

# Professional Satisfaction of Women in Surgery

## Results of a National Study

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**Hypothesis:** Individual, group, and organizational factors influence the professional satisfaction of women surgeons in Austria.

**Design:** Survey on professional and private issues sent out by mail in 2000 and 2001.

**Setting:** Women surgeons working in hospitals and/or in private practices and those who were retired or on maternity leave.

**Participants:** All 351 Austrian women surgeons of all core surgical specialties (general, trauma, pediatric, plastic, thoracic, and cardiovascular), certified or in training, were addressed.

**Main Outcome Measures:** Proportional odds regression models were used to correlate professional satisfaction with objectively measurable prognostic factors such as age, surgical subspecialty, status of training, type of hospital, location of work (federal states vs the capital), status of activity (active vs on maternity leave), profession of private partner, number of children, and subjectively assessed prog-

nostic factors such as operative volume and departmental organization.

**Results:** The response rate was 58.7% (206/351). One hundred eighty-seven surgeons—active or on maternity leave—were included in the analysis. Higher satisfaction was reported by active surgeons in subspecialties, certified surgeons, comparatively younger and older surgeons, surgeons working in hospitals outside the capital, and surgeons with a physician as a partner. When entering subjectively assessed variables into the model, the quality of departmental organization and operative volume ( $P < .001$ ), as well as the status of activity ( $P < .001$ ), had the strongest effect.

**Conclusions:** Women surgeons' professional satisfaction highly depends on departmental organization and status of activity. Inadequate leadership, low operative volume, and being on maternity leave have a negative effect on job satisfaction. Private factors seem to be of little influence. Optimal departmental organization would help women to reconcile their professional and their private lives.

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**T**HE NUMBER OF WOMEN SURGEONS is increasing worldwide, partly reflecting the increasing number of medical students.<sup>1</sup> In 2000, the percentage of female medical students in Austria was 63%, and the percentage of female graduates from medical schools was 54%. According to official statistics, there are 34 593 medical doctors in Austria, 36.7% of whom are women; they make up about 10% of all certified surgeons in general surgery and 4.7% to 27.0% in the core surgical subspecialties, resulting in a total of 175 certified female surgeons.<sup>2</sup>

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It is mainly Anglo-American studies that document career advancements and social characteristics of female physicians and

surgeons.<sup>3-16</sup> In Europe, studies on women surgeons are rare.<sup>17</sup>

We conducted a survey among all Austrian women surgeons of subspecialties with a high operative volume. Our aim was to assess current professional and social characteristics of women surgeons in Austria, to study the perception of working conditions, and to identify the factors influencing professional satisfaction.

## METHODS

### STUDY DESIGN AND POPULATION

The survey includes all female surgeons who either started or finished their training in Austria or who are retired. All surgical subspecialties known to have a high operative volume are included. In accordance with the definition of *surgery* by the professional boards of all German-speaking countries,

the subspecialties of general (visceral), trauma, pediatric, plastic/reconstructive, cardiac, thoracic, and vascular surgery are included. In Austria, a surgeon is certified by the Austrian Medical Association after a 6-year training period; from 1979, the candidates could take a voluntary examination, which became compulsory in 2002.

Names of certified surgeons currently working were obtained from the *Handbook of Medical Professions in Austria 2000/2001*,<sup>18</sup> the data of which are provided by the Austrian Medical Association. In addition, all 255 surgical departments in a total of 133 hospitals were contacted by phone for information on surgeons in training (residents), retired surgeons, or surgeons living abroad. Various editions of the *Handbook of Medical Professions in Austria* (covering the years 1997-2001) and member lists of the national surgical societies were used to include persons not listed in the handbook. Personal communication to personnel offices and surgeons enabled us to draw up a comprehensive list of surgeons. Thus, another 42 surgeons were added to the list of 309 officially registered, certified women or residents, resulting in a total of 351 women surgeons.

