Opinions, plans, and demographics of orthodontic residents: A follow-up study

2023 Orthodontic Faculty Development Fellowships (OFDFA)

Dr. Howard M. Freedman

freedman@ohsu.edu
O: 503-494-8921

FollowUp Form

Award Information

In an attempt to make things a little easier for the reviewer who will read this report, please consider these two questions before this is sent for review:

- *Is this an example of your very best work, in that it provides sufficient explanation and justification, and is something otherwise worthy of publication? (We do publish the Final Report on our website, so this does need to be complete and polished.)*
- *Does this Final Report provide the level of detail, etc. that you would expect, if you were the reviewer?*

Title of Project*

Opinions, plans, and demographics of orthodontic residents: A follow-up study

Award Type

Orthodontic Faculty Development Fellowship Award (OFDFA)

Period of AAOF Support

July 1, 2023 through June 30, 2024

Institution

Oregon Health & Science University

Names of principal advisor(s) / mentor(s), co-investigator(s) and consultant(s)

Dongseok Choi, PhD; Co-Investigator for Biostatistical consultation and analyses. Laura R. Iwasaki, DDS, MSc, PhD; Principal Advisor

Amount of Funding

$30,000.00

Abstract

(add specific directions for each type here)

See attached.

Respond to the following questions:

Detailed results and inferences:*

If the work has been published, please attach a pdf of manuscript below by clicking "Upload a file".
OR
Use the text box below to describe in detail the results of your study. The intent is to share the knowledge you have generated with the AAOF and orthodontic community specifically and other who may benefit from your study. Table, Figures, Statistical Analysis, and interpretation of results should also be attached by clicking "Upload a file".

AJODO-D-26-00125_R1_revised.pdf
Manuscript has been accepted for publication. Please see uploaded files.

Were the original, specific aims of the proposal realized?*

Yes.

Were the results published?*

No

Have the results of this proposal been presented?*

Yes

To what extent have you used, or how do you intend to use, AAOF funding to further your career?*

As I had discussed in my application, transitioning from a clinical path to an academic one has in some ways reignited my professional career and the AAOF funding I received with my OFDFA grant has been instrumental in that process. Most significantly, my research plan project led to my mentorship for Dr. Lori Gossett's Master's thesis project, which was funded by my grant. This work focused on US and Canadian residents' demographics, educational experiences and future plans has been presented at the AAO and WOCON meetings as well as at our university's Research Day and will be published soon. My hope is this project will raise awareness of the challenges our residents face on their academic journeys and potentially help guide curricula development and educational funding options for our future orthodontists. The grant also funded my own graduate studies, allowing me to earn my Certificate in Public Health. The knowledge I gained through my coursework (including classes in epidemiology, biostatistics, public health practice, environmental health and health systems organization) has allowed me to be a more informed mentor to residents through their research. It has also helped me to better understand issues related to access to care in our state and country and improve systems in our clinic, specifically related to our Medicaid recipients. In addition to Dr. Gossett's work, I have served or am currently serving on other residents' research committees for projects exploring orthodontic providers' participation in and perception of the Oregon Health Plan, how accurately the HLD score reflects patients' perception of their malocclusion and dental student well-being. My OFDFA funding also covered tuition for a TAD certification course which increased my confidence in

supporting our residents with TAD placement and mechanics. Besides funded endeavors, my OFDFA plans included classes in radiographic interpretation, management training and teaching skills. Overall, the education and experience I have gained in fulfilling the requirements of my OFDFA grant have made me a better clinician, manager, and instructor, benefiting our students and staff and enriching my professional life.

*Please note, leftover funds listed below may not be our final number. We are waiting to hear on a possible additional expense for our statistical support.

Accounting: Were there any leftover funds?

$5,256.36

Not Published

Are there plans to publish? If not, why not?*

The manuscript has been accepted for publication in the AJODO (manuscript number AJODO-D-26-00125, May 19, 2026).

Presented

Please list titles, author or co-authors of these presentation/s, year and locations:*

1. "Opinions, plans and demographics of orthodontic residents: A follow-up study". Lori Gossett, Howard Freedman, Dongseok Choi, Lyndie Foster Paige, Laura Iwasaki.
American Association of Orthodontists Scientific Posterboard Presentation, Philadelphia, PA, April 25, 202.
2. "Opinions, plans and demographics of orthodontic residents: A follow-up study". Lori Gossett, Howard Freedman, Dongseok Choi, Lyndie Foster Paige, Laura Iwasaki. Pacific Coast Society of Orthodontists Scientific Posterboard Presentation, Western Orthodontic Conference, Honolulu, HI, October 16, 2025
3. “A reassessment of orthodontic residents’ demographics, values, and opinions.” Howard M Freedman. OHSU School of Dentistry Research Day, Portland, OR, March 5, 2026.

Was AAOF support acknowledged?

If so, please describe:

Yes, AAOF acknowledgement was included on the posters.

Internal Review

Reviewer comments

All planned aims of the OFDFA grant titled "Opinions, plans, and demographics of orthodontic residents: A follow-up study" have been successfully realized. This OFDFA grant resulted in a peer reviewed publication and several presentations. Congratulations to Dr. Freedman!

Reviewer Status*

Approved

File Attachment Summary

Applicant File Uploads

- AJODO-D-26-00125_R1_revised.pdf

American Journal of Orthodontics & Dentofacial Orthopedics

A Reassessment of Orthodontic Residents' Demographics, Educational Experiences, and Future Goals

--Manuscript Draft--

Manuscript Number:	AJODO-D-26-00125R1
Article Type:	Original Article
Keywords:	Demography; Female; Follow-Up Studies; Internship and Residency; Orthodontics; Surveys and Questionnaires
Corresponding Author:	Laura R. Iwasaki, DDS, MSc, PhD Oregon Health & Science University Kansas City, Missouri UNITED STATES OF AMERICA
First Author:	Lori A. Gossett, DDS, MS
Order of Authors:	Lori A. Gossett, DDS, MS
	Howard Freedman, DDS
	Dongseok Choi, PhD
	Lyndie Foster Paige, BDS, PhD
	Laura R. Iwasaki, DDS, MSc, PhD
Abstract:	Introduction This study reassessed orthodontic residents' demographics, educational experiences, and future goals, for comparison with previously reported results. Methods An anonymous 41-question survey was distributed via e-mail to orthodontic residents in American and Canadian programs, according to Institutional Review Board-approved protocols. Wilcoxon and Fisher's exact tests compared responses from females versus males and those with ≤$300,000 versus >$300,000 total educational debt, where $p<0.05$ defined significance. Current results were compared to previously published data to identify changes. Results Of 270 respondents, 61% versus 39% were female versus male and 39% versus 61% reported total educational debt of ≤$300,000 versus >$300,000. Respondents were aged 29±3 years, most were single (66%) and without children (88%). Female versus male respondents showed significant differences for age (female<male), single (female>male) versus married (female<male) status, children (female<male), importance of program costs (female<male) and diverse/inclusive environment (female>male) and plans to purchase and start a practice (female<male). Those with ≤ versus >$300,000 total educational debt showed significantly lesser importance for program costs, more support from family and less from financial aid, and lesser anxiety and influence on where-to-work due to debt. Survey results from 2003 to 2024 showed increases in female respondents from 38% to 61% and median total educational debt from $101,000-$150,000 to $301,000-$400,000. Conclusions Sex and level of estimated educational debt had significant effects on responses to some 2024 survey questions. Despite high satisfaction with residency programs, further increases in tuition, educational debts, and anxiety regarding educational debt, suggest the need for improved financial literacy amongst orthodontic residents.

- Protocols used in this study were approved by the Oregon Health & Science University Institutional Review Board (June 15, 2023, #25895).

- P. 17, Acknowledgements
  - The authors thank all the survey participants, the Orthodontic Program Directors who assisted with e-mail invitations to participate in the survey, and Drs. David Bui, Kira Chen, Spencer Gibbons, Bryce Bothwell, Chris Elkhal, Gayeong Lee, and Madeline Stein who assisted with recruitment. The American Association of Orthodontists Foundation provided funding for this project through an Orthodontic Faculty Development Fellowship Award to Dr. Howard Freedman.

