

## Adolescent Patients' Treatment Motivation and Satisfaction with Orthodontic Treatment

*Do Possible Selves Matter?*

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### ABSTRACT

**Objective:** To determine whether adolescents' satisfaction with orthodontic treatment outcomes is correlated with the degree to which (1) the adolescents focused on and (2) were energized by imagining their posttreatment possible selves before the treatment, and whether parents' assessments of their children's pretreatment motivation would correlate with their children's posttreatment satisfaction.

**Methods:** Data were collected from 75 former adolescent orthodontic patients (28 male, 47 female; 60 European American, 14 other) and from 72 parents (59 female, 12 male, 1 missing) with mailed questionnaires. Satisfaction with the treatment outcome was assessed with a revised version of Kiyak's Post-Surgical Patient Satisfaction Questionnaire.

**Results:** The more the patients had focused on the posttreatment esthetics and functioning and the more they were energized by thinking about their posttreatment possible selves before the treatment, the more satisfied they were with the outcomes ( $r = .337, P = .004$ ;  $r = .231, P = .053$ ;  $r = .465, P < .001$ ). The more the parents believed that their children were energized by thinking about posttreatment possible selves, the more satisfied the parents were with the outcomes ( $r = .326, P = .007$ ).

**Conclusions:** Increasing adolescents' possible self considerations before orthodontic treatment is likely to increase their own and their parents' posttreatment satisfaction. (*Angle Orthod.* 2009; 79:821–827.)

**KEY WORDS:** Treatment satisfaction; Orthodontic treatment; Treatment motivation; Adolescent patients

### INTRODUCTION

National Health and Nutrition Examination Survey data showed that substantial percentages of the US population had a definite orthodontic treatment need and that some children and adults had such a severe malocclusion that it could be described as “disfigur-

ing.”<sup>1-3</sup> The fact that large percentages of adolescents have an orthodontic treatment need was also supported by other research.<sup>4-6</sup> One interesting question is how satisfied adolescents and their parents are when these patients receive orthodontic treatment. Research showed that only 34% of orthodontic patients were totally satisfied, 62% were relatively satisfied, and 4% were actually dissatisfied.<sup>7</sup> This finding raises the question whether there is a way that orthodontists could identify—prior to orthodontic treatment—which patients might be less satisfied with the treatment outcome. If these patients could be identified, the next question would be how orthodontists could intervene to improve treatment satisfaction for these patients. This study proposes to explore whether one aspect of adolescent patients' pretreatment motivation, namely their possible self-related motivation, would predict posttreatment satisfaction. If this relationship could be found, communication strategies could be developed to shape patients' pretreatment

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motivation, which should result in increased satisfaction with their treatment outcome.

The concept of possible selves was introduced by Markus and Nurius.<sup>8</sup> These authors defined possible selves as a person's thoughts concerning what they might become in the future. Positive possible selves are hopes or dreams about positive future identities, and negative possible selves are fears of who the person might become in the future. Regardless of whether these possible selves are positive or negative, they affect a person's motivation in two ways.<sup>9</sup>

First, they energize the person to work toward making positive possible selves become a reality or toward preventing negative possible selves from becoming a reality. In this sense, they affect the intensity/strength of a patient's motivations. Second, they focus a person on a specific goal and thus direct their motivation as well. Before adolescents begin orthodontic treatment, they are likely to differ in the degree to which they have possible self-related thoughts imagining themselves after orthodontic treatment. Some patients might be very excited when they imagine how they will look after the treatment. These patients would therefore be highly motivated for their treatment. Other patients might not be excited at all—thus having a low level of treatment motivation. In addition, some patients might frequently focus on how their teeth will look after the treatment and how much more others might like their smile. These patients have more focused possible self-reflections compared with patients who rarely entertain such thoughts. The theory of possible selves predicts that these differences, in the degree to which patients are (1) energized by and (2) focused on their future possible selves after the orthodontic treatment, will predict how satisfied the patients will be with the treatment outcomes.

