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This is to certify that the thesis prepared by Gillian Rebecca Kelly, D.M.D., entitled Attire and appearance of orthodontists: a survey of parent preferences has been approved by her committee as satisfactory completion of the thesis requirement for the degree of Master of Science in Dentistry.

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ATTIRE AND APPEARANCE OF ORTHODONTISTS: A SURVEY OF
PARENT PREFERENCES

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science
in Dentistry at Virginia Commonwealth University.

by

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Abstract

ATTIRE AND APPEARANCE OF ORTHODONTISTS: A SURVEY OF PARENT PREFERENCES

by Gillian Rebecca Kelly, D.M.D.

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science
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Virginia Commonwealth University, 2013

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The objective of this study was to evaluate parents' preferences of the appearance and attire of orthodontists. Six subjects were asked to pose for photographs wearing various combinations of attire (casual, scrubs, white coat, formal), hairstyle and nametag. Survey participants were presented with choice sets and asked to select the most and least preferred provider photographs. A total of 77 parents of orthodontic patients participated in the computer-based survey. The results indicated that there were significant differences due to provider sex ($P = 0.0013$), provider age ($P < .0001$), dress ($P < .0001$), nametag ($P = 0.0065$) and hair ($P < .0001$). The most preferred providers were the younger female and the older male. Formal attire or scrubs was the most preferred style of dress. There was also a preference for the use of a nametag and for the provider to have his/her hair in a controlled style.

Introduction

The process of selecting an orthodontist is complex and multifactorial. Initial impressions are crucial in the relationship that develops between practitioners and potential patients. The orthodontic office is unique because the person selecting the practitioner is often not seeking treatment for themselves but rather in search of a provider for their child. Each parent may have his/her own set of criteria guiding the choice of a particular orthodontist. The way in which orthodontists present themselves may be an important consideration for some. Variations in attire and appearance may influence a parent's choice of an orthodontist and therefore may be of particular importance in an increasingly competitive orthodontic market. Attire and appearance have been studied thoroughly in the medical literature but few studies exist in the dental literature and presently none in the orthodontic literature.

The topic has long been considered important and dates back to Hippocrates who stated that the physician must be clean and well-dressed.¹ Furthermore, the white coat has been an accepted symbol of the medical practitioner in the Western world for more than 100 years.²

In the medical literature, the attire preference is towards a more formal type of dress. In a study that investigated parents' perceptions of pediatric emergency physicians' attire, it was found that parents favored the most formally dressed physicians.³ The least preferred mode of dress was doctors wearing no white laboratory coat, no tie and tennis shoes. These findings did not vary by demographic factors such as age, race, and gender.³ A 2005 study found that

patients prefer their physician dressed in a white coat with a nametag.⁴ Other studies have supported that traditional items such as a nametag, white coat, and visible stethoscope were considered the most desirable by patients in a family practice setting.⁵

A study conducted in Israel found that a physician with a shirt and tie under a white coat was the most preferred attire choice for males and a white coat with trousers and a blouse was preferred for female physicians. Study participants preferred both male and female physicians with nametags. A short haircut was the most preferred for both male and female physicians.²

A 2005 study conducted in an internal medicine outpatient setting in South Carolina indicated a clear preference for professional attire (shirt, neck tie and white coat for males; tailored trouser or skirt with white coat for females) with 76.3% of respondents reporting that as the most preferred style of dress. Surgical scrubs were preferred by 10.2% of respondents. Participants also stated they would be more comfortable to share personal health information with the physicians in professional attire.¹ Lill and Wilkinson⁶ also found that attire is becoming increasingly important as a greater proportion of women are entering the health professions. However, there is some ambiguity in the preferred professional dress style for females. In this study, the majority of patients (76%) preferred doctors to always wear a name badge and they preferred it to be worn on the breast pocket.⁶ There is also a trend away from medical paternalism resulting in fewer physicians opting to wear a white coat.

There are also several studies which examine attire and appearance from the standpoint of parents and children. In a study by McCarthy et al.,⁷ sixty percent of parents surveyed agreed that attire is important. Kuscu et al.⁸ found that children prefer healthcare providers in formal attire (45.6%). Marino et al.⁹ found that parents preferred formally dressed physicians and had a strong negative reaction to physicians dressed in informal attire.

Budny et al.¹⁰ found that patients reported that the following characteristics reduced their confidence in their physician: facial jewelry, visible tattoos, male earrings, nontraditional hairstyles, male facial hair and excessive female makeup. Overall, the data from the medical literature tends towards a preference of parents and children for a more formally dressed physician.

Unlike in hospital settings, dental practitioners are most often small business owners and determine their own dress code and appearance. Brosky et al.¹¹ in 2005 found that the majority of dental patients preferred either a white laboratory coat or surgical scrubs. Interestingly, about half of the patients surveyed answered neutrally when asked about hairstyle, makeup and jewelry.¹¹ In a 2007 study in the United Kingdom, it was found that the majority of dental patients surveyed most preferred the use of nametags and professional dress accompanied by a white coat.¹² The use of nametags was preferred by 93% of patients sampled.¹² Shulman and Brehm¹³ found that nametags were preferred particularly in practices with multiple doctors. In 2011, a study in Saudi Arabia found that 90% of children preferred their dentist to wear traditional formal attire with a white coat.¹⁴ To date, no surveys have specifically investigated parents' preferences toward the attire and appearance of the orthodontist.

In an increasingly competitive market, orthodontists must consider all factors that may influence a parent's choice in provider. Interestingly, a recent report indicated that the most important factor in choosing an orthodontist was actually that the "orthodontist *appears* competent, knowledgeable and confident."¹⁵ Thus, the attire and appearance of orthodontists is of utmost importance and preferences need to be examined further. Additionally, studies have shown that if patients view the appearance of their healthcare practitioner as inappropriate they

may be more likely to be critical of the service or to hold the person more accountable for an unfavorable outcome.⁴

To further complicate the dress decisions, a female orthodontist may want to differentiate herself from the orthodontic staff, which is predominantly female. This may be of critical importance particularly as the percentage of women in orthodontics increases. Variation in dress and consistent use of nametags may be one way to differentiate the female orthodontist from the female staff.

The objective of this study was to evaluate parents' preferences of the appearance and attire of the orthodontist. The intention is that the findings of this study may encourage an orthodontist to alter his/her appearance and attire to those styles that are most preferred by the public.

Materials and Methods

Two groups of subjects were involved in this study: 1) persons whose photographs were used for the survey (referred to as providers) and 2) parents of orthodontic patients that participated in the survey (referred to as evaluators). The survey was computer-based and taken by parents of patients at the initial screening visit to the VCU School of Dentistry Department of Orthodontics. The Institutional Review Board at the Virginia Commonwealth University approved this study.

A total of six persons served as providers (Table 1). These models were chosen to include a male and female representative from three age classifications (younger aged, middle aged, and older aged). All six providers were asked to sign the informed consent forms authorizing the investigators to use their photos in this study. Providers were informed of the purpose of the study and the potential use of their photographs in a scientific journal. Each of these providers was asked to dress in four types of dress (casual, scrubs, white coat, and formal). Casual attire consisted of a short sleeve polo shirt of a solid color. Formal attire, for the purposes of this study, was a collared shirt and tie for men and a button down collared blouse for women. The white coat was worn over the formal attire for the subset of photographs that required a white coat. Standard blue or green surgical scrubs were worn in photographs. The presence or absence of nametags was also varied. The six providers were also asked to wear their hair a certain way – either controlled or uncontrolled. For women, controlled meant that the hair was

pulled back off the face into a ponytail and uncontrolled meant that the hair was long and down around the face. For men, controlled meant the absence of facial hair and uncontrolled meant the presence of a mustache.

