SPECIAL TOPIC

Evaluation of Plastic Surgery Training Programs: Integrated/Combined versus Independent

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Background: The authors aimed to differentiate between combined/integrated and independent (traditional) methods of plastic surgery training with regard to quality of trainees, caliber of graduates, and practice or career outcomes once graduated.

Methods: To compare combined/integrated with independent residency program training, the authors conducted a Web-based survey of the American Society of Plastic Surgeons members looking at their experience and practice outcomes (n = 1056) and interviews of plastic surgery faculty looking at the quality of trainees (n = 72). The member survey evaluated background information, research credentials, pathway satisfaction, postgraduation activities, current practice, and academic affiliation. Faculty teacher interviews focused on knowledge base, diagnostic and treatment judgment, technical abilities, research capabilities, and prediction of future career success.

Results: The member survey showed no difference (p > 0.05) between combined/integrated and independent trainees in practice type (cosmetic/reconstructive), practice volume, or academic achievements. Combined/integrated trained surgeons are three times more likely to recommend their training pathway and two times more likely to enter fellowship after residency. Alpha Omega Alpha Honor Medical Society membership correlated with a greater likelihood of having an academic practice at 5 and 10 years or more and higher professorship titles. Faculty evaluations showed that combined/integrated residents were superior in knowledge (49 percent versus 32 percent) but that independent residents were superior in technical ability (51 percent versus 20 percent) and research (57 percent versus 19 percent). Most faculty were unable to choose a pathway producing superior residents.

Conclusions: Regarding future practice outcomes, there was not a superior training pathway. Regarding quality of trainees, there were differences in faculty evaluations, but there was no consensus on a better pathway. (*Plast. Reconstr. Surg.* 130: 157e, 2012.)

The question of how to best train plastic surgeons has been the topic of discussion for decades.^{1–3} As approved by the Residency Review Committee for Plastic Surgery of the Accreditation Council for Graduate Medical Education, several pathways exist for admissibility to the American Board of Plastic Surgery examination (Fig. 1).⁴ Terms that need to be distinguished that describe

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DOI: 10.1097/PRS.0b013e318254b3d0

current plastic surgery training pathways include independent (traditional), combined, and integrated.

The independent (traditional) model requires prerequisite training before requisite plastic training is undertaken. For the prerequisite training, there are three options: (1) formal training in general surgery, otolaryngology, neurosurgery, orthopedic surgery, or urology; (2) oral maxillofacial surgery (awarding a D.M.D./M.D. or D.D.S./M.D. degree); or (3) 3 years of general surgery before transferring into plastic surgery residency within the same institution.^{5,6} Recently, 2-year plastic surgery programs were required to switch to a 3-year training

Disclosure: The authors have no financial interest to declare in relation to the content of this article.

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Fig. 1. Routes taken for plastic surgery training. Respondents overwhelmingly were from the "traditional" route of general surgery training, then plastic surgery residency through independent match.

format with 12 months of chief responsibilities. Currently, there are approximately 71 independent programs through the San Francisco Matching Program.⁷

For medical students interested in plastic surgery training, either the combined or integrated program may be pursued. Combined pathway trainees undergo 3 years of general surgery education directed by general surgery program directors, followed by 3 years of plastic surgery curriculum.^{1,3} The American Board of Plastic Surgery and the Accreditation Council for Graduate Medical Education have voted to phase out the combined format by July 1, 2015.⁷ The integrated track imparts plastic surgery program directors control of their residents' education from the first day of training. Within certain guidelines, plastic surgery training is assimilated into earlier years of general surgery training at the program director's discretion.¹ Integrated programs are now required to be at least 6 years in length, with some requiring an additional research year.⁵ At present, there are 22 combined and 32 integrated programs participating in the Electronic Residency Application Service match.⁷⁻⁹

