17.9</b>	<b>0.042</b>
53	In feedback, do not stop at global criticisms. Be specific and directive, citing alternative ways of doing the pertinent skill.	95.3	93.8	89.7	98	8.3	0.406
54	Give the student an honest assessment of whether he or she falls short of any performance goal.	95.3	96.9	92.3	98	5.7	0.610
55	Follow negative criticism with action to help the student improve his or her performance.	93	87.5	92.3	98	10.5	0.325
56	After telling the student of a skill, knowledge area, or attitude he or she needs to improve, help the student to improve.	95.3	93.8	87.2	98	10.8	0.202
57	If a student does something wrong, tell him or her how to do it right. On the next occasion when the student does it correctly, compliment him or her.	95.3	87.1	84.6	85.7	10.7	0.402
58	Give feedback during or after individual patient visits, not just during special sessions outside clinic hours.	86	80.6	84.6	85.7	5.4	0.922

Table 6: Percent of U.S. and U.K. medical students valuing 58 teaching behaviors, by question number. **Bold=significant (15% difference AND p<0.05), Italics = near-significant or notable (10-15% difference, p<0.05 or 15% diff, p≥0.05)**

No.	Behavior	U.S.	U.K.	Absolute	p
		N=163	N=23	Difference	
<b>SECTION I: ORIENTATION</b>					
1	Early in the rotation, ask the student what specific experiences he or she hopes to have.	58	63.6	5.6	0.616
2	Early in the rotation, ask the student to identify skills he or she wants to develop.	79.8	91.3	11.5	0.185
3	Introduce the student to everyone who works in the practice.	58.9	52.2	6.7	0.541
4	<b>Orient the student to the medical record.</b>	<b>66.3</b>	<b>43.5</b>	22.8	<b>0.034</b>
5	Have the student observe you caring for patients so that you can role model what you want them to do in your practice.	69.8	65.2	4.6	0.659
6	<i>Early in the rotation, counsel the student on conducting a problem-focused patient encounter.</i>	67.3	47.8	19.5	0.067
<b>SECTION II: CREATING A FAVORABLE LEARNING ENVIRONMENT</b>					
7	Encourage students to ask questions throughout the rotation.	93.9	100	6.1	0.222
8	<b>Give student time to organize his/her thoughts before they present their findings.</b>	<b>78.5</b>	<b>56.5</b>	22	<b>0.021</b>
9	<i>Create in advance a daily list of patients who will be seen by the student; do not just select patients from your list.</i>	18.4	34.8	16.4	0.068
10	Look out for learning opportunities for the student. For example, if a patient needs a procedure, have the student do it.	90.8	95.7	4.9	0.437
11	Introduce the student to patients using the student's correct name.	45.4	43.5	1.9	0.862
12	Initiate teaching discussions.	91.4	91.3	0.1	0.986
13	Set a specific, regular time to meet with the student to review patients and give feedback.	74.1	65.2	8.9	0.371
14	Encourage questions and respond to them tactfully.	92.6	91.3	1.3	0.820
<b>SECTION III: OVERSEEING THE STUDENT'S EXPERIENCE</b>					
15	Periodically inquire about how the experience could be adjusted to better suit the student's needs.	61.7	56.5	5.2	0.632
16	Ask the student if there are aspects of the physical examination he or she wants to work on and then provide help.	92	87	5	0.423
17	Periodically ask the student if his or her personal learning goals are being met.	64.2	56.5	7.7	0.475
18	Enable the student to see a mix of acute visit patients and non-acute visit patients.	88.3	87	1.3	0.855