Highlights

- The profile of orthodontic residents' demographics, educational experiences, and future goals were updated in a 2024 survey.
- Sex influences projected decisions about orthodontic career paths, particularly regarding debt burden, career goals, and family planning.
- Level of educational debt affects well-being and projected decisions about orthodontic career paths.
- Educational debt remains one of the major challenges facing orthodontic residents.

Abstract

Introduction: This study reassessed orthodontic residents' demographics, educational experiences, and future goals, for comparison with previously reported results.

Methods: An anonymous survey was distributed via e-mail to orthodontic residents in American and Canadian programs, according to Institutional Review Board-approved protocols. Wilcoxon and Fisher's exact tests compared responses from females versus males and those with ≤$300,000 versus >$300,000 total educational debt, where $p<0.05$ defined significance. Current results were compared to previously published data to identify changes.

Results: Of 270 respondents, 61% versus 39% were female versus male and 39% versus 61% reported total educational debt of ≤$300,000 versus >$300,000. Respondents were aged 29±3 years, most were single (66%) and without children (88%). Female versus male respondents showed significant differences for age (female<male), single (female>male) versus married (female<male) status, children (female<male), importance of program costs (female<male) and diverse/inclusive environment (female>male) and plans to purchase and start a practice (female<male). Those with ≤ versus >$300,000 total educational debt showed significantly lesser importance for program costs, more support from family and less from financial aid, and lesser anxiety and influence on where-to-work due to debt. Survey results from 2003 to 2024 showed increases in female respondents from 38% to 61% and median total educational debt from $101,000-$150,000 to $301,000-$400,000.

Conclusions: Sex and level of estimated educational debt had significant effects on responses to some 2024 survey questions. Despite high satisfaction with residency programs, further increases in tuition, educational debts, and anxiety regarding educational debt, suggest the need for improved financial literacy amongst orthodontic residents.

Introduction

Orthodontic education has undergone substantial changes in curriculum structure, resident demographics, and financial burden over time. Historically, surveys on orthodontic education primarily gathered information from program administrators, focusing on clinical exposure, tuition costs, faculty resources, and research opportunities. [1-4] Since the early 1990s, however, orthodontic residents have been surveyed to capture their perspectives. [5-8] This shift has highlighted evolving trends in priorities, satisfaction, and challenges that residents face.

Three previous surveys were distributed at the Graduate Orthodontic Residency Program (GORP) starting in 1992[6] and then in 2003[5] and 2018. [8] The 1992 survey had a response rate of 81% (168/207), where 26% of respondents were female and 74% male. When asked about selecting a program, respondents listed program reputation, location, clinical content, cost, department head, research, and teaching opportunities as major factors. Overall, the majority reported they were satisfied with their program, with a small number (11%) less than satisfied, where problems and difficulties fell into two main categories: financial stress and family pressures. [6] The 2003 survey had 26 questions divided into demographics, residency training, and goals post-graduation sections, and a response rate of 77% (295/380). Respondents to this survey were 38% female, 62% male, where females compared to males had significantly lower income expectations but planned to work about the same number of hours per week. This survey reported average debts attributed to orthodontic education ranged from $26,000 to $50,000, while average overall educational debt ranged from $101,000 to $150,000. [5] The 2018 survey had response rate of 76% (369/489), 51% female and 49% male, where females compared to males had lower salary expectations but significantly more males than females planned to work 5 days a week whereas significantly more females than males planned to work 3 days a week.

Most respondents in both 2003 and 2018 listed clinical education as the most important and research opportunities as the least important factors when selecting a program. When excluding those with no student debt, average debt for orthodontic education in 2018 was $164,979±$122,211 while the average total educational debt was $387,264±$245,449. Varying levels of anxiety due to their debt were reported by 72%.

Surveys conducted between 1983 and 2018 revealed several trends among orthodontic residents. [1-8] For example, there was a marked increase in the proportion of female residents and a rise in educational debt associated with orthodontic training. These surveys have provided valuable insight into how resident demographics, program characteristics, and career goals have shifted over time. However, given that the results from the 2018 survey suggested orthodontics could be approaching a "bubble market," where the costs of education outweighed the financial benefits from orthodontic practice, [8] and the societal and economic changes that have occurred in the past seven years, a new survey was indicated. Thus, this study aimed to reassess orthodontic residents' demographics, educational experiences, and future goals, and compared these with previously reported results.

Methods

Protocols used in this study were approved by the X Institutional Review Board (June 15, 2023, #). The anonymous, cross-sectional survey used a cloud-based platform (Qualtrics, 2020, Provo, UT) and was distributed electronically in August 2024 to orthodontic residents enrolled in accredited residency programs in the USA and Canada. Invitations were sent to residents who attended the 2024 GORP and allowed their e-mail address to be shared with vendors. Quick response (QR) codes linked to the survey were also distributed at the conference to facilitate participation. Additionally, all orthodontic program directors in the USA and Canada received e-

mail messages requesting that they forward the survey opportunity to their residents. By completing the survey, respondents consented to participate in the study and received an online gift card worth $10 as reimbursement for their time.

The current survey (Supplementary Appendix) was adapted from the one used in 2018, [8] with modifications to incorporate questions about the importance of diverse and inclusive environments in residency and future work and the effects that the COVID-19 pandemic had on orthodontic residents. Categorical choices that were previously recognized as problematic in the 2018 survey were replaced by fillable fields so that text could be added directly by respondents or expanded to include more pertinent choices for current conditions.

The current survey consisted of 41 questions and was divided into three sections: demographics, program-specific questions, and future goals. The demographic section collected data on sex, age, race/ethnicity, marital status, number of children, and citizenship. Note that for "gender" the survey choices given were female, male, or other and hence are reported as "sex" to align with the categories offered rather than a spectrum of gender identities. [9] The program-specific section included questions related to tuition, stipends, faculty size, program length, and factors influencing program selection. The future goals section asked about career plans, anticipated income, interest in academic careers, and the role of educational debt in decision-making.

The data collected from the survey were exported to a spreadsheet (Excel version 16.86, Microsoft Office, Redmond, WA), then reviewed, cleaned, and analyzed with statistical software (R Core Team (2025), The R Foundation, Vienna, Austria.) to determine means and standard deviations. Results from questions using a 1-5 scale of importance were considered and collapsed to a 3-point scale of low ("Not at all"+"Slightly"), moderate ("Moderately"), and high

("Very"+"Extremely") importance. Collected data were further analyzed via Wilcoxon and Fisher's exact tests to compare females versus males and ≤ versus >$300k total educational debt, where significance was defined as $p<0.05$. Once collected and analyzed, the survey data from 2024 were compared to the survey data from 1992, 2003, and 2018 to identify changes and trends.

Results

Demographics

A total of 297 orthodontic residents participated in the survey. The majority (69%) attended the 2024 GORP conference, with a higher proportion of first-year residents in attendance compared to second- and third-year residents (91%, 72%, and 24%, respectively). Among the 270 respondents who reported their sex, 61% identified as female, 39% as male, and none selected "other." The mean age of participants was 29±3 years, where female respondents (28±3 years) were significantly younger ($p=0.005$) than male (29±3 years) respondents by one year (Table 1). The sample was 53% White/Caucasian, 30% Asian, 6% Hispanic/Latino, 6% ≥2 races, 3% "other" (described as Métis, Middle Eastern, North African), and 2% Black/African American. Most respondents (n=179/270, 66%) were single, but there was a significant difference ($p <0.001$) in the distribution of single versus married status between the sexes, where for females this was 75% versus 25%, respectively, and for males this was 52% versus 48%, respectively (Table 1). Most respondents (n=237/270, 88%) did not have children, so the number of children per person was small but significantly larger ($p<0.001$) for male (0.5±0.9) compared to female respondents (0.1±0.3; Table I).