With different pathways available, questions of the advantages and disadvantages of each pathway, the quality of trainees in each pathway, and

the caliber of graduating surgeons emerge. Fields such as urology, neurosurgery, orthopedic surgery, and otolaryngology have fully integrated surgical residencies. Plastic surgery program directors and trainees alike may ask which pathway is the best for training and which pathway can capture the breadth of plastic surgery education.¹⁰ Although selection criteria for integrated programs are rigorous, with Alpha Omega Alpha Honor Medical Society membership and letters of recommendation from well-known colleagues as two of the most important factors,^{11,12} a recent survey of integrated program directors found only 43.2 percent of directors are satisfied with the current methods of identifying potential problems with residents.¹² However, program directors, who, in addition, accept independent applicants were less satisfied with the process for selecting medical students into the integrated program. Another study identified that only 4 percent of independent pathway chairmen (one of 23) had plans to switch to integrated training, whereas 80 percent of program directors (12 of 15) with both tracks did not want to commit to either.¹⁰ The lack of ability to judge progress and outcome of residents for adequate comparison has long been

recognized.¹³ There is a paucity of research analyzing outcomes of these graduating residents.

The objective of this study is to fill in such gaps in the current understanding of differences between combined/integrated versus independent methods of training. Evaluations of an American Society of Plastic Surgeons survey were used to provide insight into career outcomes of graduates from the combined/integrated pathway compared with the independent pathway. In addition, plastic surgery faculty interviews were used to compare performance of combined/integrated residents versus independent residents during training.

MATERIALS AND METHODS

In June of 2011, an anonymous 22-question survey was sent to a cohort of American Society of Plastic Surgery members. Designed to be completed in 3 minutes, the online survey (http://www.survey monkey.com) was based on focus group feedback of 45 American Society of Plastic Surgeons members of various ages conducted at the 2010 American Society of Plastic Surgeons meeting. Focus group plastic surgeons were of various ages (30 to 45 years, 31 percent; 46 to 60 years, 48 percent; 61 years and older, 23 percent); various practices (academic, 34 percent; academic affiliated, 42 percent; private practice, 24 percent); and various geographic regions (East, 37 percent; Midwest, 19 percent; South, 16 percent; West, 28 percent). Recommendations were followed from previous successful questionnaires to increase responses.^{14,15} Certain questions were adopted from other known studies for continuity and to compare the work forces.^{16,17} Appropriate redundancy of questions was built into the survey. The survey was aimed at assessing outcomes of plastic surgery graduates from independent, combined, and integrated pathways. The survey was split into the following sections: background information, research credentials, pathway satisfaction, postgraduation activities, current practice, and academic affiliation. Responses were required for all questions to be tabulated.

Faculty Interview

Based on a focus group study (n = 10), a separate survey was created and administered to plastic surgery faculty involved with teaching of both independent and combined/integrated residents for more than 5 years (n = 72). Surgeons were selected by the senior author (J.P.B.) based on experience in resident education. Plastic surgery faculty were of various ages (30 to 45 years, 5 percent; 46 to 60 years, 47 percent; 61 years and older, 52 percent); various practices (academic, 51 percent; academic affiliated, 38 percent; private practice, 11 percent); and various geographic locations (East, 30 percent; Midwest, 22 percent; South, 15 percent; West, 33 percent). The interviews aimed to compare perspectives and opinions on residents of different training pathways. The survey was divided into five sections: (1) knowledge base (unknown case presentations, test-taking), (2) clinical judgment, (3) technical abilities, (4) research capabilities, and (5) future potential. There were four similarly worded questions in each of the five categories listed above for a total of 20 questions. In addition, we advised the faculty to select the superior group for each question. Results were tabulated by category. If all four similar questions were answered positively for a given category, it was considered positive for that resident group; otherwise, it was designated to the "neither, cannot choose" category. From these answers, a comparison was made between independent and combined/integrated residents. Similarly, if all five categories were positive, the faculty was said to favor a certain training pathway overall.