Table I: Persons used as providers

1. A Caucasian female of younger age
2. A Caucasian male of younger age
3. A Caucasian female of middle age
4. A Caucasian male of middle age
5. A Caucasian female of older age
6. A Caucasian male of older age

The primary aim of the study was to determine the effect of provider appearance and attire according to the following five dimensions: sex (male, female), age (younger, middle, older), dress (casual, scrubs, white coat, formal), nametag (nametag, no nametag), and hair (controlled, uncontrolled). Computer software exists to take all of the possible combinations and select the ones that would allow the investigator to determine the significance of each variable of interest. For this study, the design of experiments platform in JMP software was used and it was determined that a total of 12 choice sets would be sufficient to determine significance. The survey evaluator was shown each of these choice sets. Each choice set of four provider photographs was presented to the evaluator and they were asked to choose the one they most preferred and the one they least preferred. In order to assess repeatability, an additional 13th choice set was used as a control to determine if a repeated presentation would yield the same results. The characteristics of the four photographs used in the first choice set are shown below

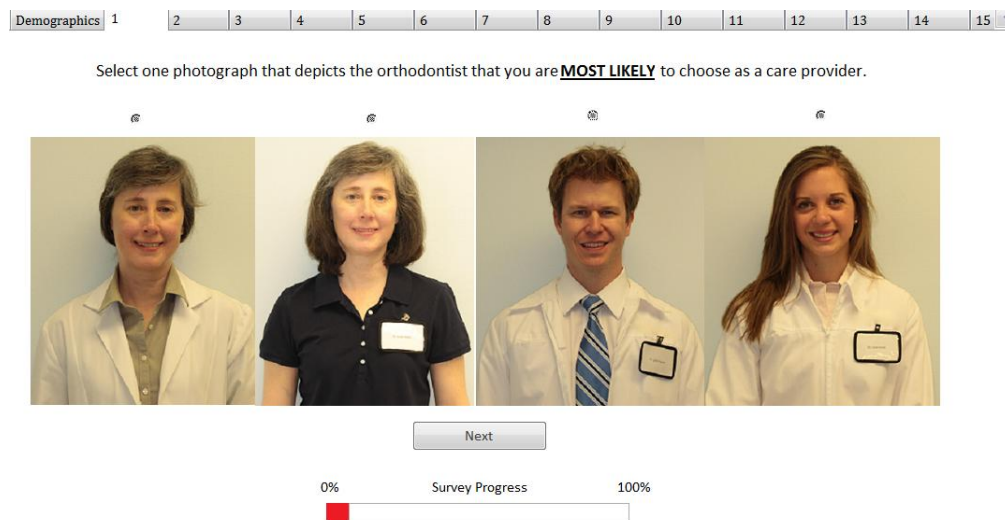
in Table II. The characteristics of the remaining choice sets 2-13 can be seen in Table A1 in the Appendix.

Table II: Provider characteristics in the first choice set displayed to each evaluator

Choice Set	Provider Characteristic				
	Sex	Age	Dress	Nametag	Hair
1	Female	Older	White Coat	No Nametag	Controlled
1	Female	Older	Casual	Nametag	Uncontrolled
1	Male	Younger	White Coat	Nametag	Controlled
1	Female	Younger	White Coat	Nametag	Uncontrolled

For example, choice set 1 is shown in Figure 1. The left-hand image is of an older female in a white coat without a nametag and with her hair controlled. The second image in from the left is of an older female in casual attire with a nametag and her hair uncontrolled. The second image in from the right is of a younger male in a white coat with a nametag and his hair controlled. The right-hand image is of a younger female in a white coat and nametag with her hair uncontrolled. The photographs for the remaining choice sets (2-13) can be seen in Figure A1 in the Appendix.

Figure 1: Choice set 1



The evaluators (parents) were only permitted to take the survey once. The information collected was stored in a Microsoft Access database and transferred to SAS software for analysis. All accumulated data was password protected and no identifying information was collected. The digital survey started with a short series of demographic questions. Parent age, parent sex, parent race, parent ethnicity, parent educational level, and parent income were recorded. The remainder of the survey asked the parent to consider the 13 choice sets each of which contained the four photographs described above. The survey asked the parent to “Select the one photograph that depicts the orthodontist that you are **MOST LIKELY** to choose as a care provider.” The same four photographs were presented again and the prompt changed to “Select the one photograph that depicts the orthodontist that you are **LEAST LIKELY** to choose as a care provider.” Each of the four photographs was then assigned a numerical score for the purpose of analysis: +1 for the photograph chosen for most likely, -1 for the photograph chosen for least likely, and 0 for the remaining two photographs.

The primary aim of the study was to determine the significance of each of the five provider characteristics (gender, age, dress, nametag, and hair). The outcome variable was the preference score (+1, 0, and -1). A secondary aim was to determine if preference differences associated with provider characteristics were consistent across the demographic groups. The following evaluator characteristics were considered: parent sex, parent age, parent ethnicity, parent race, parent educational level, and parent income level. The analysis of these specific aims was accomplished using a repeated-measures mixed-model (SAS Proc Mixed) that accounted for the correlations between the 13 choice sets and the four images within each choice set. The primary analysis included the following factors: the five provider characteristics (gender, age, dress, nametag, and hair), all possible two-way interactions between the provider

characteristics, and the interaction between each of the five provider characteristics and the evaluator demographics.

Results

A total of 86 parents participated as evaluators. Nine people were eliminated from the analysis due to incomplete responses and therefore 77 evaluators were included in all subsequent analyses. Their characteristics are shown in Table III.

Table III: Demographic characteristics of the evaluators (n=77)

Demographic	N	%
Sex		
Female	62	81
Male	15	19
Age (years)	N	%
<25	8	10
26-30	2	3
31-35	11	14
36-40	13	17
41-45	22	29
46-50	14	18
51-54	5	6
>55	2	3
Ethnicity		
Hispanic or Latino	9	13
Not Hispanic or Latino	61	87
Race ¹		
American Indian or Alaska Native	0	0
Asian	2	3
Black or African American	25	32
White	45	58
Education		
Some high school	8	11
High school graduate	17	22
Some college	23	30
College graduate	19	25
Advanced degree	9	12
Income		

< \$20,000	20	26
\$20,000-39,999	15	20
\$40,000-59,999	15	20
\$60,000-79,000	5	7
\$80,000-99,999	9	12
\$100,000-119,999	5	7
>=\$120,000	7	9

¹ Percentages may not total to 100 since race as indicated as “check all that apply”

Each evaluator ranked the four images from +1.0 (most likely), to 0 (no preference), to -1 (least likely). Although it was possible to have an average rank of 1.0 if all evaluators indicated that the image of the provider was “most likely”, the highest mean rank was 0.58. For this image, 50 evaluators (out of 77) indicated “most likely”, 22 indicated neither, and five indicated “least likely”. This most preferred image depicted the male of middle age wearing formal attire with a nametag and controlled hair. Similarly, it was possible to have an average rank of -1.0 if all evaluators indicated the image of the provider as “least likely.” However, the lowest average rank observed was -0.65 where 52 (out of 77) indicated “least likely,” 23 indicated neither, and five indicated “most likely”. The least preferred image was the middle age male wearing casual attire, no nametag, and uncontrolled hair. The raw scores and average ranks for all of the pictures are given in Table A2 in the Appendix.

The third choice set was repeated at the end of the study as the 13th choice set. A repeated-measures mixed-model analysis compared the average rank between the two control choice sets and found that there was no difference among the four pictures between the two choice sets ($P = 0.378$). Sixty-six percent (204/308) of the rankings were identical across the same images in the two choice sets ($Kappa = 0.45, P < .0001$).

The initial analysis used a repeated-measures mixed-model ANOVA which tested for the provider differences as well as the effects of the demographic characteristics of the evaluators.

