How people make decisions about whether or not to seek orthodontic care: Upstream in the treatment chain

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Introduction: "Upstream" decisions by patients are important in determining whether they seek orthodontic care for their children and for themselves and whether they seek care from general dentists or from orthodontists. Classic marketing theory suggests that purchase decisions naturally progress through a sequence beginning with awareness and proceeding to information, emotional preferences, and final purchase commitment. **Methods:** A survey was used to assess patient demographics and care history, motives for seeking care for themselves and their children, perceived barriers to care, trust in various sources of information, and preference for treatment by a general dentist or by an orthodontist. Three hundred fifty-two responses were received from patients in all states in the United Sates attending their general dentists. **Results:** Care for children was most often initiated in response to a suggestion from the family dentist, and traditional treatment with braces was expected. Adults were slightly more likely to make a decision for care themselves and for appearance reasons, often with "invisible" braces. Cost was the principal barrier to seeking care for either functional or appearance reasons. More personal and individualized sources of information, such as the family dentist or referral to a specialist were strongly more influential, with indirect sources, such as dentist Web pages or advertisements, being least influential. There was a preference for care by orthodontists compared with general dentists for functional reasons and when complications were anticipated. Orthodontists were seen as being better at identifying complications, managing complications, and delivering reliable results. Orthodontic care provided by general dentists was favored for convenience and based on established relationships. Patients with more education, higher incomes, and more preventive oral habits preferred treatment by orthodontists. Although it was expected that orthodontists would charge more, income and cost were not factors among those considering treatment. **Conclusions:** This study suggests that orthodontists should focus on educating potential patients about the functional health features of treatment for malocclusions, especially for children. Furthermore, orthodontists would benefit from working with general dentists, given their role as gatekeepers in the sequential process of reaching an upstream decision about seeking orthodontic care. (Am J Orthod Dentofacial Orthop 2019;155:826-31)

Arguably, the most important decisions regarding orthodontic treatment do not take place in the orthodontist's office. Patients must first recognize and value the opportunity for care and seek information from friends, the media, or general dentists—and sometimes from orthodontists. These "upstream" actions are not initiated by orthodontists and, although insufficient in themselves, they are necessary for eventually receiving appropriate treatment. There is a clear economic advantage for orthodontists to understand and positively affect the prediagnosis and pretreatment behavior of patients. There is also a public health concern in the sense that every individual who would benefit from orthodontic treatment should have an opportunity to interact with a professional who can guide them in this decision.

There are several studies reporting the factors motivating care seeking in orthodontics.[1-5] The classic marketing literature is also relevant in identifying a sequence of steps leading to a "purchase" decision.[6,7] This begins with awareness of a need or want, followed by information gathering, forming of preferences, and finally decision making. Attempts to influence behavior only at the decision point are

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unpredictable and often fruitless unless the preceding steps have been properly attended to.

Perhaps even more than other areas of oral health, orthodontics is being influenced by "upstream" decision factors of an indirect nature.[8,9] Advertising in the media has increased dramatically, and general dentists are assuming a more prominent role in influencing decisions, often by providing the care they recommend rather than making referrals to orthodontists.

A survey was taken of general dental patients to better understand the factors influencing individuals' decision process in seeking orthodontic care for themselves or for their children.

MATERIAL AND METHODS

A draft survey form was prepared to gather demographic information from adults receiving care in general dental offices as well as information about their own orthodontic experiences, features and benefits expected of orthodontic care, perceived barriers, and perceptions of the roles of general practitioners and orthodontists. One version of the survey asked about adults seeking care for themselves and a parallel form asked about adults seeking care for their children or potential children. The first version of the survey was tested in a focus group of 6 patients and revised accordingly.

Packets of surveys were mailed to 100 graduates of the University of the Pacific Arthur A. Dugoni School of Dentistry who had answered a previous e-mail inquiry and agreed to distribute one form of the survey or the other to patients waiting in the reception area in their offices. The participating dentists were selected at random, stratified so that 2 offices were sampled in every state.

The project was approved by the Institutional Review Board at University of the Pacific Arthur A. Dugoni School of Dentistry. Descriptive, correlation, 1-way analysis of variance with Duncan multiple range tests for post hoc comparisons, and chi-square analyses were conducted. All results reported as statistically significant had P values of <0.05.

