

**Why do you want your child to have braces? Investigating the motivations of  
Hispanic/Latino and Caucasian parents**

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## Abstract

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**Introduction:** Many psychological, social and cultural factors influence parents' motivation to seek orthodontic care for their children. The current study used Q methodology to categorize shared motives and determine whether cultural differences exist among Hispanic/Latino (H/L) and Caucasian (C) parents.

**Methods:** The fundamental question posed to the parents was "Why do you want your child to have braces?" Q methodology involves three stages. (1) Interviews of H/L (N=5) and C (N=5) parents generated thirty-five statements that represented different motives to seek orthodontic care. (2) In the Q sort, 70 new parents (N=22 H/L and N=48 C) ranked statements in order of relative importance using a forced distribution grid. (3) Factor analysis was performed separately for the H/L and C groups to uncover cultural differences.

**Results:** Four motivational profiles were described for both the H/L and C parents based upon the significant factors identified in each group. More H/L parents (18 of 22) were characterized by one of their group's four profiles compared to the C parents (22 of 48 parents). Comparison of the motivational profiles across the groups revealed four global themes: well-timed treatment that prevents future dental problems, parental responsibility, perceived benefits, and perceived need instilled by the dentist. Interestingly, specific occlusal problems were not a major motivation for treatment.

**Conclusions:** Four global themes capture the motives of most parents seeking treatment. Understanding these global themes can help the clinician frame their discussions about orthodontic treatment with parents.

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This is to certify that I have examined this copy of a master's thesis by

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and have found that it is complete and satisfactory in all respects, and that any and all revisions required by the final examining committee have been made.

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In addition to the support and guidance I received from my committee, I want to recognize the contributions of Andrew Paige, whose linguistic skills and technical savvy proved essential during the recruitment process.

## **Dedication**

To my son Cameron, the little one that kept me up “working” many a night.

## **Introduction and Literature Review**

For many parents, the decision to seek orthodontic treatment for their child is multifactorial. Combinations of psychological, social, and cultural factors influence their motivation to pursue care.<sup>1-3</sup> While previous studies have investigated the factors that motivate parents,<sup>2,4-7</sup> few studies have attempted to explain the significance of these motives and how they impact orthodontic treatment.<sup>8</sup>

Recently, Prabakaran and colleagues<sup>6</sup> used a systematic approach known as Q methodology to investigate parents' and patients' motivation for orthodontic treatment in the United Kingdom. Q methodology has been applied previously in medicine, nursing, social sciences, and health education.<sup>9-12</sup> Prabakaran and colleagues<sup>6</sup> identified and described several patient and parent profiles that explained why they sought treatment. Interestingly, they found that more non-white parents (which included all parents of "other races") were motivated by a feeling of parental responsibility to seek orthodontic care for their children compared to their white counterparts. This study emphasized the need for further research that includes other cultures and demonstrated that Q methodology is an effective tool to examine motivations for orthodontic treatment. Prior to the study by Prabakaran and colleagues, only two orthodontic studies used Q sorting (part of Q methodology) to evaluate appearance and neither performed factor analysis.<sup>13,14</sup>

The current study was undertaken to better understand the subjective motives of parents who were seeking orthodontic treatment for their children and to examine potential cultural differences in their motivation. Q methodology uses qualitative and quantitative analyses to objectively compare the subjective human experience, systematically identifying a population's shared viewpoints or opinions.<sup>11,15,16</sup> If shared viewpoints can be described in the current study,

then orthodontists may better understand how psychological, social and cultural factors influence the decision to seek treatment. It may also facilitate the development of culturally appropriate strategies adopted to improve communication and treatment planning. The study aimed to identify and describe motivational profiles that explain the reasons that Hispanic/Latino and Caucasian parents seek orthodontic treatment for their children and determine if differences exist between the parent groups.

## **Material and Methods**

### **Participants**

Study participants consisted of Hispanic or Latino (Hispanic/Latino) and Caucasian or Non-Hispanic (Caucasian) parents whose children were seeking orthodontic care. The gender of the parent participating in this study was not recorded. Hispanic/Latino Americans were compared to Caucasians because they are the second largest ethnic group in the United States,<sup>17</sup> with a significant representation in the State of Washington. Parents were recruited from the University of Washington, Department of Orthodontics, and the University of Washington, Center for Pediatric Dentistry, in Seattle, Washington.

Recruitment occurred in the clinical setting while the parent accompanied their child to an initial orthodontic exam or consultation. To be eligible for this study, parents had to meet two criteria: (1) the parent self-identified with the Hispanic/Latino or Caucasian racial/ethnic group; and (2) their child was between the ages of 8 to 16 years. Parents were excluded if their child was referred for orthognathic surgery or presented with any syndromes and/or developmental disorders. Consent was obtained from parents prior to enrollment in the study. Participants were

compensated with a gift certificate after participation. All study procedures and materials were approved under exempt status by the Human Subjects Division at the University of Washington.

## **Methodology**

Consistent with the Q methodology framework, the current study was conducted in three stages: (1) development of the statements (i.e., concourse) about the topic and final Q set; (2) ranking of the statements within the Q sort; and (3) factor analysis and interpretation.<sup>15,18</sup> The fundamental question the parents were asked was “Why do you want your child to have braces?”

Questions answered by Q methodology ask “What is the nature of a view or belief in a particular population on a certain subject” rather than “What is the extent of those views or beliefs on that subject”.<sup>10</sup> The ability of Q methodology to uncover patterns for how and why subjects have particular viewpoints rather than quantifying the percentage of people with a particular viewpoint makes it valuable when asking subjective questions.<sup>18</sup> Factor analysis “identifies a group of persons who have rank ordered the provided items in a very similar fashion or, in other words, a group of persons who share a similar perspective... about the topic...”.<sup>16</sup> The factors become amenable to interpretation, representing narratives that explain the shared perspectives among the population.<sup>15,18,19</sup>

### Stage 1: Concourse and final Q set

To develop a concourse that adequately represents the perspectives of Hispanic/Latino and Caucasian parents regarding their motivation to seek orthodontic treatment for their child,

statements were generated from brief open-ended interviews with the parents. Participants were asked to describe why they sought orthodontic treatment for their children, based upon the question: “Why do you want your child to have braces?” Interviews were conducted by the primary author (BD). When necessary, a Spanish interpreter was available. Parent responses were manually recorded verbatim. After 10 interviews with Hispanic/Latino (N=5) and Caucasian (N=5) parents, responses reached the point of saturation such that no new statements were generated. The statements were compressed by deleting duplicate statements and combining similar statements.<sup>6</sup> Compression of the discourse resulted in 35 distinct statements that formed the final Q set (Table 1). For the final Q set of distinct statements, two or more participants had provided the same response.

