The DO Difference: An Analysis of Causal Relationships Affecting the Degree-Change Debate

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Context: The academic credential awarded to osteopathic physicians is the doctor of osteopathy or doctor of osteopathic medicine (DO) degree. Public recognition of the degree has been disappointingly low, however, leading some members of the profession to argue for a change in the degree’s name and formal designation.

Objectives: To investigate antecedents to the desire among osteopathic medical students to change vs retain the DO degree designation and maintain “the DO difference.”

Methods: A self-administered cross-sectional 38-item electronic survey was distributed to 480 students at an osteopathic medical school in the Midwestern United States. The instrument included knowledge-based items about osteopathic principles and practice (OPP) as well as items designed to assess attitudes, subjective norms, perceived behavioral control, and intention to support a proposed degree change.

Results: An overall response rate of 45% was achieved (n=214). Structural equation modeling revealed that low levels of OPP knowledge were associated with positive attitudes and subjective norms favoring a degree change with the reverse true for opposing students. Knowledge did not influence perceived behavioral control. Attitudes were the best predictor of intention to vote with 85% variance predicted in our models; perceived behavioral control was the best predictor of intention to debate with approximately 38% variance observed.

Conclusions: As a result of diminished use of palpation and osteopathic manipulative treatment—two historic markers of professional identity among osteopathic physicians—the DO degree designation as an indicator of difference has received increasing scrutiny. Improved student awareness of OPP is essential to maintaining the DO difference in clinical practice and with regard to the DO degree designation.


The results of informal Internet polls conducted on sdn—
The Student Doctor Network (http://www.studentdoctor.net) indicate that many osteopathic medical students would prefer having their doctor of osteopathy or doctor of osteopathic medicine (DO) degree renamed. In particular, one of these polls (n=533) indicated that 253 (47.5%) of participating osteopathic medical students agreed that all DO degrees should be “converted” to MD (medical doctor) degrees. A second, more nuanced poll (n=115) found that the majority of respondents would prefer having their prospective degree renamed: 25 (21.7%) preferred MD; 39 (33.9%), MDO (medical doctor of osteopathy), O-MD (osteopathic medical doctor), or DOM (doctor of osteopathic medicine). The largest single group in this poll (51 [44.4%]) preferred retaining the DO designation, however. Despite the unscientific nature of Internet-based polls, the results obtained indicate that many osteopathic medical students have concerns about how their prospective degree will be received when it is compared to that of their allopathic counterparts.

Guglielmo found anecdotal evidence that younger graduates were interested in promoting the distinctive character of osteopathic medicine. However, a subsequent cross-sectional survey of recent graduates found that many newly minted DOs were struggling to define the differences between osteopathic and allopathic medicine. Moreover, at graduation, 45% of these new DOs reported that they were “turned off” by the osteopathic medical profession.

More recently, a prospective study of recent graduates confirmed these trends. Chamberlain and Yates reported that, within 10 months of clinical rotations, many students stopped using uniquely osteopathic practices for the majority of their patients. In fact, 73% of second-year students believed that they would use their palpatory skills to diagnose fewer than a quarter of their patients; by graduation, this percentage had increased to 89%. With regard to patient treatment, students anticipated similarly low rates of use for osteopathic manipulative treatment (OMT); in fact, this number increased from 80% to 93% by graduation.

A survey-based study completed at Midwestern University/Arizona College of Osteopathic Medicine in Glendale was an exception to this trend. In that study, Nichols found that, on a scale of 1 (not osteopathic) to 10 (very osteopathic), recent graduates demonstrated a marked shift toward viewing themselves as progressively “more osteopathic” during medical school, with a mean score of 4.8 at matriculation and 6.9 on
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graduation. The difficulty with Nichols’ study, however, is its retrospective design; students did not rate themselves at matriculation. This study limitation may mean that the difference in scores is an artifact of social desirability rather than an actual shift in self-perception.

Most studies4,5,7-10 do not reveal a shift in perceptions that results in DOs viewing themselves as “more osteopathic” post-graduation; students and recent graduates usually see little difference between their training and that obtained by their counterparts at allopathic medical schools. Because there is little perceived difference in training, it is unsurprising that many osteopathic medical students desire to have the same MD degree perceived difference between their training and that obtained by their counterparts, it has been suggested that these changes undermine the osteopathic medical students receive with their allopathic counterparts, it is unsurprising that many osteopathic medical students desire to have the same MD degree awarded in allopathic medical schools.