Orthodontic Residency Program

The average program length was 31±4 months. Most respondents (87%) were working towards a Master of Science and Advanced Education in Orthodontics Certificate while 13% were working towards a Certificate only. The average number of residents per class was 6±3 with a range from 1-15 residents. Faculty composition varied, with nearly half of residents (45%) reporting 3-4 full-time faculty members and a broad range of part-time faculty. The vast majority of respondents (94%) were satisfied or very satisfied with their orthodontic residency program, whereas 17 of the respondents (6%) were unsatisfied. For the question which factor was most important when selecting a career in orthodontics, 62% chose "workload flexibility and predictability," 19% chose "financial/earning potential," 14% chose "skill set," 5% chose "other," and none chose "passion for orthodontics." When asked if the COVID-19 pandemic affected their academic/career path, 93% of respondents answered "no," while 7% answered "yes." Those who shared how they were affected specified virtual interviews for residency, less clinical experience in dental school, less time to shadow, and online learning during their dental education.

Respondents (n=273) reported tuition costs for their orthodontic residency programs ranging from zero (5%) to >$100,000 per year (10%; Fig 1). Notably, for the survey's tuition-cost categories, the proportions of females and males were significantly different ($p<0.04$) with numbers of males>females for the two least expensive categories and females>males for all the rest (Fig 1). More than half of respondents (57%) did not receive stipends but 11% of those surveyed (n=34) reported that their stipend covered full tuition costs. Orthodontic and total educational debt estimates varied widely from zero for 27% and 16% of respondents, respectively, to $400,000 and >$1,000,000, respectively, for some (Fig 2 and 3). Total

educational debts of ≤$300,000 and >$300,000 were estimated by 39% and 61% of respondents, respectively.

Approximately three-quarters (73%) of respondents started their residency program directly after graduation from dental school, compared to 13%, 9%, and 4% who started 1-2 years, 3-5 years, and >5 years after graduation from dental school, respectively. The proportions of respondents with ≤ versus >$300,000 total educational debt was significantly different ($p=0.002$) for these groups, at 61% versus 82% for 0 years, 16% versus 10% for 1-2 years, 15% versus 5% for 3-5 years, and 7% versus 2% for >5 years.

Based on the percentage of respondents who rated the most important factors when selecting a residency program, the rank order was clinical education (92%), location and cost (tied, 62%), reputation (48%), length of training (43%), diverse and inclusive environment (41%), class size (23%), dental school attended (18%), and research opportunities (18%). The importance of program cost showed significant differences by sex ($p<0.01$, Table I) and educational debt ($p=0.02$, Table II), where more males and those with >$300,000 total educational debt ranked this high, whereas more females and those with ≤$300,000 total educational debt ranked this low. Significant sex differences were also shown for the importance of length of training ($p=0.018$), which was ranked high by more males than females and low by more females than males, and for a diverse and inclusive environment ($p<0.001$), which was ranked high by more females than males and low by more males than females (Table I).

The percentages of respondents answering “yes” to the questions of receiving financial support during orthodontic residency were 62% from financial aid, 56% from family, 27% from savings, 14% part-time work, 10% from bank loans, 4% from the military, and none from public

health scholarships. The proportions of those receiving support from financial aid were significantly higher for those with > compared to ≤$300,000 total educational debt, whereas the proportions of those receiving support from family were significantly higher for females compared to males (p=0.012, Table I) and those with ≤ compared to >$300,000 total educational debt (p=0.007, Table II). For 76% of respondents educational debt was a source of anxiety, and this was significantly more common in those with higher compared to lower debt burdens (p<0.001, Table II).

Future Goals

For the question about plans following graduation, the percentages of positive responses to the choices provided were: 69% employee in an orthodontic private practice, 33% employee in a corporate group, 25% purchase an existing practice, 19% start a practice, 18% equity-minded associateship, 12% undecided, 8% academics, 8% work in a pediatric or general dental office, and 1% military. Sixty-two percent of respondents affirmed that their educational debt would influence decisions on where to work following residency, with significantly stronger affirmation (p<0.001) by those with higher compared to lower estimated debt (Table II). Future work plans showed significant sex differences, where higher proportions of males than females planned to purchase an existing practice (p<0.001), start a practice (p<0.001), and work in an equity-minded associateship (p=0.021); whereas the opposite was found for work in a pediatric or general dental office (p=0.17; Table I). Nearly half of respondents (47%) expressed interest in full-time academics if income for this was improved, and 29% would consider it if not for educational debt, whereas 80% were interested in part-time academics. Half (49%) of

respondents will consider making financial contributions to their residency program and 95% plan to attain American Board of Orthodontics (ABO) certification.

When asked about expected income in their first-year post-residency, 80% chose between $200,000 and $349,999 and only 2% chose ≥$400,000. Ten years post-graduation, most respondents (63%) expected to work four days/week, however there were significant sex differences (p=0.002), where for 1, 2, 3, 4, 5, 6, and 7 days/week, female responses were 1%, 1%, 30%, 56%, 12%, 0%, and 0%, respectively, and male responses were 0%, 1%, 10%, 74%, 12%, 1% and 1%, respectively. Based on the percentage of respondents who rated five factors when deciding where to accept the first job after residency of high importance, the rank order was 89% location, 66% ability to pay off educational debt, 53% opportunity to buy a practice, 49% cost of living, and 43% diverse and inclusive environment. Significant sex differences were shown for the importance of opportunity to buy a practice (p=0.002), which was ranked high by more males than females and low by more females than males, and for a diverse and inclusive environment (p=0.001), which was ranked high by more females than males and low by more males than females (Table I). The importance of ability to pay off debt was ranked significantly higher and lower by more of those with > and ≤$300,000 total educational debt, respectively (p<0.001, Table II).

Discussion

According to the American Dental Education Association (ADEA), there were 1,146 residents enrolled in US orthodontic residency programs in 2024, and an additional 72 residents were enrolled in Canadian programs. [10,11] Of the 1,218 total residents, there were 297 respondents to the current survey, which represented approximately 24% of this total. Of the 449 residents who attended the 2024 GORP, 288 allowed their e-mail address to be shared and were sent the

survey by e-mail. From this, 206 responded, for a response rate from eligible GORP attendees of approximately 72% and an overall GORP response rate of 46%.

The current survey collected some information common to previous surveys and allowed comparison between results from 1992, 2003, 2018, and 2024 (Table III). [5,6,8] The total number of responses from the 2024 survey was 297 and was similar to the average of the three previous surveys (277) which were only administered to GORP attendees and distributed directly to residents during check-in. However, the 2024 response rate was much lower than these previous surveys, because only those residents who had agreed to share their e-mail addresses with vendors at the 2024 GORP could be contacted, which was approximately 65% of the total attendees, and whether all program directors successfully forwarded the survey to their residents was unconfirmed.

Over time, the sex distribution among survey respondents has shifted away from being predominantly male (Table III). This aligns with trends documented in dental education where a recent ADEA report found female enrollment in pre-doctoral dental programs rose from 46% in 2013 to 51% by 2018. [12] Race and ethnic representation among orthodontic residents have evolved gradually, with modest gains in diversity over the past two decades. A 2010 study reported that 73% of orthodontic residents were non-Hispanic white, 14% were Asian/Asian-American, 5% Hispanic, and 1% African American. [13] The current findings indicate a decrease in the proportion of White/Caucasian residents (to 53%) and an increase in Asian residents to 30% since 2010, with minimal changes to and continued underrepresentation of Hispanics and African Americans compared to national population demographics.

The percentage of married respondents has decreased over time for both sexes (Table III), potentially reflecting evolving societal norms and career priorities. [8] Overall, these findings

suggest that orthodontic residents, especially females, are increasingly delaying marriage during their training years. This marriage delay or choice to not marry seen in orthodontic residents mirrors broader U.S. demographic patterns where national analyses show rising ages of first marriages and predicted declines in the probability of ever marrying. [14] Financial considerations also appear to play a role at the population level where studies link higher education costs and student loan debt to postponed marriage, particularly among women. [15]

Historically, male residents have been more likely to be married and have children during training compared to females (Table III). In the 2003, [5] 2018, [8] and 2024 surveys, 30%, 14%, and 12% of respondents had children, respectively, and all found the number of children was significantly larger for male compared to female respondents. These findings indicate persistent sex differences in the timing of family planning among residents and are not unique to orthodontics. In a 2020 multicenter survey, 61% of female medical residents reported delaying childbearing during residency. [16] At the population level, U.S. childbirth has shifted to later ages, mirroring the reduction in orthodontic residents reporting children from 2003-2004. [17]

The numbers of orthodontic programs and residents in the US have increased with time (Table III). Notably, between 2018 and 2024, although the number of programs increased by one, the number of residents increased by 175, likely reflecting the enrollment of up to 45 residents per year by this new program. The average and largest class sizes in 1983 were reported to be 5 and 15 residents, respectively, [3] while the current survey found these were 6 and 15 residents, respectively, suggesting that residents from the new large class-size program were not respondents to the current survey.

