Medical Student Mentorship in Plastic Surgery: The Mentee's Perspective

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Background: Mentorship is a universal concept that has a significant impact on nearly every surgical career. Although frequently editorialized, true data investigating the value of mentorship are lacking in the plastic surgery literature. This study evaluates mentorship in plastic surgery from the medical student perspective.
Methods: An electronic survey was sent to recently matched postgraduate year–1 integrated track residents in 2014, with a response rate of 76 percent.
Results: Seventy-seven percent of students reported a mentoring relationship. Details of the mentoring relationship were defined. Over 80 percent of students reported a mentor's influence in their decision to pursue plastic surgery, and nearly 40 percent of students expressed interest in practicing the same subspecialty as their mentor. Benefits of the relationship were also described. Mentees value guidance around career preparation and advice and prioritized "a genuine interest in their career and personal development" above all other mentor qualities ($p \leq 1.6 \times 10^{-16}$). Mentees prefer frequent, one-on-one interactions over less frequent interaction or group activities. Students did not prefer "assigned" relationships (91 percent), but did prefer "facilitated exposure." Major barriers to mentorship included mentor time constraints and lack of exposure to plastic surgery. Indeed, significant differences in the presence of a mentoring relationship correlated with involvement of the plastic surgery department in the medical school curriculum.
Conclusions: This study defines successes and highlights areas for improvement of mentorship of plastic surgery medical students. Successful mentorship may contribute to the future of plastic surgery, and a commitment toward this endeavor is needed at the local, departmental, and national leadership levels. (*Plast. Reconstr. Surg.* 137: 1934, 2016.)

Medical school curricula are designed to impart the fundamentals of basic science and clinical medicine, but are not necessarily tailored to teach students how to successfully navigate the other "intangibles" encountered in a clinical career. Arguably, the matriculation process from medical school to residency is one of the most important times to become competent in navigating these intangibles, because life-changing decisions are made at this time, which include specialty choice, geographic moves, large-scale decisions that intercalate both family and career, and establishing goals that initially dictate the trajectory of one's career. It is here that the role of a mentor cannot be overstated.

Mentorship is reproducibly associated with increased productivity, career advancement,

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research publication, and grant funding, and reducing physician burnout.[1–4] Although mentorship is frequently discussed and often editorialized within the plastic surgery literature,[5–7] dedicated research devoted specifically to the value and impact of mentorship toward medical students is lacking. For this reason, we sought to evaluate medical student mentorship in plastic surgery from the medical student perspective.

MATERIALS AND METHODS

An anonymous 30-question SurveyMonkey (Palo Alto, Calif.) electronic survey was sent to all recently matched integrated track postgraduate year–1 residents regarding their experience with mentorship as a medical student. The response rate was 76 percent, or 103 of 136 postgraduate year–1 residents in 2014.

The survey consisted of five general areas of questions that included (1) mentee and mentor demographic information, (2) how mentor-mentee relationships are formed, (3) how mentor-mentee relationships are maintained, (4) qualities sought in a mentor and the benefits to mentees, and (5) barriers to mentorship from the mentee's perspective. Specific survey questions are listed in Appendix A (**see Appendix, Supplemental Digital Content 1**, which shows survey questions, ***http://links.lww.com/PRS/B741***).

Survey responses were collected and analyzed using spreadsheet software (Excel; Microsoft Corp., Redmond, Wash.). Duplicate submissions were excluded through the survey software. Data are presented as frequencies, percentages, or in a forced rank series. Where applicable, groups were compared with a *t* test.

RESULTS

Mentee and Mentor Demographics

All survey participants confirmed matriculation into an integrated plastic surgery residency in 2014. The average age of survey participants was 27.3 ± 1.9 years; 59.8 percent of the respondents were men and 40.2 percent were women. When provided with a definition of a mentor-mentee relationship (below), 77 percent of mentees identified a mentor within plastic surgery during their medical school training (Table 1).

> For the purposes of this survey, consider the following definitions:
> Mentor-Mentee Relationship: A dynamic, reciprocal relationship in a work environment between an advanced career incumbent (mentor) and a beginner protégé (mentee), aimed at promoting the development of both.
> Role Model: A person who serves as a model in a particular behavioral or social role for another person to emulate. You DO NOT necessarily have a reciprocal relationship with this person.[2]

Table 1. Mentee Characteristics

Characteristic	Value
Average respondent age	27.3 ± 1.9 yr
Respondent sex*	
Male	59.8
Female	40.2
Respondents who reported having a mentor*	77.3
Respondents who did not report having a mentor*	22.7

*Data are presented as percentage of survey respondents.