Although there is some consensus that many osteopathic medical students might not highly value the DO degree,1,2 scholars have not adequately addressed the factors that may cause students to devalue “the DO difference”—that is, the unique characteristics of osteopathic medicine.4,5 Therefore, the purpose of the present study is to investigate factors that may lead some osteopathic medical students to desire a degree change while other students oppose it.

Using the theory of planned behavior (TPB) as a guiding theoretical framework, we designed a cross-sectional survey to investigate antecedents to student desire to retain the DO degree designation and maintain the DO difference.

A literature review relevant to the degree-change debate is provided alongside a discussion of the DO difference. Next, we draw on the constructs of the TPB to predict behavioral intentions among students regarding the degree-change debate. Subsequently, we test structural equation models (SEMs) predicting osteopathic medical student support of vs objection to a degree change. Finally, based on the data gathered, we offer some conclusions and recommendations related to the degree-change debate.

Whither the DO Difference?

Many recent osteopathic medical graduates will state that they are either disinterested in or reluctant to embrace the DO difference.7,8,11 Although multiple reasons have been offered for this lack of interest,7 two have risen to prominence on an anecdotal level. First, as some commentators7,11,12 have observed that allopathic principles and procedures have become increasingly adopted by DOs in clinical practice, others suggest that these changes serve mainly to dilute osteopathic principles and practices (OPP). Second, as others11,13-15 note that the increasingly common side-by-side postgraduate residency training many osteopathic medical students receive with their allopathic counterparts, it has been suggested that these changes undermine the pedagogy that establishes a philosophical difference between the two branches of the medical profession.

The declining use in clinical settings of two traditionally and uniquely osteopathic medical practices—namely palpation and OMT5,16-18—may provide a practical reason many osteopathic medical students see little difference between what they do and what their allopathic counterparts do.

Like allopathic physicians, many, if not most, osteopathic physicians make use of medication and surgical intervention when necessary for patient treatment. Unlike allopathic physicians, however, osteopathic physicians learn palpatory and OMT techniques. The decreased use of manual methods of diagnosis and treatment in osteopathic clinical practice may represent the loss of a central component of osteopathic medicine and may put at risk the distinctive nature of osteopathic medical practice.3,16,17,19 As Johnson and Kurtz2 have found, the regular practice of OMT becomes rarer the longer an osteopathic physician has been out of medical school.

In his 2005 JAOA editorial—in part because of this decline in OMT use4,17,18—Osborn20 asked, “To what extent is the distinctive osteopathic identity alive, well, and clinically demonstrable?” Indeed, if osteopathic identity is not “alive, well, and clinically demonstrable,” should osteopathic medical students be encouraged to embrace it?

In DOs’ efforts to attain recognition as conventional physicians within the healthcare system,14 some scholars15 worry that OMT will be deemphasized further in clinical practice and that the symbolic power of OMT as a marker of distinction will be effaced. The declining emphasis on OMT in clinical practice threatens the viability of the entire profession. Johnson et al10 concluded, not because of the treatment itself, but because OMT is “an historic symbol emblematic of a proud profession.”

If the decline in student identification with the DO degree designation is related to the general decline in the use of OMT, then the solution would be greater incorporation of OMT in clinical practice for students. As Gevitz21 argues, the degree to which a given DO identifies with the larger osteopathic community is directly proportional to the degree to which distinctive OPP are incorporated in his or her daily work. Patterson22 adds, “unless osteopathic physicians clearly demonstrate to the public that they practice in ways distinct from other healthcare providers, this profession will inevitably become irrelevant” as an alternative philosophy of care.

In addition to practical similarities between the two medical professions, many osteopathic medical students see few differences because of the rise of joint residencies and preceptorships.15 The migration of students from osteopathic medical schools to residency training programs accredited by the Accreditation Council for Graduate Medical Education (ACGME) rather than those approved by the American Osteopathic Association (AOA) raises questions as to whether there are, indeed, differences between the two philosophical and educational systems.21 Internships are becoming “integrated” in that osteopathic and allopathic students often learn and work together. As such, the claim that the osteopathic internship is either unique or distinctive is, as Cummings24 put it, “now more a wish than a fact.”