The theory of possible selves has been used in several health-related contexts such as when investigating alcohol abuse,<sup>10,11</sup> chronic pain,<sup>12</sup> exercising,<sup>13</sup> and smoking behavior.<sup>11,14,15</sup> It also has been applied to explaining mental health issues such as Alzheimer disease,<sup>16</sup> borderline personality disorders,<sup>17</sup> and depression.<sup>18</sup> Meade and Inglehart used this concept in an oral health-related context.<sup>19</sup> They explored the relationship between adolescent patients' motivation for orthognathic surgery based on their possible selves and their satisfaction with the surgery outcomes. They found that the more energized the patients had been before the surgery, the more satisfied they were with the outcomes ( $r = .541, P < .001$ ); and the more they had focused on esthetic changes and on improved functioning, the more satisfied they were with the treatment outcomes ( $r = .474, P < .001$ ;  $r = .448, P < .001$ ). In addition, these authors also showed that the parents were able to assess their child's possible self-

related motivations validly and that these parental assessments also correlated significantly with the patients' treatment satisfaction. This study suggests exploring whether patients' possible selves before their orthodontic treatment will also be related to their post-treatment satisfaction. Specifically, it is expected that the more energized and focused the patients are on their possible selves, the more satisfied they will be with the posttreatment outcome. In addition, it is predicted that the parents' assessments of their child's possible self-considerations will be correlated with the patients' possible self considerations and the patients' posttreatment satisfaction.

## MATERIALS AND METHODS

This study was approved by the Institutional Review Board at the University of Michigan, Ann Arbor, Mich (HUM00017735). Patients who had completed their orthodontic treatment at the University of Michigan during a 3-year period prior to May 1, 2008 received mailed information about the study and were instructed to respond only if they had completed their orthodontic treatment before they were 21 years old. Seventy-five adolescent patients (average age when considering treatment: 11.61 years; SD: 1.920; range: 4 to 17 years) and 72 parents returned surveys. Most patients were female (62.7%) and European American (81.1% European American), and most parents were mothers (82.8%).

In order to protect the former patients' privacy, clinic staff mailed the prepared envelopes with the information letters and surveys. The patients and parents returned the surveys anonymously in provided stamped envelopes.

The patients' satisfaction with the orthodontic treatment was assessed with the Post-Surgical Patient Satisfaction Questionnaire (PSPSQ) by Kiyak et al<sup>20</sup> (see Table 1 for the wording of the questions) that was adapted to address the orthodontic treatment satisfaction instead of the orthognathic surgery satisfaction. The reliability of the scale was good (Cronbach alpha = .894). An index of "posttreatment patient satisfaction" was constructed by averaging the responses. Similarly, the parents' satisfaction with their child's treatment was also assessed with a revised version of the PSPSQ by Kiyak et al.<sup>20</sup> The reliability of this scale was also satisfactory (Cronbach alpha = .860) and a "parent posttreatment satisfaction" index was constructed by averaging the parents' responses.

For the possible self measurements, the scale developed by Meade and Inglehart<sup>19</sup> for use with orthognathic surgery patients was adapted for use with orthodontic patients. The term "orthognathic surgery"

**Table 1.** Percentages of and Average Responses to the Treatment Satisfaction Items

	1 & 2 <sup>a</sup>	3–5	6 & 7	Mean
Posttreatment patient satisfaction questions				
If you had to make the decision again, how likely would you be to undergo orthodontic treatment?	4.2%	18.8%	76.0%	5.99
Considering that this was an elective procedure, how likely would you now be to recommend braces to others?	2.8%	22.5%	74.7%	6.08
Considering everything, how satisfied are you now with the results of orthodontic treatment?	2.8%	26.8%	70.4%	6.07
Index <sup>b</sup>	1 to 2.5	>2.5 to 5.5	>5.5 to 7	Mean
Patients' satisfaction with the treatment	2.8%	22.6%	74.6%	6.05
Posttreatment parent satisfaction questions				
If you had to make the decision again, how likely would you be to have your child undergo orthodontic treatment again?	1.4%	7.1%	91.5%	6.64
Considering that this was an elective procedure, how likely would you now be to recommend braces to others?	0%	18.6%	81.4%	6.34
Considering everything, how satisfied are you now with the results of your child's orthodontic treatment?	1.4%	11.4%	87.2%	6.50
Index <sup>b</sup>	1 to 2.5	>2.5 to 5.5	5.5 to 7	Mean
Parents' satisfaction with the treatment	1.4%	8.6%	90.0%	6.00

<sup>a</sup> The answers were given on a 7-point scale ranging from 1 = "not at all" to 7 = "very."