The participants were then asked to provide information about the mentor with whom they had worked most closely. Mentors consisted of both attending physicians (88 percent) and residents (12 percent). Mentors were most often male (81 percent) and were most commonly in the age range of 40 to 50 years. General plastic surgery, microsurgical/reconstructive surgery, and pediatric/craniofacial surgery were the three most common subspecialties represented (Table 2).

Establishment of Mentor-Mentee Relationships

Mentor-mentee relationships were most commonly initiated by medical students reaching out to contact faculty members (45 percent). Smaller percentages were initiated through clinical

Table 2. Mentor Characteristics*

Characteristic	Value
Mentor career stage	
Attending	88.0
Resident	12.0
Mentor sex	
Male	81.3
Female	18.7
Mentor age range	
20–30 yr	1.3
31–40 yr	24.0
41–50 yr	41.3
51–60 yr	17.3
≥60 yr	14.7
Unsure	1.3
Mentor subspecialty	
General plastic surgery	34.7
Microsurgery and reconstructive surgery	24.0
Pediatric and craniofacial surgery	21.3
Aesthetic surgery	6.7
Hand surgery	6.7
Research faculty	1.3
Undecided, in-training	5.3

*Data are presented as percentage of survey respondents.

rotations (28 percent) or through research projects (15 percent) (Fig. 1, *above*, *left*). Over 75 percent of students reported involvement in a research project with their mentor (Fig. 1, *below*), and 67 percent of these reported research productivity in the form of publication, grant funding, or presentation at a local or national meeting (data not shown). This suggests the fact that although involvement in research projects does not necessarily initiate the majority of mentor-mentee relationships, the relationships may subsequently stimulate research interest and productivity.

The third and fourth years of medical school were the most common years during with relationships formed (56 percent), followed by the first and second years (36 percent) (Fig. 1, *above*, *center*). However, the duration of successful relationships was reported as lasting longer than 2 years for 54 percent and between 1 and 2 years for 32 percent (Fig. 1, *above*, *right*).

Interestingly, 20 percent of respondents reported that their mentor was not at their home institution (Fig. 1, *below*). A majority of these relationships were established not before medical school but rather during the third or fourth year of medical school, suggestive of the role that away rotations may play in the process. What was not addressed was the effect that the current American Council of Academic Plastic Surgeons postinterview communication policy might have on these relationships. However, over 80 percent