Statistical Analysis

Analysis was performed by using the SAS statistical package (SAS Institute, Inc., Cary, N.C.). When comparing mean difference of numeric variables between groups, the *t* test was used, as sample size in each group was large. When testing the homogeneity between two categorical variables, such as checking the probability of entering private practice in independent versus combined/ integrated groups, the chi-square test or the Fisher's exact test (if n < 5) test was applied. The odds ratio and confidence interval have been reported.

RESULTS

The survey was sent to 5400 randomly selected American Society of Plastic Surgeons members. Complete responses were obtained from 1056 members, for a response rate of 20 percent. Of the respondents, 94.3 percent were active American Society of Plastic Surgeons members; 5.7 percent were associate or international members; 24.1 percent (n = 255) were Alpha Omega Alpha Honor Medical Society Members; 29.4 percent (n = 310) were women; and the majority of respondents (71.8 percent, n = 758) trained in independent (traditional) plastic surgery programs (Fig. 1). Most of these surgeons entered plastic surgery after at least 3 years of general surgery [n = 714(67.6 percent)]. Alternatively, respondents completing subspecialty programs for their prerequisite training were in the minority and included head and neck surgery [n = 27 (2.6 percent)] or other specialties [n = 17 (1.6 percent)]. A smaller number of respondents trained in combined programs [n = 188 (17.8 percent)] or integrated programs [n = 110 (10.4 percent)]. Survey respondents were also of various ages (30 to 4 years, 39 percent; 46 to 60 years, 29 percent; 61 years and older, 32 percent); various practices (academic, 38 percent; academic affiliated, 35 percent; private practice, 27 percent); and various geographic locations (East, 33 percent; Midwest, 19 percent; South, 18 percent; West, 30 percent).

For analysis, surgeons graduating from combined or integrated programs were placed in a single group, with independent plastic surgery-trained surgeons in another category. Combined/integrated residents graduated later than independent residents (mean, 1997 versus 1990). Respondents were distributed evenly in the United States, with a slight majority graduating from the Northeast.

Plastic Surgery Residency

Surgeons entering into combined/integrated residencies were more likely (almost two times the odds) than independent program surgeons to have 2 or more years off for dedicated research

(odds ratio, 1.86; 95 percent confidence interval, 1.16 to 2.99; p = 0.009). Independent applicants have a statistically significant greater number of publications at the time of application than combined/integrated applicants (3.09 versus 2.35, p =(0.02). By contrast, after graduation, combined/ integrated residents had a greater number (5.58) versus 4.52, p = 0.017). However, no difference was found in the current number of publications between combined/integrated and independent program surgeons (15.01 versus 17.34, p > 0.05) (Fig. 2). Although both combined/integrated and independently trained surgeons were satisfied with their respective training pathway (p > 0.05), combined/integrated surgeons were more likely (almost three times the odds) to recommend their training pathway compared with traditionally trained surgeons (odds ratio, 2.74; 95 percent confidence interval, 1.71 to 4.40; p < 0.0001) (Fig. 3). A combined/integrated trained surgeon has 1.37 times the odds of being single rather than married or married with children at the time of residency graduation compared with the independently trained surgeon (odds ratio, 1.37; 95 percent confidence interval, 1.01 to 1.86; p = 0.04).

Postgraduation Activities

Immediately after residency, combined/integrated applicants were more likely to go into fel-

Number of Publications by Combined/Integrated vs. Independently Trained Surgeons



Fig. 2. Comparison of number of publications between surgeons who graduated combined/integrated versus independent residency; independently trained surgeons had a greater number of publications at the time of application (3.09 versus 2.35, p = 0.02) but fewer after graduation (5.58 versus 4.52, p = 0.017). No difference was found in current number of publications between combined/integrated and independently trained surgeons, respectively (15.01 versus 17.34, p > 0.05).