For the analysis, only the race groups Asian, Black, and White were used since none of the

evaluators indicated membership in any of the other racial groups. The analysis indicated that the provider differences did not depend upon any of the characteristics of the evaluators except for a single interaction between evaluator education and provider gender (Appendix Table A3). Out of 40 interaction tests performed, this was the only interaction that was statistically significant ($P = 0.0168$). There was a differential preference for male and female providers depending upon the educational level of the evaluator. In particular, females were preferred over males in all education groups but the magnitude of the difference varied. In those with some high school, the preference for female providers was the largest, those who were high school or college graduates had an intermediate difference, and those with advanced degrees had the smallest difference. It also indicated that the differential preference between male and female providers did not depend upon the sex of the evaluator ($P = 0.8213$). Despite the single interaction described above, there was overall homogeneity of the responses of all persons (regardless of the various demographic groups they belonged to). Therefore, it was decided to combine all of the evaluators into one group for further analysis. In other words, the differences in evaluator age, sex, race, ethnicity, education level, and income level did not change their preferences for a particular provider. The demographics collected were only used to assess the characteristics of the sample population.

The analysis included identifying the effects of the provider factors and all two-way interactions between provider factors. The results of the analysis indicated that there were significant differences due to provider sex ($P = 0.0013$), age ($P < .0001$), dress ($P < .0001$), nametag ($P = 0.0065$), and hair ($P < .0001$) (Appendix Table A4). All of the provider variables examined were found to be statistically significant (Table IV). There were also cases in which there was an interaction between multiple variables (for example, that provider preferences due

to age, dress, and hair were not consistent across provider sex ($P < .0001$). There were a significant number of interactions between the variables examined (Appendix Table A4).

The results separate the five variables examined into those factors that cannot be altered by the provider (age and sex) and those that can be altered (dress, nametag and hair control). First, the unalterable provider characteristics (age and sex) are briefly examined. This will be followed by a detailed examination of the characteristics that can be changed by the providers (dress, nametag, and hair).

Table IV: Analysis of provider effects

Effect	Num DF	Den DF	F	P- value*
Gender	1	2292	22.41	<.0001
Age	2	2068	14.68	<.0001
Gender*Age	2	2238	53.76	<.0001
Dress(Gender*Age)	18	2302	14.85	<.0001
Nametag(Gender*Age)	6	2257	7.73	<.0001
Hair(Gender*Age)	6	2197	14.39	<.0001

*Repeated-measures mixed-model ANOVA.

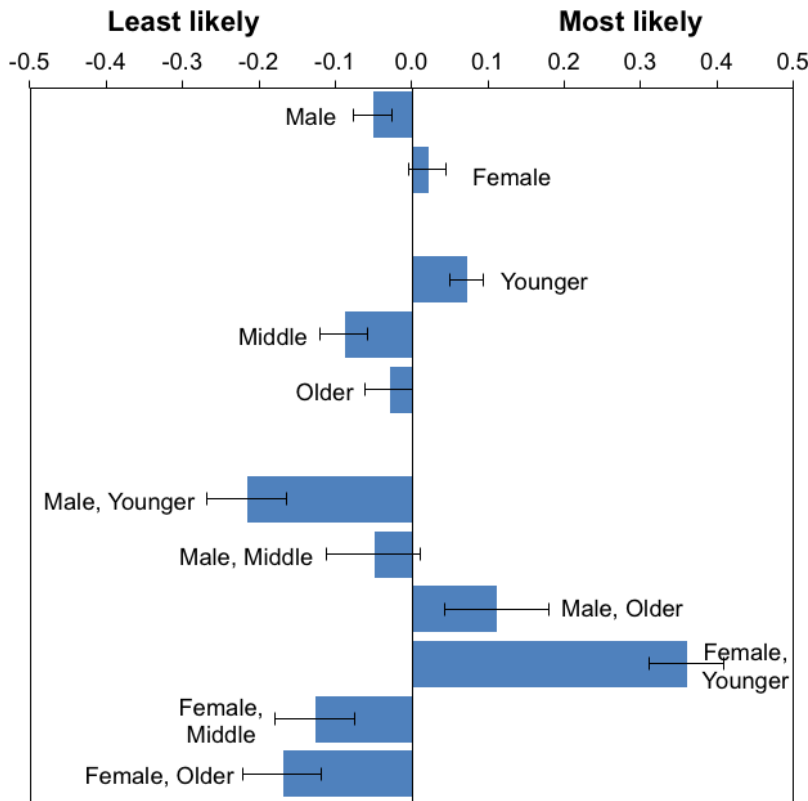
The evaluator preferences for each sex and age category are shown in Table V and Figure 2. It can be seen from the analysis that in terms of provider sex there was an overall preference for female providers. As seen in Figure 2, when averaging across the three ages, the estimated preference for males is -0.05 —that is, that “least likely” preference dominates—and the estimated preferences for females is $+0.02$ —where “most likely” preference dominates. There were also evaluator preferences in terms of provider age. When combining the sexes, there was an overall preference for the younger providers. There were also significant two-way interactions between sex and age. The most preferred providers were the younger female and the older male. This indicates that for males, there was a preference against younger providers and

towards older providers. For females, the interpretation was reversed and there was a preference for younger providers.

Table V: Effect of provider sex and age

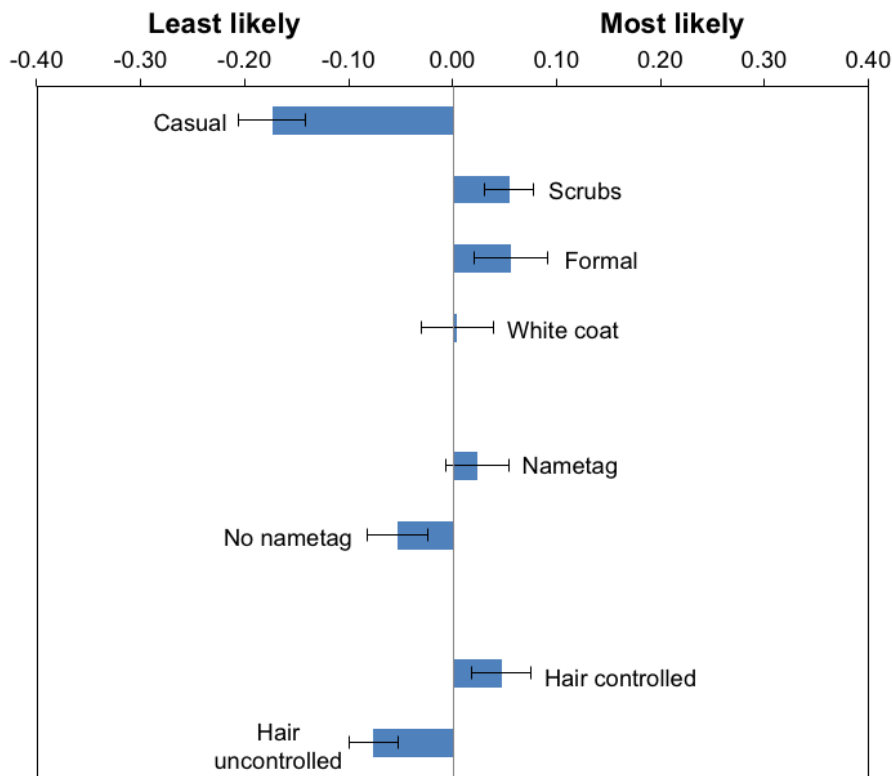
Provider	Estimate	SE	95% CI
Male	-0.051	0.013	(-0.076 to -0.026)
Female	0.022	0.012	(-0.002 to 0.046)
Younger	0.073	0.011	(0.051 to 0.094)
Middle	-0.088	0.016	(-0.119 to -0.058)
Older	-0.028	0.016	(-0.059 to 0.003)
Male Younger	-0.215	0.026	(-0.267 to -0.164)
Male Middle	-0.049	0.031	(-0.111 to 0.012)
Male Older	0.112	0.035	(0.044 to 0.180)
Female Younger	0.361	0.025	(0.312 to 0.409)
Female Middle	-0.127	0.026	(-0.178 to -0.075)
Female Older	-0.168	0.026	(-0.220 to -0.117)