## QUESTIONNAIRE

Self-administered, 164-item questionnaires and self-addressed stamped envelopes—completely anonymous without any coding—were mailed to 351 female surgeons by the Institute for Empirical Social Research, Vienna, Austria, in December 2000 and again in May 2001. The questions covered were working conditions, sex-related issues, career opportunities, operative volume, family life, and sociodemographic variables. Overall work satisfaction was measured on a 5-point Likert scale ranging from 1 (very satisfied) to 5 (very dissatisfied).<sup>19</sup> Four questions on special concerns were open-ended.

## STATISTICAL ANALYSIS

Frequency distributions and descriptive statistics were used to describe the outcome variable “professional satisfaction” and the independent variables.

Differences in demographic data between respondents and nonrespondents and between respondents included and respondents not included in the regression models were tested by  $\chi^2$  test or if necessary by an exact  $\chi^2$  test. For “number of children” and “age in decades,” a trend version of the test was performed.

The potential influence of the independent variables on professional satisfaction was assessed with proportional odds regression models.<sup>20</sup> Odds ratios, 95% confidence intervals, and *P* values were reported. Independent variables in the models included the continuous variable “age” and the following categorical variables: surgical subspecialty, training status, hospital, private partner, number of children, federal state of Austria, status of activity, organization of department, and operative volume. Univariate and multiple regression analyses were performed.

Two different models of putative prognostic factors were computed. The first one (model A) only included the 8 objectively measurable factors such as age, surgical subspecialty, training status (in training or certified), hospital affiliation, private partner, number of children, working in the capital of Austria, and status of activity (currently active or on maternity leave). The second model (model B) included these 8 objectively measurable factors and 2 additional subjectively assessed variables, namely the quality of departmental organization and the operative volume.

Data were analyzed using SAS software.<sup>21</sup> All given *P* values of the tests and models mentioned earlier are 2-tailed. The significance level was 0.05.

**Table 1. Demographic Characteristics of the 206 Respondents**

Characteristic	No. (%) of Respondents*
Surgical subspecialty	
General	109 (53)
Trauma	46 (22)
Plastic	18 (9)
Pediatric	16 (8)
Cardiothoracic/vascular	13 (6)
Workplace	
Community hospital	134 (65)
University hospital	34 (17)
Private/church-affiliated hospital	26 (13)
Other institutions	4 (2)
Training status	
Certified	117 (57)
In training	85 (41)
Working status	
Active	175 (85)
Maternity leave	15 (7)
Retired/left surgery	11 (5)
Clinical and/or research work	
100% Clinical, no research	69 (33)
≥80% Clinical, <20% research	101 (49)
<80% Clinical, ≥20% research	33 (16)
Tenure track	
Professor (full, associate, assistant)	6 (3)
Leadership function†	10 (5)
Working in capital of Austria (Vienna)	
Yes	60 (29)
No	129 (63)
Abroad	2 (1)
Age, y	
20-30	20 (10)
31-40	117 (57)
41-50	43 (21)
51-60	14 (7)
>60	7 (3)
Private status	
Single	65 (32)
Partner	136 (66)
Profession of partner	
Physician	65 (48)
Nonmedical profession	71 (52)
Motherhood	97 (47)
No. of children (for those with children)	
1	54 (56)
2	29 (30)
≥3	14 (14)

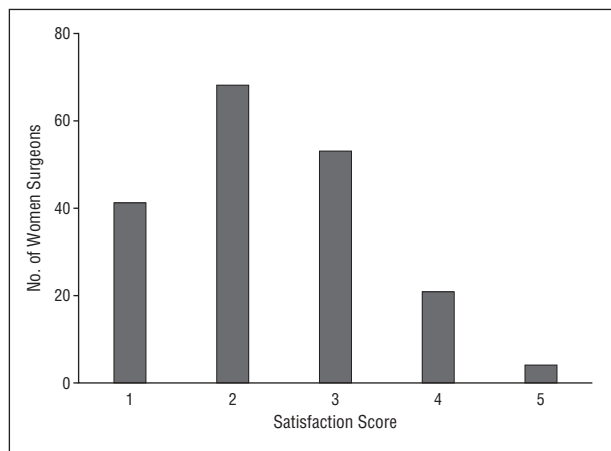
\*Because some answers were missing in the survey and values were rounded, the values do not total 100%.