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Satisfaction Training Pathway with Combined/Integrated vs. Independently Trained Surgeons



lowship after residency than independent surgeons (odds ratio, 2.32; 95 percent confidence interval, 1.76 to 3.06; p < 0.0001) (Fig. 4). The distribution of fellowships varied between pathways (Fig. 5). No difference was found for independently versus combined/integrated trained surgeons in academic propensity. Eliminating those who continued training, no graduate was

more likely to be in academic or private practice immediately after residency, 5 years after completion, or currently (if >10 years in practice) (p > 0.05). No difference was found between either training pathway and highest academic title held (p > 0.05). Barring those entering fellowship, surgeons more satisfied with their training were more likely (odds ratio, 2.75; 95 percent confidence in-

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Fellowship and Academic Affiliation Post-Residency

Fig. 4. Fellowship and academic affiliation after residency. After residency, combined/integrated graduates were more likely to go into fellowship than independently trained graduates (odds ratio, 2.32; 95 percent confidence interval, 1.76 to 3.06; p < 0.0001). When eliminating those still in training or retired, no correlation was found between either pathway and entering academic practice (p > 0.05).



Percent Distribution of Fellowships Pursued after Residencies among Different Trainees

Fig. 5. Distribution of fellowship pursued after residency between combined/integrated and independently trained surgeons. The combined/integrated graduate sought more fellowships than the independent graduate. Types of fellowship pursued were very similar (p > 0.05).

terval, 1.25 to 6.06; p = 0.009) to enter part-time clinical or full-time faculty in an academic setting immediately after residency than those who were not satisfied. Also, those who were likely to recommend their training to others were more likely (almost two times the odds) to begin in an academic track (odds ratio, 1.70; 95 percent confidence interval, 1.07 to 2.69; p = 0.02). This effect did not last 5 years out of practice or in respondents' current situation.

When comparing practice composition, no difference was elicited between independently and combined/integrated trained surgeons. Practices were found to be equal (p > 0.05) in terms of cosmetic versus reconstructive composition, current practice size, practicing city population, amount of emergency room call currently taken, and number of surgeons in military practice.

Alpha Omega Alpha Honor Medical Society Membership

Plastic surgeons trained in a combined/integrated programs were two times more likely to be Alpha Omega Alpha Honor Medical Society members when compared with surgeons trained in the independent pathway (odds ratio, 2.01; 95 percent confidence interval, 1.49 to 2.91; p < 0.0001) (Fig. 6). Alpha Omega Alpha Honor Medical Society membership did not predict satisfaction or recommendation of any particular training pathway (p > 0.05).

Alpha Omega Alpha Honor Medical Society status was a good predictor of academic inclination. Applicants who were Alpha Omega Alpha Honor Medical Society members were no more likely to dedicate time for research than those who were not (p > 0.05). However, applicants with Alpha Omega Alpha Honor Medical Society membership status had a statistically significant greater number of publications at the time of application (3.49 versus 2.68, p = 0.015), at the time of plastic surgery graduation (6.15 versus 4.40, p = 0.0001), and at their current states (26.84 versus 13.44, p < 0.0001) (Fig. 7). Immediately after residency, when eliminating fellowship-bound respondents, Alpha Omega Alpha Honor Medical Society membership status did not predict whether a trainee would enter private or academic practice (p > 0.05). However, Alpha Omega Alpha Honor Medical Society members 5 years out of residency (odds ratio, 1.63; 95 percent confidence interval, 1.20 to 2.22; p = 0.0017) and in current states (odds ratio, 1.72; 95 percent confidence interval, 1.28 to 2.32; p =(0.0003) were almost two times more likely to be in an academic setting, as opposed to full-time private practice. Furthermore, Alpha Omega Alpha Honor Medical Society membership increased chances of holding higher academic titles (p = 0.001). Alpha Omega Alpha Honor Medical Society status did not



Alpha Omega Alpha Membership of Independent vs. Combined/Fully Integrated Surgeons*

Fig. 6. Alpha Omega Alpha Honor Medical Society membership comparison between independently and combined/integrated trained surgeons. Surgeons graduating from combined/integrated residency were twice as likely to be Alpha Omega Alpha Honor Medical Society members as independently trained surgeons (odds ratio, 2.01; 95 percent confidence interval, 1.49 to 2.91; p < 0.0001).