Figure 2: Effect of sex and age (estimated preference)



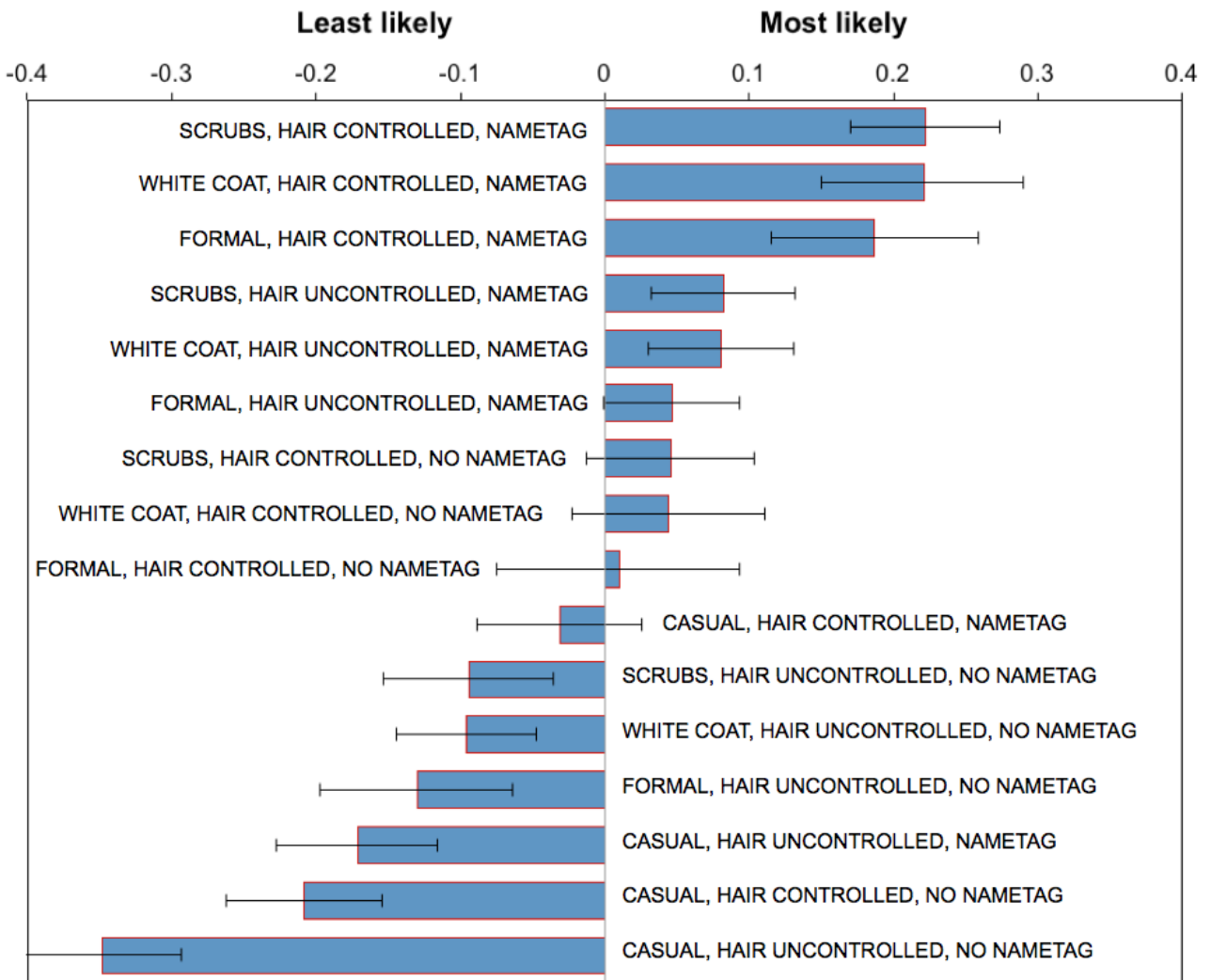
The next component of the analysis was to examine the evaluator preferences for the variables that a provider can control (dress, nametag and hair). When removing the effects of age and sex of the provider, evaluators indicated significantly different preferences depending upon dress ($P < .0001$), nametag ($P < .0001$), and hair ($P < .0001$). Figure 3 demonstrates the overall preferences for evaluators. As may be seen in that figure, casual dress was the least preferred style. Scrubs and formal attire were both preferred styles. The evaluators did not indicate a preference one way or the other regarding the use of a white coat. Furthermore, one can see that wearing a nametag was desirable and similarly not wearing a nametag was undesirable. In terms of hair, there was a general preference for controlled hair and a negative response associated with uncontrolled hair.

Figure 3: Effect of dress, nametag, and hair control



A practitioner's appearance includes the combination of all three factors: dress, nametag, and hair. Therefore, all of these combinations can be ranked from most preferred to least preferred. This ordering is shown in Figure 4 and Table A5 (Table A5 is in the Appendix). The most preferred styles were providers that all had controlled hair and wore a nametag, and were dressed in scrubs, white coat, or formal attire. All of the photographs that depicted providers with casual dress had consistently negative ratings.

Figure 4: Combined effect of dress, nametag, and hair control



While the general preferences were noted above, there were some preferences that do not appear to be uniform across the six providers used in the images. The significance of dress, nametag, and hair control is shown separately for each sex and age in Table VI. Generally, it was noted that there was a preference for controlled hair, however, this was not found in the younger female ($P > 0.4946$) or the older male ($P > 0.6480$). Furthermore, dress was an important variable for each of the providers, except for the young female ($P > 0.3610$). In fact, there were no significant differences between the modes of dress for the younger female provider. Generally, there were preferences for a nametag except in younger practitioners ($P > .9313$) and the older female ($P > 0.0728$).

Table VI: Significance of provider characteristics and within each sex and age group (P-values)

Characteristic	Provider					
	Male			Female		
	Younger	Middle	Older	Younger	Middle	Older
Dress	<.0001	<.0001	<.0001	0.3610	0.0087	<.0001
Nametag	0.4555	<.0001	0.0145	0.9313	<.0001	0.0728
Hair	<.0001	0.0021	0.6480	0.4946	0.0006	0.0186

Discussion

The results of this study indicated that parents have preferences in terms of the attire and appearance of orthodontic providers. In fact, no other studies have examined these variables in orthodontics and therefore these findings may have tremendous implications. Every variable examined in this study (age, sex, dress, nametag, and hair) showed statistically significance in terms of preferences. Parents had clear positive and negative preferences for all of the alterable characteristics examined (dress, nametag, and hair). Specifically, there was a positive preference for scrubs, formal attire, controlled hair and the use of a nametag. There was a negative preference associated with casual attire, uncontrolled hair and the absence of a nametag.

The investigation into the unalterable provider characteristics (sex and age) also revealed significant differences. There was an overall preference for female providers. This is consistent with a recent dental study which found a similar preference for female dentists.¹⁶ While this preference is likely multifactorial, it may be related to the previous finding that female dentists were more likely to be seen as possessing empathy-related traits.¹⁷ Female dentists were also perceived as having more effective communication and calming skills.¹⁷ This may be particularly relevant as those surveyed in this study were parents seeking practitioners for their children and may consider these traits desirable. There was an overall preference for younger providers. These results are in accordance with previous studies in the dental literature which found an overall preference for younger dentists.¹⁸ This preference may reflect a predilection for

younger providers who are perceived by the public as most up to date with recent advances and modern techniques.