†Including heads of surgical departments and leaders of surgical subunits.

## RESULTS

### DEMOGRAPHIC AND PROFESSIONAL CHARACTERISTICS

Of 351 questionnaires, 206 (58.7%) were returned. Professional and sociodemographics are shown in **Table 1**. The mean ± SD age was 39.4 ± 8.7 years (range, 24-78 years), and 115 respondents (56%) were between 35 and 45 years of age. One hundred thirty-six respondents (66%) had a private partner, of whom



**Figure 1.** Satisfaction scores of 206 female surgeons responding to the survey (1=very satisfied; 5=very dissatisfied).

65 (48%) were physicians too. Ninety-seven (47%) had at least 1 child.

The majority, 109 (53%), were general surgeons, followed by trauma (46 [22%]), plastic/reconstructive (18 [9%]), and pediatric surgeons (16 [8%]). Owing to small numbers, the fields of cardiac, thoracic, and vascular surgery were combined (13 [6%]). One hundred thirty-four (65%) were working at community hospitals. Overall, 117 (57%) were certified. Most respondents (175 [85%]) were active. One hundred one respondents (49%) spent most of their time doing clinical work; doing research work made up less than 20% of their time. About one third were doing clinical work only. Six women (3%) were on tenure track, including 1 with full professorship (plastic/reconstructive surgery); 10 (5%) had leadership functions. Regarding the location, 60 (29%) were working in the capital city, 129 (63%) were working in the other 8 federal states, 2 (1%) were working abroad, and 14 (7%) did not mention their location.

Response rates did not differ in the different parts of Austria or in subspecialties ( $P=.66$ ). Response rates from those working in private/church-affiliated, community, or university hospitals were 87%, 58%, and 45%, respectively ( $P<.001$ ). Eighty percent of surgeons in training and 42% of certified surgeons responded ( $P<.001$ ); 15 (58%) of 26 women on maternity leave, 4 (36%) of 11 retired surgeons, and 7 (16%) of 44 women who had left surgery took part in the survey. The response rate in the active group was 65%.

## RESULTS OF KEY QUESTIONS

### Professional Satisfaction

Answers to the question “How satisfied are you with your professional situation?” are shown in **Figure 1**. One hundred seventeen respondents (57%) were (very) satisfied (score, 1 or 2), 58 (28%) moderately satisfied (score, 3), and 27 (13%) were (very) dissatisfied (score, 4 or 5). Three of the 206 respondents did not answer this question. The mean score was 2.3. Professional satisfaction was the dependent variable in the proportional odds regression models.

## Departmental Organization

The quality of the organization was assessed with the question “How well organized is your department?” No further explanations were given. Fifty-two respondents (25%) described the organization as being very good; 111 (54%), as average; and 37 (18%), as bad. Five respondents (2%) gave no answer.

## Operative Volume

Concerning the question “How do you assess your overall operative volume?”, 43 respondents (21%) considered the quality and quantity of operative volume as excellent; 99 (48%), as good/average; 54 (26%), as bad/insufficient; and 8 (4%) had only operated very little or not at all; 2 (1%) did not answer.

## Issues of Concern

Forty-four respondents (21%) wrote frank comments to the open-ended questions regarding areas of dissatisfaction. The most frequently mentioned issues were poor management and leadership, poor surgical training, low operative volume, and being bullied by colleagues. There was much concern regarding insufficient opening hours of day-care centers for children and the lack of opportunities to reenter surgery after maternity leave. One person addressed the issue of salary.

## UNIVARIATE AND MULTIPLE REGRESSION ANALYSES

The results of statistical analyses are shown in **Table 2**. By univariate analyses of 10 putative prognostic factors, age, status of activity, the quality of departmental organization, and operative volume significantly influenced women’s professional satisfaction.

