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## **AAO Foundation Final Report Form (a/o 6/30/2020)**

Please prepare a report that addresses the following:

**Type of Award:** Research Aid Award

**Name(s) of Principal Investigator(s):** Catherine Campbell, DMD, MSED; Laura Anne Jacox, DMD, PhD, MS; Ching-Chang Ko, DDS, PhD; Feng-Chang Lin, PhD; Paul Mihos, MS

**Institution:** University of North Carolina, Chapel Hill

**Title of Project:** Understanding Factors Influencing Young Orthodontist Career Decisions

**Period of AAOF Support:** 07-01-18 to 12-31-19

**Amount of Funding:** \$5,000.00

### **Summary/Abstract**

Orthodontic graduates are choosing associateships over ownership as their initial employment following residency. This is in marked contrast to residency graduates in the 2000's and earlier who primarily pursued ownership after graduation. Less than one-third of recent graduates pursue ownership today, compared to 62% in 2010. The field of orthodontics is being reshaped by increasing numbers of graduates with high student debt, growth of corporate dentistry, changing gender demographics and evolving consumer behaviors with direct-to-consumer products. The relative importance of these changes in young doctors' career decisions is unknown, and it is unclear what long-term sequelae result from deferring ownership. Through qualitative interviews and a national survey, this study aimed to identify factors influencing orthodontist career trajectories and to evaluate how early career choices influence job satisfaction.

Twenty-five residents, early-career and mid-career orthodontists were interviewed in a semi-structured format following a topic guide. Interview transcripts were analyzed to identify factors

influencing career decisions and job satisfaction. Thematic patterns were established through iterative systematic analysis, and qualitative validity was ensured by research triangulation. To test generalizability of our qualitative results, we developed and distributed a national survey to AAO members via the Partners in Research Program. A total of 3,441 working orthodontists listed as AAO members were randomly selected and emailed in both distribution waves, with a total combined response rate of 9.97% and n=343. A total of 1,318 orthodontic residents listed as active AAO members were randomly selected and emailed with a total combined response rate of 14.03% response rate and n=185. Survey data were assessed using descriptive and bivariate analyses. Descriptive statistics such as mean, standard deviation and percentage are reported for collected variables. Bivariate association analysis between demographic variables and questions (scales) were explored using t-tests and chi-squared tests when appropriate. Responses with continuous variables were analyzed using two-sample t-tests for pairwise comparisons. Categorical data was assessed using the chi-square test. Multiple-choice questions where respondents could choose up to 2 answers or as many options as desired are reported as frequencies with chi-square test pairwise comparisons.

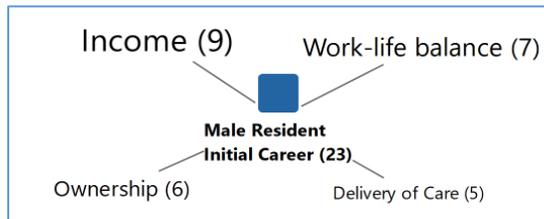
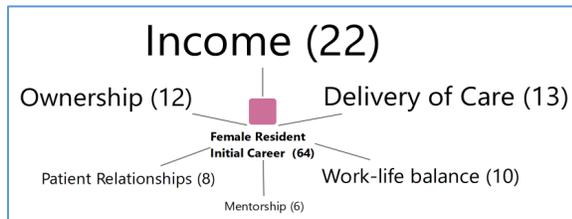
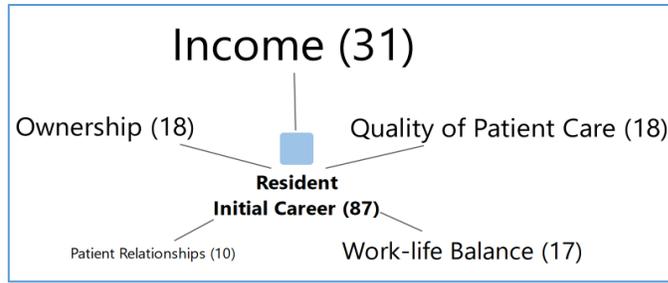
Qualitative data supports that residents, regardless of gender, are primarily influenced by income when choosing their initial career followed by ownership and quality of patient care (Figure 1). Work-life balance was also mentioned frequently by residents with males mentioning it slightly more than females. Quantitative data supports our qualitative data with residents placing importance on quality of patient care followed by income and work-life balance when choosing their initial career. Males value ownership more than females who place more value in mentorship. Later in life, working orthodontists value work-life balance and flexibility most when transitioning to a new job (Table 1). Inability to afford a practice, significantly influenced the decision of graduates to pursue employment rather than ownership, while gender and marriage status did not significantly influence career choice of residents (Figure 2). Quantitative data shows that over 80% of residents think about their debt often to all of the time and 65% report debt as stressful to extremely stressful (Figure 3). Qualitative data shows that current residents are considering employment positions more often than their predecessors who sought out ownership capacity sooner (Figure 4). Quantitative data shows fewer residents prepared to buy-out or start a practice following residency (Table 2). Despite this, co-occurrence data gathered from qualitative interviews identified autonomy, through ownership, as an important goal, with graduates delaying practice purchase and peak earnings to establish themselves financially and personally. Quantitative data confirms this with 57% of residents indicating plans to pursue ownership within two years of residency with that number rising to 94% within ten years of residency (Table 3). Ownership remains an ultimate career goal for residents. Qualitative and quantitative data positively correlate when it comes to job satisfaction of both residents and working orthodontists. Both agree that striking a balance between quality of patient care, financial success and work-life balance are key to overall happiness in the field, and over 80% of working orthodontists report they are very or extremely satisfied with their choice to enter the field.