RESULTS

Three hundred fifty-two usable surveys were returned. The average respondent was 41.75 years of age (SD 14.4), had household income of $71,346 (SD 650), and had some college education or had completed college. Respondents could be regarded as having good overall oral health treatment habits, with 71% (SD 4.5%) reporting that they completed the survey while visiting the dentist for routine preventive care and having last seen a dentist an average of 7.36 months (SD 10.7) earlier. Fifty-one percent reported that they had received orthodontic care themselves, and 17% of those who had received it as an adult.

As presented in Table I, the family dentist plays a dominant role in initiating orthodontic treatment for children, and parents prefer traditional treatment with braces for their children but "invisible" braces for themselves.

Table II presents the factors considered to be of greatest influence in respondents' decisions about orthodontic treatment for children and for themselves. No factors were decisive in the aggregate (value = 1) or irrelevant (value = 4). Cost was the most prominent barrier. Where there was a difference between factors affecting child versus adult care, the difference was always in the direction of greater attention to choice factors for decisions concerning children.

Reasons for seeking care differed depending on whether patients were concerned about functional issues or appearance. The correlation between motivation by function concerns and "pictures of beautiful smiles in advertisements" was 0.346 and between function and "possible correction without metal braces" was 0.348. The correlations with concern for appearance were 0.542 and 0.440, respectively. Although all of these associations were significant, the test for differences involving related correlations showed that ads for appearance were more predictive of patient attention than were ads for functional treatment ($P<0.001$ and $P<0.035$).

Figure 1 displays the relative importance of various sources of information as motivators for seeking care for oneself or for one's children. A panel of 8 independent lay judges rated how personal and direct each source of information were felt to be. The sources of information judged to be personal had stronger motivating effect ($r = 0.936$ for children; $r = 0.975$ for adults).

Generally, respondents exhibited weak knowledge of the characteristics of the orthodontic care system. The estimated length of treatment was similar across providers: 20.3 months for general dentists and 20.0 months for orthodontists. Respondents estimated that general dentists charge an average of $3959 per case (SD $3138), whereas orthodontists charge $5539 (SD $3798). This difference is statistically significant despite a huge range for general dentists (from $50 to $25,000 per case) and for orthodontists (from $100 to $35,000 per case).

Respondents have different expectations for orthodontic care provided by general dentists or by specialists. These are summarized in Table III . Results toward the left in this table show different perceptions of characteristics of providers; those on the right reflect preferences for care by type of provider. General practitioners, relative to orthodontists, were thought to provide more convenient care and to enjoy an already established relationship with patients ($P<0.001$). Orthodontists, in contrast to general

Table I. Attitudes toward care for children or self differ depending on demographic and life history characteristics

	Whose idea initiates care seeking?			*Type of care preferred*	
Patient	*Family dentist*	*Parent, friend*	*Patient*	*Traditional braces*	*"Invisible" braces*
Child	72	52	3	64	14
Adult	36	71	52	42	36
	$\chi^2 = 55.71$; $df = 2$; $P < 0.001$			$\chi^2 = 14.26$; $df = 1$; $P < 0.001$	

Table II. Reasons for seeking orthodontic care, barriers to care for functional and appearance problems, and sources of information about care differ for attitudes concerning care for child or self

	Overall		*Child*	*Adult*	*Child vs adult*	
Factor	*Mean*	*SD*	*Mean*	*Mean*	*t*	P
Reasons						
Family dentist recommendation	1.975[a]	0.947	1.773	2.169	3.777	0.001
Functional concern, physical problems	2.023[a]	1.009	1.803	2.237	3.862	0.001
Appearance concerns	2.045[a]	0.895	1.902	2.182	2.801	0.005
Pictures of beautiful smiles, ads	2.637[b]	1.041	2.572	2.698	1.065	
Possible correcdtion without braces	2.652[b]	0.989	2.582	2.720	1.230	
Functional concerns						
Out-of-pocket cost	2.102[a]	0.798	2.124	2.081	0.487	
Insurance, good payment plan	2.122[a]	0.843	2.081	2.164	0.905	
Finding good person to give care	2.127[a]	0.855	2.059	2.195	1.478	
Certainty complications will be handled	2.172[a]	0.889	2.071	2.272	2.092	0.040
Availability, can I get an appointment	2.436[b]	0.843	2.329	2.541	2.323	0.020
Time involved withg treatment	2.786[c]	0.836	2.726	2.846	1.319	
Busy, other things going on in my life	2.823[c]	0.877	2.777	2.869	0.970	
Appearance concerns						
Out-of-pocket cost	2.110[a]	0.853	2.109	2.112	0.029	
Insurance, good payment plan	2.153[a]	0.879	2.091	2.213	1.271	
Finding good person to give care	2.157[a]	0.853	2.201	2.092	0.961	
Certainty complications will be handled	2.163[a]	0.878	2.232	2.350	1.462	
Availability, can I get an appointment	2.438[b]	0.873	2.350	2.524	1.821	0.070
Time involved with treatment	2.718[c]	0.838	2.628	2.807	1.951	0.050
Busy, other things going on in my life	2.794[c]	0.847	2.844	2.111	1.093	
Sources of influence						
Referral from own dentist	2.000[a]	0.882	1.860	2.139	2.904	0.004
Stories, experiences of friends	2.381[b]	0.884	2.235	2.524	3.001	0.003
Having own dentist do the work	2.454[b]	0.976	2.360	2.549	1.760	0.080
Dental society, specialty recommendation	2.684[c]	0.932	2.601	2.767	1.608	
Online (Web) information	2.843[d]	0.852	2.739	2.945	2.192	0.030
Other advertising	3.078[e]	0.812	3.025	3.130	1.163	