### Stage 2: Q sort

For the Q sort activity, new Hispanic/Latino and Caucasian parent participants (different from those previously interviewed) were recruited using the same recruitment procedure and inclusion/exclusion criteria as described above. If the parent was willing to participate, a link was sent to his or her provided email. In total, 128 parents were enrolled.

The Q sort task relies upon a forced distribution Q methodology grid, the continuum of preference, which resembles a quasi-normal distribution; fewer statements can be placed at the extreme ends of the grid and more statements are admitted in the middle “neutral” section.<sup>18</sup> For this study, the Q sort was performed using an internet application called Q-Assessor (q-assessor.com). When compared to traditional paper sorting, online Q sorting with Q-Assessor has been demonstrated to be reliable and valid.<sup>20</sup> In the Q-Assessor approach, the researcher

inputs the statements (final Q set) to be used in the Q sort task, inputs and configures the bins (i.e., “the conceptual structure”) into which the statements are sorted, and configures the interface approach (button or drag and drop interface). The sort bins “define the ranked groupings into which subjects sort statements. Each bin contains a certain number of statements, has a certain numerical value used to calculate the study factor, and has a descriptive label...”<sup>20</sup>

In the current study, the 35 statements in the final Q set were available in English and Spanish. All statements were translated by a native Spanish speaker, with back translation done to confirm proper translation. There were 11 sort bins ranging from “most disagree (-5)” to “most agree (+5)”; the neutral midpoint (0) was designated as “uncertain”. Study participants were presented with the question, “Why do you want your child to have braces?” Parents were asked to complete two sorts of the 35 statements; the initial sort asked them to ‘drag and drop’ each statement into one of three boxes (agree, disagree, or uncertain), the second sort asked them to ‘drag and drop’ each statement within the three boxes into the forced distribution grid based on where they thought the statement belonged (Figure 1). Parents were asked to fill the “most agree” bin first, then the “most disagree” bin, and then the remaining bins. The Q sort was complete after the participants placed all 35 statements in the sort bins on the grid. Following the Q sort, parents were asked “How would you describe your race/ethnicity: Hispanic/Latino or Caucasian (Non-Hispanic)?” A bilingual research assistant was available to answer questions and assist the Hispanic/Latino parents on the Q sort process.

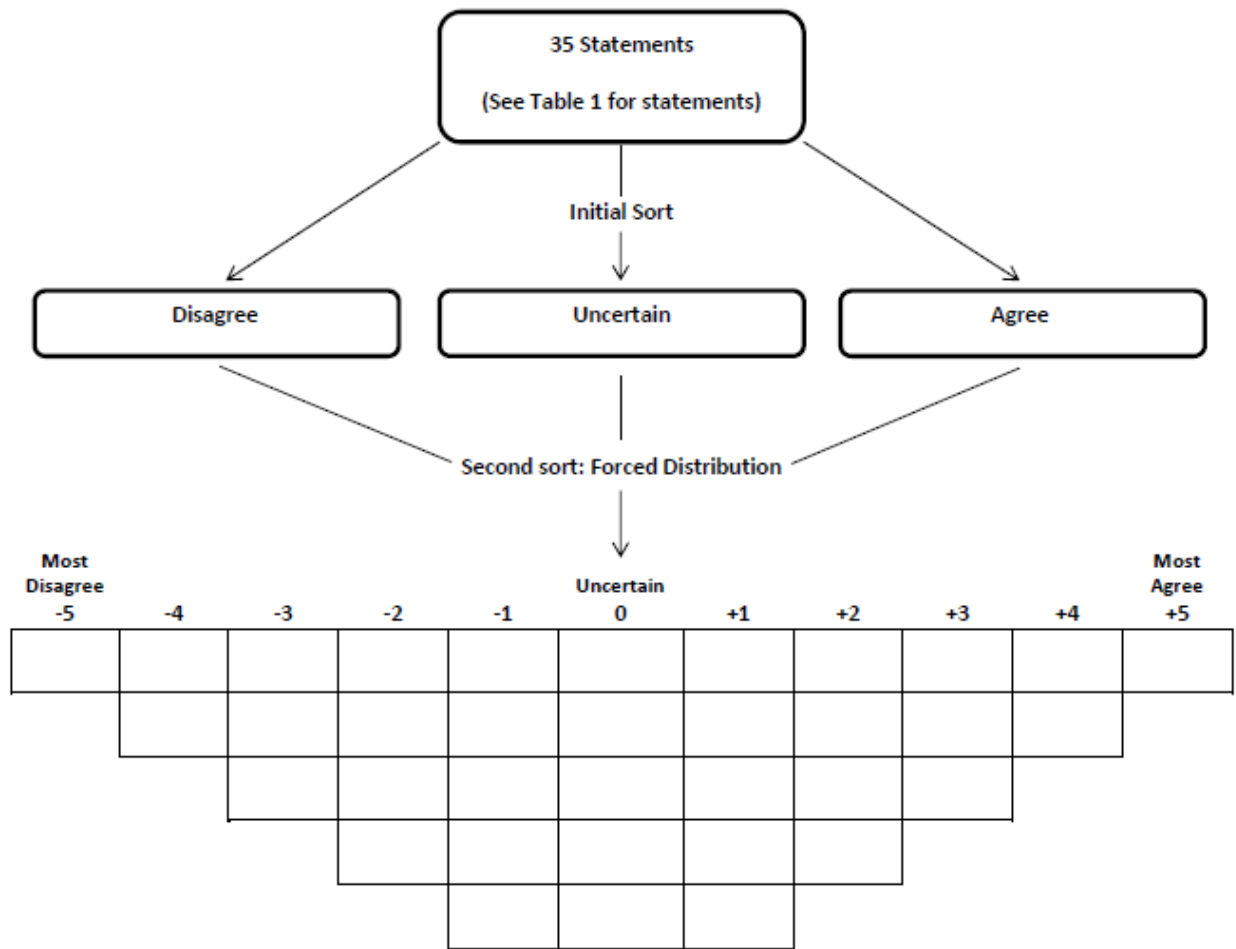
### Stage 3: Factor analysis and interpretation