Fig. 7. Comparison of number of publications between Alpha Omega Alpha Honor Medical Society members and nonmembers at various career time points. Alpha Omega Alpha Honor Medical Society members had a statistically significant greater number of publications at the time of interview (3.49 versus 2.68, p = 0.015), at the time of graduation (6.15 versus 4.40, p = 0.0001), and at the current time (26.84 versus 13.44, p < 0.0001).

predict (p > 0.05) cosmetic versus reconstructive practice, current practice size, practicing city population, amount of emergency room call currently taken, and number of surgeons in military practice.

Faculty Perceptions

Of the 72 interviewed faculty, all had taught both independent and combined/integrated residents. When asked to compare residents in the different training pathways, there was a slight preference for combined/integrated residents overall. For the best overall resident, 28 faculty (or 39 percent) chose combined/integrated program, and only 18 faculty (or 25 percent) chose the independent program ($p \ge 0.05$). The faculty also felt that combined/integrated residents were superior in "knowledge": combined/integrated, 35 faculty (49 percent); and independent, 23 faculty (32 percent) (Fig. 8). By contrast, the faculty felt that the independent residents were superior in technical ability [n = 36 (50 percent) versus n =14 (19 percent)] and research [n = 41 (57 percent) versus n = 14 (19 percent); $p \ge 0.05$]. The majority of faculty [n = 52 (74 percent)] admitted

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Faculty Perceptions: Resident Ability in Five Categories

Fig. 8. Faculty perceptions in five categories. Faculty were asked to rank resident ability in five different categories. Combined/integrated residents were felt to be stronger in knowledge. Independent residents were ranked superior in technical ability and research.

that they could not choose which pathway led to the best potential career in plastic surgery.

DISCUSSION

Plastic surgery residency remains one of the most highly sought after residency positions, with nearly 100 percent filling of available positions for both independent and integrated pathways.^{12,18} Currently, there are two avenues for admissibility to American Board of Plastic Surgery examination as dictated by the Residency Review Committee for Plastic Surgery of the Accreditation Council for Graduate Medical Education: the independent pathway and the integrated pathway (Fig. 1).⁴ Since plastic surgery training began in the 1940s, plastic surgery and general surgery have had many overlapping aspects. Plastic surgery was considered a subspecialty to general surgery. Training was established through the independent model: 5 years of general surgery and 2 to 3 years of plastic surgery.¹³ Over time, plastic surgery has evolved with new technological developments of subspecialties, including craniofacial, microsurgery, hand, and cosmetic surgery. Likewise, general surgery began concentrating on endoscopic and minimally invasive procedures.^{1,3,13} These changes resulted in a divergence in the core educational objectives of general surgery versus plastic surgery residency.¹³ From the faculty interviews conducted, we learned there are concerns that the general surgery training today is different and not nearly as relevant to plastic surgery as it was 10 to 20 years ago.

The combined pathway, technically part of the independent pathway, selects candidates from medical school through Electronic Residency Application Service. This track became officially available in 1989 after a meeting between the Association of Program Directors in Surgery and the Association of Academic Chairmen of Plastic Surgery.^{1,12,19} The first 3 years are in general surgery and the second half is in plastic surgery. The integrated model, a separate and distinct track, entails a 6- to 7-year curriculum designed completely under the auspices of the plastic surgery program director. Although the official requirement is at least 36 months of plastic surgery training, many integrated programs have greater than 4 years cumulatively.⁶ Several studies have held the integrated model as essential to the survival of plastic surgery.^{2,19} The number of programs accepting medical students has increased from 40 in 2004 to 54 in 2011.⁸ Integrated pathways allow additional time, especially in the face of work-hour limitations, to tackle the breadth of plastic surgery knowledge.^{6,20} In addition, there is increased longitudinal evaluation of performance, and relevant junior resident experience is allowed.¹⁹ More time is given to customize plastic surgery resident experiences and allow for remediation.