Parents were chosen as evaluators because they make the healthcare decisions for their children. The vast majority of evaluators were females (81%) as often mothers accompany their children to doctors' appointments. Of the forty demographic interaction tests performed, there was only a single significant interaction between provider gender preference and the educational level of the evaluator. Those evaluators with less than a high school education had a stronger preference for female providers as opposed to those with advanced degrees. Interestingly, there was an interaction between the preference for provider gender and the educational level of the evaluator. In other words, female orthodontists were preferred to a greater extent by those evaluators with low educational levels. This finding may be related to the fact that gender stereotypes may still exist in some socioeconomic groups. Perhaps more educated evaluators are more likely to retain gender stereotypes and perceive female practitioners as less competent than male practitioners. All of the other demographic characteristics of the evaluators did not matter in terms of their preferences for a particular provider. This finding is in agreement with previous studies that demographic characteristics did not play a role in the choice of a care provider based on attire.³ Parents of all ages and socioeconomic levels chose practitioners that care for their children based on their attire and appearance. Therefore, a clinician must carefully consider the implications of appearance.

By design, the images used in this study were constructed using six individual models. Every attempt was made to select representative individuals for each age and sex category. However, the authors acknowledge that there may be some inherent bias in the subject selection due to a lack of formal randomization. Thus, there are two equally plausible conclusions that

support the data. The first possibility is that, for example, the young female selected is representative of all young females and therefore any findings related to her may be interpreted as the same for any young female provider. The second equally plausible possibility is that that particular young female was selected or not selected due to some inherent characteristic or characteristics that other young females may or may not have. Due to this potential bias, the most applicable findings can be taken when examining the controllable factors alone (dress, nametag, and hair). However, an analysis of how these controllable factors were differentially preferred among the six providers may still be relevant and will be discussed.

Our results demonstrate that for the young female none of the controllable factors mattered (i.e. dress, nametag, and hair). Perhaps the young female practitioner does not have to consider her attire as much as other practitioners because her youthful appearance is what appeals to parents rather than her attire. However, attire was a significant factor for the other five providers and therefore should be considered of utmost importance. The use or absence of a nametag did not appear to matter for the younger providers and the older female. Perhaps, this is again because younger providers are inherently more desirable and thus they did not need external factors like a nametag to make them more desirable as a potential provider. Controlled hair was always preferred except in the case of the older male and the younger female. It may be speculated from this finding that certain styles are age appropriate. It may be more acceptable and more common to see a young female with long hair as opposed to older females which may explain the lack of preference for hair control in the young female. Similarly, it is more common to see an older male with a mustache than it is a younger male and perhaps, this accounts for the finding that parents did not mind uncontrolled hair in the older male. The older male may have also been preferred because he personifies experience and competency. Either

way, a practitioner has to use his or her own judgment when making individual style decisions. The intention of this study was to guide the practitioner into making attire and appearance decisions which are most appealing to parents and appropriate for a professional environment.

There was an overall preference for the use of a nametag. The top six rated photographs all had subjects wearing a nametag. The preference for a nametag is in accordance with multiple other studies in both the medical and dental literature.^{2,6,12,13} Identifying information, such as a nametag, may be of particular importance for female providers as the majority of medical, dental, and orthodontic support staff members are also females. This leads one to believe that parents want to be able to identify the orthodontist by name and distinguish him or her from the staff. Introducing nametags into an orthodontic practice would be a very simple and practical way to be more preferable to parents and therefore the findings presented should encourage practitioners to wear nametags if they are not already doing so.

There was also an overall preference for controlled hair. In other words, there was a preference for male practitioners to be clean-shaven without facial hair and for female practitioners to wear their hair in a neat tied back fashion. This finding is actually inconsistent with the medical literature which found that patients were neutral about the presence of a mustache on a male physician and long hair in a female physician.⁵ Perhaps this discrepancy is due to the fact that orthodontic providers have much closer contact to patients and therefore presence of uncontrolled hair may be perceived as less hygienic. Controlled hair is the overall preference for both sexes in the orthodontic setting which may be related to the physical proximity of the dentist to the patient in the dental chair. Therefore, providers should be cognizant of their appearance and avoid uncontrolled hair in the orthodontic office.

By far the least preferred style of dress was casual which is consistent with many previous studies.^{1-6,9,12} The use of casual attire in practices may have come from the feared white coat syndrome which was thought to be present among both adults and children. However, our study and others have confirmed that people do not fear white coats but instead often times prefer them.^{5,14}

Parents prefer an orthodontist in formal attire or scrubs more than an orthodontist dressed casually. Based on these results, a practitioner may wish to reconsider the choice of attire and consider a more formal, professional dress. The orthodontist should always wear a nametag for identification, as it was a desirable trait according to parents of orthodontic patients. The use of a nametag was perceived as preferable by parents and may help them to identify and differentiate between the orthodontist and the staff. Additionally, the orthodontist should always wear his or her hair in a controlled fashion to be most appealing to patients' parents. These attire preferences are based upon classic and traditional styles and therefore will likely remain similar for the foreseeable future. The findings from this study clearly indicate that parents of patients do have significant preferences for a formal and professional appearance of orthodontic practitioners that they choose to care for their children.

Conclusions

- In this study, the demographic characteristics of the evaluators did not influence the choice of the most and least preferred providers.
- The most preferred providers were the younger female and the older male.
- There was an overall positive preference for the following: scrubs, formal attire, controlled hair, and the use of a nametag.
- There was an overall negative preference for the following: casual attire, uncontrolled hair and the absence of a nametag.

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Appendix

Table A1: Provider characteristics of choice sets 2-13 displayed to each evaluator

Choice Set	Provider Characteristic				
	Sex	Age	Dress	Nametag	Hair
2	Male	Younger	Scrubs	Nametag	Uncontrolled
2	Female	Younger	Scrubs	Nametag	Controlled
2	Female	Middle	Scrubs	No Nametag	Controlled
2	Male	Older	Scrubs	No Nametag	Uncontrolled
3	Male	Younger	White Coat	No Nametag	Uncontrolled
3	Female	Younger	Formal	Nametag	Uncontrolled
3	Male	Younger	Formal	Nametag	Controlled
3	Female	Younger	Scrubs	No Nametag	Uncontrolled
4	Male	Older	Casual	Nametag	Controlled
4	Male	Younger	Scrubs	No Nametag	Controlled
4	Female	Younger	Casual	No Nametag	Uncontrolled
4	Male	Younger	Casual	Nametag	Uncontrolled
5	Female	Younger	White Coat	No Nametag	Controlled
5	Female	Middle	White Coat	No Nametag	Uncontrolled
5	Male	Middle	White Coat	Nametag	Uncontrolled
5	Female	Older	Formal	Nametag	Controlled
6	Male	Middle	Scrubs	No Nametag	Uncontrolled
6	Male	Older	Scrubs	Nametag	Controlled
6	Female	Middle	White Coat	No Nametag	Controlled
6	Female	Middle	Formal	Nametag	Uncontrolled
7	Male	Younger	Formal	No Nametag	Uncontrolled
7	Male	Middle	Formal	Nametag	Controlled
7	Male	Younger	Casual	No Nametag	Controlled
7	Female	Middle	Formal	No Nametag	Controlled
8	Female	Middle	Casual	Nametag	Uncontrolled
8	Male	Middle	Formal	No Nametag	Uncontrolled
8	Female	Middle	Casual	No Nametag	Controlled
8	Female	Younger	Formal	No Nametag	Controlled
9	Male	Middle	Casual	No Nametag	Uncontrolled
9	Female	Older	White Coat	Nametag	Uncontrolled
9	Male	Middle	White Coat	No Nametag	Controlled