Factor analysis was performed with the Q-Assessor program. Factor analysis creates factors that represent clusters of participants with similar opinions and viewpoints.<sup>18</sup> The Q-Assessor program can display the unrotated (using the Centroid method) and rotated (either varimax or manual) factor structures. For the current study, separate factor analyses were conducted for the Hispanic/Latino and Caucasian parents Q sorts using the varimax rotation method. Varimax rotation was used to maximize variance between factors – i.e., identifies Q sorts that are close to the viewpoint of a specific factor. The study team deemed factors significant if their eigenvalues were greater than 1 and at least three parents' Q sorts mapped onto the factor.<sup>16</sup>

Q-Assessor can generate reports which include tables and summaries of the factor scores which assist with interpretation. For this study, factor arrays were generated to indicate the relative position of each statement for each significant factor and identify which statements distinguish or do not distinguish (i.e. consensus) the significant factors. The factor array is a composite Q sort that represents how a participant who loaded to a particular factor would rank the statements.<sup>6</sup> The numerical values are weighted means of the participants who mapped to each significant factor. To better inform the interpretation, factor interpretation crib sheets were created from factor arrays for each significant factor based on methods described by Watts and Stenner.<sup>16</sup> The crib sheets provided an organization framework from which to understand the ranking of the statements within a factor relative to the other factors. All significant factors were described, including statements with which parents agreed or disagreed were reasons for seeking orthodontic treatment for their children.

**Table 1: Final Q set** of 35 statements generated in response to “Why do you want your child to have braces?”

Without braces, my child is defined by their poor teeth  
Braces improve my child's ability to chew and function  
I'm worried about gum problems  
My child's midline is off to one side  
My child's friends have braces  
Braces will help with jaw problems (e.g., TMJ)  
My child wants braces  
I want to improve the appearance of my child's face  
I want my child's teeth to last as long as possible  
Improve my child's health  
Improve my child's smile  
Dentist or physician recommended braces  
Braces have a social benefit  
I want to improve my child's confidence  
Overbite  
My child notices that things are uneven and wants straight teeth  
It's a rite of passage to have braces  
My child has oral-motor issues  
I have problems with my teeth and I don't want my child to have problems  
Braces are best when my child is growing  
I had braces myself  
My child has a crossbite  
Braces have a cosmetic/esthetic benefit  
Facilitates better hygiene  
Crooked teeth  
Tooth pain  
It's the responsibility of the parent to take care of their child's health needs/issues  
Prevent future problems  
There's not enough space for my child's permanent teeth  
I want my child to be equal to others  
My child is teased  
Braces are popular for children  
My significant other and/or I want my child to have braces  
Appearance [of the teeth] matter when getting a job  
I'm concerned about injury to the front teeth



**Figure 1: Schematic of the Q sorting process.** In the initial sort, participants sort the 35 statements based upon whether they “agree” with, “disagree” with, or are “uncertain” about the statement. In the second sort, the 35 statements must be sorted relative to one another on the forced distribution grid with 11 bins (35 cells).

## Results

As previously described, the final Q set was composed of 35 distinct statements derived from parent interviews during first part of the study. Of the 128 enrolled parents for the second part of the Q methodology study, 70 (54.7%) parents completed Q sorts. Of those 70 participants, 22 participants were Hispanic/Latino (31.4%) and 48 were Caucasian (68.6%).

The initial factor analysis revealed that the unrotated factor matrix for Hispanic/Latino parents yielded four factors while the matrix for Caucasian parents yielded six factors. After varimax rotation, four factors in each group were deemed significant. Table 2 shows the Q-Assessor factor analyses after varimax rotation for Hispanic/Latino and Caucasian parent participants including the significant factors after rotation, associated eigenvalues, percentage of variance accounted for by each factor, and the number of parents' Q sorts who mapped to each factor. Not all parents mapped to one of the four significant factors within the Hispanic/Latino and Caucasian groups. Table 3 shows the factor arrays (composite Q sorts) of the H/L and C parents who mapped to each factor and how statements were ranked relative to the other factors. The table also shows distinguishing and consensus statements among the Hispanic/Latino and Caucasian parents. For interpretation, the significant factors were termed parent motivational profiles.

### Hispanic/Latino parent profiles

Of the 22 Hispanic/Latino parents that participated, 18 (82%) mapped to one of the four motivational profiles suggesting the H/L participant population shared relatively similar reasons for seeking orthodontic treatment; and probably a similar perspective of orthodontic treatment.

Table 4 shows the narratives for the four significant Hispanic/Latino motivational profiles, described below as:

H/L 1: Feeling of parental responsibility instilled by dental professional

H/L 2: Perceived oral health needs, identified by dental professional

H/L 3: Prevent future problems; perceived benefits; child's motivation

H/L 4: Esthetic benefit to improve self-image

#### Caucasian parent profiles

Of the 48 Caucasian parents that participated, only 22 (46%) mapped to a motivational profile.

For the majority of parents in this group, their motivation could not be explained by one of the four significant Caucasian profiles. Table 5 shows the narratives for the four significant

Caucasian motivational profiles, described below as:

C 1: Parental responsibility prompted by dental professional

C 2: Perceived dental problems identified by dental professional; no child influence

C 3: Prevent future problems; child's motivation

C 4: Perceived interpersonal, oral health and esthetic benefits for self-image; prevent future problems

#### Comparison of profiles between Hispanic/Latino and Caucasian parents

For Hispanic/Latino Profile 1 [Feeling of parental responsibility instilled by dental professional] and Caucasian Profile 1 [Parental responsibility prompted by dental professional], these parents felt responsibility to immediately address any oral health issues identified by the dentist. For Hispanic/Latino Profile 1 parents, they sought to do the best they could for their children, taking into consideration their own current or past oral health issues. For Caucasian Profile 1, these parents were more motivated by their own orthodontic treatment or desire for treatment.