### Regression Analysis—Model A

Of the 8 objectively measurable factors, the status of activity, the surgical subspecialty, the training status, and age were statistically significant ( $P<.01$ ). Actively working in surgery increased the odds for satisfaction about 7.5 times; being certified, up to 2.8 times, and being specialized in a surgical subspecialty other than general surgery, up to 3.1 times. Working in the capital lowered the odds by a factor of 0.4 ( $P=.02$ ). Younger as well as older women were more satisfied than middle-aged women (**Figure 2**). If the life partner was a physician too, the odds for professional satisfaction were 2.3 times higher. Women without children tended to be more satisfied than those with children, and women working in private or church-affiliated hospitals had a 1.9 times higher odds ratio for satisfaction than those in community hospitals ( $P=.33$ ).

### Regression Analysis—Model B

Including the subjectively assessed variables, departmental organization and operative volume had the highest impact ( $P<.001$ ) with an odds ratio of 77.1 for a well-organized department and an odds ratio of 14.3 for excellent opera-

**Table 2. Results of Univariate and Multiple Proportional Regression Models of Professional Satisfaction in Austrian Women Surgeons\***

Covariates	Univariate Analysis		Multivariate Analysis—Model A†		Multivariate Analysis—Model B‡	
	Odds Ratio (95% CI)	P Value	Odds Ratio (95% CI)	P Value	Odds Ratio (95% CI)	P Value
Age, y		.01		.009		.25
Linear	0.7 (0.5-0.9)§		0.6 (0.4-0.8)		0.7 (0.5-1.1)	
Quadratic	1.005 (1.001-1.008)		1.006 (1.002-1.010)		1.0 (1.0-1.0)	
Surgical subspecialty		.14		.003		.053
General	1		1		1	
Trauma	1.6 (0.8-3.1)		3.0 (1.5-6.2)		2.4 (1.1-5.3)	
Pediatric/plastic	2.1 (0.1-4.3)		3.1 (1.4-6.8)		1.2 (0.5-3.1)	
Cardiothoracic/vascular	2.2 (0.7-7.0)		2.8 (0.9-9.5)		4.0 (1.0-15.7)	
Training status		.12		.008		.90
In training	1		1		1	
Certified	1.5 (0.9-2.6)		2.8 (1.3-5.9)		0.95 (0.4-2.2)	
Hospital		.75		.33		.58
Community	1		1		1	
Private/church-affiliated	1.4 (0.6-3.0)		1.9 (0.8-4.4)		1.4 (0.5-3.8)	
University	1.1 (0.5-2.1)		0.9 (0.4-1.9)		1.5 (0.6-3.7)	
Private partner		.19		.04		.69
Not a physician	0.8 (0.4-1.4)		1.1 (0.5-2.2)		1.2 (0.6-2.7)	
Physician	1.4 (0.7-2.6)		2.3 (1.1-4.9)		1.5 (0.6-3.3)	
Single	1		1		1	
No. of children		.34		.10		.16
0	1		1		1	
1	0.8 (0.4-1.4)		0.8 (0.4-1.5)		0.5 (0.2-1.0)	
≥2	0.6 (0.3-1.2)		0.4 (0.2-0.9)		0.6 (0.2-1.4)	
Working in capital of Austria (Vienna)		.25		.02		.16
No	1		1		1	
Yes	0.7 (0.4-1.2)		0.4 (0.2-0.8)		0.6 (0.3-1.1)	
No answer	0.5 (0.2-1.5)		0.5 (0.2-1.6)		0.4 (0.1-1.5)	
Status of activity		<.001		<.001		<.001
Maternity leave	1		1		1	
Active	7.2 (2.6-19.6)		7.5 (2.5-22.5)		8.9 (2.6-31.2)	
Organization of department		<.001				<.001
Very good	79.9 (28.6-223.2)				77.1 (22.7-261.7)	
Average	8.7 (3.8-19.8)				11.1 (4.3-28.7)	
Bad	1				1	
Operative volume		<.001				<.001
Excellent	19.6 (4.5-85.0)				14.3 (2.6-80.4)	
Good	2.9 (0.8-11.0)				2.8 (0.6-13.4)	
Low	0.5 (0.1-2.1)				0.5 (0.1-2.5)	
Very low	1				1	

Abbreviation: CI, confidence interval.

