

Factors Affecting the Vocational Calling of Laboratory Animal Care and Research Employees

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We surveyed laboratory animal care and research workers to determine the factors affecting their vocational calling. The survey comprised 56 questions in 4 groups: passion, job stability or happiness, work volition, and demographics. We hypothesized that personnel who worked in the field a longer time, were older, had higher education levels, were involved with AALAS, and in higher positions in their organization were more likely to indicate a calling to the laboratory animal care field. In addition, we hypothesized that job satisfaction and classifying one's job as a calling were positively related to organizational support and work volition. Overall, 44% of respondents categorized their work as at least partially a calling. Those working at a higher level in the position of laboratory animal technician and in the organization were more likely to view their work as a calling. Increasing education level was related to work being a calling. Overall, vocational calling was significantly associated with higher pay, but technicians were the only subgroup where calling and higher pay were significantly related. Vocational calling and job satisfaction were associated with organizational support. For our sample of workers in the animal care field, other factors analyzed were not related to work being considered a calling. Leaders in the field of animal care may find our survey results valuable as they strive to adapt their organization's structure to the perceptions of their workforce with regard to their sense of calling.

A 1985 study presented 3 types of relationships that a person can have with his or her work: a job, a career, or a calling.¹ Each of the 3 work categories can be summarized in simple terms. A job is simply a source of material benefits to be enjoyed elsewhere. A career is a way to achieve status, power, and self-esteem. A calling is intrinsically rewarding and a central part of one's very existence.^{1,28} How employees view their work markedly affects many aspects of their performance and health. For example, persons who have a calling for their work have higher job satisfaction, are more satisfied with life in general, and take fewer sick days.^{28,36} In addition, a calling is associated with a sense of zest that further improves a person's psychologic wellbeing, leading to improved job performance, more innovation, reduced turnover, and improved physical health.^{9,27,33}

A survey of 9803 employed adults revealed that about 30% said that they had a calling to do their work.²⁸ The prevalence of a calling in the workforce was observed more commonly in older workers in higher status job, but was present in workers of all ages and all job types.²⁸ We conducted a survey to capture the prevalence of a calling for the laboratory animal workforce. Factors such as age, length of time in the field, AALAS membership, educational level, and employment position were examined for their relationship to calling. We hypothesized that personnel who worked in the field a longer time, were older, had higher education levels, were involved with AALAS, and held higher positions in their organization were more likely to indicate a calling to the laboratory animal care field.

In addition, we asked about employees' perceptions of their organization and whether they felt appreciated by their employers. Members of the animal care team are often assigned repetitious tasks with high demand, high levels of expecta-

tions for perfection, and low rewards.²⁰ Also, facilities often operate with a near-zero tolerance for mistakes with mandates for perfection by both regulations and management. Such an environment places stress on animal care personnel and imposes psychologic challenges, as workers may face dismissive, condescending or derogatory attitudes from investigators, laboratory personnel, and students.²⁰ We hypothesized that job satisfaction and classification of work as a calling are positively related to organizational support and work volition.

Materials and Methods

A survey was hosted on the University of Michigan Qualtrix website for 3 mo in 2014. The survey link was distributed to potential participants by several different mechanisms. The survey was posted on the listservs of the Veterans Affairs Veterinary Medical Unit and Compmed, sent to members of the American Society for Laboratory Animal Practitioners and the American College of Laboratory Animal Medicine, as well as being forwarded to all AALAS branch leaders and AALAS district trustees for distribution to their constituents.

The questions included demographic information based on the AALAS 2014 Laboratory Animal Facility Compensation Survey and previously vetted questions from manuscripts on work passion and volition.¹¹⁻¹⁴ In total there were 56 questions, with some questions populated depending on the answer to a previous question. The questions were grouped into 4 sections: passion, job stability or happiness, work volition, and demographics. Many of the questions (Figure 1) were formatted with Likert-type responses (that is, 6-point scale ranging from strongly agree to strongly disagree with no neutral choice but with a 'not applicable' option). Survey responses were anonymous. The Wright State University Institutional Review Board approved the study.