<sup>b</sup> The index was computed by averaging the responses to the three questions.

was therefore replaced with "the braces" (see Table 2a,b).

The patient possible self instrument consisted of 12 questions. Four questions were designed to measure the energizing component of the patients' possible selves (Cronbach alpha = .79), three items measured how much the patients had focused on the posttreatment esthetics (Cronbach alpha = .78), and five items measured the focus on the posttreatment functioning (Cronbach alpha = .613). The parent possible self instrument consisted of 11 questions that asked the parents to assess their child's motivation before the treatment. Four items were combined to create an index of the parents' perceptions of their child's energizing possible self component (Cronbach alpha = .832), and seven items were combined into an index of the parents' perceptions of their child's focusing component (Cronbach alpha = .803).

### Statistical Analyses

The data were analyzed using SPSS (version 16.0).<sup>21</sup> Descriptive statistics were used to describe the responses concerning the satisfaction and possible selves. Correlation analyses with Spearman correlation coefficients were performed to determine the predicted relationships. A *P* value < .05 was considered statistically significant.

### RESULTS

First, analyses focused on how satisfied the patients and parents were with the orthodontic treatment. Table 1 shows that only 2.8% of patients were strongly dis-

satisfied with their orthodontic treatment. However, 22.6% of patients had intermediate levels of satisfaction, and 74.6% expressed high treatment satisfaction. The parents' satisfaction was higher than the patients' satisfaction with 90% being highly satisfied with their child's orthodontic treatment.

Table 2a provides an overview of patient responses concerning their possible selves. Responses showed that 81% of patients agreed/strongly agreed that they were really excited about the way their teeth would look after braces, and 75.7% agreed/strongly agreed that they were really excited when thinking about the way they would look after braces, while only 39.2% agreed/strongly agreed with the statement "I was excited about the way my profile would look after braces" and "I was really excited about having braces." Overall, 66.2% of the patients were highly motivated due to this energizing possible self component, 22.3% had a medium motivation, and 13.5% had a low orthodontic treatment motivation.

Concerning the patient self-assessment of their focus on posttreatment esthetics, the data showed that only 40.6% agreed/strongly agreed that they often thought about how their profile would look after braces, while 79.7% agreed/strongly agreed that they often thought about how they would look after the braces, and 83.7% agreed/strongly agreed that they often thought about what their teeth would look like after braces. Overall, only 10.8% of the patients had a low level of this motivation, while 25.7% had a medium level, and 66.5% had a high level of this motivation.

The data concerning the patients' focus on the functioning aspect of possible selves showed that a low

**Table 2a.** Percentages of Patient Responses Indicating Low, Medium, and High Patient Motivation for Having Braces

	Low Motivation 1 & 2 <sup>a</sup>	Medium Motivation 3	High Motivation 4 & 5	Mean
<b>Self-assessments of energizing component of possible selves</b>				
I was really excited when thinking about the way I would look after braces.	10.8%	13.5%	75.7%	4.07
I was excited about the way my profile would look after braces.	36.5%	24.3%	39.2%	3.08
I was really excited about the way my teeth would look after braces.	9.5%	9.5%	81.0%	4.26
I was really excited about having braces.	44.6%	16.2%	39.2%	2.85
Energizing index <sup>b</sup>	13.5%	20.3%	66.2%	3.56
<b>Self-assessments of focusing on esthetics</b>				
I often thought about how I would look after the braces.	9.5%	10.8%	79.7%	4.12
I often thought about how my profile would look after braces.	37.9%	21.6%	40.6%	3.11
I often thought about what my teeth would look like after braces.	4.1%	12.2%	83.7%	4.36
Esthetics index <sup>b</sup>	10.8%	25.7%	66.5%	3.86
<b>Self-assessments of focusing on functioning</b>				
I often thought about how it would be easier to chew after braces.	60.8%	16.2%	25%	2.41
I often thought about how my speech would be improved after braces.	74.4%	13.5%	12.1%	1.96
I was really determined to have braces.	35.1%	18.9%	46.0%	3.12
I understood why I was having braces.	4.1%	8.1%	87.8%	4.51
How much did you think about having braces? <sup>c</sup>	38.7%	34.6%	26.7%	2.89
Functioning index <sup>b</sup>	27.0%	48.7%	24.3%	2.98

<sup>a</sup> Answers were given on a 5-point scale ranging from 1 = “strongly disagree” (low degree of motivation) to 5 = “strongly agree” (higher degree of motivation).