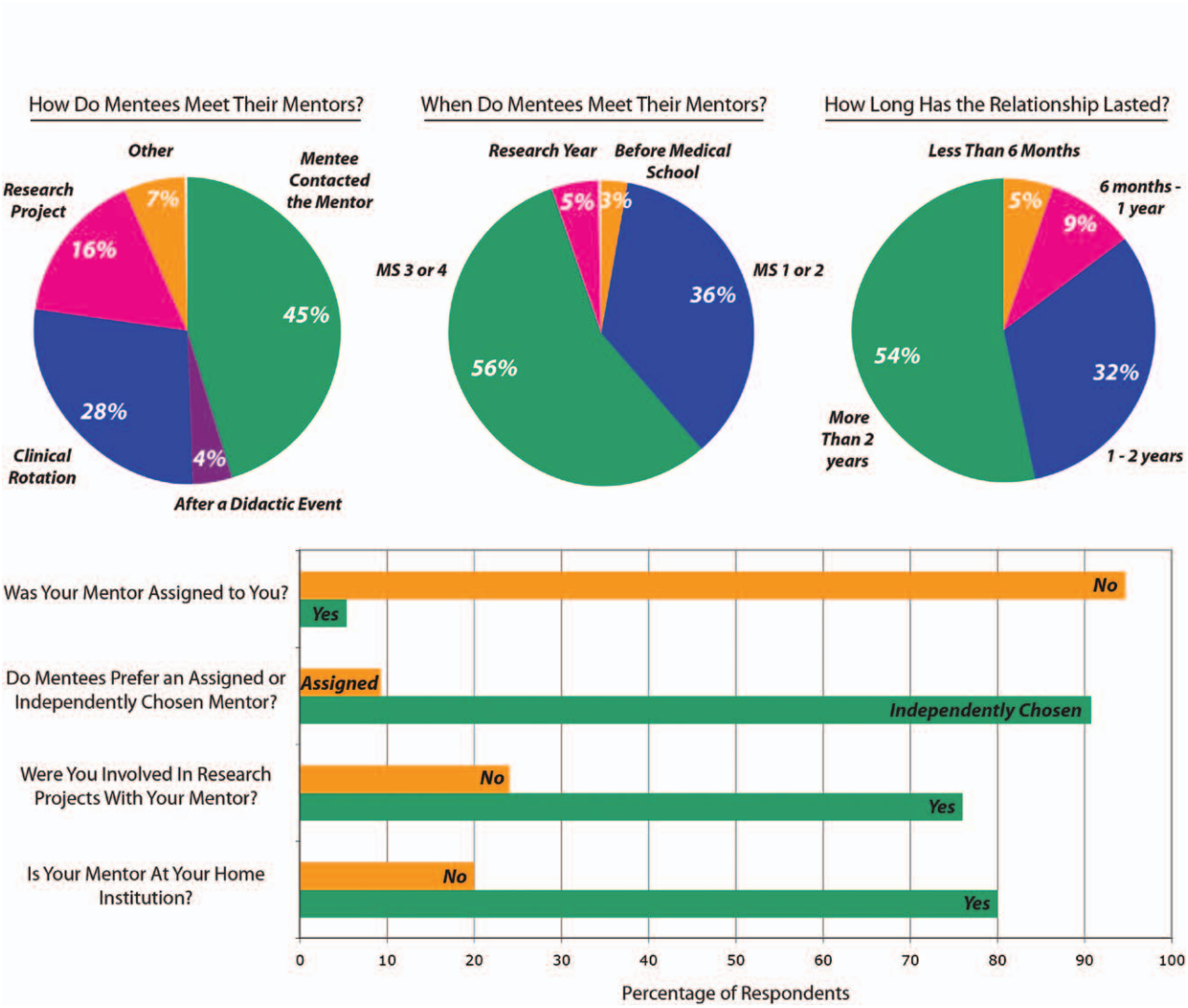

Fig. 1. How mentoring relationships commonly form. Mentees were asked how they met their mentor (*above*, *left*), when they met their mentor (*above*, *center*), and the duration of their relationship (*above*, *right*). Mentoring relationships were most commonly not assigned, nor were formal assignments preferred (*below*, *top two bar graphs*). Most students reported involvement in a research project with their mentor, and up to 20 percent had mentors that were not present at the mentee's home institution (*below*, *bottom two bar graphs*). Data are presented as percentage of survey respondents. *MS*, medical school year.

reported that their mentor was still able to provide guidance about away rotations and interviews and also provided a letter of recommendation (data not shown). The majority of respondents did not prefer to have a mentor assigned to them (91 percent) and, indeed, the vast majority of mentees did not have an assigned mentor (95 percent) (Fig. 1, *below*).

Maintenance of Mentor-Mentee Relationships

Survey participants were asked how they most commonly communicated with their mentor, and this was then compared to what would be their preferred form of communication. Phone calls or text messaging were the least common forms of interaction and also the least preferred. However, a discrepancy between preference and actual occurrence was found, with e-mail being the most common type of communication despite the fact that mentees generally preferred in-person meetings (Fig. 2, *above*).

The most common frequency for communication between the mentor and mentee was roughly the same between once per week (25 percent), once every other week (26 percent), or once per month (21 percent). As the frequency of communication