Statistical analysis. Likert-type responses were transformed to agree–disagree replies for analysis of job satisfaction and

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I am satisfied with my current job.
The organization fails to appreciate any extra effort from me.
The organization would ignore any complaint from me.
The organization really cares about my wellbeing.
Even if I did the best job possible, the organization would fail to notice.
The organization cares about my general satisfaction at work.
The organization takes pride in my accomplishments at work.

Figure 1. Survey items with Likert-type response scales.

occupational volition. Likert-type responses were treated as categorical. To analyze job classification, the workforce was categorized as either being a veterinarian, research staff, animal technician, office personnel, or other. Age was grouped by generation: 'silent generation' (born prior to 1946), 'baby boomers' (born 1946 to 1964), 'generation X' (born 1965 to 1981), and 'millennials' (born after 1981). Means and standard deviations are reported for continuous variables, and counts and percentages for categorical variables. The Mann-Whitney test was used for comparisons involving 2 groups and a second variable measured on a continuous scale. The χ^2 test of homogeneity or the Fisher exact test was used to compare 2 categorical variables. Spearman correlation was used to examine the relationship between calling and salary. Inferences were made at the 0.05 level of significance, with no corrections for multiple comparisons. Analyses were conducted using SPSS Statistics version 23.0 (IBM, Armonk, NY).

Results

Survey response included 793 complete surveys and 100 partially completed surveys, of which 47 could be used in some analyses (maximal total respondents, 840). Data were excluded only when the specific question being analyzed was not answered. Because not all subjects answered all questions, the number of respondents differs in the tables. The job title of the respondents was well diversified, with representation in all job categories (Table 1). The most surveys were received from veterinarians, animal health-care or veterinary technicians, and laboratory animal technicians. Response from entry-level laboratory animal technicians and cage-wash personnel was not as strong. The 'Other' category was mixed and included veterinary residents, veterinarians and laboratory animal technicians with alternate titles, compliance personnel, research scientists, and a mix of other job titles. Because some career groups were small, we combined job titles into vocational categories (Table 2). All but 21 employees from the 'other' job title category could be moved into the combined job categories or vocations (Table 2).

In response to the item "I consider my current job to be," 44% of respondents answered that at least part of their job is a calling (Table 3). We used categories from this question to compare how personnel viewed their work in comparison to other demographic and Likert-type questions. That is, do they consider their work to be more like a job, a career, or a calling? The job categories differed with regard to calling ($P = 0.009$; Table 2). Greater proportions of veterinarians (49.5%) and research scientists (50.0%) identified their work as at least partially to be a calling, compared with 40.5% to 42.9% of animal technicians, office personnel, and other individuals. With regard to the level of laboratory animal technician (entry-level or cage-wash technician, midlevel technician, senior-level technician, and supervisor), calling increased in frequency as position in the organization was higher (10%, 16%, 36%, and 51%, respectively; $P = 0.024$; Table 4).

Salary was nominally associated with calling, with a Spearman correlation coefficient (r) of 0.211 ($P < 0.001$). However,

Table 1. Number and percentage of respondents in each job title

	No. (%)
Director	107 (13)
Assistant or associate director	52 (6)
Clinical veterinarian	133 (16)
Facility manager	64 (8)
Research technician	34 (4)
Animal health care or veterinary technician	146 (17)
Shipping coordinator or manager	4 (0)
Administrative or business manager	7 (1)
Purchasing coordinator	2 (0)
Administrative support assistant	7 (1)
Facility compliance manager	3 (0)
IACUC coordinator	12 (1)
Training coordinator	26 (3)
Supervisor	67 (8)
Senior-level laboratory animal technician	43 (5)
Midlevel laboratory animal technician	30 (4)
Entry-level laboratory animal technician	9 (1)
Cage washer	1 (0)
Other	93 (11)
Total	840 (100)