Indeed, the integration of both forms of medicine in clerkships by the University of New England College of Osteopathic Medicine (Biddeford, Me) and the University of Massachusetts
Medical School (Worcester) has been labeled an “unqualified success,” not only because osteopathic and allopathic physicians learn effectively in joint clerkships, but because integrating programs conserves teaching resources.\textsuperscript{25}

Although joint programs are useful for students and cost-effective for institutions, they may be harmful to the osteopathic medical profession as a whole. Shen et al\textsuperscript{23} concluded that DOs who entered an ACGME-accredited residency training program performed significantly better on Parts I ($P<.001$) and II ($P<.01$) of the National Board of Osteopathic Medical Examiners’ examination than did those who entered an AOA-approved program. Although there was no statistically significant difference in scores for Part III/Level 3 examinations regarding medical problem-solving abilities, ACGME-trained DOs’ higher scores on clinical presentation and completing physician tasks is worrisome for those who promote the DO difference because these findings may indicate that any “difference” in this instance is a difference of deficit.\textsuperscript{23}

In addition, ACGME-trained osteopathic physicians have emerged in the work of previous researchers\textsuperscript{16} as being less likely than DOs trained in AOA-approved programs to use OMT. Reduced use of OMT during residency training may exacerbate low use trends in clinical practice.

Because there has been a move away from OMT as a symbolic marker of osteopathic professional identity, Johnson and Kurtz\textsuperscript{17} have argued that educators and practitioners “must curtail the ongoing exodus of young graduates from the philosophical roots of the profession” by emphasizing osteopathic medicine’s heritage and history. As such, to maintain the DO difference because these findings may indicate that any “difference” in this instance is a difference of deficit.\textsuperscript{23}

A Rose Is a Rose...or Is It?

Recent debates\textsuperscript{27,28} regarding the value of the DO designation as compared to the MD designation is a recapitulation of previous worries over the perceived value of osteopathic medicine. In the first half of the 20th century, many osteopathic practitioners chose to stop describing themselves as “osteopaths” and begin describing themselves instead as “osteopathic physicians.” This change in terminology was intended “to capture the expanding medical mission of the osteopathic medical profession.”\textsuperscript{18} Indeed, since the 1930s, osteopathic physicians have increasingly adopted allopathic practices and standards, making the addition of “physician” with “osteopathic” as a modifier a sensible change.\textsuperscript{3}

In the 1950s and 1960s, many so-called “prestige-starved” DOs began to use “Dr” or “physician and surgeon” instead of “doctor of osteopathy” to deemphasize differences in their training from their allopathic counterparts.\textsuperscript{7}

Attempts to force a conflation of DO with MD reached a high water mark in 1962, at which time the California Medical Association and the California Osteopathic Association agreed that there would be no future licensing of DOs in the state and granted “academic,” not “professional,” MD degrees to DOs who surrendered their osteopathic identities and paid a $65 fee.\textsuperscript{29} These actions convinced federal authorities, including the United States Civil Service Commission and the US Department of Defense, that the two medical degrees should be considered equivalent.

After the Supreme Court of California ruled in 1974 that the newly founded Osteopathic Physicians and Surgeons of California was to license DOs as the California Osteopathic Association once had, the federal government also recognized osteopathic medical schools for the purposes of federal aid.\textsuperscript{29} Consequently, more state governments began supporting osteopathic medical schools and independent osteopathic hospitals.\textsuperscript{29}

These relative advancements, all without the sacrifice of the DO degree, led Gevitz\textsuperscript{29} to state in 1984 that osteopathic medicine’s “longstanding battle to overcome discriminatory practices is just about won.” However, this initially triumphant tone was removed in the second edition of his book, published 20 years later, when he wrote:

For most of its history, the AOA derived a great deal of internal cohesion and social solidarity among its membership from the menacing actions of the once-powerful AMA [American Medical Association].\textsuperscript{14}

Once the AMA ceased its menacing posture and began to accept osteopathic medical training for allopathic licensing procedures, there was a parallel decline in cohesion and solidarity among osteopathic physicians. In addition, with the threat of forced absorption gone, ideological opposition to the inclusion of allopathic principles in osteopathic training programs declined. Moreover, in 1984, the AOA chose to identify both DOs and MDs as “physicians,” a position they reaffirmed in 2003.\textsuperscript{30} Likewise, in 1994, the AMA chose to define “physician” to include DOs as well as MDs, reaffirming this position in 2004.\textsuperscript{31}

These formal definitions, then, provide mutual recognition of both professions. They also, however, raise the question of whether the two professions really are distinct. The question of maintaining distinctiveness is not only philosophically important, but intensely practical. As Northup\textsuperscript{32} posited:

We must not allow our distinct image to fade and disappear. If we do...the public will pose an uncomfortable question: “Why two professions?”

Recent history has proven that the public is not the only group that may ask this question. Osteopathic medical students have also begun asking this question, thus making the degree-change debate relevant to the continued survival of osteopathic medicine as a unique profession.\textsuperscript{12,27,28}

Predicting Support of the DO Difference

We conducted a cross-sectional survey of osteopathic medical students to investigate antecedents for the following two positions:

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To assist us in predicting whether an osteopathic medical student would support or oppose a degree change, we applied the TPB as a guiding theoretical framework. The theory of planned behavior is generally used to predict an individual’s intention to engage in a particular behavior as a proxy for the behaviors that an individual is likely to adopt. The theory holds that an individual’s intention is essentially a function of three antecedent factors: attitudes, subjective norms, and perceived behavioral control.