For Hispanic/Latino Profile 2 [Perceived oral health needs, identified by dental professional], these parents followed the dentist's recommendation to seek treatment. They were driven almost entirely by oral health concerns, which could relate to their own problems. Similar to the Caucasian profile 2 [Perceived dental problems identified by dental professional; no child influence], these parents wanted to address the problems identified by the dental professional. Caucasian profile 2 parents were not influenced by their child's desire for treatment. For both parent profiles, they sought to address specific needs or problems – they were not interested in esthetic improvement.

In Hispanic/Latino Profile 3 [Prevent future problems; perceived benefits; child's motivation], these parents did not feel a responsibility to seek treatment, but they did want to intercept any potential problems. In many ways, this Hispanic/Latino profile was similar to Caucasian profile 3 [Prevent future problems; child's motivation]; where the child's motivation greatly influenced the parents desire to seek treatment. For both the Hispanic/Latino and Caucasian parents in these profiles, they listed “avoid future problems” as their primary motivator, but they additionally sought the perceived benefits that would improve their child's self-image.

Hispanic/Latino Profile 4 [Esthetic benefit to improve self-image], was the only Hispanic/Latino profile not greatly influenced by the dentist's recommendation. Additionally, these parents were motivated to improve their child's appearance and self-image. This desire to improve self-image was comparable to Caucasian Profile 4 [Perceived interpersonal, oral health and esthetic benefits for self-image; prevent future problems] parents. However, Caucasian Profile 4 parents were also concerned about potential problems in the future. It was clear these parents wanted to improve their child's self-image with orthodontic treatment now, so that it would not affect their child negatively in the future.

**Table 2. Factor analysis results** after standard varimax rotation for the Hispanic/Latino and Caucasian parents

	<b>Hispanic/Latino parents</b> (N=22)				<b>Caucasian parents</b> (N=48)			
<b>Factors</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>Eigenvalues</b>	3.8	1.9	2.3	2.5	4.1	6.3	4.5	6.1
<b>% of total variance</b>	17.1%	8.5%	10.5%	11.4%	8.6%	13.1%	9.3%	12.8%
<b># of parents loaded to factor*</b>	7	3	4	4	4	6	4	8

\*Not all parents mapped to the four significant factors resulting from the varimax rotation analysis

**Table 3. Factor arrays** (composite Q sorts) for each of the four study factors among Hispanic/Latino (H/L) and Caucasian (C) parents. Numerical values represent weighted means of the participants who mapped to each significant factor.

	Factors	Hispanic/Latino Factor Rank				Caucasian Factor Rank			
		1 (N=7)	2 (N=3)	3 (N=4)	4 (N=4)	1 (N=4)	2 (N=6)	3 (N=4)	4 (N=8)
#	Statement								
1	Without braces, my child is defined by their poor teeth	-2	0	-1	-1	-3	-1	-1	0
2	Braces improve my child's ability to chew and function	3	2	-1	-1	-1	3	2	1
3	I'm worried about gum problems	1	-1*	1	-4*	2*	-2	-1	-1
4	My child's midline is off to one side±	0	-2	0	0	-2	-1	2	-5*
5	My child's friends have braces	-3	0	0	-2	2	-4	0	2
6	Braces will help with jaw problems (e.g., TMJ) ¥	1	-2	-2	1	0	1	1	0
7	My child wants braces	-2*	1	2	1	0	-5*	2	2
8	I want to improve the appearance of my child's face	-1	-3	-5*	0*	-3	-1	1	1
9	I want my child's teeth to last as long as possible±	3	2	3	2	4	2	4	5
10	Improve my child's health±	2	4	2	4	3	2	1	3
11	Improve my child's smile	0*	3	4	5	0	-2*	3	3
12	Dentist or physician recommended braces	4	5	3	0*	5*	3	0	2
13	Braces have a social benefit	-2	-1	4*	-1	-2	0	-2	-2
14	I want to improve my child's confidence	1*	3	3	3	0	1	1	4*
15	Overbite	-1	0	-4	-3	-1	4*	-1	0
16	My child notices that things are uneven and wants straight teeth±	2	2	2	2	1	-2	4	-1
17	It's a rite of passage to have braces	-3	0*	-2	-4	-2	-3	-4	-1

18	My child has oral-motor issues	0	2	-3	-2	-5	-1	-2	-3
19	I have problems with my teeth and I don't want my child to have problems	4*	1	1	-3*	-1	1	3	-3
20	Braces are best when my child is growing¥	3	0	0	1	1	2	0	2
21	I had braces myself	-3	-4	-3	-5	3	-4	-5	-4
22	My child has a crossbite	1*	-3	2*	-3	-3	1	-1	-3
23	Braces have a cosmetic/esthetic benefit	2	-3*	1	3	1	0	-1	1
24	Facilitates better hygiene	1	4*	0	-1	0	0	0	1
25	Crooked teeth	-1*	1	1	1	3	2	1	-1*
26	Tooth pain	-2	-5*	-1*	-2	-4	-3	-4	-2
27	It's the responsibility of the parent to take care of their child's health needs/issues¥	5	3	1*	4	4*	3	2	3
28	Prevent future problems	2	-1*	5*	0	2	4	5	4
29	There's not enough space for my child's permanent teeth	0	-1	-2	2*	1	5	-3	-1
30	I want my child to be equal to others	-4	-1	-2	0	-1	0	0	0
31	My child is teased	-4	-2	-4	-2	-4	-2	-3	-4
32	Braces are popular for children¥	-5	-4	-3	-1	-1	-3	-2	-2
33	My significant other and/or I want my child to have braces	-1	1	-1	1	2	-1	-2	1
34	Appearance [of the teeth] matter when getting a job	-1	-2	0	3*	1	1	3	0
35	I'm concerned about injury to the front teeth±¥	0	1	-1	2	-2	0	-3	-2

\*Statements that distinguish a factor from the other three factors with H/L and C groups