1 = Decisive; 2 = big factor; 3 = minor matter; 4 = not relevant.
[a-e]Mean values with identical superscripted letters are indistinguishable groups according to the Duncan multiple range test.

practitioners, were thought to be more expensive and to be more reliable at identifying complex cases, producing completely satisfactory results, and managing complications ($P < 0.001$). There were no differences in anticipated length of treatment or in who tends to promise more than they can deliver.

The preference for being treated by an orthodontist was greatest when there is a functional concern and when complications may be involved and less pronounced for appearance matters. Preference for care provided by an orthodontist was associated with respondent characteristics. The orthodontist was preferred by respondents who were preventively oriented, more educated, and who trusted their general dentist's advice in such matters. There was a preference for using a general practitioner by adults who were considering treatment for themselves for appearance.

Respondents were asked whether they would prefer a general dentist or an orthodontist as the provider of care for themselves or their children when the case involved

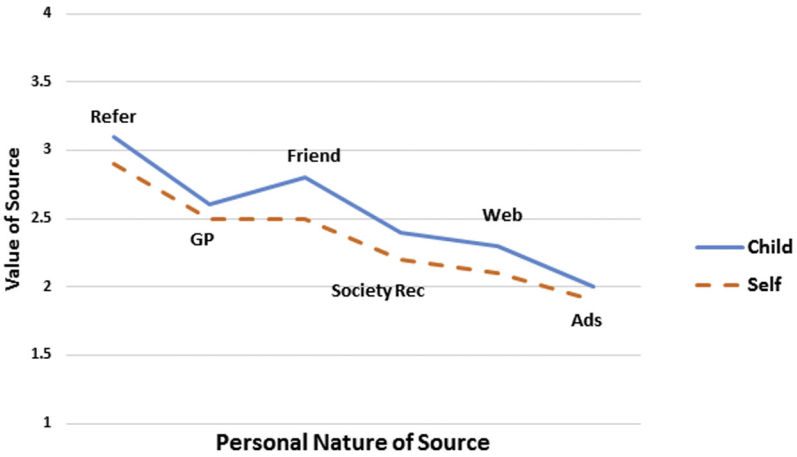

Fig 1. Relationships between personal nature of information sources and their value.

Table III. Difference in perceptions of general dentists and orthodontists performing orthodontic care and preference for provider

				Prefer orthodontist for		
	GP	*Ortho*	*Diff (P)*	*Function*	*Appearance*	*Complex*
Seeking care for self (not child)					−0.135	
Age						
Preventive visit				0.253		0.154
Income						
Education				0.147	0.137	0.237
Trust own general dentist				0.159	0.288	0.134
Cost	$3948	$5514	0.001			
Duration of treatment	20.9	21.8				
Convenient appts, location, hours					−0.211	
Very easy	52%	38%	0.001			
Fine	41	47				
Difficult	56	15				
Reputation, previous relationship					−0.187	
Known, comfortable	75%	53%	0.001			
Assumed	20	41				
I will overlook doubts	5	6				
Reliably distinguish easy or difficult cases				0.391	0.368	0.330
Knows and tells me	54%	78%	0.001			
Probably knows	37	21				
Unsure, may conceal	9	1				
Certainty of 100% successful outcome				0.338	0.339	0.303
Positively	52%	71%	0.001			
Hopefully	43	29				
A little doubt	5	0				
Ability to manage all complications				0.362	0.335	0.353
Positively	47%	73%	0.001			
Hopefully	45	27				
A little doubt	8	0				
Promises more than can be delivered				0.233	0.171	0.220
Never	36%	36%				
Extremely rare	36	43				
Sometimes	28	20				

Values on the right are correlation coefficients. Only coefficients that are statistically significant at $P < 0.05$ are shown; coefficients above 0.160 are significant at $P < 0.01$ or less.