Comparison between the independent and combined/integrated applicant pools draws im-

mediate contrast. Guo et al. found integrated residents were from more highly ranked medical schools, had higher United States Medical Licensing Examination step 1 scores, and more preresidency publications.²¹ Combined/integrated applicants are typically top medical students. According to 2009 data, plastic surgery remains the most competitive specialty out of medical school, with only an approximately 50 percent match rate. Successful applicants are known to have the highest board scores and the greatest number of publications compared with other specialties.²² According to our data, medical students accepted into plastic surgery programs are two times more likely to be Alpha Omega Alpha Honor Medical Society members than independent surgeons (odds ratio, 2.01; 95 percent confidence interval, 1.49 to 2.91; p <0.0001).

Burnout is a relevant phenomenon in the independent pathway. New Accreditation Council for Graduate Medical Education requirements of 3 years of plastic surgery⁶ combined with research requirement in many general surgery programs (up to 2 years) make the independent model a possible decade-long endeavor.⁵ This lengthy training, before subspecialty fellowship, may result in decreased motivation for further training. Imahara et al. found independent trainees and those with dependents to be more likely to enter private practice without fellowship.²³ We also found that independent applicants are two times less likely to take on rigorous fellowships than combined/ integrated trainees (odds ratio, 2.32; 95 percent confidence interval, 1.76 to 3.06; p < 0.0001). Independent applicants had significantly more publications than combined/integrated applicants at the time of plastic surgery application (3.09 versus 2.35, p =0.02). In a shift in productivity, independent surgeons graduated with fewer publications compared with combined/integrated trainees (5.58 versus 4.52, p = 0.017). Ultimately, however, they ended up with a similar number of publications (15.01 combined/integrated versus 17.34 independent, p >0.05). Our survey indicates that although both independent and combined/integrated trainees were satisfied with their training (p > 0.05), combined/ integrated trainees were three times more likely to recommend their pathway to others (odds ratio, 2.74; 95 percent confidence interval, 1.71 to 4.40; p < 0.0001).

Philosophical differences exist between the two schools of thought.^{3,10} Although some believe it to be a necessary step in the evolution of plastic surgery training,^{2,13} in the past 10 years, four to five programs, including our institution, have stopped

taking medical students.¹² As a deviation from tradition, several criticisms can be made of the combined/integrated pathway, including early commitment to a lifelong career and lack of initial operative experience.^{10,16} Program directors of independent programs highlight the intangible, "battle-tested" qualities of the general surgery resident entering plastic surgery. By that time, these surgeons are mature, married, and possibly more stable. In addition, a clinical track record already exists. A study of 850 senior surgeons revealed most chose surgical specialties at the junior resident level.¹⁶ Some may argue that medical students do not have sufficient information with which to decide on a lifelong career. Although the exact attrition rate in plastic surgery is unknown,¹² anecdotally, these independent residents seem less likely to quit. We found that independent residents have higher pre-plastic surgery training publications than combined/integrated applicants.²¹ Another criticism, albeit difficult to evaluate, is operative ability. Chairmen of independent programs (versus integrated program chairmen) were found to be more likely to feel that the operative judgment and technical skill set of a combined/integrated resident is inferior.¹⁰ Our faculty interview suggests that, although combined/integrated residents had a stronger knowledge base, independent residents were felt to have stronger technical ability and research background.