the coefficient of determination (r^2) equaled 0.045, meaning that salary contributed only 4.5% of the variance in calling, leaving 95.5% to be accounted for by other variables. When the different career titles were examined, only the laboratory animal technician group had a significant correlation between salary and calling ($r = 0.287$, $P < 0.001$). The salary (mean \pm 1 SD) for laboratory animal technicians with a calling for their work was \$52,242 \pm \$17,325 ($n = 198$) compared with \$43,231 \pm \$16,555 ($n = 125$) for those without a calling ($P < 0.001$). For the other 4 job categories (veterinarian, office personnel, researcher, other) those with or without a calling for their work did not differ in salary.

We also examined the effects of education level, gender, length of employment in the field, and age on work perception. Education level was related to job, career, or calling ($P = 0.013$), but there was no identifiable pattern among the levels of education (Table 5). Excluding the 'silent generation' (that is, employees born before 1946), a category containing only 14 respondents, age was related to calling ($P = 0.008$). Older workers were more likely to view their work as a calling (Table 6). In contrast, women and men did not differ in the percentages that viewed their work as a job, career, or calling ($P = 0.37$; Table 7) nor did the length of employment in laboratory animal science ($P = 0.20$).

Overall 85% of respondents were satisfied with their current job,³ with no differences in work satisfaction between the 5 job categories (86% for veterinarians, laboratory animal technicians, and research scientists; 81% for other; 77% for office personnel; $P = 0.39$). Despite overall satisfaction with their job, surprisingly high proportions of respondents felt that their institution either (1) would ignore any complaint from them (29%), (2) did not value extra effort from them (45%), (3) would not notice even if they did their best job (35%), (4) did not care about their general satisfaction at work (31%), or (5) did not care about their wellbeing (27%; Figures 2 through 6). Employees satisfied with their job had a more positive opinion about the organization (Table 8). In addition, except for the organization failing to appreciate extra effort (no significant difference), personnel who had a

Table 2. Subjects' perceptions of work as based on vocation according to job category

	Money only	Job of interest	Career	Partial calling	Primarily calling
Veterinarian	12 (3.8)	25 (7.8)	124 (38.9)	108 (33.9)	50 (15.7)
Office personnel	4 (5.4)	10 (13.5)	30 (40.5)	26 (35.1)	4 (5.4)
Laboratory animal technician	23 (6.2)	61 (16.5)	136 (36.8)	112 (30.3)	38 (10.3)
Research scientist or research technician	2 (3.6)	10 (17.9)	16 (28.6)	20 (35.7)	8 (14.3)
Other	4 (19.0)	4 (19.0)	4 (19.0)	6 (28.6)	3 (14.3)

Data are given as no. (%) of respondents; percentages refer to the row. Vocational calling differed ($P = 0.009$) between job categories.

Table 3. Survey results for the item "I consider my current job to be"

	No. (%)
A way to make money only; I would be just as happy doing other work.	45 (5)
A job that I have some interest in doing.	110 (13)
A career in which I look to remain in the field and develop my skills to be better.	312 (37)
Some parts are a career and others are a calling.	272 (32)
Primarily a calling; I was meant to do this type of job.	103 (12)
Total	842 (100)

calling for their work had a more favorable opinion about the organization (Table 9).

Finally, the relationship between job satisfaction ("I am satisfied with my current job" [agree or disagree]) and salary was examined. For the 5 job categories, only among laboratory animal technicians did those who were satisfied have a higher mean salary than those who were not satisfied with their current job ($\$47,420 \pm \$17,629$ compared with $\$42,697 \pm \$15,551$, $P = 0.039$). Job satisfaction was not related to education level ($P = 0.33$), AALAS membership ($P = 0.29$), years in the field ($P = 0.85$), or generation (silent generation, baby boomers, generation X, millennials; $P = 0.10$) or attendance at branch, district, or national AALAS meetings ($P = 0.82, 0.34$, and 0.43 , respectively).