\*For categorical variables an odds ratio greater than 1 indicates a greater chance for satisfaction in the specific category compared with the base category and vice versa. Note that the base category has an odds ratio of 1 by definition.

†Model A includes objectively measurable covariates only. Univariate and regression analyses (model A) included 187 persons. There was no significant difference in sociodemographic and professional characteristics between the total of 19 respondents not included and the 187 respondents included in the model.

‡Model B includes both objectively measurable and subjectively assessed covariates. This model includes only 183 persons because of missing values in the additional variables.

§Concerning age, odds ratio refers to a change of 1 year; the quadratic age effect on the odds ratio is presented in Figure 2.

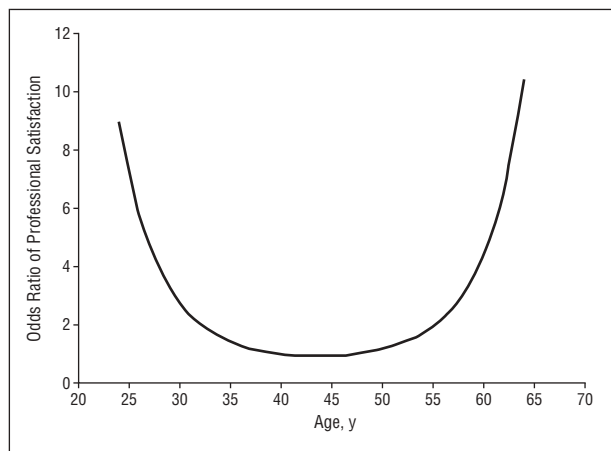
tive volume. The assessment of organization is shown in **Figure 3**. Women in active service had an 8.9 times higher odds ratio for professional satisfaction compared with those on maternity leave ( $P < .001$ ). The trend to greater satisfaction in surgical subspecialties decreased in comparison with model A ( $P = .053$ ). The other variables, such as age, training status, type of hospital, working location, and private factors, lost their importance in this model.

## COMMENT

This is the first study of women surgeons' satisfaction—and on women surgeons in general—ever carried out in Central Europe, comprising 206 respondents in the core surgical specialties with a high operative volume, namely general, trauma, plastic/reconstructive, cardiothoracic, and vascular surgery. It is 1 of the largest series pub-

lished on women surgeons worldwide. The Canadian study of 459 women surgeons included 133 surgeons in the core specialties<sup>5</sup> but also a large number of women from other areas of surgery, such as obstetrics and gynecology, ophthalmology, and ears, nose, and throat, where surgeons spend far less time in the operating theater than surgeons in the other fields. In other studies, the number of women surgeons in the core specialties, according to our definition, ranges between 9 and 133 respondents, compared with 206 respondents in our series.<sup>3,8-10,13,14,16</sup> The percentages of women surgeons are often too small to permit subanalyses.<sup>3,5,7,9,10,13</sup>

The main finding of this study is that professional satisfaction is significantly influenced by the way a department is organized, the overall operative volume, and by the status of activity, whereas private issues recede into the background.



**Figure 2.** Odds ratio of professional satisfaction in women surgeons at different ages. Age has a quadratic influence on satisfaction (ie, younger and older surgeons are more satisfied than middle-aged surgeons, about 40 years of age).

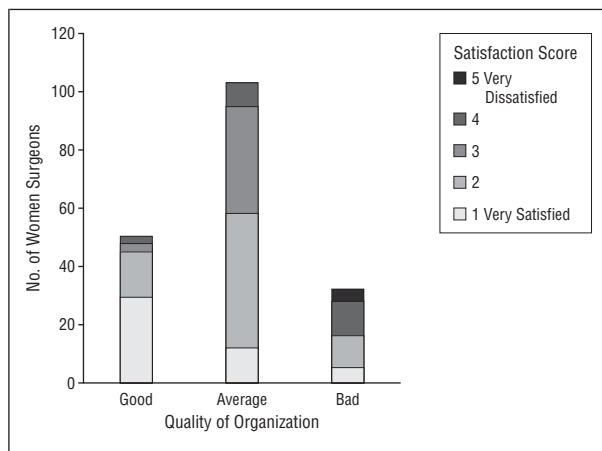
The response rate of 58.7%, achieved after mailing the questionnaire only twice and without making any follow-up phone calls, must be regarded as very good. Our assumption that anonymity was a critical factor was confirmed by the fact that 7% of the respondents said that they would rather not answer the question pertaining to the state they were currently living in.