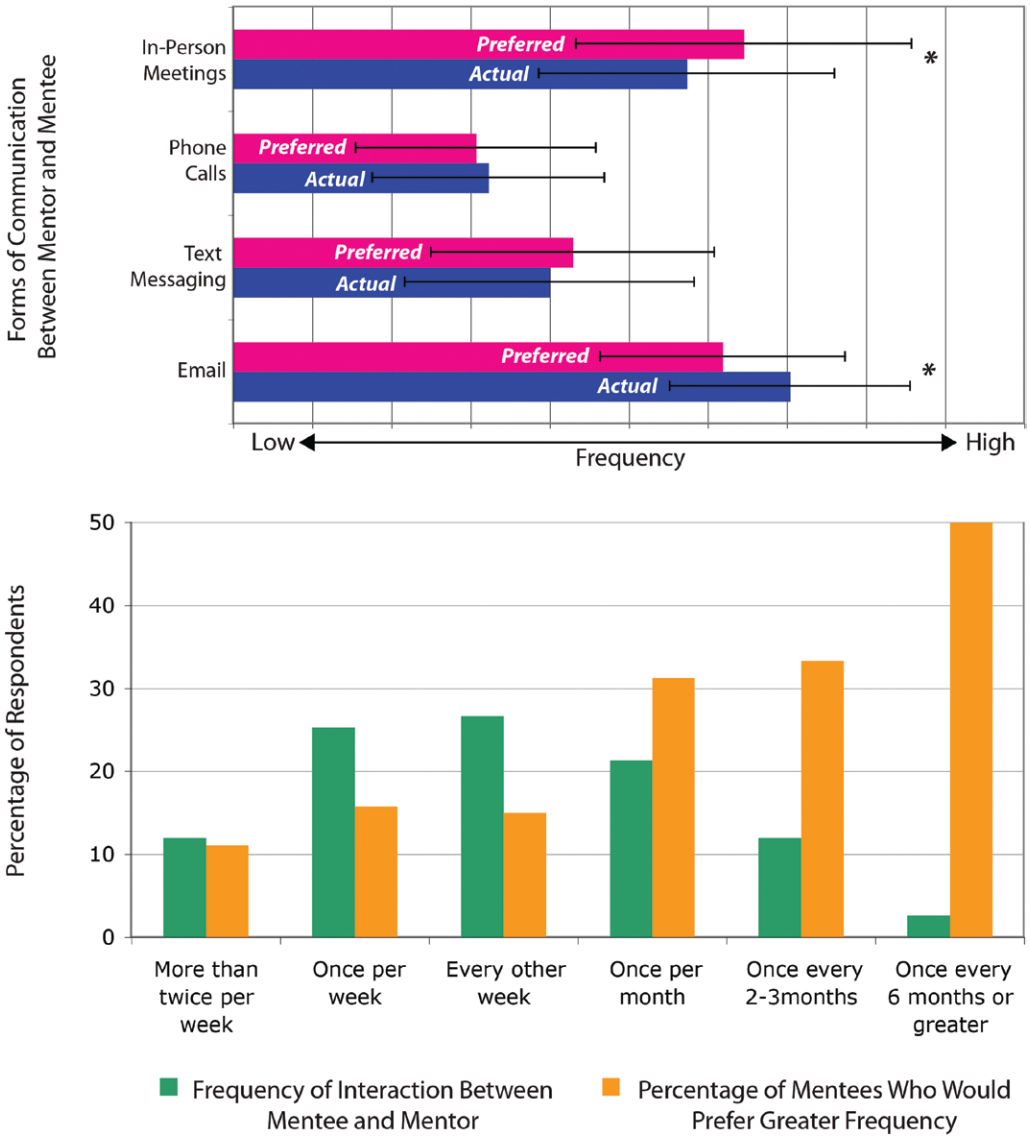

Fig. 2. How mentees communicate with their mentors. Comparisons were made between how mentees actually communicate with their mentors versus how they prefer to communicate with their mentors (*above*). Data are presented as a forced rank series ± SD and the *t* test was used to compare average ranks (*$p < 0.02$). Mentees were asked how often they communicate with their mentor (*below*) (*green*). As frequency decreased, dissatisfaction increased (*below*) (*orange*). Data are presented as percentage of respondents.

decreased, though, the percentage of respondents within that category who were dissatisfied with the frequency increased (Fig. 2, *below*).

Next, respondents were asked what types of interactions with mentors were most meaningful from their perspective. The question was arranged as a forced rank series of nine items. The most meaningful interactions included meetings to discuss career and personal goals, one-on-one teaching in the operating room, and informal situations such as a conversation over a cup of coffee or lunch. The items ranked lowest included group social events, other didactic activities such as lectures, clinical teaching rounds, or suture laboratories (Fig. 3, *above*). At each level of rank, an item was compared to the previous item for statistical significance. A statistically significant demarcation was present between the fifth and sixth items within the series between "technical participation in the operating room" and "clinical teaching rounds" ($p = 0.0006$). Interestingly, all items highly ranked above this demarcation included more personalized, one-on-one activities, whereas all items below this demarcation consisted primarily of group activities.