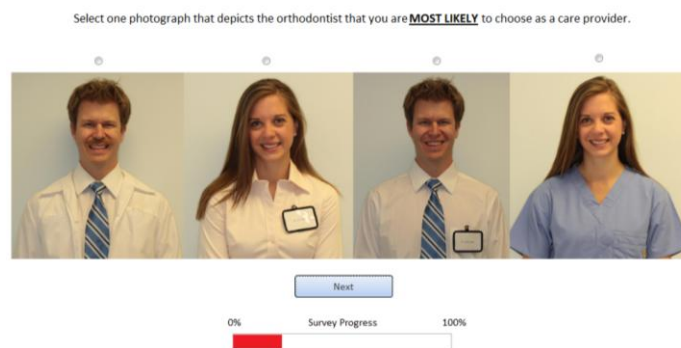
9	Male	Older	White Coat	Nametag	Controlled
10	Male	Middle	Casual	Nametag	Controlled
10	Male	Older	Scrubs	Nametag	Controlled
10	Female	Middle	Scrubs	Nametag	Uncontrolled
10	Female	Older	Scrubs	No Nametag	Controlled
11	Male	Older	Formal	Nametag	Uncontrolled
11	Male	Middle	Formal	No Nametag	Controlled
11	Male	Older	White Coat	Nametag	Uncontrolled
11	Female	Older	Casual	No Nametag	Controlled
12	Female	Younger	Casual	Nametag	Controlled
12	Female	Older	Formal	No Nametag	Uncontrolled
12	Male	Older	Casual	No Nametag	Uncontrolled
12	Female	Older	Scrubs	Nametag	Uncontrolled
13	Male	Younger	White Coat	No Nametag	Uncontrolled
13	Female	Younger	Formal	Nametag	Uncontrolled
13	Male	Younger	Formal	Nametag	Controlled
13	Female	Younger	Scrubs	No Nametag	Uncontrolled

Figure A1: Choice sets 2-13

Choice Set 2



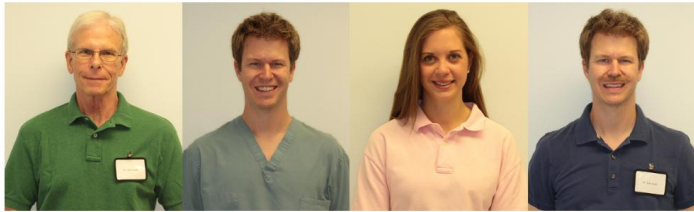
Choice Set 3



Choice Set 4

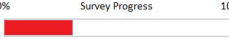
Select one photograph that depicts the orthodontist that you are **MOST LIKELY** to choose as a care provider.

○ ○ ○ ○



Next


0% Survey Progress 100%



Choice Set 5


Select one photograph that depicts the orthodontist that you are **MOST LIKELY** to choose as a care provider.

○ ○ ○ ○



Next


0% Survey Progress 100%



Choice Set 6


Select one photograph that depicts the orthodontist that you are **MOST LIKELY** to choose as a care provider.

○ ○ ○ ○



Next


0% Survey Progress 100%



Choice Set 7

Select one photograph that depicts the orthodontist that you are **MOST LIKELY** to choose as a care provider.

Four small circular icons are positioned above the photographs.



Next


0% Survey Progress 100%

A red progress bar is shown below the text, indicating approximately 25% completion.

Choice Set 8

Select one photograph that depicts the orthodontist that you are **MOST LIKELY** to choose as a care provider.

Four small circular icons are positioned above the photographs.



Next


0% Survey Progress 100%

A red progress bar is shown below the text, indicating approximately 25% completion.

Choice Set 9

Select one photograph that depicts the orthodontist that you are **MOST LIKELY** to choose as a care provider.

Four small circular icons are positioned above the photographs.



Next

0% Survey Progress 100%

A red progress bar is shown below the text, indicating approximately 25% completion.

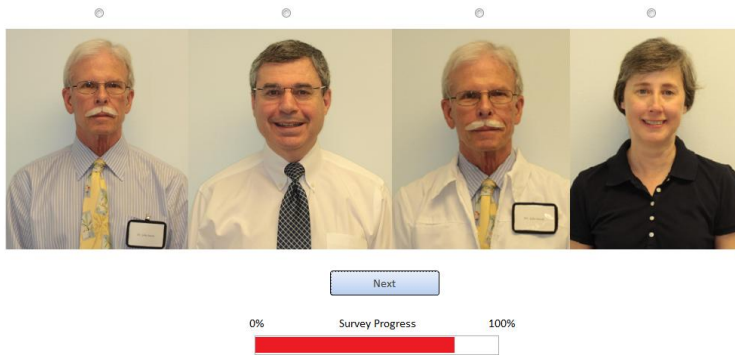
Choice Set 10

Select one photograph that depicts the orthodontist that you are **MOST LIKELY** to choose as a care provider.



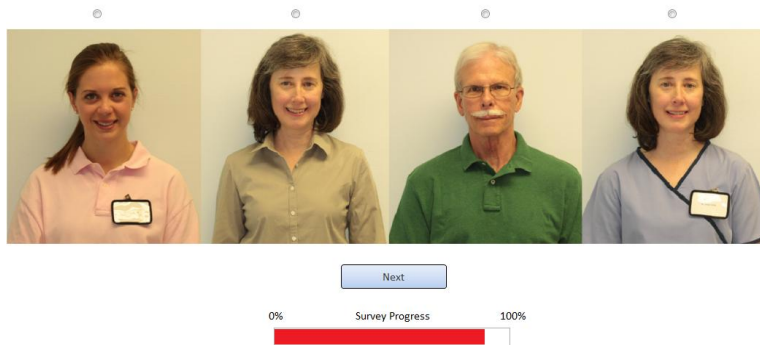
Choice Set 11

Select one photograph that depicts the orthodontist that you are **MOST LIKELY** to choose as a care provider.



Choice Set 12

Select one photograph that depicts the orthodontist that you are **MOST LIKELY** to choose as a care provider.



Choice Set 13

Select one photograph that depicts the orthodontist that you are **MOST LIKELY** to choose as a care provider.