Osteopathic medical students’ knowledge of OPP and the issues surrounding the degree-change debate are a vital prerequisite to understanding their attitudes and opinions related to the debate. Students who are in the midst of their medical education and training are likely to have varying degrees of knowledge related to osteopathic medicine. Level of knowledge regarding OPP might indeed contribute to student attitudes and opinions related to the degree-change debate.

Although individuals often have a cognitive awareness of the variety of outcomes possible as a result of potential actions taken, mere knowledge is generally not enough to alter behavior. Most models of behavior change posit that knowledge is often followed by other variables (eg, attitudes) before it is used as the basis for action. An attitude may be defined as an individual’s positive or negative evaluation of a specific behavior or outcome.

Extant research indicates that attitudes are a strong predictor of an individual’s behavioral intentions in many contexts. Moreover, researchers suggest that one’s attitude regarding a specific behavior predicts one’s intention to engage in that behavior.

Within the context of the degree-change debate, advocates of the DO difference often argue that a distinct osteopathic philosophy must be promoted and that students must be taught to protect the DO difference. They argue that students who are aware of the differences between OPP and allopathic principles and procedures will value these differences and, therefore, seek to maintain them. Based on these arguments, we offer three hypotheses:

- **H1**—Lesser knowledge of differences between osteopathic and allopathic medicine will be positively associated with attitudes favoring a degree designation change.
- **H2a**—Attitudes favoring a degree designation change will be positively associated with intentions to vote in favor of changing the DO degree designation.
- **H2b**—Attitudes opposing a degree designation change will be positively associated with intentions to participate in the debate over changing the DO degree designation.

In addition to attitudes, subjective norms often influence an individual’s behavioral intention. A subjective norm represents an individual’s beliefs of how salient referents (eg, friends, family, coworkers) feel about a specific behavior.

Research suggests that subjective norms are a reliable antecedent to intention to engage in a specific behavior. Moreover, there is a strong and significant association between subjective norms and actual behaviors.

In this context, influences from “important others” will likely contribute to a student’s intention to vote on or debate a designation change. Several advocates of the DO difference have indicated that practicing physicians, professors, and other significant actors in the osteopathic medical community should serve as mentors who enact uniquely OPP. Specifically, if an osteopathic medical student believes that his or her professors, practicing osteopathic physicians, patients, and peers support a degree change, these important others are likely to influence that individual’s intention to support a degree change and to participate in debates related to proposed changes. Therefore, we include three additional hypotheses:

- **H3**—Lesser knowledge of differences between osteopathic medicine and allopathic medicine will be positively associated with subjective norms favoring a degree designation change.
- **H4a**—Subjective norms that favor a degree designation change will be positively associated with an individual’s intention to vote in favor of changing the DO degree designation.
- **H4b**—Subjective norms opposing a degree designation change will be positively associated with intentions to participate in the debate over changing the DO degree designation.

Finally, behavioral intentions are often influenced by a person’s perceived behavioral control, which represents the degree to which an individual believes he or she can enact—and enact successfully—the desired behavior.

Current research suggests that perceived behavioral control is a reliable predictor of actual behavior—albeit not as strong a predictor as attitudes or social norms.

Within the degree-change debate, those who feel informed about the differences between osteopathic and allopathic medicine may feel they can act to maintain (or change) the DO difference and, subsequently, choose to act. Therefore, we add to our discussion three additional hypotheses:

- **H5**—Greater knowledge of differences between osteopathic medicine and allopathic medicine will be positively associated with perceived behavioral control to act in this debate.
- **H6a**—Higher degrees of perceived behavioral control will be positively associated with an individual’s intention to vote in favor of changing the DO degree designation.
- **H6b**—Higher degrees of perceived behavioral control will be positively associated with intentions to participate in the debate over changing the DO degree designation.

Voting intention (H1, H2a, H3, H4a, H5, and H6a) and intention to participate in debate (H1, H2b, H3, H4b, H5, and H6b) are
The 38-item survey took approximately 20 minutes to complete and included OPP knowledge—assessment items as well as statements based on the TPB model.

The present research project was approved by the institutional review board at OU-COM. Data were collected for the present investigation from March 2007 to May 2007, during the second half of OU-COM’s academic year.