Trends suggest that more residents enter orthodontic residency directly after graduation from dental school, where in 1992, just under half of respondents reported starting residency

immediately following dental school, [6] whereas in 2003,[5] 2018, [8] and 2024, these numbers were 56%, 67%, and 73%, respectively. The current survey showed a significantly larger proportion of respondents with > versus ≤$300,000 total educational debt began residency immediately after dental school. Possibly, dentists who delayed starting residency may have used that interim period to earn income and reduce debt. Further studies should aim to explore the underlying factors contributing to this disparity, such as financial planning or career urgency.

In 1992, program reputation was reported as the most important factor respondents considered when choosing a residency program,[7] whereas in 2003, 2018 and 2024, clinical education was the most important factor. In 2018, significantly greater numbers of females rated location and clinical education as more important than their male colleagues. [8] In 2024, males versus females and those with higher versus lower total educational debt were significantly more likely to rank program cost of higher versus lower importance. Similarly in 2024, males versus females were significantly more likely to rank program length of higher versus lower importance whereas females versus males were significantly more likely to rank a diverse and inclusive environment of higher versus lower importance for both their orthodontic program and work post-residency. These results reflect both continuity and evolution in choice of residency with significant differences between the sexes and amounts of total educational debt.

Overall, tuition costs for orthodontic residency have increased with time. In 1989 average tuition for state schools were approximately $6,500/year for in-state residents and $9,000/year for out-of-state residents. [4] By comparison, in 2003, the median annual cost of tuition was $10,000-$15,000/year[5] and in 2024, reported tuition costs were up to >$100,000/year and reflected a wide range. Stipends can represent a critical form of financial relief for orthodontic residents, particularly in programs with high tuition costs. In this study, 43% of

respondents reported receiving a stipend, while 57% did not. This is similar to the findings in 2018, where 39% of residents reported receiving a stipend, however, this decreased from the 50% of residents who reported receiving a stipend in 2003. [5,8] Notably, in the 2024 survey, only 25% of stipend recipients indicated that their stipend fully covered their tuition, leaving the majority with residual costs.

The 2024 survey revealed a number of variables that were significantly different between the sexes, and suggest that males may be more financially conscious that females, including lower tuition; higher importance of program costs, length of training, and opportunity to buy a practice; future work plans to purchase a practice, start a practice, and work in an equity-minded associateship; and less financial support from family. The downstream impact of these differences may be important. For example, male respondents were much more likely than female respondents to report plans to purchase or start a practice, a trend that may partially reflect earlier financial recovery due to lower tuition and debt. Higher educational costs may delay or deter practice ownership, particularly among female orthodontists, exacerbating long-term income and wealth gaps in the field. American Association of Orthodontists (AAO) member data from a 2019 salary analysis confirm this, where male orthodontists reported average annual earnings just under $400,000 whereas female orthodontists reported earnings of roughly $300,000. [18] Likewise, a recent AAO Economics of Orthodontics survey showed significant sex-based income discrepancies even after adjusting for age and ownership, with female respondents disproportionately concentrated in lower salary categories and more likely to enter employee or Dental Support Organization/Orthodontic Support Organization positions. [19] Consistent with these disparities, in 2022, Campbell Worthington et al. found that female orthodontists earned an average of $119,000 less per year than male colleagues despite working the same number of days

per week. [20] The study also showed that females charged approximately 9% less than the national average and less than males for both extraction and non-extraction cases, and started 27% fewer new cases annually. [20] In addition, female orthodontists were more likely to be the primary caregivers for their children, a factor the authors suggested may limit practice growth and contribute to income differences. [20] Ultimately, these findings support ongoing concerns about tuition increases for orthodontic education and the disproportionate impact across demographic groups.

Comparison of survey results shows that the sources of financial support for orthodontic residents have shifted with more support from financial aid and less support from family, savings, part-time work, bank loans, and other sources, over time (Table III). In 1992[6] versus 2024, respondents who received financial assistance from family were 61% versus 51%, respectively, while those who received financial aid were 37% versus 58%, respectively. In addition to the sex differences described above, the current study found that those with >$300,000 in total educational debt were significantly more likely to receive financial aid, while those with lower debt were more likely to receive family support. The results highlight the divergent financial strategies employed by residents depending on sex and debt level, which may influence not only the affordability of orthodontic education, but also post-graduation financial flexibility.

Educational debt remains one of the major challenges facing orthodontic residents. Comparing prior and current survey results, the trajectory of increasing debt is clear (Table III). In the 2003 GORP survey, the median debt attributed to orthodontic residency was $26,000-$50,000, and the median total educational debt was $101,000-$150,000. [5] The 2024 survey found the median debt from orthodontic residency alone to be $51,000-$100,000 and the median total

educational debt to be $301,000-$400,000. Related to this, 72% and 76% of respondents reported some level of anxiety regarding their educational debt in 2018[8] and by 2024, respectively. The 2024 survey also found that residents with >$300,000 in total educational debt were significantly more likely to report anxiety about their debt and to state that their debt influenced their future career plans. Collectively, these findings highlight how rising educational debt not only affects residents' current well-being but also constrains their long-term career trajectories. With tuition rising and stipends not keeping pace, the financial barriers to academia and practice ownership may continue to widen unless systemic reforms are introduced.

In 2018, Stoker et al. raised concerns that orthodontics may be approaching a "bubble market," where the long-term financial benefits of the profession may no longer justify the upfront costs of education and training.[8] Even with the rising cost of education, applicant demand has not decreased. Orthodontic match participation grew from 487 candidates in 2018 to 657 in 2024.[21,22] Still, given the increasing variability in program tuition and stipends as well as the influence of debt on resident decision-making and career planning this financial model may not be sustainable for new orthodontists. Continued evaluation of the economics of graduate education as well as financial counseling in residency programs may help inform policy changes and support structures that ensure continued access to the profession.

In 2024 the majority of residents (69%) reported plans to work as employees in private orthodontic practices, consistent with findings from Stoker et al.[8] Notably, 33% also expressed interest in corporate group settings which is a significant rise from the 8% in 2018. Surveys prior to 2018 did not distinguish corporate practice models, underscoring the recent growth of corporate dentistry. Supporting this trend, in 2022 Campbell Worthington et al. found that 71% of final-year residents were open to corporate employment, compared to only 46% of practicing

orthodontists. [20] These findings suggest a generational shift, with current residents more receptive to corporate positions as an initial career path.

Interest in ABO certification has increased markedly over the past three decades. From just 3% of residents planning certification in 1992, this figure rose to 87% by 2003, 91% in 2018, and 95% in the current 2024 study. [5,6,8] This sustained growth likely reflects ongoing efforts by the American Board of Orthodontics to reduce barriers to participation. [23]

This study offers valuable insight into the 2024 orthodontic residents' demographics, educational experiences, and future goals, but several limitations must be noted. To start, participation was voluntary, which introduces potential response bias. The absence of responses from residents in large class-sized programs limits generalizability, as these perspectives were not represented. Additionally, although efforts were made to align this survey with past versions, changes in content and format to address limitations from previous studies may have reduced comparability with earlier data. The expanded length of the 2024 survey may also have contributed to reduced response rates or incomplete submissions. Despite these limitations, the findings contribute meaningfully to ongoing efforts to monitor trends in orthodontic education.