In discussion, limitations of this study include recall bias and self-reporting. Recall bias was prevalent in both the qualitative and quantitative portions of this study. During interviews, we asked interviewees from the early and mid-career orthodontist categories to recall a variety of related topics linked to their initial career as an orthodontist. We asked them to recall initial

employment, initial income, debt at the time of graduation along with factors that were important to them at the time. Similarly, we requested that working orthodontists recall many of the same topics through our series of survey questions for quantitative data collection. Recall bias is prevalent in our study as comparisons were made with the orthodontic resident group. Self-reporting was also a limitation of our survey. We relied on both orthodontic residents and working orthodontists to self-report during both the interview and survey portions of our study. We are relying on accuracy of their self-reports when tabulating and conveying study conclusions. Lastly, we are pleased with our survey response rate, considering national distribution, and are thankful we had the opportunity to include a survey incentive to respondents. We relied on the AAOF Partners in Research program to distribute the survey, and it is possible that some respondents may have opted out from receiving email notifications, therefore not receiving the study. It is also possible that emails were routed to an individual's spam or junk and were never seen due to the electronic nature of the survey distribution. In addition, the length and complexity of our survey may have been a deterrent.

Our survey reveals important insight into the decision processes of graduating residents today and how that has changed from generations. Our data dispels the myth that an increase in females correlates to the decrease in ownership. Instead, we know student debt levels, which are likely to continue rising, are strongly influencing the decisions of graduating residents. In conclusion, this study supports the following:

1. Graduating orthodontic residents are choosing employment over ownership as their initial career decision. Orthodontic residents maintain long-term ownership goals.
2. Importance of patient care, necessity for adequate income, and desire for work-life balance are the most important factors for residents when choosing initial employment, regardless of gender. Working orthodontists highlight patient care, work-life balance, and ownership as most important considerations when making a job transition.
3. High student debt and decreased ownership opportunities have led to higher percentages of orthodontic residents pursuing employment opportunities after graduation. The majority of residents report their student debt responsibilities are very or extremely stressful. More than half of residents think about debt most to all of the time. The majority of working orthodontists no longer think about their student debt.
4. Work-life balance is important to both residents and working orthodontists. The desire to spend more quality time with family friends at the cost of income is contributed to increased job satisfaction later in one's career.