Discussion

In our survey, 44% of respondents categorized their work at least in part as being a calling, a finding somewhat higher than the 30% rate from a survey of workers from a wider range of occupations.²⁸ Veterinarians, research scientists, and senior-level technicians were more likely to view their work as a calling. Similar to a previous study²⁸ that found that professional and managerial personnel were more likely to have a calling to their work than were blue-collar workers and clerical and administrative staff, we found that persons in higher-level positions related to work as a calling.

For most of the United States population, salary is not identified as a strong occupational motivator. For example, a survey of Americans showed that important, meaningful work is the job feature that is most valued—more so than promotions, income, job security, and work hours.⁷ Furthermore, increased salary makes a diminishing contribution to wellbeing,¹⁰ low income is associated with both low life evaluation and low emotional wellbeing, and emotional wellbeing rises with income but plateaus at approximately \$75,000.²² In our study, laboratory animal technicians were the only subgroup for which calling was related to higher pay. Given that technical staff members are the lowest paid workers among laboratory animal care and research employees, salary may be a stronger incentive for this subgroup than among, for example, veterinarians or research

scientists. In a survey of cage washers, animal caretakers, animal technicians, and supervisors to determine the motivational importance of job characteristics, good wages ranked the highest among cage washers, animal caretakers, and animal technicians, whereas supervisors ranked promotion potential and growth the highest.⁸ When supervisors were asked what they thought their employees wanted most, they concurred with care staff on the priority of wages.⁸ Another previous study showed that the greatest motivator for animal care technicians was money,³⁰ but technicians, supervisors, and senior management all responded that recognition was very important as well.²⁷ Using Maslow's hierarchy of needs theory as a guide, although meeting laboratory animal technicians' financial needs may be a primary goal, managers should also create a recognition program to increase happiness and sense of appreciation.^{10,21,30}

Any strategy that helps workers see where their activities fit into the larger picture will also increase their enthusiasm for what they do.²⁶ In addition, task significance contributes to work motivation by enabling employees to experience their work as meaningful.^{15,17} The relationship between having a higher level of education and considering work as a calling may be partially explained by those personnel (senior management, veterinarians, research scientists) better understanding the relevance and importance of the laboratories projects. Management should have a plan for improving awareness of the importance of the laboratories work among those in lower-level positions.

Organizational support was also related to calling and job satisfaction. Employees who felt called to their work and who were more satisfied with their job viewed their organization more positively. Several features make a job more satisfying, including the presence of a safe and secure environment and optimal levels of challenge, variety, and responsibility.³¹ A positive work environment is affected by what a person brings to his or her work. Generally happy people are more likely to be satisfied at work,^{6,32} especially when they have close friends in the workplace.²⁹ Satisfaction is further enhanced when the work unit has a large proportion of personnel that views work as a calling, which, in turn, leads to higher morale and better communication.³⁴

Our survey results revealed an unexpectedly high level of general dissatisfaction with the organization. Personnel working in the laboratory animal industry at all levels carry a high degree of responsibility. Situations in which employees feel that their organizations do not listen to them or respond to their needs can lead to adverse outcomes. Managers and supervisors should assess how to improve employee perceptions of the organization.

In our earlier survey, we reported that 81% of the respondents were working in a job that closely aligned with their calling, 75% were working in the job to which they were called, and 85% were satisfied with their current job.³ The response differences between our earlier and current surveys may, in part, be due to our change to the Likert-type scale in the present questionnaire, with the absence of a neutral statement. Without the option to

Table 4. Vocational calling according to subject's laboratory animal technician level

	Money only	Job of interest	Career	Partial calling	Primarily calling
Entry level or cage washer	2 (20.0)	2 (20.0)	5 (50.0)	1 (10.0)	0 (0)
Midlevel	6 (19.4)	9 (29.0)	11 (35.5)	4 (12.9)	1 (3.2)
Senior level	3 (6.7)	10 (22.2)	16 (35.6)	14 (31.1)	2 (4.4)
Supervisor	3 (4.3)	7 (10.0)	24 (34.3)	30 (42.9)	6 (8.6)

Data are given as no. (%) of respondents; percentages refer to the row. Vocational calling differed significantly ($P = 0.024$) between the different technician levels.