The current study highlights several areas where further investigation could advance understanding of orthodontic residency training and post-residency planning. Future studies should explore further how sex influences orthodontic career paths, particularly regarding debt burden, career goals, and family planning. Improved demographic questions may enhance inclusivity and data precision. In addition, longitudinal research is needed to assess whether residents' early career intentions align with actual outcomes. Lastly, economic analyses, including return on investment and debt-to-income ratios, could help evaluate the sustainability

of orthodontic education and guide policy decisions that support access and equity in the profession.

Overall, the results of this study provide valuable current perspectives on the costs, anxieties, and challenges as well as the benefits associated with being an orthodontic resident. These results suggest that financial literacy and debt management education should be incorporated into pre-dental, dental, and residency programs. This could be done in conjunction with career counseling in high schools and colleges and professional organizations like the American Dental Association and American Association of Orthodontists. Given the educational debt burdens, current and future residents should also be made aware of the advantages and disadvantages of working before entering residency and of the different work settings available after residency including academic/hospital and solo, group, corporate, and dental/orthodontic service organization-managed practices so they are able to make informed decisions. Nevertheless, the increased, high satisfaction ratings of residents in 2024 are encouraging and suggest orthodontic residency programs are generally meeting expectations.

Conclusions

This study captured an updated profile of orthodontic residents' demographics, educational experiences, and future goals. Some significant differences were found between male and female respondents as well as between those with ≤ $300,000 versus >$300,000 total educational debt. Comparison with previous survey results since 1992 revealed trends, especially a further rise in female representation, further increases in both tuition and educational debts, and further anxiety regarding educational debt. Collectively, these results suggest a need for improved financial literacy to improve decision-making, reduce and manage debts, and relieve anxiety.

Acknowledgements

The authors thank all the survey participants, the Orthodontic Program Directors who assisted with e-mail invitations to participate in the survey, and Drs. A, B, C, D, E, F, and G who assisted with recruitment. The American Association of Orthodontists Foundation provided funding for this project through an Orthodontic Faculty Development Fellowship Award to Dr. H.

References

1. Keim RG, Sinclair PM. Orthodontic graduate education survey, 1983-2000. Am J Orthod Dentofacial Orthop 2002;121:2-8. doi: https://doi.org/10.1067/mod.2002.120400

2. Rudolph DJ, Sinclair PM. Orthodontic graduate education survey 1983-1994. Am J Orthod Dentofacial Orthop 1997;112:418-424. doi: https://doi.org/10.1016/s0889-5406(97)70050-7

3. Sinclair PM, Alexander RG. Orthodontic graduate education survey. Am J Orthod 1984;85:175-181. doi: https://doi.org/10.1016/0002-9416(84)90009-5

4. Sinclair PM, Rudolph DJ. Orthodontic graduate education survey--1983 to 1989. Am J Orthod Dentofacial Orthop 1991;100:465-471. doi: https://doi.org/10.1016/0889-5406(91)70087-D

5. Bruner MK, Hilgers KK, Silveira AM, Butters JM. Graduate orthodontic education: the residents' perspective. Am J Orthod Dentofacial Orthop 2005;128:277-282. doi: https://doi.org/10.1016/j.ajodo.2005.04.031

6. Keith O, Proffit WR. Orthodontic training: the residents' perspective. Am J Orthod Dentofacial Orthop 1994;106:649-653. doi: https://doi.org/10.1016/S0889-5406(94)70091-5

7. Noble J, Hechter FJ, Karaiskos N, Wiltshire WA. Motivational factors and future life plans of orthodontic residents in the United States. Am J Orthod Dentofacial Orthop 2010;137:623-630. doi: https://doi.org/10.1016/j.ajodo.2008.03.034

8. Stoker AC, Schwarz E, Doyle L, Iwasaki LR. Opinions, plans, and demographics of orthodontic residents: A follow-up study. Am J Orthod Dentofacial Orthop 2020;157:809-817. doi: https://doi.org/10.1016/j.ajodo.2020.01.014

9. Kaufman MR, Eschliman EL, Karver TS. Differentiating sex and gender in health research to achieve gender equity. Bull World Health Organ 2023;101:666-671. doi: https://doi.org/10.2471/BLT.22.289310

10. The American Dental Education Association. ADEA Trends in Dental Education 2024-25. Avaliable at: https://www.adea.org/docs/default-source/adea-main/publications/adea-trends/adea_trends_2024_25.pdf?sfvrsn=1384b8f6_3/. Accessed July 12, 2025.

11. The American Association of Orthodontists. Accredited Orthodontic Programs. Avaliable at: https://www2.aaoinfo.org/programs-for-residents-and-educators/accredited-orthodontic-programs/. Accessed July 12, 2025.

12. The American Dental Education Association. ADEA Snapshot of Dental Education 2019-20. Avaliable at: https://www.adea.org/docs/default-source/adea-main/publications/adea-trends/2019-20_adea_snapshot_of_dental_education.pdf?sfvrsn=f6266bb3_7&utm/. Accessed June 18, 2025.

13. Burk T, Orellana M. Assessment of graduate orthodontic programs in North America. J Dent Educ 2013;77:463-475.

14. Bloome D, Ang S. Marriage and Union Formation in the United States: Recent Trends Across Racial Groups and Economic Backgrounds. Demography 2020;57:1753-1786. doi: https://doi.org/10.1007/s13524-020-00910-7

15. Bozick R, Estacion A. Do student loans delay marriage? Debt repayment and family formation in young adulthood. Demographic Research 2014;30. doi: https://doi.org/10.4054/DemRes.2014.30.69

16. Stack SW, Jagsi R, Biermann JS, Lundberg GP, Law KL, Milne CK et al. Childbearing Decisions in Residency: A Multicenter Survey of Female Residents. Acad Med 2020;95:1550-1557. doi: https://doi.org/10.1097/ACM.0000000000003549

17. Brown AD, Hamilton BE, Kissin DM, Martin JA. Trends in Mean Age of Mothers: United States, 2016–2023: National Vital Statistics Reports; 2025. doi: https://doi.org/10.15620/cdc/174598

18. The American Association of Orthodontists. AAO Studying Causes of Gender Differences in Salaries. Available at: https://www2.aaoinfo.org/aao-member-data-indicates-an-orthodontic-pay-gap-exists/. Accessed July 16, 2025.

19. The American Association of Orthodontists. AAO Economics of Orthodontics Survey Report: Patient Data Similar to Pre-COVID Reports; Growth in DSO/OSO Employment. Available at: https://www2.aaoinfo.org/aao-economic-survey-report-patient-data-similar-to-pre-covid-reports-continued-growth-in-dso-oso-employment/. Accessed July 16, 2025.

20. Worthington CC, Mihas P, Bocklage C, Frazier-Bowers SA, Lin FC, Ko CC et al. Educational debt and the gender gap: Understanding factors influencing orthodontists' career decisions. Am J Orthod Dentofacial Orthop 2022;161:e20-e61. doi: https://doi.og/10.1016/j.ajodo.2020.10.027

21. The Postdoctoral Dental Matching Program. Results of the Matching Program for 2018-2019 Positions. https://natmatch.com/dentres/stats/2018sumstats.pdf/. Accessed September 1, 2025.

22. The Postdoctoral Dental Matching Program. Results of the Matching Program for 2025-2026 Positions. https://natmatch.com/dentres/stats/2025sumstats.pdf/. Accessed September 1, 2025.

23. Park JH, Hernandez-Orsini R, Rossouw PE, Puntillo AM, Rejman DJ, Vishwanath M et al. The American Board of Orthodontics: A brief history and update of the orthodontic certification process. Am J Orthod Dentofacial Orthop 2024;166:308-312. doi: https://doi.org/10.1016/j.ajodo.2024.07.001

Figure Captions

Fig 1 Tuition costs per year from $0->$100,000 by percentage of respondents to survey question "How much is the tuition for your program each year?" showing responses from females (white) and males (gray).

Fig 2 Results from survey question "Estimate your debt at the time of graduation from orthodontic residency only," for categories from $0-$400,000 by percentage of respondents, where k=1,000.

Fig 3 Results from survey question "Estimate your total educational debt at the time of graduation from orthodontic residency" for categories from $0->$1,000,000 by percentage of respondents, where k=1,000.