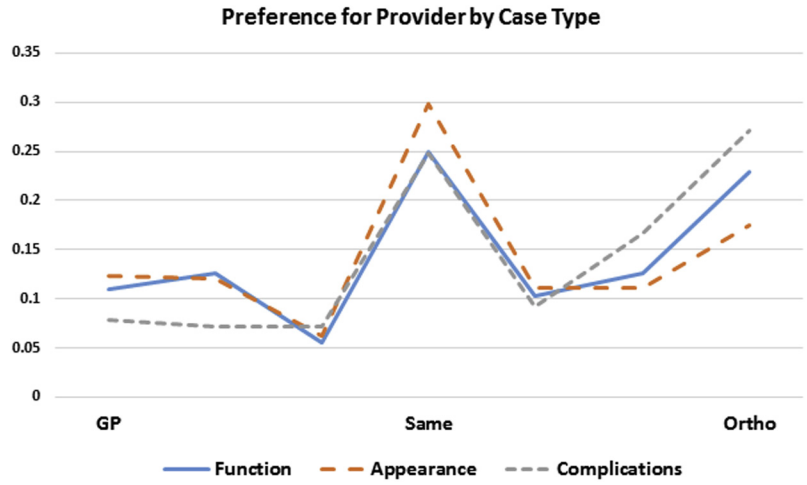

Fig 2. Preference for care provided by a general dentists or orthodontists depending on treatment expectations.

appearance, functional concerns, or when the case might involve complications. Lack of knowledge about orthodontics treatment may be the reason for the peak in the middle of Figure 2. A large number of respondents were indifferent between care provided by orthodontists and general practitioners, and this may reflect faint understanding of what is involved in such treatment.

DISCUSSION

This survey of patients regarding their views on orthodontic treatment for themselves and their children and for correction of function or appearance issues suggests that patients have imprecisely developed concepts of orthodontic treatment and that the general dentist is the primary source of information rather than media or other general sources.

The accepted logic in marketing is that awareness comes first and is followed by information, preferences, and finally decisions.[6,7] The present study is consistent with the view that the weak point in the chain is information. Patients have vastly different opinions, for example, regarding the cost of orthodontic treatment, with patients who have higher levels of education and income and more regular oral health habits being better informed.

Credibility of sources of information about orthodontic care varied. Direct, personal, and professional sources were regarded as more influential. The role of the general dentist, in either referring or offering orthodontic services appears to be dominant. Although there is a growing literature in dentistry and medicine on how electronic media should be crafted and how patients orient toward these media,[10-14] less is known about how media affect patient choices.[15,16] This study found that patients place greater trust in personal sources (information) than in impersonal sources that are more apt to emphasize benefits and target emotions. Patients expect more sources and more trusted sources when making decision about their children than about themselves. Adults considering care for themselves out of concern for appearance are slightly more open to indirect media.

A preference was noted for treatment by an orthodontist compared with a general practitioner. This preference was marked in the case of children, functional concerns, and cases that might involve complications. Orthodontists were thought to be more qualified to identify complex cases, manage complications, and deliver expected results. Patients with higher education levels and more preventive oral health habits were more apt to prefer care from an orthodontist. Adults with esthetic concerns were slightly more open to care by a general dentist. Although cost represents a barrier to seeking orthodontic care, among those considering care, level of personal income and cost of treatment were not factors differentiating preference for provider.

Clayton Christensen is well known for his theory of disruptive technology.[17] Established market entities (eg, orthodontists) compete with each other by adding features rather than lowering price. As the cost of care rises for patients who are not educated to appreciate the value of new features, new market entrants come in with "basic" models at lower prices and erode the position of those who have dominated the market. Something like this may be happening with general practitioners offering quick esthetic corrections with the use of aligners. Christensen's newest position is that this does not happen in all markets.[18] An essential ingredient is "nonconsumption." Disruption only occurs

where there is latent demand. It remains to be determined how many patients, adults and children, have been kept out of the orthodontic market because of cost, lack of information, and poor access.

CONCLUSIONS

This study did not find strong support for direct marketing to patients targeting appeal to image. There was, however, evidence that educating the public at the more basic level of providing health information would be effective in guiding patients toward care provided by orthodontists. The role of the general dentist in decisions about orthodontic care is important.

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