Mentor Qualities and Perceived Mentee Benefits

When asked to rank the value of different mentor qualities, survey participants listed "a

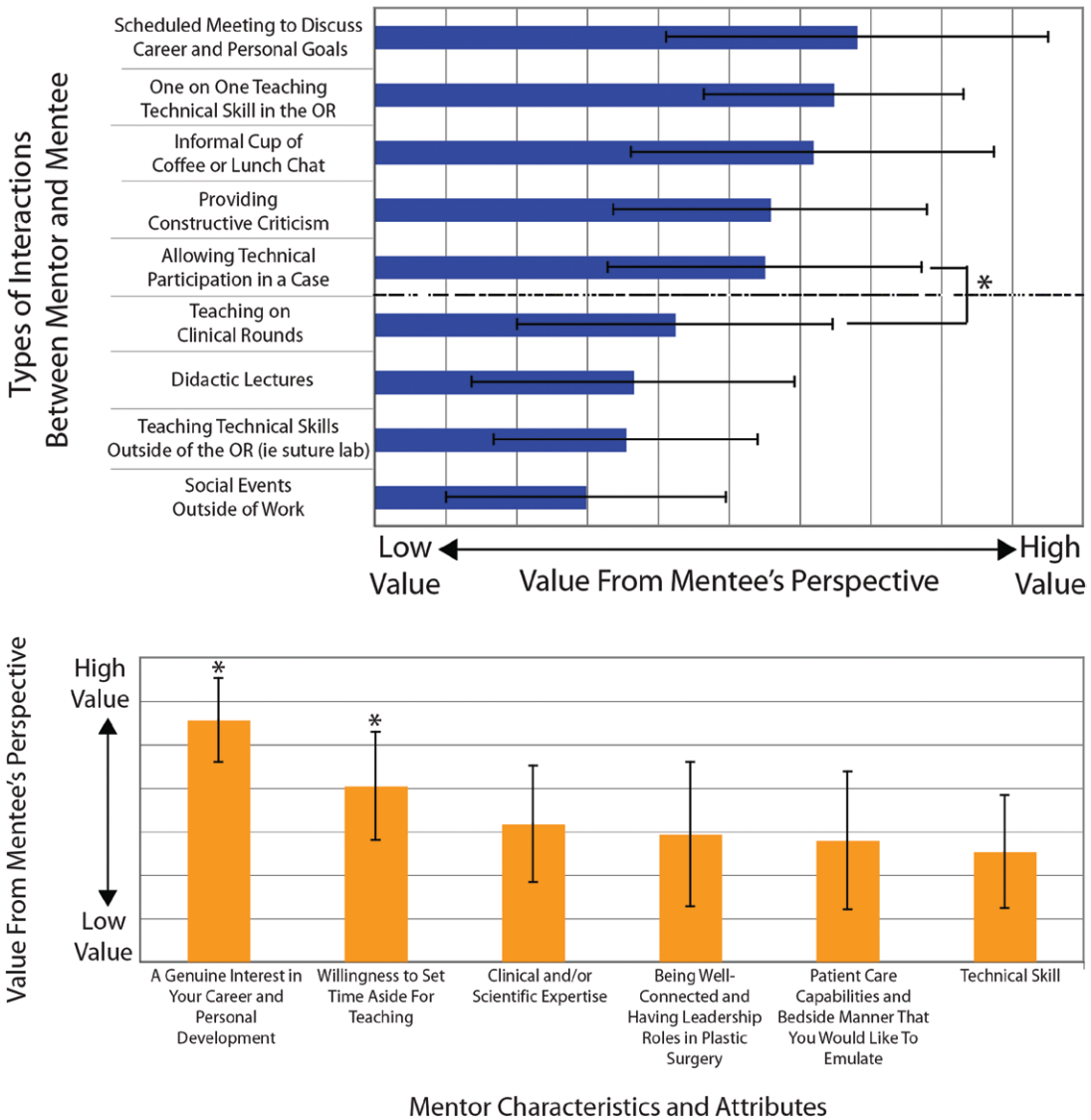

Fig. 3. Mentee preferences and values. Mentees prefer interactions that are one-on-one with their mentor (*above*, *above line*) and do not favor interactions that are group-based (*above*, *below line*). Mentees value a genuine interest in their development from their mentor above all other mentor qualities (*below*). Data are presented as a forced rank series ± SD and the *t* test was used to compare average ranks (*$p < 0.0006$). *OR*, operating room.

genuine interest in your career and personal development" and "willingness to set aside time for teaching" as the most valued attributes. These were significantly ranked above others such as expertise, being well connected in plastic surgery, patient care, and technical skill ($p = 4.5 \times 10^{-6}$ to $p = 5.6 \times 10^{-46}$) (Fig. 3, *below*). Similar to the comparison of mentor interactions, the mentor qualities that highlighted personalized interaction were the most highly valued by mentees.