Figure 1

Click here to access/download;Figure;Figure 1.tif

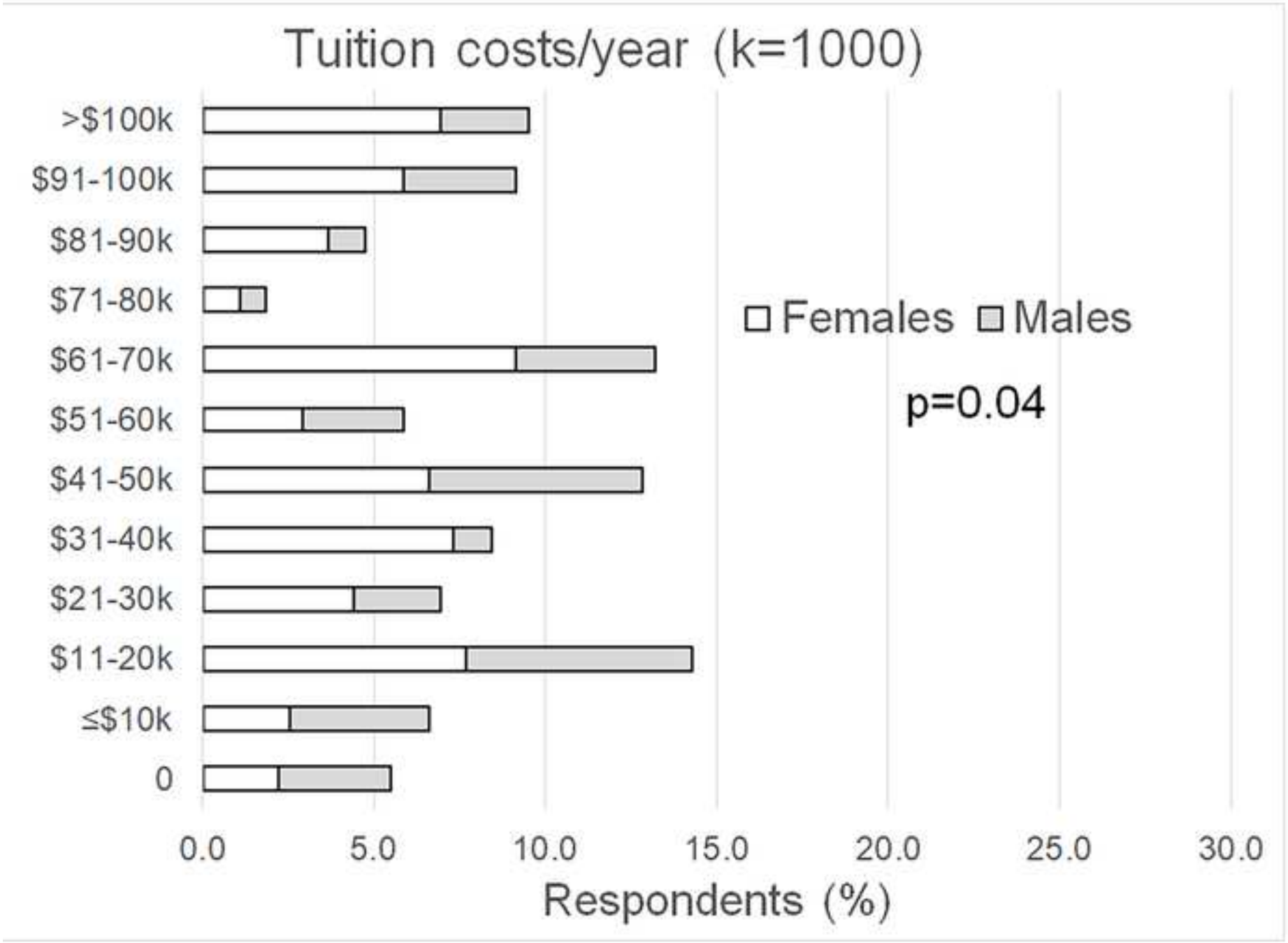

Figure 2

Click here to access/download;Figure;Figure 2.tif

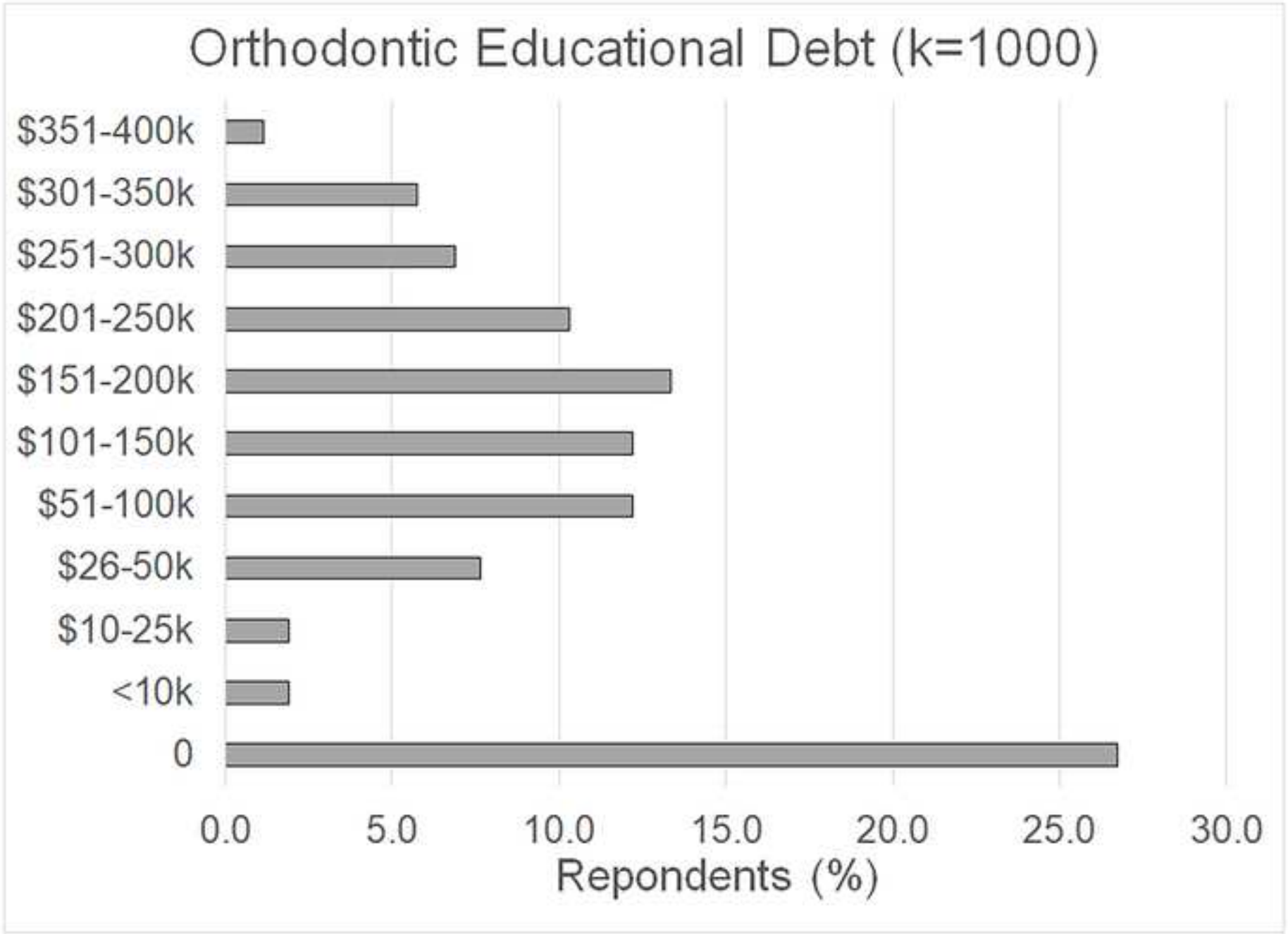

Figure 3

Click here to access/download;Figure;Figure 3.tif

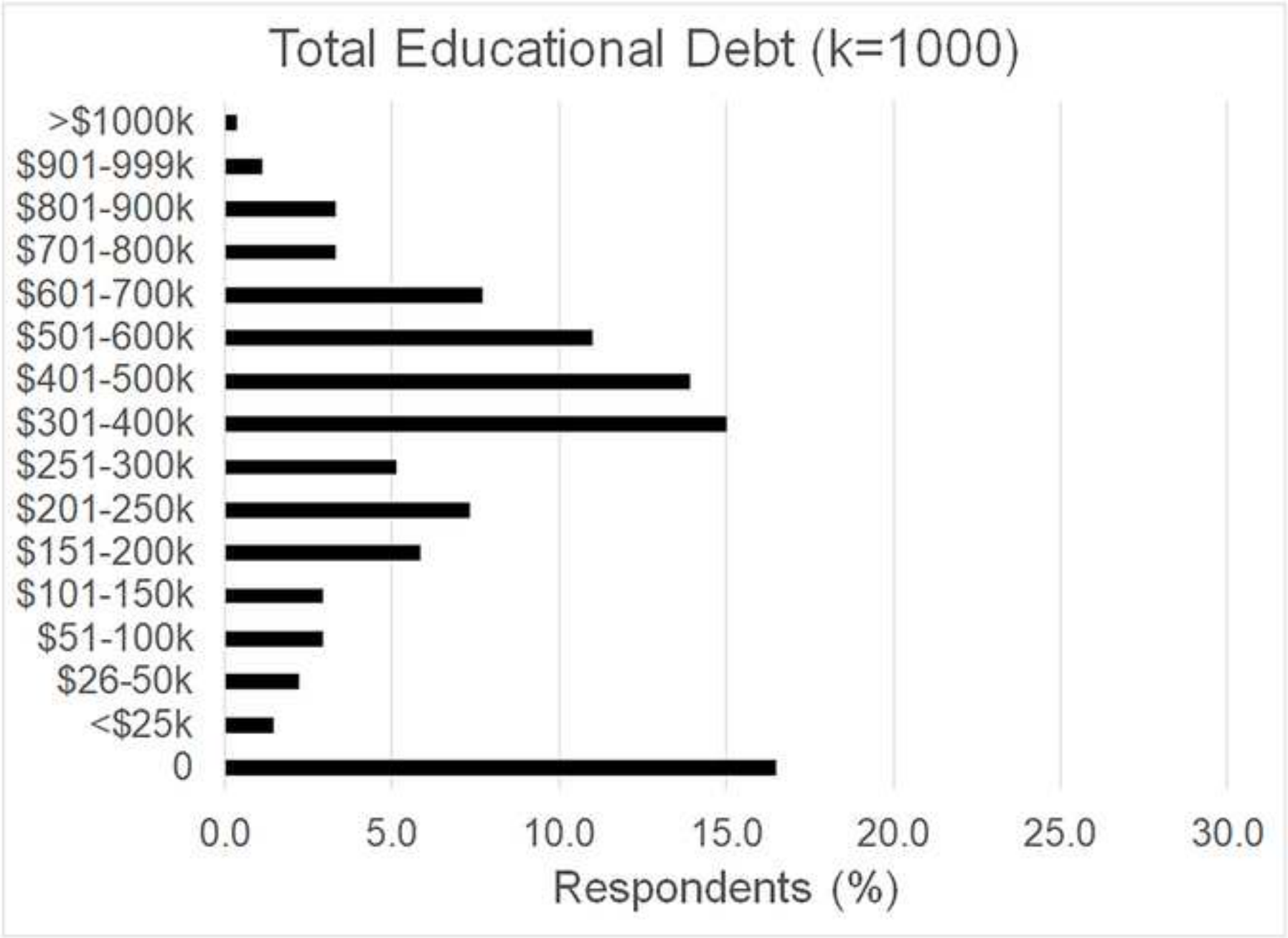

Table I Sex, age, marital status, children, considerations about orthodontic program, and future plans overall (n = 270) and for female and male respondents in terms of % or mean ± standard deviation. Resulting p-values are provided from comparisons between sexes.

Feature	Overall	Females	Males	p-value
Sex		61%	39%	
Age (years)	29 ± 3	28 ± 3	29 ± 3	0.005
Single	66%	75%	52%	<0.001
Married	34%	25%	48%	
Children	12%	0.1 ± 0.3	0.5 ± 0.9	<0.001
Importance of: Program cost?				0.002
High	62%	54%	74%	
Moderate	25%	28%	19%	
Low	14%	18%	7%	
Importance of: Length of training?				0.018
High	43%	38%	50%	
Moderate	37%	36%	37%	
Low	20%	26%	12%	
Importance of: Diverse and inclusive environment?				<0.001
High	41%	50%	28%	
Moderate	26%	24%	29%	
Low	33%	27%	44%	
In residency: Financial support from family?				0.012
No	49%	38%	54%	
Yes	51%	62%	46%	
Future work plans: Purchase existing practice?				<0.001
No	75%	86%	52%	
Yes	25%	14%	48%	
Future work plans: Start own practice?				<0.001
No	81%	87%	68%	
Yes	19%	13%	32%	
Future work plans: Equity-minded associateship?				0.021
No	82%	84%	72%	
Yes	18%	16%	28%	
Future work plans: Pediatric or general dental office?				0.017
No	92%	87%	96%	
Yes	8%	13%	4%	
Important for first job post-residency: Opportunity to buy a practice?				0.002
High	52%	44%	66%	
Moderate	32%	36%	27%	
Low	16%	20%	39%	
Important for first job post-residency: Diverse and inclusive environment?				0.001
High	43%	48%	33%	
Moderate	28%	28%	28%	
Low	**29%**	**23%**	**39%**	

Table II Significantly different responses to questions regarding finances by percentage of respondents with ≤ versus >$300,000 estimated total educational debt (n=273) and resulting p-values.

Feature	Debt ≤$300,000	Debt >$300,000	p-value
Importance of: Program cost?			0.02
High	60%	64%	
Moderate	21%	28%	
Low	20%	9%	
In residency: Financial support from financial aid?			<0.001