Table 5. Subjects' perceptions of work according to education level

	Money only	Job of interest	Career	Partial calling	Primarily calling
High school	5 (8.5)	12 (20.3)	19 (32.2)	19 (32.2)	4(6.8)
Technical or vocation or trade school or college	7 (6.1)	17 (14.9)	43 (37.7)	33 (28.9)	14 (12.3)
Undergraduate degree	13 (5.5)	43 (18.2)	89 (37.7)	73 (30.9)	18 (7.6)
Graduate or professional degree	20 (4.7)	37 (8.7)	156 (36.9)	145 (34.3)	65 (15.4)

Data are given as no. (%) of respondents; percentages refer to the row. Vocational calling differed significantly ($P = 0.013$) between the different education levels.

Table 6. Subjects' perceptions of work according to generation

Birth year	Money only	Job of interest	Career	Partial calling	Primarily calling
Pre1946	0 (0)	2 (14.3)	7 (50.0)	4 (28.6)	1 (7.1)
1946–1964	20 (7.7)	32 (12.4)	68 (26.3)	96 (37.1)	43 (16.6)
1965–1981	15 (4.2)	44 (12.4)	148 (41.7)	108 (30.4)	40 (11.3)
Post1981	45 (5.4)	109 (13.1)	307 (36.9)	270 (32.5)	101 (12.1)

Data are given as no. (%) of respondents; percentages refer to the row. Vocational calling differed significantly ($P = 0.008$) between generations.

Table 7. Perception of work according to gender

	Money only	Job of interest	Career	Partial calling	Primarily calling
Men	15 (6.8)	35 (15.8)	73 (32.9)	70 (31.5)	29 (13.1)
Women	30 (4.9)	74 (12.1)	234 (38.4)	200 (32.8)	72 (11.8)

Data are given as no. (%) of respondents; percentages refer to the row. Vocational calling did not differ between men and women ($P = 0.37$).

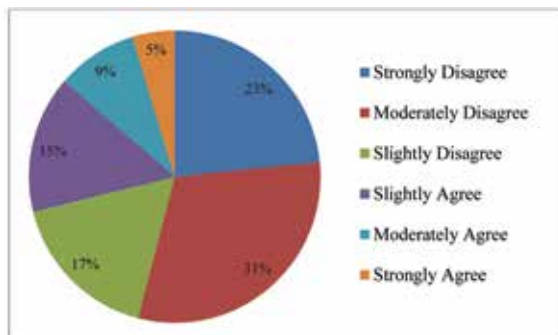


Figure 2. Percentages of respondents' answers to the question "The organization would ignore any complaint from me."

be neutral on a survey item, respondents were 'forced' to state whether they were or were not working in their calling. Our results closely parallel the findings from a study of zookeepers' passion for their job.⁴ Among the 157 zoos in the United States and Canada were assessed to identify the level of zookeeper calling, more than 90% of zookeepers were strongly called to their work and identified their work as having a broader

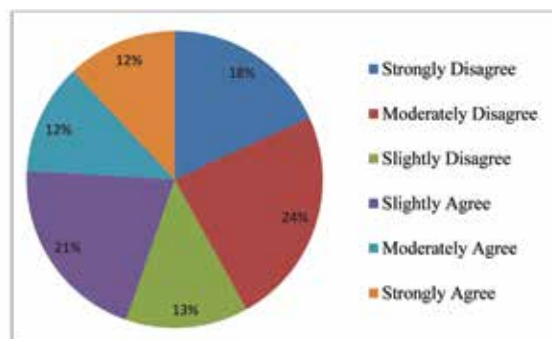


Figure 3. Percentages of respondents' answers to the question "The organization fails to appreciate any extra effort from me."