± Statements in which there is consensus (not distinguishable from other factors) among H/L parents

¥ Statements in which there is consensus (not distinguishable from other factors) among C parents

**Table 4:** Motivational profiles for Hispanic/Latino (H/L) parents

<b>Hispanic/Latino Profiles</b>
<p><b>H/L Profile 1: Feeling of parental responsibility instilled by dental professional</b></p> <p><i>General</i></p> <ul style="list-style-type: none"> <li>• Parents sought opportunities for their children they were never afforded</li> <li>• Followed dentist’s recommendation</li> <li>• Functional and oral health benefits were more important than interpersonal or esthetic benefits</li> </ul> <p><i>Motivators</i></p> <ul style="list-style-type: none"> <li>• Their own dental problems (statement 19)</li> <li>• Long term solutions for their child’s oral health and ability to function (statements 9, 2, 3, 6)</li> <li>• Timing (statement 20)</li> </ul> <p><i>Non-motivators</i></p> <ul style="list-style-type: none"> <li>• Child’s social image (statements 32, 30, 31, 1) or their child’s own motivation, if any (statement 7)</li> <li>• Potential social and esthetic benefits (statements 13, 11, 14)</li> </ul>
<p><b>H/L Profile 2: Perceived oral health needs, identified by dental professional</b></p> <p><i>General</i></p> <ul style="list-style-type: none"> <li>• Parents based their decision upon the dentist’s or physician’s recommendation</li> </ul> <p><i>Motivators</i></p> <ul style="list-style-type: none"> <li>• Oral health concerns (statements 10, 24)</li> <li>• Specific dental problems identified by the dentist or physician (statements 18, 25, 15)</li> <li>• Perceived social status (statements 5, 17, 31, 33)</li> <li>• Interpersonal benefit at this age (statements 14, 1)</li> </ul> <p><i>Non-motivators</i></p> <ul style="list-style-type: none"> <li>• Potential problems in future problems (statements 28, 24)</li> <li>• Dental problems that the dentist or physician had not identified (statements 26, 4, 6, 22)</li> <li>• Esthetic benefits (statement 23)</li> </ul>
<p><b>H/L Profile 3: Prevent future problems; perceived benefits; child’s motivation</b></p> <p><i>General</i></p> <ul style="list-style-type: none"> <li>• Seeking benefits for their child in the future, these parents just need confirmation that treatment will also prevent potential problems</li> <li>• Parents limited by their level of dental and orthodontic understanding</li> <li>• Child’s desire for treatment is influential</li> </ul> <p><i>Motivators</i></p> <ul style="list-style-type: none"> <li>• Long-term oral health (statements 9, 3)</li> <li>• Social and interpersonal benefits (statements 14, 13)</li> <li>• Child’s motivation (statements 7, 5)</li> <li>• Occlusal problems (statements 22, 25)</li> </ul> <p><i>Non-motivators</i></p> <ul style="list-style-type: none"> <li>• Facial esthetics (statement 8)</li> <li>• Specific dental problems (statements 15, 18, 29, 2, 6, 35)</li> <li>• Teasing (statement 31)</li> <li>• Parental responsibility (statements 27, 33)</li> </ul>

#### **H/L Profile 4: Esthetic benefit to improve self-image**

##### *General*

- Parents felt responsible to improve their child's appearance and address any oral health concerns
- Non-esthetic statements were not ranked highly

##### *Motivators*

- Felt responsibility to improve their child's appearance (statements 23, 8, 29, 25) and confidence (statement 14)
- Oral health (statements 10, 35)
- Esthetic benefits to improve their child's social status (statements 34, 30, 31, 32)

##### *Non-motivators*

- Their own dental status (statements 21, 19)
- Recommendation of dental professional about specific dental problems (statements 12, 3, 2, 24, 22)
- Potential dental problems in the future (statement 28)

**Table 5:** Motivational profiles for Caucasian (C) parents

<b>Caucasian Profiles</b>
<p><b>C Profile 1: Parental responsibility prompted by dental professional</b></p> <p><i>General</i></p> <ul style="list-style-type: none"> <li>• The recommendation of the dentist or physician greatly influenced their decision, probably prompting the feeling of a parental responsibility to address dental problems that the child may have</li> </ul> <p><i>Motivators</i></p> <ul style="list-style-type: none"> <li>• Their own treatment or desire for treatment (statements 21, 33)</li> <li>• Parental responsibility (statement 27)</li> <li>• Oral health concerns (statements 10, 3)</li> <li>• Esthetics (statement 23)</li> <li>• Specific dental problems (statement 25)</li> <li>• Perceived social status (statements 5, 32)</li> </ul> <p><i>Non-Motivators</i></p> <ul style="list-style-type: none"> <li>• Interpersonal and social benefits (statements 31, 1, 13, 30, 8)</li> <li>• Specific problems that the dentist had not identified (statements 18, 15, 22, 26, 2)</li> </ul>
<p><b>C Profile 2: Perceived dental problems identified by dental professional; no child influence</b></p> <p><i>General</i></p> <ul style="list-style-type: none"> <li>• Specific dental concerns recommended by dentist or physician, especially those relating to function and spacing</li> <li>• Parents did not allow their child’s motivation to influence their decision to seek orthodontic treatment</li> </ul> <p><i>Motivators</i></p> <ul style="list-style-type: none"> <li>• Specific dental problems (statements 15, 22)</li> <li>• Timing (statement 20)</li> <li>• Functional benefit for their children (statements 2, 6)</li> <li>• Preventing future problems (statement 28)</li> </ul> <p><i>Non-Motivators</i></p> <ul style="list-style-type: none"> <li>• Child’s motivation (statement 7, 16)</li> <li>• Social pressures (statements 5, 32)</li> <li>• Dental problems related to esthetics or the periodontium</li> </ul>

### **C Profile 3: Prevent future problems; child's motivation**

#### *General*

- Parent's motivation driven by their child's desire to for treatment
- Parents felt disadvantaged themselves without orthodontic treatment, they want to avoid potential problems

#### *Motivators*

- Child's motivation (statements 16, 7, 30)
- Their own dental problems (statement 19)
- Facial esthetics (statements 11, 8, 34, 4) to benefit the child's self-image (statement 1) in the future