<sup>b</sup> The percentages of responses on the indices were divided into categories: 1: <2.5; 2: 2.5 to <3.5; and 3: ≥3.5.

<sup>c</sup> The answers were given on 5 point answer scales ranging from 1 = “not at all” to 5 = “very much”.

percentage of patients agreed/strongly agreed with four of the five statements. While 87.8% agreed/strongly agreed that they understood why they had braces, significantly lower percentages agreed/strongly agreed that they often thought about how their speech would be improved after braces (12.1%) and how it would be easier to chew after braces (25%),

and that they were really determined to have braces (46%). Overall, only 24.3% were highly motivated based on this possible self aspect, while 48.7% had a medium level of this motivation, and 27% had a low level of this motivation.

Table 2b provides the percentages of parents with different degrees of possible self motivations. Con-

**Table 2b.** Percentages of Parents Who Perceived That Their Child Had a Low, Medium, or High Degree of Motivation for Having Braces

	Low Motivation 1 & 2 <sup>a</sup>	Medium Motivation 3	High Motivation 4 & 5	Mean
<b>Assessments of child’s possible selves—energizing component: My child . . .</b>				
was really excited when thinking about the way he/she would look after braces.	14.3%	22.9%	62.8%	3.89
was excited about the way his/her profile would look after braces.	31.5%	24.3%	44.2%	3.27
was really excited about the way his/her teeth would look after braces.	11.3%	18.3%	70.4%	4.08
was really excited about having braces.	31%	23.9%	45.0%	3.28
Energizing index <sup>b</sup>	17.1%	32.9%	50.0%	3.62
<b>Assessments of child’s possible selves—focusing component: My child . . .</b>				
often thought about how he/she would look after braces.	11.5%	22.9%	65.7%	3.91
often thought about how it would be easier to chew after braces.	44.3%	18.6%	37.1%	2.84
often thought about how speech would be improved after braces.	57.4%	24.0%	18.6%	2.29
often thought about how his/her profile would look after braces.	32.8%	24.3%	42.9%	3.19
often thought about how his/her teeth would look after braces.	8.4%	18.3%	73.3%	4.06
was really determined to have braces.	28.2%	25.4%	46.5%	3.32
understood why he/she was getting braces.	2.8%	33.8%	63.4%	4.54
Focusing index <sup>b</sup>	15.7%	38.6%	45.7%	3.71

<sup>a</sup> Answers were given on a 5-point scale ranging from 1 = “strongly disagree” (low degree of motivation) to 5 = “strongly agree” (higher degree of motivation).

<sup>b</sup> The percentages of responses on the indices were divided into categories: 1: <2.5; 2: 2.5 to <3.5; and 3: ≥3.5.

**Table 3.** Correlations Between the Patients' Self-Assessed Motivations and the Parents' Assessments of their Children's Motivations

	Patients' Self-Assessments of Possible Selves		
	Energizing Component	Focus on Posttreatment Esthetics (Focus I)	Focus on Posttreatment Function (Focus II)
Patients' self-assessments of possible selves			
Energizing component	—	.818, $P < .001$	.704, $P < .001$
Focus on posttreatment esthetics (Focus I)	.818, $P < .001$	—	.592, $P < .001$
Focus on posttreatment function (Focus II)	.704, $P < .001$	.592, $P < .001$	—
Parents' assessments of children's possible selves			
Energizing component	.652, $P < .001$	.506, $P < .001$	.611, $P < .001$
Focus on posttreatment esthetics (Focus I)	.583, $P < .001$	.539, $P < .001$	.626, $P < .001$

cerning the energizing component of their child's motivation, less than half of the parents agreed/strongly agreed that their child was excited about the way his/her profile would look after braces (44.2%) and that their child was really excited about having braces (45%). However, more than half of the parents agreed/strongly agreed that their child was really excited when thinking about the way he/she could look after braces (62.8%) and about the way his/her teeth would look after braces (70.4%). Overall, 50% of parent assessments of their child's motivation based on the energizing possible self component were high, while 32.9% had a medium level, and 17.1% had a low level of this type of motivation.