Survey respondents were provided seven common items and asked to "select all of the ways in which their mentor has assisted in preparation for a career in plastic surgery." The most commonly selected items included career guidance (95 percent) and away rotation and interview advice (91 percent), whereas the least commonly selected items included patient care (64 percent) or didactic teaching (40 percent) (Table 3). Mentees perceived greater benefit from categories related to career development rather than the teaching of actual plastic surgery content. Despite this fact, 83 percent of respondents replied affirmatively when asked, "Did your relationship with your mentor influence your decision to pursue plastic surgery?" Furthermore, at the end of the survey, respondents were asked which subspecialty area of plastic surgery interested them most. Nearly 40 percent of respondents selected the same subspecialty as their mentor, a finding congruent with existing literature.[8]

Barriers to Mentorship

Incoming postgraduate year–1 integrated residents were asked about the barriers they had encountered to mentorship while in medical school. The responses were subdivided into those who reported having a mentor in medical school and those who did not (Fig. 4, *above*). The most commonly cited barrier to mentorship for a medical student with a mentor was the mentor's time constraints (80 percent). The most commonly cited barrier for those who did not have a mentor was the lack of an official mentoring program at their home institution (72 percent), also followed closely by mentor time constraints (68 percent). Although few respondents included lack of same-sex mentors as a barrier, it is interesting to note that 100 percent of the respondents who mentioned this as a barrier were women, and this accounted for one-third of the total female respondents. There was no significant difference in the gender distribution for those with or without mentors, and no other demographic trends were identified in the "no-mentor" group.

Survey participants were also asked "if they had attempted to reach out to a potential mentor and failed, what was the perceived cause of the failure?" Again, the most commonly cited reason for failure was the mentor's time constraints (42 percent). The next most common reason for failure was an element of perceived disinterest or lack of response to mentee e-mails from the mentor (36 percent), followed by inability to establish a personal connection with the mentor (32 percent) (data not shown).

The majority of students did not experience exposure to plastic surgery within their medical curriculum until the fourth year of medical school (Fig. 4, *below*). Interestingly, when respondents were subdivided into those with a mentor and those without a mentor, a substantial difference was noted in plastic surgery involvement in the medical school curriculum. For those without a mentor, less than 10 percent of survey respondents had exposure to plastic surgery in the medical curriculum, at any stage of training.

In an optional open text response question, participants were asked for suggestions on how mentorship could be improved within plastic surgery. A robust 47 percent of the respondents participated in this optional question. Remarkably, nearly all of the unprompted, open text responses could be clustered into a few categories. The most common suggestion was to establish formalized mentoring programs (46 percent). Many specifically stated that this did not imply the need for "assigned" mentors, but rather the option to "meet and greet" those who are available for mentoring or to be provided with a list of faculty who were willing to participate in mentorship. We did not identify any demographic trends among those who

Table 3. Perceived Mentee Benefits

Benefit	Value (%)
Mentor provided information about plastic surgery that guided career choice	94.7
Mentor provided guidance about away rotations and interviews	90.7
Mentor introduced other attending physicians/residents in plastic surgery	86.7
Mentor wrote letter of recommendation	82.7
Mentor made plastic surgery less intimidating/more approachable	78.7
Received teaching through patient care from mentor	64.0
Received teaching through didactic sessions from mentor	40.0
"Did your relationship with your mentor influence your decision to pursue plastic surgery?"	
Yes	82.7
No	17.3