#### *Non-Motivators*

- Recommendation of dental or physician (statement 12)
- Parental responsibility (statements 17, 21, 33)
- Dental problems (statements 26, 29, 35)
- Social benefit (statement 13)

### **C Profile 4: Perceived interpersonal, oral health and esthetic benefits for self-image; prevent future problems**

#### *General*

- Parents were largely focused on the benefits braces have on their child's self-image
- They desire confirmation that treatment will prevent problems in the future
- Parents are cognizant of their child's desire for treatment

#### *Motivators*

- Child's appearance (statements 8, 23) and self-image (statements 14, 11, 30, 1)
- Avoiding any future problems (statement 28)
- Oral health (statement 10)
- Child's motivation (statements 7, 5)
- Timing (statement 20)

#### *Non-Motivators*

- Specific concerns about their child's dentition (statements 4, 22, 25)
- Their own dentition (statement 19)
- Social pressure (statements 31, 13)

## Discussion

The current study, using Q methodology, aimed to identify and categorize the reasons that Hispanic/Latino and Caucasian parents seek orthodontic treatment for their children. Q methodology allows participants to inject meaning into each statement, using their point of view or belief system to position one statement relative to another. With many statements contributing to each significant factor, the factor array of the ranked statements relative to the other factor arrays provided rich detail to construct the motivational profiles and interpret their meanings. In many ways, the factor analysis and interpretation performed in this study and by Prabakaran and colleagues<sup>6</sup> permitted a more robust investigation of the motives that influenced parents' decisions to seek treatment for their children.

This was the first study that compared Hispanic/Latino and Caucasian parents' motives for seeking orthodontic treatment for their children using Q methodology. Based upon the motivational profiles, it is clear that both differences and similarities existed between the parent groups. Some of the differences in motivation may be explained by the parents' cultural perspectives.

The majority of Hispanic/Latino parents mapped to one of the four motivational profiles suggesting this group shared relatively similar reasons for seeking orthodontic treatment. Their specific dental concerns appeared limited by the extent of their dental knowledge. Consequently, their interaction with dental professionals greatly influenced how the Hispanic/Latino parents judged the statements representing specific dental problems. Cultural barriers to communication may explain these parents' limited dental knowledge. If this is the case, improving the clinician's knowledge of culturally-based barriers may facilitate better communication and education.<sup>21</sup> To better appreciate the cultural impact, knowing the degree of acculturation for the Hispanic/Latino

participants would have been beneficial. For instance, the one Hispanic/Latino motivational profile not influenced by the dental professional was profile 4, which assigned more value to improving their child's appearance. It would be interesting to know the degree of acculturation for these Hispanic/Latino parents in motivational profile 4 – whether this explains their perspective relative to the other Hispanic/Latino profiles.

In sharp contrast to the Hispanic/Latino parents, the majority of Caucasian parents' motivations could not be explained by one of the four Caucasian motivational profiles. With this variability, it may be more difficult to describe the underlying viewpoints in the Caucasian population, especially considering the definition of Caucasian in this study allowed considerable heterogeneity in ethnic/cultural background (participants self-identified as Caucasian or Non-Hispanic). The Caucasian parents generally agreed that it was the parent's responsibility to prevent any future problems for their child (statements 27 and 28). None of the Caucasian motivational profiles regarded esthetics as their principal motive, although Caucasian motivational profile 4 clearly expressed a desire to improve their child's facial esthetics (statements 8, 11, and 23).

Many of the statements generated during the concourse stage of the study were consistent with the previously described motives for seeking treatment highlighted in other studies.<sup>2</sup> However, the significance of these motives was different. Esthetic motives are widely reported as the primary reason to seek orthodontic treatment.<sup>2,4,22</sup> In the current study, the Hispanic/Latino and Caucasian parents were not greatly influenced by esthetics (based upon statement 23). In fact, the Caucasian parents generally ranked statement 23 neutral relative to the other statements. Studies demonstrate that the influence of race and ethnicity may encourage different preferences

for facial esthetics;<sup>23-28</sup> however, the different racial and ethnic preferences did not influence the perceived esthetic benefit of orthodontic treatment.

Additionally, several studies have reported the influence of teasing as a motivation for seeking treatment;<sup>2,5</sup> over 40% of parents reported that their children were teased because of tooth appearance.<sup>29,30</sup> However, in the current study parents did not attribute motivation for treatment seeking to peer teasing. They felt motivated by others social pressures (i.e. child's friends, popularity of braces, etc.). Since this study only investigated parents' motivation, the parents' secondhand account may have undervalued the importance of this reason for their child.

While the findings from the current study revealed some important differences and similarities between Hispanic/Latino and Caucasian parents when seeking orthodontic care for their children there are several limitations to note. Participants were generally unfamiliar with Q methodology and many of them reported difficulty with the concept of ranking on a forced distribution grid. For some Q sorts, participants had to place statements they may "agree" with in "neutral" or "disagree" with bins.

An inherent limitation of Q methodology is that the motivational profiles from this study cannot be generalized to all Hispanic/Latino and Caucasian parents. Q methodology is not designed to project to broader populations, it explains the shared views of the participants. Additionally, the parent participants recruited from the academic dental setting in this study typically have Medicare coverage for their children. This may affect their perceived need for and the benefits of treatment when compared to a private practice population.

While the Q sort statements were in both English and Spanish, the basic instructions on the Q-Assessor site were not in Spanish. A bilingual research assistant was available to answer

any questions; however, Hispanic/Latino parents may have neglected to ask for help or may have received very detailed instructions compared to the Caucasian parents.

Additionally, several Hispanic/Latino parents required assistance from the research assistant to complete the survey due to limited experience with a laptop computer and mouse. All choices were made by the participants, but this nevertheless created a degree of separation between them and the survey. It also affected the way that the instructions were administered, because the participants only had to point to their desired box rather than dragging and dropping the statements into their desired box under their own accord. In some cases, parents would turn to their children for help in deciding how they felt about a certain statement. Sometimes it was because the parent simply did not know the answer (e.g., the statement about the child being teased for poor teeth), and sometimes it was because the parent wanted their child's input. Nevertheless, not all answers came solely from the parents, Q sorts may have reflected how the child felt about the statement rather than how the parent felt.