Concerning the parent assessments of their child's focus on their possible selves, it is important to note that the parents' assessments of their child's focusing on esthetics and focusing on functioning scores were combined into one index, indicating that the parents did not differentiate between these two aspects of their child's possible self motivations. Table 2b shows that less than half of the parents agreed/strongly agreed with the statements that their child often thought about how speech would be improved after braces (42.9%) and how it would be easier to chew after braces (37.1%), while more than half of the parents agreed/strongly agreed that their child understood why he/she was getting braces (63.4%), often thought about how he/she would look after braces (65.7%), and about how his/her teeth would look after braces (73.3%). Overall, slightly less than half of parents (45.7%) reported that their child had a high level of focusing motivation, while 38.6% reported a medium level, and 15.7% a low level of this motivation.

As predicted, the patient and parent assessments of the energizing component of the child's possible selves were strongly correlated ( $r = .652, P < .001$ ) and both focusing aspects of the child's self-assessments and the parent assessment of the child's focusing possible selves aspect were also significantly correlated ( $r = .539, P < .001; r = .626, P < .001; Table 3$ ).

Concerning the most important question whether

there is a relationship between patients' pretreatment possible selves and their posttreatment satisfaction, Table 4 shows that each of the three patient possible self aspects was significantly correlated with the patient treatment satisfaction (energizing:  $r = .465, P < .001$ ; focus on esthetics:  $r = .337, P = .004$ ; focus on functioning:  $r = .231, P = .053$ ). The parent assessments of the child's possible selves were also significantly correlated with the patients' treatment satisfaction (energizing:  $r = .4495, P < .001$ ; focus on esthetics:  $r = .323, P = .016$ ). While the patients' possible self components were not significantly correlated with the parents' satisfaction index, the parent assessment of the energizing component of their child's possible selves was significantly correlated with the parents' satisfaction score ( $r = .326, P = .007$ ), and there was a tendency that the parents' assessment of the focusing component of their child's possible self was also correlated with the parents' satisfaction index ( $r = .218, P = .074$ ).

## DISCUSSION

Before discussing the findings concerning the role of possible selves in shaping satisfaction with orthodontic treatment outcomes, it is crucial to understand that not all patients were highly satisfied with their orthodontic treatment (see also earlier research<sup>7</sup>). It seems, therefore, worthwhile to reflect on how to potentially increase patient satisfaction. The results of this study suggest that communicating with patients about their possible selves prior to their treatment in a way that the patients (1) get more energized by thinking about their possible selves and (2) focus more clearly on these possible selves might ultimately lead to a higher satisfaction with their treatment. Consistent with the findings by Meade and Inglehart,<sup>19</sup> the findings of this study confirm that patients differ widely in the degree to which they engage in possible self considerations. Table 2a showed that while some patients were strongly energized by thinking about the way they would look after braces and the way their teeth

**Table 4.** Correlations Between Possible Self Components and Treatment Satisfaction

	Patients' Self-Assessments of Possible Selves			Parents' Assessments of Children's Possible Selves	
	Energizing Component	Focus on Esthetics (Focus I)	Focus on Function (Focus II)	Energizing Component	Focus on Esthetics (Focus I)
Patient satisfaction questionnaire <sup>20</sup>					
If you had to make the decision again, how likely would you be to undergo orthodontic treatment?	.466, <i>P</i> < .001	.289, <i>P</i> = .015	.270, <i>P</i> = .023	.452, <i>P</i> < .001	.344, <i>P</i> = .010
Considering that this was an elective procedure, how likely would you now be to recommend braces to others?	.481, <i>P</i> < .001	.317, <i>P</i> = .007	.209, <i>P</i> = .080	.384, <i>P</i> = .004	.270, <i>P</i> = .046
Considering everything, how satisfied are you now with the results of braces?	.404, <i>P</i> < .001	.365, <i>P</i> = .002	.204, <i>P</i> = .087	.349, <i>P</i> = .009	.246, <i>P</i> = .070
Patient satisfaction index	.465, <i>P</i> < .001	.337, <i>P</i> ≤ .004	.231, <i>P</i> = .053	.449, <i>P</i> < .001	.323, <i>P</i> = .016
Parents' satisfaction with child's orthodontic treatment					
If you had to make the decision again, how likely would you be to undergo orthodontic treatment?	.268, <i>P</i> = .042	.294, <i>P</i> = .025	.133, <i>P</i> = .320	.321, <i>P</i> ≤ .007	.242, <i>P</i> ≤ .045
Considering that this was an elective procedure, how likely would you now be to recommend braces to others?	.266, <i>P</i> = .043	.251, <i>P</i> = .058	.170, <i>P</i> = .203	.361, <i>P</i> = .002	.282, <i>P</i> = .019
Considering everything, how satisfied are you now with the results of braces?	.139, <i>P</i> = .297	.075, <i>P</i> = .586	.125, <i>P</i> = .352	.208, <i>P</i> = .086	.107, <i>P</i> = .380
Parent satisfaction index	.209, <i>P</i> = .115	.198, <i>P</i> = .135	.077, <i>P</i> = .563	.326, <i>P</i> = .007	.218, <i>P</i> = .074