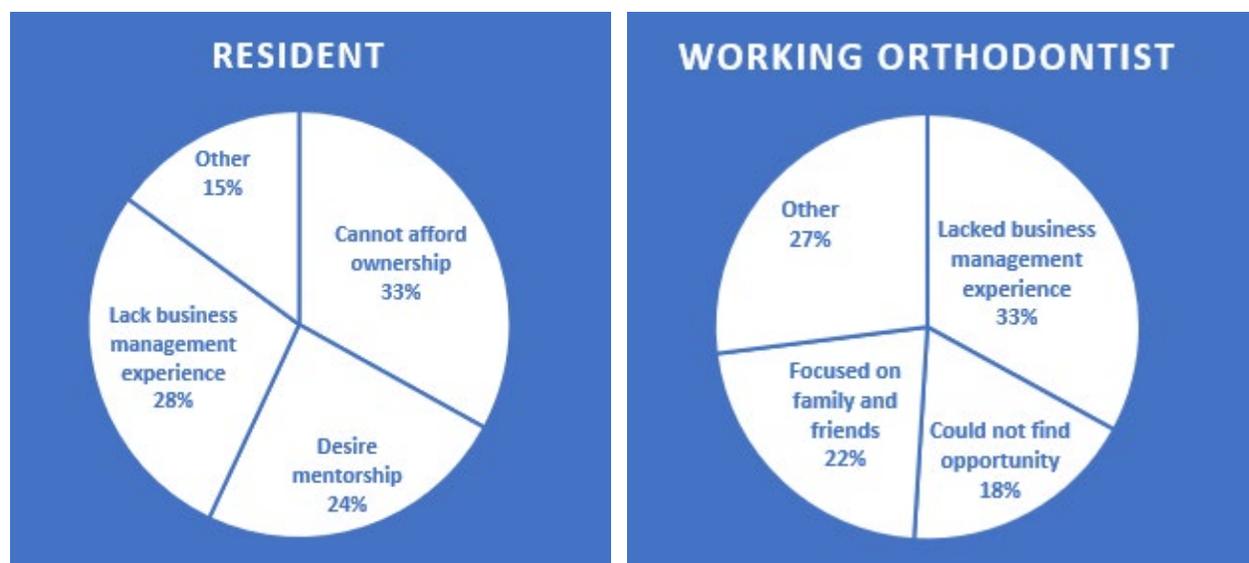


**Figure 1:** Initial career co-occurrence map. **A.** Resident co-occurrence map of initial career choice with income (30), ownership (18), quality of patient care (18), work-life balance (17), patient relationships (10). **B-C.** Female and male resident co-occurrence map breakdown, respectively. Text size is proportional to frequency of co-occurrences. Threshold of 15 co-occurrences

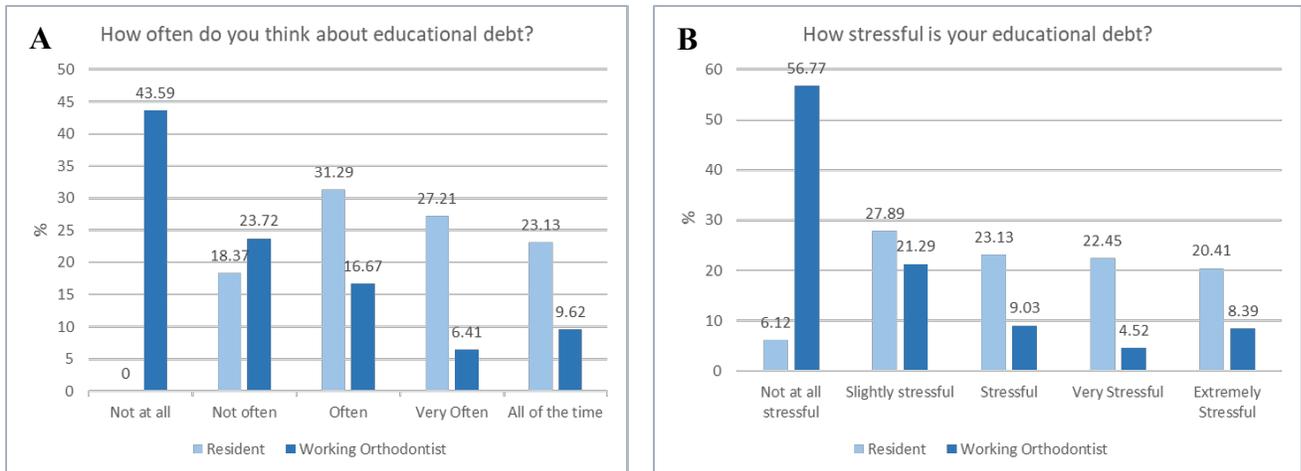
**Table 1: Factors Important to Initial & Current Career Choice**