No.	Behavior	U.S. N=163	U.K. N=23	Absolute Difference	p
<b>SECTION IV: ORCHESTRATING STUDENT-PATIENT INTERACTIONS</b>					
19	<i>Leave the student alone with the patient until he or she has completed his or her evaluation.</i>	74.1	56.5	17.6	0.080
20	<i>Obtain consent from the patient for the student's participation.</i>	45.7	30.4	15.3	0.168
21	Before each patient encounter, give the student a specific time limit for completing the history and physical examination.	29	26.1	2.9	0.772
22	<b>For most patients, ask the student to present the history and physical examination (H&amp;P) in front of the patient.</b>	12.5	47.8	35.3	0.000
23	<b>If the student presents the H&amp;P in front of the patient, provide the student an opportunity to also talk to the preceptor away from the patient.</b>	78.5	50	28.5	0.004
24	<b>Hold preliminary discussions about diagnosis and treatment away from the patient.</b>	66.9	31.8	35.1	0.001
<b>SECTION V: TEACHING CLINICAL SKILLS</b>					
25	<b>Create opportunities for the student to educate patients.</b>	85.9	54.5	31.4	0.000
26	Watch the student do focused components of the physical examination (e.g. knee examination) to determine his or her skill level and learning needs.	88.3	100	11.7	0.091
27	Watch the student do the visit/consultation closure.	68.9	68.2	0.7	0.942
28	<i>Regularly watch the student perform critical tasks in history-taking and other patient communications.</i>	58.3	77.3	19	0.087
29	Assure that the student regularly interviews and examines patients on his or her own.	96.3	90.9	5.4	0.242
30	Guide the student in devising a plan of care and caring for the patient; avoid replacing the student or just telling the student what to do.	96.9	95.5	1.4	0.713
31	Ask the student to do minor procedures, such as injections, tuberculin skin testing, and ECG interpretation.	89.6	90.9	1.3	0.846
32	<b>Delegate responsibility to the student for the wrap-up discussion with the patient (for explaining the diagnosis and treatment, etc.).</b>	78.9	56.5	22.4	0.019
33	<b>Delegate responsibility to the student for telephone calls to patients (i.e., to check on treatment outcome or convey test results).</b>	48.1	26.1	22	0.047
34	<b>Delegate responsibility to the student for ascertaining and interpreting test results.</b>	82.5	60.9	21.6	0.016
35	Ask for the student's assessment and plan before giving your own formulation.	95.1	91.3	3.8	0.456
36	<i>Ask questions to lead the student to his or her own diagnosis or treatment.</i>	92.6	78.3	14.3	0.026
37	Challenge the student to explain choices he or she makes regarding diagnostic strategies or therapeutics.	97.5	95.7	1.8	0.603
38	Regularly teach physical examination techniques.	88.9	87	1.9	0.785

No.	Behavior	U.S. N=163	U.K. N=23	Absolute Difference	p
39	Create opportunities for the student to watch you manage difficult patient encounters.	83.3	78.3	5	0.547
40	Create opportunities for the student to watch you communicate with patients.	81.5	69.6	11.9	0.181
41	Seek out the student to demonstrate physical findings on patients not seen by the student.	92.6	100	7.4	0.177
42	<b>Facilitate the student's sense of being the caregiver.</b>	<b>74.1</b>	<b>39.1</b>	<b>35</b>	<b>0.001</b>

## SECTION VI: TEACHING KNOWLEDGE

43	Ask questions to probe the student's knowledge.	76.1	87	10.9	0.243
44	Use questions to help students improve their understanding of particular issues.	87.7	95.7	8	0.261
45	<b>Put students in the teaching role. Give them assignments to educate both of you.</b>	<b>73</b>	<b>47.8</b>	<b>25.2</b>	<b>0.014</b>
46	When a student incorrectly answers a question, don't leave the discussion there, but direct the student to the correct answer.	95.1	100	4.9	0.277
47	<i>Question students about their medical knowledge in front of patients.</i>	7.4	21.7	14.3	0.025
48	Take time during or immediately after each patient visit to ask if the student has questions or to make a teaching point.	88.3	100	11.7	0.083
49	Help students identify uncertainty and formulate questions relating to patients.	83.4	78.3	5.1	0.538
50	Reserve time outside the clinic sessions to discuss patients with the student.	60.2	73.9	13.7	0.207
51	Choose reading assignments that are relevant, that influence patient care or educate other caregivers.	72.2	65.2	7	0.487

## SECTION VII: FEEDBACK

52	When students do something well, tell them they did it well.	89.6	78.3	11.3	0.116
53	In feedback, do not stop at global criticisms. Be specific and directive, citing alternative ways of doing the pertinent skill.	94.5	91.3	3.2	0.546
54	Give the student an honest assessment of whether he or she falls short of any performance goal.	95.7	91.3	4.4	0.357
55	Follow negative criticism with action to help the student improve his or her performance.	93.3	91.3	2	0.732
56	After telling the student of a skill, knowledge area, or attitude he or she needs to improve, help the student to improve.	93.9	95.7	1.8	0.734
57	If a student does something wrong, tell him or her how to do it right. On the next occasion when the student does it correctly, compliment him or her.	88.3	95.7	7.4	0.286
58	Give feedback during or after individual patient visits, not just during special sessions outside clinic hours.	84.6	82.6	2	0.809