Survey Instrument
Given the nature of the differences between DOs and MDs and general issues surrounding the national debate on this issue, knowledge of OPP was assessed with a series of 11 true/false statements. These survey items asked participants about the differences between DOs and MDs with regard to education, training, licensing examinations, practice, and the current status of revisions to the DO degree designation.

Using a 7-point scale—with 1 indicating “strongly disagree,” and 7, “strongly agree”—participant attitudes concerning the degree change were assessed through their responses to the following eight items:

- Overall, the effect of changing the designation of the DO degree on the medical community would be good.
- Overall, the effect of changing the designation of the DO degree on the medical community would be beneficial.

Methods
Using the electronic listserv at Ohio University College of Osteopathic Medicine (OU-COM) in Athens, investigators e-mailed all osteopathic medical students enrolled at that institution in March 2007 (N=480).

Potential subjects were informed of federal and university regulations requiring signed consent for participation in research involving human subjects. They were also provided with an explanation of the study and were informed that no risks, physical discomfort, or financial benefit was associated with the project. Subject confidentiality was guaranteed and contact information for the research coordinator (J.P.M.) was provided. An informed consent statement was provided. Consent was granted by clicking on a hyperlink button that launched the online survey.

A total of three e-mails were sent to solicit study participation. Each e-mail was sent to all students, regardless of survey participation status. The two follow-up e-mails were sent on a weekly basis after the initial study description and invitation to participate was sent.

Participants were asked to create a unique, anonymous identifier code that prevented them from accidentally completing the survey more than once.

**Figure 1.** Hypothesized structural model of relationships among knowledge of differences between osteopathic and allopathic medicine, attitudes toward DO (doctor of osteopathy or doctor of osteopathic medicine) degree designation change, subjective norms regarding degree designation change, and intention to participate in the degree-change debate or to vote for a degree change.
Four of these survey items (*) were reverse coded (ie, worded negatively) to reduce participant response bias. Cronbach’s α49 (α=.88) indicated that the scale was reliable.

An additional eight survey items were used to assess normative influences (ie, the subjective norm) surrounding the degree-change debate. Using the same 7-point scale, participants were asked to respond to statements such as:

- In general, my/most [fellow students, professors, osteopathic physicians, patients] think changing the designation of the DO degree is good for the medical community.
- In general, my/most [fellow students, professors, osteopathic physicians, patients] think changing the designation of the DO degree is beneficial for the medical community.

The scale was determined to be reliable (α=.96).

Perceived behavioral control was measured with two survey items using the 7-point scale:

- Being outspoken about my opinions surrounding changing the designation of the DO degree is something I can easily do.
- I am confident that I can participate in the debate surrounding changing the designation of the DO degree.

None of these items were reverse coded. This scale was also reliable (α=.82).

Three survey items including those shown below were presented with the 7-point multiple-choice scale to assess participant intentions to contribute to the degree-change debate:

- In the next few weeks, I intend to contribute to the debate surrounding changing the designation of the DO degree.
- Contributing to the debate surrounding changing the designation of the DO degree is something I intend to do in the next few weeks.

None of these items were reverse coded. This scale was highly reliable (α=.97).

Using the same 7-point scale, two survey items addressed participant intention to vote on several issues related to potential revisions to the DO degree designation:

- If a vote were held today, I would definitely vote for changing the designation of the DO degree.
- If a vote were held today, I would definitely vote against changing the designation of the DO degree.*

One of these survey items (*) was reverse coded. In addition, a set of four survey items measured participant response to each of four proposed degree designations: “If a vote were held today, the DO designation should be changed to XXX.” In these statements, the option presented changed to reflect various proposals from degree-change proponents: MD-O, O-MD, MDO, OMD.

The scale for these six items was reliable (α=.90).

Hypothesized models were estimated using the SEM feature in the LISREL for Windows software package (version 8.8; Scientific Software International Inc, Lincolnwood, Ill). Structural equation modeling is a flexible data-analysis technique that purifies manifest variables of error variance, generating truer tests of association between latent constructs of interest. Following generally accepted statistical procedures, data analysis included testing the measurement model via confirmatory factor analysis before testing the hypothesized associations in SEMs.30

As compared to manifest variable statistical techniques (eg, ordinary least squares hierarchical regression) that allow piecemeal investigation of complex models, SEM permits researchers to test overall global model fit in a single procedure. For the confirmatory and structural models, we assessed model fit via three common fit indices: (a) model χ², (b) the root mean square error of approximation (RMSEA), and (c) the comparative fit index (CFI).50

Model χ² is a basic statistical test used to assess model fit, with good fit indicated by nonsignificant χ² values. One weakness of the χ² statistic is that it relies strongly on sample size—such that moderately large samples almost always produce statistically significant χ² values even when model misfit is negligible. The additional common fit indices correct for this shortcoming. The RMSEA statistic assesses amount of model misfit per degree of freedom, with RMSEA values below .08 indicating acceptable fit.51 The CFI statistic indicates the degree to which the observed data fits the specified model better than a null hypothesis model (ie, with no specified relationships between latent constructs); for this fit index, values above .95 indicate close model fit.50

Results
A total of 214 participants (106 men; 108 women) completed the research instrument, for an overall response rate of 45%. There were no significant differences between participants and nonparticipants on any demographic variable.