No	61%	19%	
Yes	39%	81%	
In residency: Financial support from family?			0.007
No	36%	52%	
Yes	64%	48%	
Debt: Source of anxiety?			<0.001
No	43%	9%	
Yes, mild	28%	22%	
Yes, moderate	18%	44%	
Yes, major	11%	26%	
Debt: Influence decision on where to work?			<0.001
No	60%	20%	
Yes	40%	80%	
Important for first job post-residency: Ability to pay off debt?			<0.001
High	45%	81%	
Moderate	13%	16%	
Low	41%	3%	

Table III Comparison of data from 1992, 2003, 2018, and 2024, where: GORP=graduate orthodontic resident program, k=1,000, USA=United States of America, n=number, NA=not asked, *=Response rate from GORP attendees. Table modified from Stoker et al., 2020[8] to include results from 2024.

Survey year:	1992	2003	2018	2024
USA programs (n)	51	58	68	69
USA residents (n)	577	722	1043	1,218
GORP attendees (n)	207	430	489	449
Respondents (n)	168	330	372	297
Survey response rate	81%	77%	76%	46%*
Male/Female/Other respondents (n)	74%/26%/NA	62%/38%/NA	49%/51%/0%	39%/61%/0%
Married respondents (n)	58%	56%	37%	34%
Married male respondents (n)	64%	60%	40%	48%
Married female respondents (n)	42%	48%	33%	25%
Respondents with children (n)	27%	30%	14%	12%
Male respondents with children (n)	30%	36%	22%	22%
Female respondents with children (n)	9%	17%	5%	0.1%
Median orthodontic educational debt	NA	$26k-50k	$101k-150k	$51-100k
Median total educational debt	NA	$101k-150k	$251k-300k	$301-400k
Financial support from: Family	61%	42%	58%	51%
Financial support from: Financial aid	37%	53%	53%	58%
Financial support from: Savings	36%	29%	20%	25%
Financial support from: Part-time work	29%	25%	12%	13%
Financial support from: Bank loan	18%	17%	13%	9%
Financial support from: Other source	5%	11%	10%	0.03%

Supplementary Appendix: 2024 Survey

Please participate in a research study investigating current orthodontic residents' demographics, their perspectives about their orthodontic training and their future goals. All responses are anonymous and no personal identifiers will be collected. Your participation in this research is voluntary. The survey should take 5-10 minutes to complete. By completing the survey, you consent to participate in the study. Thank you for your participation.