Finally, within the Hispanic/Latino group, there were two subgroups, solely Spanish-speaking and bilingual participants. These are two distinct populations that have different experiences in this country and acculturation level, and they may therefore feel differently about orthodontic care for their children. Future studies could examine parental motivations based on acculturation status.

#### Global themes and clinician strategies that address the motivational profiles' viewpoints

This study revealed some overarching themes for the reasons parents seek treatment, which included “preventing future problems (timing)”, “parental responsibility”, “perceived

benefits of treatment (esthetic, interpersonal, and oral health)”, and “perceived need instilled by the dentist”. To a certain extent, these themes were consistent with the motivational profiles found among parents in the Prabakaran and colleagues<sup>6</sup> study; suggesting that global themes for parental motivation may exist.

Although profiles emerging from Q methodology are not generalizable, they can serve to inform everyday practice.<sup>10</sup> In the case of this study, these global themes can help the clinician frame communication at a consultation appointment and/or personalize treatment discussions. The orthodontist can better consider matters relevant to the patient and parent; for instance, the patient’s expectations for treatment, the perceived benefits and needs, as well as the value of traditional orthodontic treatment goals at the outset of treatment.<sup>31</sup>

- For parents seeking treatment to “prevent future problems (timing)”, the orthodontist should clarify the potential orthodontic problems that pertain to their child. Parental education is essential – especially because the orthodontist should convey the preventive value of treatment and demonstrate the benefits of orthodontic treatment during childhood.
- For parents who feel a “parental responsibility” to seek orthodontic treatment, the orthodontist should reassure them that they are fulfilling their responsibility. Allow these parents to take an active role in treatment, helping with home care and/or monitoring their child’s compliance.<sup>6</sup>
- For parents that seek the “perceived esthetic, interpersonal, and oral health benefits of treatment”, the orthodontist should outline potential benefits that may pertain to their child. Be prepared to discuss topics like self-esteem, appearance, and societal benefits

and provide evidence of how orthodontic treatment can impact these perceived benefits of orthodontic treatment.

- For parents that have a “perceived need instilled by dentist”, the orthodontist should confirm the need for treatment and demonstrate how correction can be achieved. The parent trusts the dentist’s expertise and recommendation, so demonstrate inter-office collaboration. Even though the dentist recommended treatment to correct a specific occlusal concern, do not anticipate that this specific problem is consistent with the parent’s motivation. Provide value for comprehensive care.

As the current study exhibited, there may be overlap between these themes; in fact, most of the motivational profiles shared similar reasons to explain motivation for treatment. This is why it may be more difficult than often imagined to analyze parents’ motives for seeking treatment – because such significant overlap exists, driven by a multitude of psychological, social and cultural factors. Unfortunately, the traditional views held by clinicians do not always account for these different perspectives.<sup>3</sup> For daily practice, the orthodontist should therefore operate under the premise that all of these global themes can explain a parent’s motivation to seek orthodontic treatment, just in varying degrees. The recommendation for all parents and patients would be to design culturally-appropriate communication and treatment strategies that include education, evidence of potential problems and benefits, emphasis on global concepts rather than specific details, positive feedback and inter-office communication.

## **Conclusions**

As recently reported by Tsihlaki and O'Brien,<sup>8</sup> the orthodontic literature has largely overlooked outcomes measures relevant to the patient and parent. The current study attempted to describe the reasons for orthodontic treatment, by using Q methodology to identify the shared motives and views of Hispanic/Latino and Caucasian parent populations. The study identified profiles that can inform orthodontic practice about parental motives for seeking orthodontic care. Moreover, the narratives from these profiles suggest that four global themes may capture the motives of most parents seeking treatment.

## Appendix

### Appendix A: Spanish translation of the final Q set statements

Sin brackets, mi hijo/a es conocido por sus malos dientes  
Los brackets mejoran la función y habilidad de mi hijo/a para masticar  
Estoy preocupado/a por los problemas de encías  
La línea media de mi hijo/a está desviada hacia un lado  
Los amigos/as de mi hijo/a tienen brackets  
Los brackets ayudarán con los problemas de la mandíbula (por ejemplo: Articulación Temporo Mandibular)  
Mi hijo/a quiere brackets  
Quiero mejorar la apariencia de la cara de mi hijo/a  
Quiero que los dientes de mi hijo/a duren lo más que sea posible  
Mejorar la salud de mi hijo/a  
Mejorar la sonrisa de mi hijo/a  
El dentista o médico nos recomendó colocar brackets  
Los brackets tienen un beneficio social  
Quiero mejorar la confianza de mi hijo/a  
Sobremordida  
Mi hijo/a nota que las cosas están disparejas y quiere enderezar sus dientes  
Es un ritual de paso el tener brackets entre los niños/as  
Mi hijo/a tiene problemas con la función motora-oral  
Tengo problemas con mis dientes y no quiero que mi hijo/a tenga problemas con sus dientes  
Es mejor usar brackets cuando mi hijo/a esté creciendo  
Yo misma/o tuve brackets  
Mi hijo/a tiene mordida cruzada  
Los brackets tienen un beneficio cosmético/estético  
Facilita una mejor higiene  
Dientes torcidos  
Dolor de diente  
Es responsabilidad de los padres cuidar de las necesidades/problemas de salud de su hijo/a  
Prevenir futuros problemas  
No hay suficiente espacio para los dientes permanentes de mi hijo/a  
Quiero que mi hijo/a sea igual a los demás  
Se burlan de mi hijo/a  
Tener brackets es popular entre los niños/as  
Mi pareja y/o yo queremos/quiero que mi hijo/a tenga brackets  
La apariencia [de los dientes] importa al momento de obtener un trabajo  
Estoy preocupado/a por posible daño a los dientes de al frente