	Residents				Working Orthodontics				R vs W
	All	Male	Female	p-value	All	Male	Female	p-value	p-value
<b>Initial career choice</b>									
Quality of patient care	2.3 (1.4)	2.4 (1.5)	2.3 (1.2)	0.731	2.4 (1.1)	2.3 (1.0)	2.7 (1.1)	0.002	0.423
Income	3.1 (1.4)	3.0 (1.5)	3.2 (1.3)	0.286	2.8 (1.6)	2.9 (1.6)	2.3 (1.4)	0.022	0.039
Work-life balance	3.2 (1.4)	3.4 (1.4)	3.0 (1.4)	0.075	3.3 (1.4)	3.3 (1.3)	3.4 (1.4)	0.593	0.316
Mentorship	3.3 (1.7)	3.7 (1.7)	2.7 (1.6)	<0.001	3.6 (1.9)	3.7 (1.9)	3.5 (2.0)	0.461	0.106
Ownership	4.0 (1.8)	3.4 (1.7)	4.8 (1.6)	<0.001	4.1 (1.8)	3.7 (1.8)	4.8 (1.5)	<0.001	0.655
Length of commute	5.1 (1.1)	5.1 (1.1)	5.1 (1.0)	0.631	4.8 (1.2)	5.0 (1.0)	4.3 (1.4)	<0.001	0.010
<b>Current employment choice</b>									

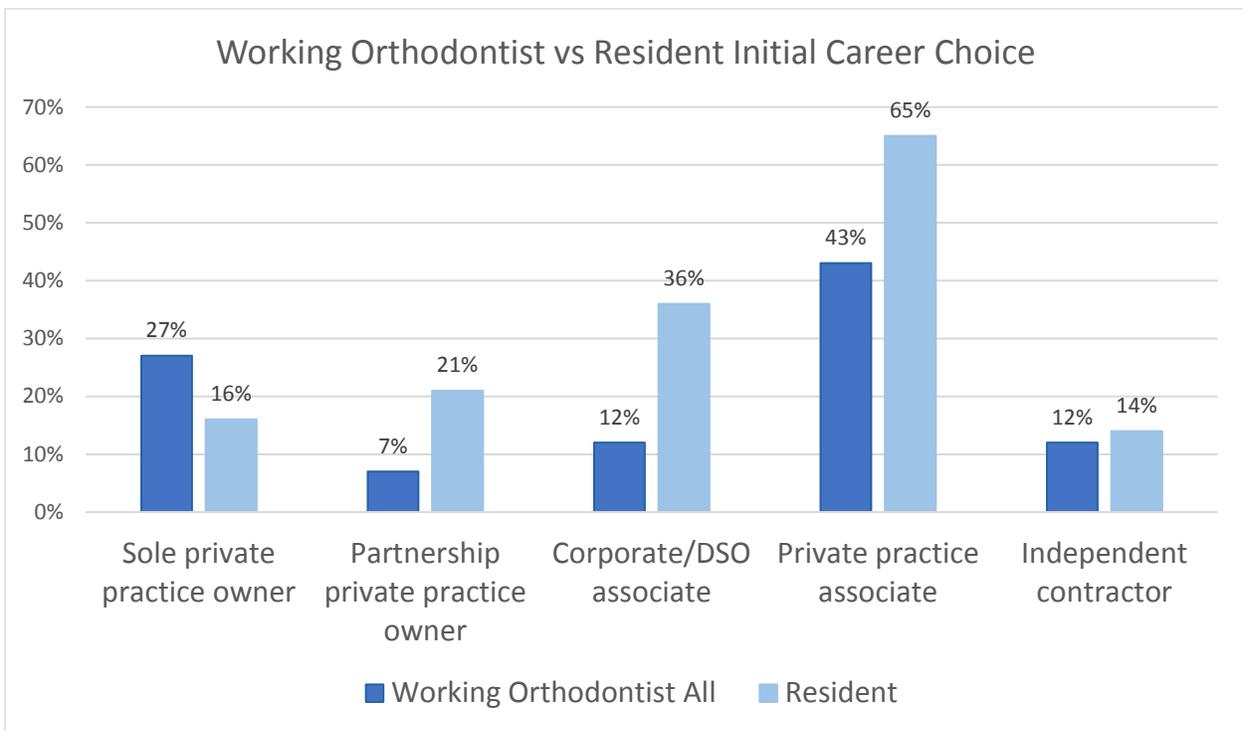
Quality of patient care					2.4 (1.1)	2.4 (1.1)	2.3 (1.0)	0.238	
Work-life balance					2.4 (1.2)	2.5 (1.2)	2.4 (1.3)	0.862	
Ownership					2.6 (1.6)	2.5 (1.6)	2.8 (1.7)	0.059	
Income					3.4 (1.2)	3.4 (1.1)	3.5 (1.3)	0.295	
Length of commute					4.9 (0.9)	5.1 (0.8)	4.7 (1.0)	<0.001	
Mentorship					5.2 (1.3)	5.2 (1.3)	5.3 (1.4)	0.824	



**Figure 2:** Factors contributing to perceptions of ownership unpreparedness. Residents are not pursuing ownership because they cannot afford it. Working orthodontists didn't pursue ownership because they lacked business management experience.