Participant age ranged from 22 to 48 years with a mean (SD) of 26.14 (3.66) years. The majority (166 [77.6%]) of participants were white/European-American; the remainder were black/African-American (22 [10.3%]), of Asian/Pacific Islander origin (12 [5.6%]), or American Indian/Alaskan Native (2 [0.9%]).
Twelve subjects (5.6%) specified “Other” as their race/ethnicity. Seven subjects (3.3%) stated that they were of Hispanic origin; the remainder were non-Hispanic.

Students from all 4 years of medical school participated: 61 (28.5%) were first-year students; 61 (28.5%), second year; 41 (19.2%), third year; and 51 (23.8%), fourth year.

Confirmatory factor analysis tested a measurement model specifying the association between the manifest indicators and six latent constructs:

- knowledge
- positive attitude toward degree change
- subjective norms favoring degree change
- perceived behavioral control over degree change
- intention to debate degree change
- intention to vote in favor of a degree change

Consistent with recent evidence that three manifest indicators per latent construct is ideal for model estimation and identification, the manifest indicators for each scale were grouped into parcels, or “aggregate-level [indicators] comprised of the sum (or average) of two or more items, responses, or behaviors.” The only exception to this practice were the perceived behavioral control construct (identified by constraining the two indicators to equal loadings) and the intention to debate construct. Because a total of three survey items were used to measure this latter construct, each item was modeled as a separate manifest indicator. After a minor modification allowing one correlated residual between two manifest indicators of the attitude latent construct, the measurement model demonstrated good model fit, \( \chi^2=176.65 \) (df=104), \( P<.01 \); RMSEA=.053 (90% confidence interval [CI], 0.038-0.068); CFI=.98. The Table presents the LISREL estimates for the \( \lambda \) loadings and \( \theta+\) matrix residuals for the measurement model, as well as the correlation matrix between the latent constructs.

We created separate structural models for each dependent variable (ie, intention to debate vs vote). The structural model predicting intention to debate demonstrated good model fit (Figure 2), \( \chi^2=107.15 \) (df=70), \( P<.01 \); RMSEA=.047 (90% CI, 0.026-0.066); CFI=.99, accounting for 38% of the variance in the dependent variable. The structural model predicting intention to vote also produced acceptable model fit (Figure 3), \( \chi^2=138.04 \) (df=70), \( P<.01 \); RMSEA=.066 (90% CI, 0.049-0.082); CFI=.98, explaining a large amount of variance (84%) in intention to vote.

The first hypothesis predicted an inverse association between knowledge and attitude toward a degree change, such that those with more knowledge about OPP would tend to oppose the change. Likewise, the third hypothesis predicted that those with more OPP knowledge would perceive fewer subjective norms favoring the degree change, while the fifth hypothesis predicted that more knowledge would also generate

<table>
<thead>
<tr>
<th>Latent Construct</th>
<th>( \lambda ) (SE)</th>
<th>( \theta ) (SE)</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<tr>
<td>Knowledge</td>
<td></td>
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<tr>
<td>Indicator 1</td>
<td>0.64 (.14)</td>
<td>1.18 (.19)</td>
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<tr>
<td>Indicator 2</td>
<td>0.30 (.11)</td>
<td>1.39 (.14)</td>
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<tr>
<td>Indicator 3</td>
<td>0.39 (.13)</td>
<td>1.71 (.18)</td>
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| Attitude         | .51†             | 1.00             |   |    |    |    |    |
| Indicator 1      | 2.07 (.12)       | 0.26 (.24)       |   |    |    |    |    |
| Indicator 2      | 0.96 (.11)       | 1.93 (.19)       |   |    |    |    |    |
| Indicator 3      | 0.93 (.11)       | 1.99 (.20)       |   |    |    |    |    |