would look after the braces, others were not at all engaged in these thoughts. In addition, the patients also differed substantially in the degree to which they had focused on esthetics and functioning before they had braces. However, it is interesting that the patients reported higher levels of possible self considerations concerned with esthetic aspects of their treatment outcomes compared with functional aspects. This finding is consistent with the results of other studies that showed that esthetic considerations were the primary reason for orthodontic treatment, and that considerations about improved functioning were much less common.<sup>22,23</sup> These findings are not surprising given that research showed that the face is a crucial characteristic in the development of a person's self-esteem and self-image.<sup>24,25</sup> It seems understandable, therefore, that the patients were on average more energized by and focused on esthetics than functioning.

While earlier studies had explored patients' self perceptions and how they were affected by malocclusion,<sup>26</sup> this study suggests to consider one specific type of self perception, namely possible selves, and to explore how this perception is related to the patients' posttreatment satisfaction. The results showed convincingly that there is a relationship between possible self-based pretreatment motivation and posttreatment satisfaction. The more energized the patients were by thinking about future possible selves and the more fo-

cused they were, the more satisfied they were after the treatment.

These findings offer a strategy to potentially improve patients' orthodontic treatment satisfaction. Given that pretreatment possible self considerations correlate with posttreatment satisfaction, a first step would be to assess patients' possible selves during the screening appointment. Assessing these possible selves can be achieved by communicating with the patient and the parents about these considerations. Parents are clearly aware of their child's possible self considerations and could therefore be a valuable source of information. The second step would be to shape the patients' possible selves in a way that the patients become more excited about how they will look after the braces and how they will be able to function. Focusing patients on how they will look and making them excited about the ultimate treatment outcome should result in increased treatment satisfaction.

In addition to exploring these issues prior to the treatment, it might also be worthwhile to keep these issues in mind when communicating with a patient during the treatment. Patients' motivation is dynamic and can be affected throughout the course of the treatment. Even if patients had not been energized and focused prior to their treatment, orthodontists and their staff could encourage their patients to engage in possible self-related reflections during the treatment. As a

result, patients who might have been at risk for being dissatisfied with their treatment outcome might become increasingly more motivated by thinking about the future. One way to engage patients in possible self reflections could be to share images of expected treatment outcomes with the patient.

The major limitation of this study was that it was a retrospective study. Patients and parents were asked to complete an assessment of their pretreatment possible self considerations after their treatment had been completed. The fact that the patients and parents had invested a considerable amount of time, effort, and cost into the treatment might have affected their responses. These results should therefore be used as the basis to conduct a future prospective study which could demonstrate the usefulness of the possible self concept definitively.

## CONCLUSIONS

- Before adolescent patients start their orthodontic treatment, they differ in the degree to which they are energized by and focus on future posttreatment possible selves.
- Parents can assess the degree to which their child is energized by and focuses on posttreatment possible selves.
- The more energized and focused the patients are prior to the treatment, the more satisfied they are with the treatment outcomes. The more the parents perceive that their child has been energized and focused on their posttreatment possible selves, the more satisfied the patients and the parents are with the outcomes of the orthodontic treatment.

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