A. **Please answer the following specific questions about your PROGRAM**

1. In what year of residency are you? □ 1st □ 2nd □ 3rd □ 4th +
2. Number of residents/class: □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □ 7 □ 8 □ 9 □ 10 □ 11 □ 12 □ 13 □ 14 □ 15 □ ≥16
3. Length of program in months: _____ (fillable field)
4. Number of full-time faculty at your program: □ 0 □ 1-2 □ 3-4 □ 5-6 □ >7
5. Number of part-time faculty at your program: □ 0 □ 1-2 □ 3-5 □ 6-8 □ 9-11 □ 12-14 □ >14
6. What type of program is yours? □ Certificate □ Master of Science/Certificate □ Doctor of Philosophy/Certificate □ MBA/Certificate □ Post-Doctoral Fellowship
7. How satisfied are you with your orthodontic residency training program? □ Unsatisfied □ Satisfied □ Very satisfied
8. When choosing a career in orthodontics, which of the following factors is most important to you? □ Passion for orthodontics □ Workload Flexibility and Predictability □ Financial/Earning Potential □ Skill Set □ Other _____
9. How many years after dental school graduation did you begin your orthodontic residency? □ 0 years □ 1-2 years □ 3-5 years □ >5 years
10. If you did not go straight from dental school to residency, what was your main employment activity? □ Dental School Faculty □ Military □ Work in a community health clinic □ Work in a corporate group □ Work in a private practice □ Other_____ (fillable field)
11. Using a scale of 1=Not at all important and 5=extremely important, please rate how important each of the following were when selecting your orthodontic program.

	Not at all important	**Slightly important**	**Moderately important**	**Very important**	**Extremely important**
	1	2	3	4	5
Reputation	□	□	□	□	□
Location	□	□	□	□	□
Cost	□	□	□	□	□
Clinical education	□	□	□	□	□
Length of training	□	□	□	□	□
Where I went to dental school	□	□	□	□	□
Research opportunities	□	□	□	□	□

Class size	□	□	□	□	□
Diverse and inclusive environment	□	□	□	□	□

12. Do you think it would be better for applicants if all programs were in the Match? □ Yes □ No
13. If you conduct research in your program, do you plan to pursue publishing your research in a peer reviewed journal: □ Yes □ No □ N/A
14. How much is the tuition for your program each year: □ $0 □ ≤$10K □ $11-20K □ $21-30K □ $31-40K □ 41-50K □ 51-60K □ 61-70K □ 71-80K □ 81-90K □ 91-100K □ >100K
15. Do you receive a stipend? □ Yes □ No
16. How much is your stipend?

1st yr:	□<$1K	□ $1-10K	□ $11-20K	□ $21-30K	□ $31-50K	□ >$50K
2nd yr:	□<$1K	□ $1-10K	□ $11-20K	□ $21-30K	□ $31-50K	□ >$50K
3rd yr:	□<$1K	□ $1-10K	□ $11-20K	□ $21-30K	□ $31-50K	□ >$50K

17. Does your stipend cover full tuition costs? □ Yes □ No
18. What additional financial support have you received while in your orthodontic residency? (Check all that apply)
    □ Family □ Financial Aid □ Bank Loans □ Savings □ Part Time Work □ Military □ Public Health Scholarship □ Other_____
19. Estimate your debt at the time of graduation from orthodontic residency.
    From <u>orthodontic residency</u> only:
    □ $0 □ <$10K □ $10-25 □ $26-50K □ $51-100K □$101-150K □ $151-200K □ $201-250K □ $251-300K □ $301-350K □ $351-400K □ >$400K
20. Estimate your debt at the time of graduation from orthodontic residency.
    Total <u>educational debt</u>:
    □ $0 □ <$25K □ $26-50K □ $51-100K □ $101-150K □ $151-200K □ $201-250K □ $251-300K □ $301-400K □ $401-500K □ $501-600K □ $601-700K □ $701-800K □ $801-900K □ $901-999K □ >$1M
21. If not for educational debt, would you consider pursuing a full-time academic faculty position after graduation?
    □ Yes □ No
22. Is your educational debt a source of anxiety in your life? □ Yes, major anxiety □ Yes, moderate anxiety □ Yes, mild anxiety □ No
23. Will your educational debt influence your decision on where to work following residency? □ Yes □ No

B. Please answer the following questions about your FUTURE GOALS:

24. What are your plans following graduation? (Select all that apply)
    □ Academics □ Military □ Purchase of an existing practice □ Start your own practice □ Work as an employee in a corporate group □ Work as an employee in an orthodontic private practice □ Equity minded associateship □ Work in pediatric or general dental private office □ Undecided

25. Would you be interested in full-time academics if the income for teaching were improved? □ Yes □ No □ I am already considering a full-time academic career
26. Are you interested in part-time academics combined with private practice? □ Yes □ No
27. In which US state, Canadian province, or country outside of the US/Canada do you wish to practice in the future?
28. Do you want to stay in the same area as you went to residency? □ Yes □ No
29. What is your expectation of first year annual income?
    □ Less than $100,000 □ $100,000-149,999 □ $150,000-199,999 □ $200,000-249,999 □ $250,000-299,999 □ $300,000-349,999 □ $350,000-399,999 □ ≥$400,000
30. Ten years after graduation I plan to work weekly:
    □ 1 day □ 2 days □ 3 days □ 4 days □ 5 days □ 6 days □ 7 days
31. I plan to attain ABO certification? □ Yes □ No
32. After graduation will you consider making financial contributions to the residency in which you trained?
    □ Yes □ No □ Undecided
33. Using a scale of 1=Not at all important and and 5=Extremely important, please rate how important each of the following factors are when deciding where to accept your first job after residency.

	Not at all important	**Slightly important**	**Moderately important**	**Very important**	**Extremely important**
	1	2	3	4	5
Location	□	□	□	□	□
Cost of Living	□	□	□	□	□
Ability to pay off educational debt	□	□	□	□	□
Opportunity to buy a practice	□	□	□	□	□
Diverse and inclusive environment	□	□	□	□	□

34. Did the COVID-19 pandemic affect your academic/career path?
    □ No □ Yes (Please share how you were affected): _____

C. Please answer the following DEMOGRAPHIC questions:

35. Gender □ Male □ Female □ Other
36. Age: _____
37. Ethnicity □ White/Caucasian □ Black/African American □ Asian □ Hispanic/Latino □ Native American Indian/Alaska Native □ Native Hawaiian/Other Pacific Islander □Two or More Races □ Other:_____
38. Marital Status: □ Single □ Married □ Divorced
39. # of Children □ 0 □ 1 □ 2 □ 3 □ 4 □ 5+
40. Are planning on to have children/more children:

□ During residency □ After residency □ No plans to have children □ Already have children

41. Citizenship: □ US □ Canada □ Other_____

Credit Author Statement

Manuscript title: A Reassessment of Orthodontic Residents' Demographics, Educational Experiences, and Future Goals

Author: Roles

- Lori A. Gossett: Methodology, Validation, Formal Analysis, Investigation, Data Curation, Writing – Original Draft, Writing - Review & Editing, Visualization, Project administration.
- Howard Freedman: Conceptualization, Methodology, Writing – Original Draft, Writing - Review & Editing, Visualization, Project administration, Funding acquisition.
- Dongseok Choi: Methodology, Software, Validation, Formal analysis, Resources, Writing - Review & Editing, Supervision.
- Lyndie Foster Paige: Software, Writing - Review & Editing, Supervision.
- Laura R. Iwasaki: Conceptualization, Methodology, Formal Analysis, Resources, Data Curation, Writing – Original Draft, Writing - Review & Editing, Visualization, Supervision, Project administration, Funding acquisition.