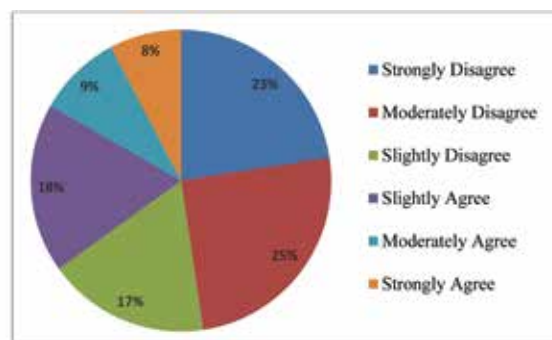


Figure 4. Percentages of respondents' answers to the question "Even if I did the best job possible, the organization would fail to notice."

meaning and significance. In fact, zookeepers were more likely to see their work as a moral duty and to sacrifice pay, personal time, and comfort to do their work. Other authors mention a double-edged sword dilemma in this regard:⁴ when following your calling, you are working in your ideal field but often must give up personal time, pay, and comfort to do so.

The positive benefit of being passionate about your life or work is self-satisfaction. This belief that you are doing something significant or meaningful often can lead to success. Our prior survey found that the laboratory animal care workforce has a strong altruistic calling for its work. The 2 most common responses were a calling to be the guardian or voice for the

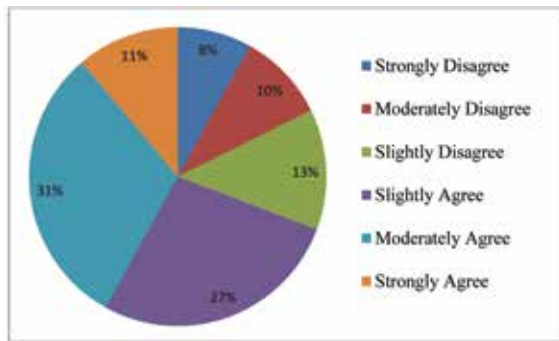


Figure 5. Percentages of respondents answers to the question “The organization cares about my general satisfaction at work.”

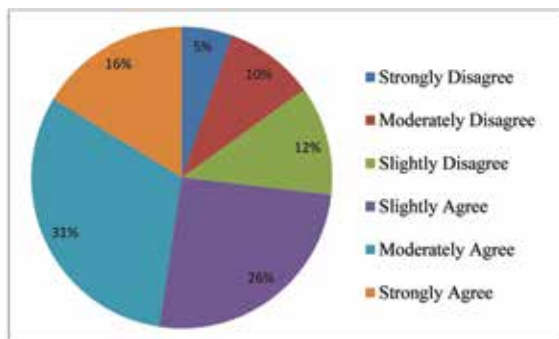


Figure 6. Percentages of respondents' answers to the question “The organization really cares about my wellbeing.”

Table 8. Subjects' perceptions of the organization according to job satisfaction (low or high)

	Low	High	P
The organization fails to appreciate extra effort			
Disagree	35 (27.3)	431 (60.4)	0.001
Agree	93 (72.7)	283 (39.6)	
The organization would ignore my complaint			
Disagree	53 (41.4)	542 (75.9)	<0.001
Agree	75 (58.6)	172 (24.1)	
The organization really cares about my wellbeing			
Disagree	66 (51.6)	160 (22.4)	<0.001
Agree	62 (48.4)	554 (77.6)	
The organization would fail to notice my best job possible			
Disagree	41 (32.0)	507 (71.0)	<0.001
Agree	87 (68.0)	207 (29.0)	
The organization cares about my general satisfaction at work			
Disagree	77 (60.2)	182 (25.5)	<0.001
Agree	51 (39.8)	532 (74.5)	
The organization takes pride in my accomplishment at work			
Disagree	78 (60.9)	156 (21.8)	<0.001
Agree	50 (39.1)	558 (78.2)	