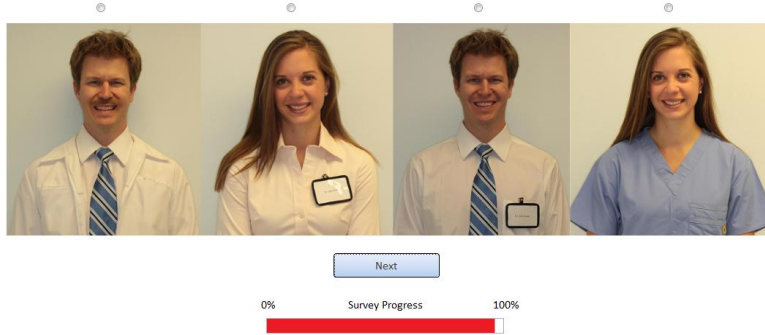


Table A2: Raw responses for each choice set

Sex	Age	Dress	Nametag	Hair	Choice set	Rank			Mean	SD
						-1	0	+1		
Female	Younger	Scrubs	Nametag	Controlled	2	9	36	32	0.30	0.67
Female	Younger	Scrubs	No nametag	Uncontrolled	3	4	46	27	0.30	0.56
Female	Younger	Scrubs	No nametag	Uncontrolled	13	6	55	16	0.13	0.52
Female	Younger	Casual	Nametag	Controlled	12	16	30	31	0.19	0.76
Female	Younger	Casual	No nametag	Uncontrolled	4	10	40	27	0.22	0.66
Female	Younger	Formal	Nametag	Uncontrolled	3	10	37	30	0.26	0.68
Female	Younger	Formal	Nametag	Uncontrolled	13	9	32	36	0.35	0.68
Female	Younger	Formal	No nametag	Controlled	8	7	36	34	0.35	0.64
Female	Younger	White coat	Nametag	Uncontrolled	1	10	27	40	0.39	0.71
Female	Younger	White coat	No nametag	Controlled	5	7	36	34	0.35	0.64
Female	Middle	Scrubs	Nametag	Uncontrolled	10	20	34	23	0.04	0.75
Female	Middle	Scrubs	No nametag	Controlled	2	17	50	10	-0.09	0.59
Female	Middle	Casual	Nametag	Uncontrolled	8	23	39	15	-0.10	0.70
Female	Middle	Casual	No nametag	Controlled	8	27	45	5	-0.29	0.58
Female	Middle	Formal	Nametag	Uncontrolled	6	12	49	16	0.05	0.60
Female	Middle	Formal	No nametag	Controlled	7	17	48	12	-0.06	0.61
Female	Middle	White coat	No nametag	Controlled	6	20	48	9	-0.14	0.60
Female	Middle	White coat	No nametag	Uncontrolled	5	39	34	4	-0.45	0.60
Female	Older	Scrubs	Nametag	Uncontrolled	12	5	42	30	0.32	0.59
Female	Older	Scrubs	No nametag	Controlled	10	19	52	6	-0.17	0.55
Female	Older	Casual	Nametag	Uncontrolled	1	30	40	7	-0.30	0.63
Female	Older	Casual	No nametag	Controlled	11	38	21	18	-0.26	0.82
Female	Older	Formal	Nametag	Controlled	5	17	50	10	-0.09	0.59
Female	Older	Formal	No nametag	Uncontrolled	12	16	52	9	-0.09	0.57
Female	Older	White coat	Nametag	Uncontrolled	9	8	44	25	0.22	0.62

Sex	Age	Dress	Nametag	Hair	Choice set	Rank			Mean	SD
						-1	0	+1		
Female	Older	White coat	No nametag	Controlled	1	11	49	17	0.08	0.60
Male	Younger	Scrubs	Nametag	Uncontrolled	2	29	41	7	-0.29	0.63
Male	Younger	Scrubs	No nametag	Controlled	4	8	41	28	0.26	0.64
Male	Younger	Casual	Nametag	Uncontrolled	4	43	31	3	-0.52	0.58
Male	Younger	Casual	No nametag	Controlled	7	25	45	7	-0.23	0.60
Male	Younger	Formal	Nametag	Controlled	3	15	49	13	-0.03	0.61
Male	Younger	Formal	Nametag	Controlled	13	10	51	16	0.08	0.58
Male	Younger	Formal	No nametag	Uncontrolled	7	29	40	8	-0.27	0.64
Male	Younger	White coat	Nametag	Controlled	1	22	43	12	-0.13	0.66
Male	Younger	White coat	No nametag	Uncontrolled	3	47	23	7	-0.52	0.66
Male	Younger	White coat	No nametag	Uncontrolled	13	46	22	9	-0.48	0.70
Male	Middle	Scrubs	No nametag	Uncontrolled	6	33	35	9	-0.31	0.67
Male	Middle	Casual	Nametag	Controlled	10	24	43	10	-0.18	0.64
Male	Middle	Casual	No nametag	Uncontrolled	9	52	23	2	-0.65	0.53
Male	Middle	Formal	Nametag	Controlled	7	5	22	50	0.58	0.61
Male	Middle	Formal	No nametag	Controlled	11	11	45	21	0.13	0.64
Male	Middle	Formal	No nametag	Uncontrolled	8	20	34	23	0.04	0.75
Male	Middle	White coat	Nametag	Uncontrolled	5	13	35	29	0.21	0.71
Male	Middle	White coat	No nametag	Controlled	9	4	54	19	0.19	0.51
Male	Older	Scrubs	Nametag	Controlled	6	12	22	43	0.40	0.75
Male	Older	Scrubs	Nametag	Controlled	10	14	25	38	0.31	0.77
Male	Older	Scrubs	No nametag	Uncontrolled	2	18	31	28	0.13	0.77
Male	Older	Casual	Nametag	Controlled	4	16	42	19	0.04	0.68
Male	Older	Casual	No nametag	Uncontrolled	12	39	31	7	-0.42	0.66
Male	Older	Formal	Nametag	Uncontrolled	11	14	55	8	-0.08	0.53
Male	Older	White coat	Nametag	Controlled	9	12	34	31	0.25	0.71
Male	Older	White coat	Nametag	Uncontrolled	11	14	33	30	0.21	0.73

Table A3: Analysis of provider differences and evaluator demographics

Effect	Num DF	Den DF	F Value	P-value	
<i>Provider differences</i>					
Gender	1	2030	4.96	0.0260	***
Age	2	2248	11.02	<.0001	
Dress	3	2179	13.79	<.0001	
Nametag	1	2136	0.16	0.6849	
Hair	1	1794	4.37	0.0368	***
Gender*Age	2	2214	62.49	<.0001	
Gender*Dress	3	2172	9.37	<.0001	
Gender*Nametag	1	2466	0.25	0.6142	
Gender*Hair	1	1752	38.45	<.0001	

Age*Dress	6	2271	8.20	<.0001	
Age*Nametag	2	2349	4.52	0.0110	***
Age*Hair	2	2266	3.42	0.0329	***
Dress*Nametag	3	2216	0.26	0.8557	
Dress*Hair	3	2101	0.13	0.9437	
Nametag*Hair	1	2746	20.01	<.0001	
Dress*Nametag*Hair	3	2294	17.08	<.0001	

Provider differences, depending upon Evaluator groups

Rater_Gender*Gender	1	949	0.05	0.8213	
Rater_Age*Age	14	1016	1.32	0.1877	
Rater_Age*Gender	7	949	1.53	0.1534	
Ethnicity*Gender	1	949	0.04	0.8331	
Race_Asian*Gender	1	949	0.05	0.8180	
Race_Black*Gender	1	949	0.13	0.7220	
Race_White*Gender	1	949	0.02	0.8994	
Education*Gender	4	949	3.03	0.0168	***
Income*Gender	6	949	0.29	0.9401	
Rater_Gender*Age	2	999	0.86	0.4237	
Ethnicity*Age	2	999	0.04	0.9583	
Race_Asian*Age	2	999	0.26	0.7686	
Race_Black*Age	2	999	0.67	0.5126	
Race_White*Age	2	999	0.24	0.7843	
Education*Age	8	1013	1.34	0.2205	
Income*Age	12	1016	0.47	0.9342	
Rater_Gender*Dress	3	909	1.41	0.2391	
Rater_Age*Dress	21	920	0.86	0.6486	
Ethnicity*Dress	3	909	0.79	0.5002	
Race_Asian*Dress	3	909	0.59	0.6197	
Race_Black*Dress	3	909	0.81	0.4889	
Race_White*Dress	3	909	0.32	0.8125	
Education*Dress	12	919	0.43	0.9515	
Income*Dress	18	920	0.82	0.6830	
Rater_Gender*Nametag	1	1689	1.58	0.2090	
Rater_Age*Nametag	7	1689	1.10	0.3590	
Ethnicity*Nametag	1	1689	0.16	0.6914	
Race_Asian*Nametag	1	1689	0.32	0.5698	
Race_Black*Nametag	1	1689	0.24	0.6236	
Race_White*Nametag	1	1689	0.00	0.9515	
Education*Nametag	4	1689	0.26	0.9027	
Income*Nametag	6	1689	0.96	0.4510	

Rater_Gender*Hair	1	1243	0.02	0.9012
Rater_Age*Hair	7	1243	1.78	0.0884
Ethnicity*Hair	1	1243	0.72	0.3979
Race_Asian*Hair	1	1243	0.09	0.7687
Race_Black*Hair	1	1243	0.10	0.7538
Race_White*Hair	1	1243	1.08	0.2981
Education*Hair	4	1243	1.68	0.1530
Income*Hair	6	1243	0.99	0.4339