Training residents in plastic surgery residency is a lengthy endeavor. Spots are limited and highly sought after. Instructors teaching residents invest time and effort. Logically, faculty need predictive factors that seek young surgeons who will continue this tradition.²⁴ We previously found having children and years taken off for research before entering plastic surgery residency forecasted academic tendencies in an independent pathway applicant.²⁵ In a follow-up study, previous dedicated research training, more years of clinical training, and more scientific publications were predictive factors for academic practice in a fellowship applicant.²⁴ Current data indicate that combined/integrated applicants were more likely to have taken 2 years or more off for research. Independent applicants had more publications at the time of plastic surgery application (likely because of longer careers at application time). No difference existed between the combined/integrated and independent surgeon in terms of current number of publications. It should also be emphasized, when tracking progression of graduates and ultimate academic success, that no correlation was found between either pathway entering academic practice immediately, at 5 years after completion, and currently among those more than 10 years in practice.

Instead, our results indicate Alpha Omega Alpha Honor Medical Society membership to be a good predictor of practice outcome. Alpha Omega Alpha Honor Medical Society honor status remains among the most highly valued in the residency selection process.¹² Several studies have found Alpha Omega Alpha Honor Medical Society membership to be predictive of residency performance.^{26,27} When tracking progress of survey respondents at 5 years (odds ratio, 1.63; 95 percent confidence interval, 1.20 to 2.22; p = 0.0017) and at greater than 10 years (odds ratio, 1.72; 95 percent confidence interval, 1.28 to 2.32; p = 0.0003) out of residency, Alpha Omega Alpha Honor Medical Society members were more than twice as likely to practice in an academic practice, with increased chance of holding higher academic titles (p = 0.001). Alpha Omega Alpha Honor Medical Society members were more academically involved, with an increased number of publications at interview (3.49 versus 2.68, p =0.015), at plastic surgery graduation (6.15 versus 4.40, p = 0.0001), and currently (26.84 versus 13.44, p < 0.0001). When academic plastic surgeons were surveyed, motivation and determination have been found to be personal attributes most contributing to academic success.²⁸ These qualities may have been established before medical school and increase the chance of receiving Alpha Omega Alpha Honor Medical Society nomination.²⁵

Drawbacks to our study are several. Only American Society of Plastic Surgeons members were surveyed: a selection bias may be in place. Those involved in organizations tend to be more academic, skewing analysis of academic versus private surgeons. Our survey analysis considered a respondent's positive answers in four of four for similar categorical questions as an overall positive for that resident group. Any less than four of four positive for similar questions (even three of four or one of four), was considered "neither, cannot choose." This tended to make the "neither, cannot choose" category larger with more variations in responses. However, this provides a greater assurance that a "positive" overall response was truly positive and a "negative" overall response was truly negative.

In addition, the authors acknowledge that there were a number of factors that contribute to the number of publications an applicant had when applying. For instance, independent applicants may train for a greater number of years; however, a combined/integrated applicant may take off 1 to 2 years to perform basic science research in an attempt to improve his or her chances on matching at a competitive plastic surgery program. These various factors are not controlled for in the study. Despite not eliciting why an applicant has more or fewer publications, the important aspect for a program to know is how many publications an applicant (from either of the two types of programs) has at the time of residency interviews.

As highlighted earlier, advantages of independent applicants are the intangible "battle tested" qualities. These qualities are difficult to evaluate for, and certainly need more than a survey to examine. As integrated and combined models of training continue to evolve, continued analysis to probe benefits and drawbacks is needed. The effects and eventual outcome of recent changes, such as the 80-hour work week, remain to be seen.²⁹

CONCLUSIONS

Although there were differences in resident performance during training noted by plastic surgery faculty between combined/integrated and independent pathway residents, based on a large American Society of Plastic Surgeons survey, graduates were similar with regard to practice outcomes and tested career successes. Combined/ integrated residents were thought to have more "book" knowledge, but the independent residents were felt to have superior technical and research skills. However, final practices were equivalent with regard to cosmetic versus reconstructive surgery, practice outcomes, and academic achievements. Interestingly, Alpha Omega Alpha Honor Medical Society members had greater propensity for academic practice at 5 and more than 10 years out of residency, and higher professorship titles. Although more study is needed to examine this correlation, this may provide program directors and chairmen with insight into resident selection.

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