In our survey, designed to present the self-perception of women surgeons, 57% of women surgeons described their professional situation as very satisfactory or satisfactory, 28% as moderately satisfactory, and 13% as unsatisfactory (1% did not answer); this is similar to the findings of other studies.<sup>3,5,10,13</sup>

We decided to focus on 10 putative prognostic factors. Multiple regression analysis revealed that departmental organization is an important predictive factor for professional satisfaction. Organizational and leadership characteristics are key success factors as pointed out by Arnetz.<sup>22</sup> Good organization involves clearly defined tasks, good team work, a structured working schedule, and a good communication style that helps avoid unnecessary stress.

The operative volume and performing a variety of operations play an important role in women's professional satisfaction and are an integral part of good departmental management.<sup>23</sup> This is in accordance with the results of other studies that describe enhanced professional satisfaction among internal residents and physicians who encountered a positive learning experience.<sup>24,25</sup> In our survey, the odds for professional satisfaction for women with an excellent operative volume were about 14 times higher than those with a low volume. In most of the studies, however, there is no analysis of the catalog of operations.<sup>5,6,8,14,17</sup> Male and female cardiothoracic surgeons are reported to spend the same amount of time in the operating theater or to have the same operative volume.<sup>8,14</sup> A quantitative and qualitative analysis of procedures performed by male and female surgeons, separated into subspecialties, should be performed in future studies.

Active service plays a significant role too, as women who were on maternity leave at the time of the survey were professionally more dissatisfied than those in ac-



**Figure 3.** The organization of a surgical department and its influence on active women surgeons' professional satisfaction.

tive service. This appears to be an expression of a special affinity to the profession; particularly in areas requiring manual skills; a leave of absence from the job is accompanied by disadvantages. In Austria, many women surgeons are on maternity leave for 8 weeks before and 8 weeks after delivery. American studies show that maternity leave is considerably shorter there. Although the period of maternity leave is fixed by law in Austria, there are no regulations about reintegration after a long absence, a situation possibly similar to that in other countries. It is a rule that every pilot has to take a theoretical and practical test after a 6-month absence from duty; there are, however, no such guidelines for women surgeons, although their profession is one that carries an equally high degree of responsibility.

Variables referring to the private life, such as partnership, motherhood, and the number of children, were not so important.<sup>13</sup> The workplace, and not the family, seems to be the main source of stress.<sup>4</sup> In our study, women with a partner in the medical profession tended to be more satisfied, which might be interpreted to be an expression of better understanding from the partner or as a kind of protective factor.

Children did not influence women's professional satisfaction, although there was a minimal trend to higher satisfaction in women without children, who then had more time to achieve professional goals.<sup>9</sup> It may be speculated that women who are not satisfied in their job decide to have children.<sup>26</sup> On the one hand, a study of American women physicians—3% of whom were surgeons—reported that career satisfaction was not influenced by children.<sup>3</sup> On the other hand, another study—also including 3% of surgeons—reported an increase in career satisfaction with the number of children in postmenopausal women.<sup>13</sup>

The subspecialty also plays a certain role, though not as significant a role as the culture of organization. Women in trauma, pediatric/plastic, and cardiothoracic/vascular surgery were up to 3 times more likely to be satisfied than their colleagues in general surgery. This fact should not be overestimated, because the significance is lost in the regression model including all factors. Considering only the objectively measurable variables, women

of about 40 years of age were less satisfied than younger or older women. In the literature, the effect of age on career satisfaction is reported as ranging from lacking correlation<sup>5</sup> to higher satisfaction<sup>13</sup> or lower satisfaction with higher age.<sup>22,25</sup>