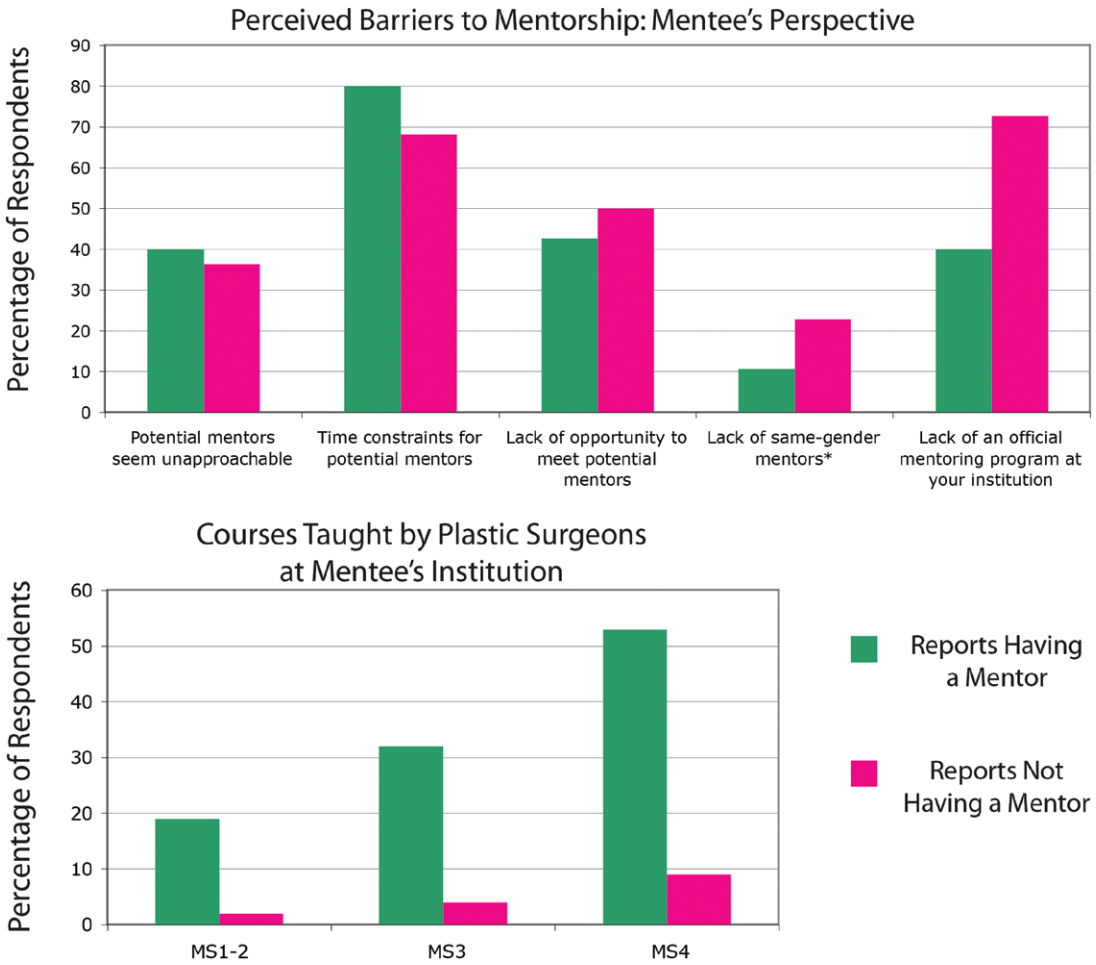

Fig. 4. Perceived barriers to mentorship. For students with mentors (*green*), the most common barrier to mentorship was "mentor time constraints." For students without mentors (*pink*), the most common barrier included problems with access to mentors, or "lack of an official mentoring program" (*above*). Participation in the medical school curriculum by the plastic surgery program at all levels was more commonly found for students with mentors compared to those without (*below*), suggesting the importance of involvement in the curriculum for the establishment of mentoring relationships. Data are presented as percentage of respondents.

suggested the establishment of a formal mentoring program. The next most common suggestion was to incorporate earlier involvement of plastic surgeons in the medical school curriculum (19 percent), followed by increased overall access to plastic surgeons (17 percent), and a call for increased commitment and interest toward medical students from potential mentors (13 percent). Other responses included incorporation of plastic surgery interest groups, mentor incentivization, or protected time for mentorship. Only 6.5 percent of the respondents did not feel as though mentorship needed improvement at their program (Table 4).

DISCUSSION

The data presented provide a unique insight into the minds of those being mentored, and can be used as a blueprint to improve the mentoring process of medical students in plastic surgery programs nationwide. Several key points can be extrapolated from the opinions of medical students regarding mentorship from this study. The first is that interactions between the mentee and the mentor optimally occur in a one-on-one environment. Students did not prefer activities that occurred in large groups with their mentor such as didactic lectures, skills laboratories, or even informal group social events. Undeniably, the mentoring experiences with the greatest impact require an element of open vulnerability, trust, and personalized advice. Although this is not surprising, it is therefore important to be mindful of the fact that not all time spent with a mentee is equal: one-on-one time "counts more" toward the mentoring relationship. The content of the

Table 4. Mentee Suggestions to Improve Mentorship*

	Value (%)
Category of open-text response	
Formalized mentorship program	45.7
Earlier exposure to plastic surgeons in the medical school curriculum	19.6
Increased access to mentors overall	17.4
Increased commitment to mentorship and interest from mentors	13.0
Plastic surgery interest groups	6.5
Mentor incentivization	6.5
No improvement needed	6.5
Protected time for mentorship	2.2

*Mentees were asked how mentoring could be improved at their institution in an open-text question format. Responses were categorized into common themes. Data are presented as percentage of survey respondents.

mentoring experience is also different from standard educational content. Students reported relying on their mentors for career advice and for learning to navigate the waters of the specialty, not for clinical plastic surgery education. With abundant time constraints, this information can help potential mentors tailor the content of their interactions toward the greatest need.