**Figure 3: Impact of educational debt. A.** The majority of residents report thinking about their educational debt often to all of the time. Working orthodontists reporting thinking about their educational debt not often or not at all. **B.** The majority of residents report educational debt as stressful to extremely stressful. The majority of working orthodontists consider educational debt not at all stressful.



**Figure 4: Initial career choice of Residents vs Working Orthodontists.** Residents are more frequently seeking initial career choice as associates. Working orthodontists, when considering their initial career, were less likely to gravitate toward employment and more likely to seek ownership capacity.

**Table 2: Perceptions on ownership preparedness**

	Resident				Working Orthodontist				R vs WO
	All	Male	Female	p-value	All	Male	Female	p-value	p-value
Do/did you feel prepared to buy-out/in following residency	35% n=61	48% n=47	19% n=14	<0.001	48% n=158	55% n=126	33% n=32	<0.001	0.009
Do/did you feel prepared to start a practice following residency	28% n=48	36% n=35	18% n=13	0.014	43% n=141	48% n=110	32% n=31	0.010	0.001

**Table 3: Long-term ownership plans of residents**

	Residents			
	All	Male	Female	p-value
Plan to pursue ownership in the next 2 years?	57% n=66	63% n=37	51% n=29	0.198
Plan to pursue ownership in the next 10 years?	94% n=47	95% n=21	93% n=26	0.701

**Respond to the following questions:****1. Were the original, specific aims of the proposal realized?**

The original specific aims were achieved. Please refer to results summary for further detail.

*Objective:* This study will identify distinct factors important to initial practice decisions of graduating orthodontic residents, and will provide guidance for future transition to a more permanent career decision.

*Aim 1:* Understand experiences and identify factors important to orthodontists at different career stages when choosing employment and ownership opportunities

*Aim 2:* Evaluate job satisfaction based on career trajectory and years post-residency

**2. Were the results published?**

The results have not yet been published. Final manuscript preparation is underway and will be submitted to AJODO. AAOF support will be acknowledged.

**3. Have the results of this proposal been presented?**

This work was presented by Dr. Catherine Campbell for her master's thesis defense on March 27, 2020 via a Zoom conference to the University of North Carolina, Chapel Hill Division of Craniofacial and Surgical Care. The Zoom presentation platform was used due to implications of the COVID-19 pandemic. Dr. Campbell delivered an oral presentation to the entire UNC Adams School of Dentistry for UNC's Dental Research in Review Day held on February 12, 2020. AAOF support was mentioned during both of these presentations. In

addition, her research has been accepted for poster presentation at the 2020 AAO Annual Session, where we additionally plan to acknowledge AAOF support. Due to COVID-19, the poster will be presented virtually and submitted as an e-poster.

*Title:* Understanding Factors Influencing Young Orthodontist Career Decisions

*Co-Authors:* Dr. Laura Jacox, Dr. Ching-Chang Ko, Dr. Feng-Chang Lin, Dr. Paul Mihas

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

I am incredibly grateful for the AAOF and their support of orthodontic residents like myself. This project stemmed from a comment made by a well-respected leader in the dental community who concluded that the decline in new dental graduates entering ownership opportunities is solely due to the rise in females entering the profession. Embarking on this project meant starting from ground zero. Dr. Jacox was instrumental in introducing me to the mixed methods approach of interviewing subjects for qualitative analysis prior to generalizing results through a quantitative approach. Funding from the AAOF provided the necessary support to fully execute this study. Once published, this study will provide helpful information for residents as they navigate employment options, for working orthodontists as they consider the next step in their career, and for educators who are influencing the decisions of young doctors. Working with the AAOF has been a wonderful experience, and I plan to further consider their resources as I move into my professional life as an orthodontist.

Dr. Jacox is dedicated to furthering research in our field and is the Proffit Fellow and newest orthodontic assistant professor at the University of North Carolina Adams School of Dentistry. Dr. Jacox has assumed the role of the founding Director of the Graduate Orthodontic Research Program further displaying her commitment and enthusiasm for resident research. Committed to academia, she acknowledges the opportunity to receive support is critical to residents as they develop meaningful research projects and is deeply appreciative of the support the AAOF has provided to her during residency and beyond. She is thankful for all the AAOF has done to further her career in orthodontic research and academia.

**Accounting for Project:** All funds were utilized for project expenses. Account balance is \$0.00.