In Austria, there are a few leading women in pediatric and plastic surgery, whereas there is only 1 leading woman in general surgery; in the rest of the surgical fields, there is no female leader. At the time of this survey, there was 1 leading woman surgeon in the field of cardiothoracic surgery in Germany.<sup>17</sup> The reasons given for the small number of women in top positions in surgery, even internationally, are assumed to be family duties and responsibilities, sexism at the workplace, and sex stereotyping.<sup>7,27-29</sup> Other leading women consider time constraints combined with the inflexibility of academic routine and promotion processes an obstacle to advancement.<sup>29</sup>

The results of this study must be assessed with care. First, it is the perception of women at a defined point in their careers. Only longitudinal studies find the changing pattern of satisfaction in women's lives.<sup>26</sup> In our population of 356 women surgeons, 40 (11.2%) had left surgery; only 7 of them responded to the survey and were not included in regression analysis. Their scores of satisfaction, however, were low and could be compared with those of women on maternity leave. In a longitudinal study of surgical residents, the attrition rate was 12%; in general surgery, it went up to 26%.<sup>30</sup> In most studies, only "survivors" are included; an analysis of the reasons why women left surgery is absolutely necessary.<sup>31</sup>

Second, a quantitative approach may not meet the needs of the addressees. The answers to open-ended questions suggest that women have issues of concern that were not addressed in the questionnaire. In interviews with department chairs, a qualitative approach was used to document barriers to advancement of women.<sup>29</sup>

Third, we included surgeons of all ages; this fact might result in a recall bias of older surgeons who were more satisfied than middle-aged surgeons. Thus, in their study of women in academic medicine, Levinson et al<sup>31</sup> excluded women aged 51 years or older, limiting the sample to an age group for which child-rearing experience was relatively recent, as did Sinal et al.<sup>3</sup> The percentage of respondents older than 50 years, however, was only 10% in our study.

Fourth, the overall response rate was 58.7% in our study, and nonrespondents might skew the data.<sup>3,10,16</sup> Demographics, however, did not differ significantly between respondents and nonrespondents (and between respondents not included and those included in regression analyses). Because of the anonymity of the nonrespondents, we did no follow-up inquiries.

Only 1 person addressed the issue of income in an open-ended question. This corresponds to our and other people's experience that salary is not a prevailing topic for women<sup>12</sup>; however, several Anglo-American studies compare salary differences between male and female physicians.<sup>8,9,32</sup> Respondents pointed out shortcomings in organizational and human aspects, which need to be addressed by people who have the power to institute changes.<sup>33</sup> Surgery is specifically an area where cooperation between men and women, who bring to bear their

sex-specific perspectives with regard to surgical techniques and perioperative care, can achieve optimal results for the patients.<sup>34</sup> The business world has recognized that it is time to capitalize on women's intellectual capital,<sup>35</sup> which should be recognized in surgery as well.

There are many suggestions to improve the situation of female surgeons,<sup>11,36,37</sup> but good intentions alone are not enough.<sup>33</sup> It is praiseworthy that women often take the initiative and build careers for themselves. A lot more, however, is needed, such as support from outside (ie, mentors). Role models are often mentioned, as they were known in the 1980s and early 1990s, a time when they were probably needed,<sup>6</sup> but now they are secondary in practice.<sup>7,38</sup> They often mask token women who might not be recognized at first sight. Institutionalized programs to improve the situation of female surgeons were successfully implemented in the United States.<sup>11,23,35</sup> It is equally important that there is a change in the attitude of society as a whole.<sup>14,35,36</sup> A healthy environment has to be created in which female surgeons can best develop their potentials.

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#### Correction

**Error in Reference.** In the article titled "The Best of the Best—2003," published in the July issue of the ARCHIVES (2004;139:709-711), the reference for Velmahos et al should have been *Arch Surg*. 2003;138:475-481. The ARCHIVES regrets the error.