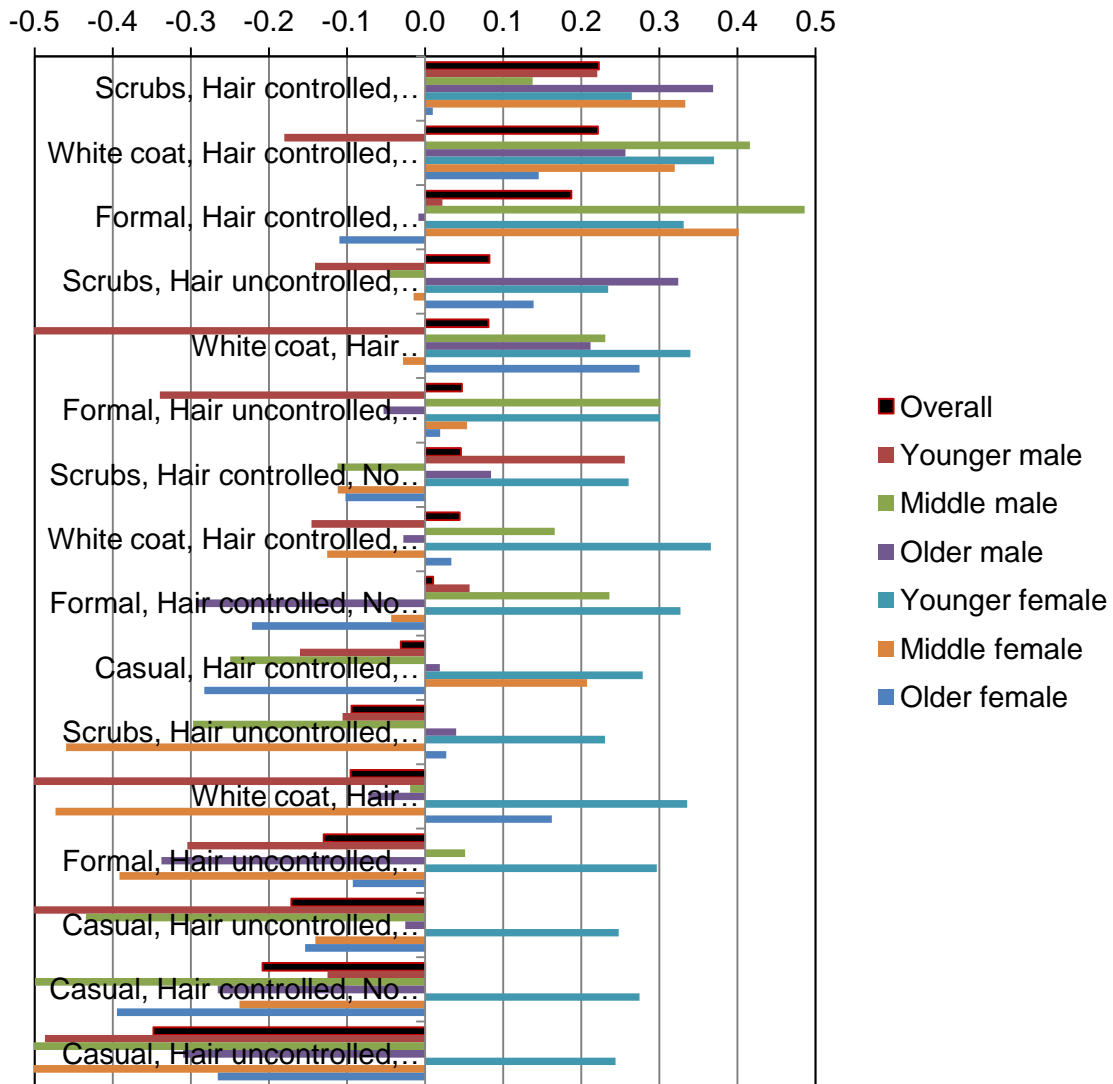
Table A4: Analysis of provider differences

Effect	Num DF	Den DF	F Value	P-value
Gender	1	2470	10.31	0.0013
Age	2	2341	31.98	<.0001
Dress	3	2488	36.99	<.0001
Nametag	1	2439	7.42	0.0065
Hair	1	2668	26.21	<.0001
Gender*Age	2	2248	61.45	<.0001
Gender*Dress	3	2206	9.21	<.0001
Gender*Nametag	1	2512	0.25	0.6203
Gender*Hair	1	1795	37.82	<.0001
Age*Dress	6	2307	8.10	<.0001
Age*Nametag	2	2389	4.45	0.0118
Age*Hair	2	2298	3.39	0.0339
Dress*Nametag	3	2258	0.25	0.8624
Dress*Hair	3	2147	0.12	0.9455
Nametag*Hair	1	2784	19.67	<.0001
Dress*Nametag*Hair	3	2329	16.85	<.0001

Table A5: Combined effect of dress, nametag, and hair control, overall and for each sex and age (estimated preferences)

Dress, Hair, Nametag	Overall	Male			Female		
		Younger	Middle	Older	Younger	Middle	Older
Scrubs, Hair controlled, Nametag	0.222	0.221	0.138	0.369	0.265	0.333	0.010
White Coat, Hair controlled, Nametag	0.221	-0.180	0.416	0.256	0.370	0.320	0.145
Formal, Hair controlled, Nametag	0.187	0.022	0.486	-0.009	0.331	0.402	-0.110
Scrubs, Hair uncontrolled, Nametag	0.082	-0.141	-0.047	0.324	0.234	-0.015	0.139
White Coat, Hair uncontrolled, Nametag	0.081	-0.542	0.231	0.212	0.340	-0.028	0.274
Formal, Hair uncontrolled, Nametag	0.047	-0.339	0.301	-0.053	0.301	0.054	0.019
Scrubs, Hair controlled, No nametag	0.046	0.256	-0.112	0.084	0.261	-0.112	-0.102
White Coat, Hair controlled, No nametag	0.044	-0.145	0.166	-0.028	0.366	-0.125	0.033
Formal, Hair controlled, No nametag	0.010	0.057	0.236	-0.293	0.327	-0.043	-0.222
Casual, Hair controlled, Nametag	-0.031	-0.160	-0.249	0.019	0.278	0.207	-0.283
Scrubs, Hair uncontrolled, No nametag	-0.094	-0.106	-0.297	0.040	0.230	-0.460	0.027
White Coat, Hair uncontrolled, No nametag	-0.096	-0.507	-0.019	-0.072	0.335	-0.473	0.162
Formal, Hair uncontrolled, No nametag	-0.130	-0.304	0.051	-0.338	0.296	-0.391	-0.093
Casual, Hair uncontrolled, Nametag	-0.171	-0.522	-0.434	-0.026	0.248	-0.141	-0.154
Casual, Hair controlled, No nametag	-0.208	-0.125	-0.499	-0.265	0.274	-0.238	-0.395
Casual, Hair uncontrolled, No nametag	-0.348	-0.487	-0.684	-0.310	0.244	-0.585	-0.266

Figure A2: Effect of provider characteristics overall and within each sex and age group



Vita

Gillian Rebecca Kelly was born on June 16, 1985 in New Haven, Connecticut. She graduated from Winslow High School in Winslow, Maine in 2003. She then attended The Pennsylvania State University where she received a Bachelor of Science degree in Geography. Following her undergraduate studies, she graduated from the University of Connecticut School of Dental Medicine in 2011. She was accepted into the graduate orthodontic program at the Virginia Commonwealth University and received a Certificate in Orthodontics as well as a Master of Science in Dentistry degree in 2013. Upon graduation, she will enter private practice as an orthodontist in Connecticut.