| Social Norms     |                  |                  |   |    |    |    |    |
| Indicator 1      | 1.40 (0.07)      | 0.05 (0.01)      |   |    |    |    |    |
| Indicator 2      | 1.50 (0.08)      | 0.07 (0.02)      |   |    |    |    |    |
| Indicator 3      | 1.35 (0.08)      | 0.35 (0.04)      |   |    |    |    |    |

| Behavioral Control |                  |                  |   |    |    |    |    |
| Indicator 1       | 1.39 (0.08)      | 0.99 (0.15)      |   |    |    |    |    |
| Indicator 2       | 1.39 (0.08)      | 0.72 (0.13)      |   |    |    |    |    |

| Intention to Debate |                  |                  |   |    |    |    |    |
| Indicator 1        | 1.58 (0.09)      | 0.29 (0.04)      |   |    |    |    |    |
| Indicator 2        | 1.69 (0.08)      | 0.06 (0.03)      |   |    |    |    |    |
| Indicator 3        | 1.56 (0.09)      | 0.34 (0.04)      |   |    |    |    |    |

| Intention to Vote  |                  |                  |   |    |    |    |    |
| Indicator 1        | 1.76 (0.10)      | 0.43 (0.07)      |   |    |    |    |    |
| Indicator 2        | 1.87 (0.11)      | 0.81 (0.10)      |   |    |    |    |    |
| Indicator 3        | 1.55 (0.10)      | 0.66 (0.08)      |   |    |    |    |    |

* All calculations of estimates for structural equation modeling were conducted using LISREL for Windows software (version 8.8; Scientific Software International Inc, Lincolnwood, Ill).
† \( P<.01 \)
‡ \( P<.05 \)

Abbreviation: SE, standard error.
higher perceived behavioral control regarding such change. The first hypothesis received support in the first (β = −.48, z = −2.34, P < .05) and second (β = −.52, z = −2.53, P < .05) structural models (Figure 2). The third hypothesis likewise received support, with knowledge inversely predicting subjective norms in both the first (β = −.36, z = −2.35, P < .05) and second (β = −.37, z = −2.51, P < .05) models. However, OPP knowledge did not significantly predict perceived behavioral control in either the first (β = .09, z = 0.78, P > .05) or second (β = .06, z = 0.52, P > .05) model, thus providing no support for the fifth hypothesis.

Following the TPB, several hypotheses identified potential predictors of intention to vote for a degree change. Specifically, we hypothesized that attitudes favoring a degree change (H2a), subjective norms favoring the change (H4a), and higher degrees of perceived behavioral control (H6a) would all positively predict intention to vote. Results supported only attitude favoring a degree change (H2a) as a significant predictor (β = .81, z = 3.61, P < .01) with neither subjective norms (β = .13, z = 1.24, P > .05) nor higher degrees of perceived behavioral control (β = .03, z = 0.60, P > .05) significantly predicting intention to vote.

For the structural model predicting intention to debate, we predicted that positive attitude toward degree change (H2b), perceived subjective norms favoring a degree change (H4b), and higher degrees of perceived behavioral control (H6b) would each predict intention to debate. As Figure 2 indicates, only the latter hypothesis (H6b) received support, with perceived behavioral control positively and significantly predicting intention to debate (β = .60, z = 7.23, P < .01). Neither attitude toward (β = .01, z = 0.10, P > .05) nor subjective norms favoring (β = .20, z = 1.76, P > .05) a degree change significantly predicted intention to debate, providing no support for hypotheses H2b and H4b.

Analysis of responses to the items related to the degree change revealed that 117 participants (54.7%) opposed the change, while 22 (10.3%) were neutral or undecided. The remaining participants (75 [35.0%]) were generally in favor of a degree change.

Comment
The primary purpose of the present study was to investigate antecedents to the desire among osteopathic medical students to retain vs change the DO degree designation. These desires were operationalized in two ways: the intention to vote for or against the degree change and the intention to participate in the debate surrounding this change.

Using the TPB, we posited that attitudes, subjective norms, and perceived behavioral control would predict student intentions and that OPP knowledge would be negatively associated with attitudes and subjective norms and positively associated with perceived behavioral control.

Figure 2. Final structural model predicting osteopathic medical student intention to participate in the DO (doctor of osteopathy or doctor of osteopathic medicine) degree designation change debate. *P < .01. †P < .05.
degree-change debate. Moreover, attitudes and subjective norms opposing a change in the degree designation are influenced by greater knowledge of OPP. Given these connections, OPP advocates are encouraged to mentor students so that they might see and experience the DO difference; merely informing them about this difference is not enough.3,6,7,21,47

Therefore, subjective norms cultivated through the consistent demonstration of uniquely osteopathic procedures as well as open discussion of OPP are likely the best ways to maintain the DO difference in clinical practice as well as on the more symbolic level of the DO degree designation debate.