## References

1. Marques LS, Pordeus IA, Ramos-Jorge ML, Filogonio CA, Filogonio CB, Pereira LJ, Paiva SM. Factors associated with the desire for orthodontic treatment among Brazilian adolescents and their parents. *BMC Oral Health* 2009; 9 (34): 1-7.
2. Samsyanova L, Broukal Z. A Systematic Review of Individual Motivational Factors in Orthodontic Treatment: Facial Attractiveness as the Main Motivational Factor in Orthodontic Treatment. *Int J Dentistry* 2014; 1-7.
3. Stanford ND, Ip TB, Durham J. Adult orthodontic patients' views regarding dentofacial normality: A qualitative study. *Am J Orthod Dentofacial Orthop* 2014; 45:287-95.
4. Birkeland K, Katle A, Lovgreen S, Boe OE, Wisth PJ. Factors influencing the decision about orthodontic treatment. A longitudinal study among 11- and 15-year-olds and their parents. *J Orofac Orthop* 1999; 60: 292–307.
5. Fleming PS, Proczek K, DiBiase AT. I want braces: factors motivating patients and their parents to seek orthodontic treatment. *Community Dent Health* 2008; 25: 166–9.
6. Prabakaran R, Seymour S, Moles DR, Cunningham SJ. Motivation for orthodontic treatment investigated with Q methodology: Patients' and parents' perspectives. *Am J Orthod Dentofacial Orthop* 2012; 142: 213-220.
7. Gosney MBE. An investigation into some of the factors influencing the desire for orthodontic treatment. *Br J Orthod* 1986; 13: 87-94.
8. Tsihaki A, O'Brien K. Do orthodontic research outcomes reflect patient values? A systematic review of randomized control trials involving children. *Am J Orthod Dentofacial Orthop* 2014; 146: 279-85.
9. Bullington P, Pawola L, Walker R, Valenta A, Briars L, John E. Identification of medication non-adherence factors in adolescent transplant patients: the patient's viewpoint. *Pediatr Transplant* 2007; 11: 914–921.
10. Baker R, Van Exel J, Mason H, Stricklin M. Connecting Q & Surveys: Three Methods to Explore Factor Membership in Large Samples. *Operant Subjectivity: The International Journal of Q Methodology* 2010; 34 (1): 38-58.
11. Baker R, Wildman J, Mason H, Donaldson C. Q-ing for health – A new approach to eliciting the public's views on health care resource allocation. *Health Econ* 2013.
12. Cross RM. Exploring attitudes: the case for Q methodology. *Health Education Research* 2005; 20: 206-13.
13. Coy K, Speltz ML, Jones K. Facial appearance and attachment in infants with orofacial clefts: a replication. *Cleft Palate Craniofac J* 2002; 39: 66–72.
14. Schabel BJ, McNamara Jr JA, Franchi L, Baccetti T. Q-sort assessment vs visual analog scale in the evaluation of smile esthetics. *Am J Orthod Dentofacial Orthop* 2009; 135 (Suppl): 61–71.
15. Simons J. An introduction to Q methodology. *Nurse Researcher* 2013; 20 (3): 28-32.
16. Watts S, Stenner P. *Doing Q Methodological Research: Theory, Method and Interpretation*. London: Sage; 2012.
17. Campbell PR. *Population Projections for States, by Age, Sex, Race and Hispanic Origin: 1995 to 2025*. 1996; Report PPL-47, U.S. Bureau of the Census, Population Division.
18. Valenta AL, Wigger U. Q-methodology: Definition and Application in Health Care Informatics. *J Am Med Inform Assoc* 1997; 4: 501-10.

19. Brown SR. Q technique and questionnaires. *Operant Subjectivity* 2002; 25: 117–26.
20. Reber BH, Kaufman SE, Cropp F. Assessing Q-Assessor: A Validation Study of Computer-Based Q Sorts versus Paper Sorts. *Operant Subjectivity* 2000; 23(4): 192-209.
21. Schouten BC, Meeuwesen L. Cultural differences in medical communication: A review of the literature. *Patient Education and Counseling* 2006; 64: 21-34.
22. Daniels AS, Seacat JD, Inglehart MR. Orthodontic treatment motivation and cooperation: a cross-sectional analysis of adolescent patients' and parents' responses. *Am J Orthod Dentofacial Orthop* 2009; 136: 780-7.
23. Mejia-Meidl M, Evans CA, Viana G, Anderson NK, Giddon DB. Preferences for facial profiles between Mexican Americans and Caucasians. *Angle Orthod* 2005; 75: 953-8.
24. McKoy-White J, Evans CA, Viana G, Anderson NK, Giddon DB. Facial profile preferences of black women before and after orthodontic treatment. *Am J Orthod Dentofacial Orthop* 2006; 129: 17-23.
25. Park Y, Evan CA, Anderson NK, Giddon DB. Profile preferences of Korean American orthodontic patients and orthodontists. *World J Orthod* 2006; 7(3): 286-92.
26. Nomura M, Motegi E, Hatch JP, Gakunga PT, Ng'ang'a PM, Rugh JD, Yamaguchi H. Esthetic preferences of European American, Hispanic American, Japanese, and African judges for soft-tissue profiles. *Am J Orthod Dentofacial Orthop* 2009; 135: S87-95.
27. Hockley A, Weinstein M, Borislow AJ, Braitman LE. Photos vs silhouettes for evaluation of African American profile esthetics. *Am J Orthod Dentofacial Orthop* 2012; 141:161-8.
28. Soh J, Chew MT, Wong HB. A comparative assessment of the perception of Chinese facial profile esthetics. *Am J Orthod Dentofacial Orthop* 2005; 127: 692-9.
29. Kilpelainen PVJ, Phillips C, Tulloch JFC. Anterior tooth position and motivation for early treatment. *Angle Orthod* 1993; 63: 171–4.
30. Al-Bitar ZB, Al-Omari IK, Sonbol HN, Al-Ahmad HT, Cunningham SJ. Bullying among Jordanian schoolchildren, its effect on school performance, and the contribution of general physical and dentofacial features. *Am J Orthod Dentofacial Orthop* 2013; 144: 872-8.
31. McKeta N, Rinchuse DJ, Close JM. Practitioner and Patient Perceptions of Orthodontic Treatment: Is the Patient Always Right? *Journal of Esthetic and Restorative Dentistry* 2012; 24(1): 40-50.