Data are given as no. (%) of respondents.

animals and a calling to improve the world (or more specifically, to improve the wellbeing of both animals and humans).³

Our current study did not identify a difference in job satisfaction according to years in the field or generation. Prior studies in other fields have shown conflicting results in this area. For example, a study comparing GenXers and baby boomers found that the baby boomers were in general more satisfied with

Table 9. Subjects' perceptions of the organization according to calling compared with no calling to their work

	No calling	Calling	P
The organization fails to appreciate extra effort			
Disagree	249 (53.3)	217 (57.9)	0.19
Agree	218 (46.7)	158 (42.1)	
The organization would ignore my complaint			
Disagree	312 (66.8)	283 (75.5)	0.006
Agree	155 (33.2)	92 (24.5)	
The organization really cares about my wellbeing			
Disagree	146 (31.3)	80 (21.3)	0.001
Agree	321 (68.7)	295 (78.7)	
The organization would fail to notice my best job possible			
Disagree	282 (60.4)	266 (70.9)	0.001
Agree	185 (39.6)	109 (29.1)	
The organization cares about my general satisfaction at work			
Disagree	173 (37.0)	86 (22.9)	<0.001
Agree	294 (63.0)	289 (77.1)	
The organization takes pride in my accomplishment at work			
Disagree	159 (34.0)	75 (20.0)	<0.001
Agree	308 (66.0)	300 (80.0)	

Data are given as no. (%) of respondents.

their jobs.² In contrast, another study showed that there was decreased job satisfaction with increasing years of experience.²⁵ We cannot explain the reason for the absence of a difference in our study.

One limitation of our current study was the sample collection process, which was primarily performed by internet survey. Although most people have access to the internet, whether a representative sample of the intended audience responded to the questionnaire is unknown. For example, we had only one respondent who self-identified as a cage-wash employee and 9 who designated themselves as entry-level laboratory animal technicians. Given that increased passion or calling is seen more often in higher-earning positions, our results may be biased toward a more positive view of the job environment. In addition, all responses may contain bias because disgruntled or unmotivated employees might be less likely to take the time to fill out a survey. Future studies might target entry-level positions to better assess this group's view of work. In addition, we may have overestimated the incidence of calling in the laboratory animal workforce because employees who are passionate about their work may be more likely to respond to a survey about their field.

Although our survey was constructed to determine the frequency of calling in the field of laboratory animal work, the results also led us to suggestions on how to improve the work environment for those with and without a calling. When a job provides opportunities for contact with the beneficiaries of one's work, employees become more aware of the outcomes and influence of their efforts on the wellbeing of recipients, provided that workers are exposed to favorable social information.¹⁶ In the laboratory animal field, exposure of the workforce to the benefits of their ongoing research and the lives that are affected would be a superior method to improve an employee's work perceptions. Employees would learn how their work makes a positive difference in other people's lives.¹⁷ In addition, identifying and using the strengths and supporting the interests of workers substantially enhance the work environment.^{5,19} These strategies allow employees to be placed in a position better aligned with

their value to the organization.³⁵ In addition, when employees find a mentor,²⁴ align their personal values with those inherent in their profession,¹⁶ and find a purpose in their work,¹⁸ greater job satisfaction results.²⁸ For passionate people motivation may be somewhat different compared with those who are not called to their work. Because the laboratory animal care industry has a large number of people with a vocational calling, giving them time to express their calling, providing them time to focus on their calling, and having time to socialize with other passionate people can strengthen a calling to their work.²³ As a group, participants in the laboratory animal field are considered altruistic. Capitalizing on this virtue and improving opportunities for a dedicated workforce will strengthen the organization and improve the wellbeing of employees.

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