This study suggests that anyone can be a mentor. Mentors ranged from residents to attending physicians, full-time clinical to full-time research faculty, men and women, and all age ranges. In fact, there were no qualities described by the mentee that could be perceived as prerequisites to serving as a mentor such as technical expertise, clinical capabilities, or national notoriety. The simple fact of demonstrating a genuine interest in the career development and well-being of the student was perceived as the most important quality. Thus, effective mentorship requires time and commitment, not prerequisites or specific skill sets, per se. Although a variety of categories of mentors existed, some were underrepresented. These included both female mentors and resident mentors. Residents are uniquely positioned to serve as mentors to medical students, as they have recently encountered the same challenges that graduating medical students are soon to face.[9–11] Residency programs, like medical school curricula, are well equipped to teach clinical plastic surgery, but often do not impart other "intangible" skills, such as teaching or training in mentorship. This study highlights an opportunity for both acquisition of skills by residents and also improved mentoring of medical students in plastic surgery through encouragement and facilitation of resident mentorship of medical students.

Students demonstrated clear opinions about their preferred frequency and method of interactions. In-person, face-to-face meetings were preferred above all else. Furthermore, as the frequency of meeting decreased, the student's dissatisfaction with the mentoring experience increased. Given this, it is likely important to seek feedback from mentees. Improved communication could include questions such as "Are we meeting frequently enough?" "Are our interactions effective?" "Are we covering the content that you need to be covered?" Very little exists in the mentorship literature that defines the ideal way to assess mentoring efficacy, from either an individual perspective or from a systems perspective. There are few, if any, validated surveys, and honest feedback is not always prioritized. With the knowledge that true preferences do exist from mentees, it is important to be mindful to seek this feedback.

These data suggest that very few students in plastic surgery prefer to have assigned mentors, and this is congruent with other studies on mentorship.[12,13] Despite this fact, many endorsed the need for formal mentoring programs that, instead, facilitated the exposure between students and potential mentors. Lack of exposure was frequently cited as a barrier to mentorship, and this also extended to include the absence of plastic surgery faculty within the core medical curriculum. Students without mentors were less likely to have plastic surgery faculty involvement in their medical curriculum, and plastic surgery presence within the medical school curriculum had a direct impact on the formation of mentoring relationships for students. Indeed, Rees-Lee and Lee describe the contracting presence of plastic surgery faculty in the medical school curriculum, internationally, and the potential impact on career specialization for medical students.[14] Greene and May further describe the fact that medical student exposure to plastic surgery is the single most important factor that predicts plastic surgery career choice for medical students.[15] Our work is congruent with these findings and further suggests that mentorship may be the critical link between early exposure to plastic surgery and ultimately choosing to pursue plastic surgery as a career.[9,16,17] In our population, 80 percent of the student respondents reported that their mentor was influential in their career choice.

The study presented here is not without limitations, however. No validated survey exists for assessing the efficacy of mentorship for medical students, causing an inherent limitation in our design. Furthermore, although our 76 percent response rate was robust, 24 percent of the recently matched integrated track residents are

not represented and might have added additional valuable insight. Lastly, these data portray the experiences of those who successfully matched into plastic surgery and do not assess those who were unsuccessful in the match, were deterred from plastic surgery, or never had exposure to plastic surgery during their medical school training. It is possible that those with a successful match into plastic surgery have a more positive impression of their mentoring experience compared with those who did not. Despite these limitations, the data presented here are the first to objectively investigate mentorship of medical students in plastic surgery and thus provide a unique and contemporary perspective.

The population surveyed here can be considered a success for mentorship in plastic surgery, as nearly 80 percent of incoming postgraduate year–1 integrated track residents felt mentored as a medical student. Despite this accomplishment, the pursuit for increased awareness, innovative solutions, and quality improvement in mentorship must continue. Successful mentorship of medical students may contribute to the future of plastic surgery, and a commitment toward this endeavor is needed at the local, departmental, and national leadership levels.

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