In terms of the outcome variables, cultivating attitudes and subjective norms against a degree change appears most likely to guard against conflation of the DO and MD degrees when it comes to voting intentions. The same is not true with regard to intention to participate in the degree-change debate, however. Intention to vote is strongly and directly influenced by one’s attitudes toward a degree change, attitude is tightly coupled with subjective norms, and attitudes and subjective norms are clearly influenced by level of knowledge. Therefore, if an osteopathic medical student becomes aware of the differences between osteopathic and allopathic medicine, she or he will likely vote against a degree change.

Thus, a powerful strategy for advocates who wish to maintain the DO difference lies in the cultivation of attitudes and subjective norms favorable to OPP among osteopathic medical students.

In addition to didactic education regarding the DO difference, our models suggest a second potentially fruitful strategy. Although not predicted by our hypotheses, there is a strong linkage between attitudes and subjective norms regarding the degree-change debate. Moreover, attitudes and subjective norms opposing a change in the degree designation are influenced by greater knowledge of OPP. Given these connections, OPP advocates are encouraged to mentor students so that they might see and experience the DO difference; merely informing them about this difference is not enough.3,6,7,21,47

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When it comes to intention to participate in the debate over a degree change, however, public advocacy is not pre-
dicted by these variables. The relationships among knowledge, attitudes, and subjective norms operate in much the same way as seen in intention to vote, though intention to debate is predicted only by perceived behavioral control—a variable not influenced by knowledge, attitudes, or subjective norms. That is, individuals who have little knowledge of the DO difference are as likely to participate in debates over a potential degree change as those who are well informed. Because active participation in public advocacy efforts is linked only to individual behavioral differences, advocates of maintaining the DO difference should encourage like-minded individuals to “recognize their behavioral control.” In other words, collegial encouragement and thoughtful, creative suggestions for advocacy efforts would likely be warmly received among vocal proponents of the DO difference.

One limitation of the present study is that the sample was limited to students at one college of osteopathic medicine in the Midwestern United States. A sample of osteopathic medical students from across the country is recommended for future research. A larger sample of this kind would provide a more comprehensive summary of student attitudes, intentions, beliefs, and opinions regarding the degree-change debate. Regional summaries may also be of interest by way of comparison.

Although the models and recommendations we present in the current study may not provide new arguments or strategies in the degree-change debate, they do provide empirical support for a variety of strategies currently in use to support and promote the DO difference.

When it comes to public education efforts with regard to osteopathic medicine, advocates of the DO difference have long emphasized the role of physicians as educators. One part of what Gevitz has named “osteopathic invisibility syndrome” is insufficient public knowledge of osteopathic medicine. Aguwa and Leichty agreed, noting the profession’s “meager efforts in increasing separation of medicine” and that “public advocacy efforts are linked only to individual behavioral differences, advocates of maintaining the DO difference should encourage like-minded individuals to “recognize their behavioral control.” In other words, collegial encouragement and thoughtful, creative suggestions for advocacy efforts would likely be warmly received among vocal proponents of the DO difference.

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Our models suggest that the osteopathic invisibility syndrome may also affect osteopathic medical students. Renewed efforts to promote and advance the profession’s distinctiveness to osteopathic medical students are clearly warranted. Greater knowledge of OPP is the best way to assist our students in recognizing and valuing the DO difference. Further promotion of the DO difference within the profession will likely establish subjective norms and attitudes that further clarify this difference and, ultimately, lead to a desire to preserve it.

References

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Editor’s Note: The American Osteopathic Association (AOA) House of Delegates and Board of Trustees both considered this important issue last July during the AOA Annual Business Meeting in Chicago, Ill. The House of Delegates is the AOA’s policy-making body. It is composed of more than 500 leaders within the osteopathic medical profession, representing state, specialty, and student organizations. Although those who advocated a change to the DO degree were advised to demonstrate their intent through a resolution to the Board and House, the one resolution brought forward about the DO designation was a resolution reaffirming the DO degree. On this important resolution, AOA leaders unanimously voted to reaffirm “DO” as the designation for osteopathic physicians.

The AOA understands that recognition of the DO degree is of paramount importance to DOs and osteopathic medical students and is committed to making it a household word. The AOA’s Greatness Campaign aims to do that in part by supporting public education advocacy. To learn more about this project, please read more on DO-Online (https://www.do-online.org/index.cfm?PageID=aoa_greatfund).

If readers disagree with the affirmation of the DO degree, the AOA urges them to work with the appropriate state and/or specialty association to develop and submit a resolution to this effect.