

SCIENTIFIC
SECTIONPatients' and parents' expectations of
orthodontic treatment

Renske Hiemstra, Annemieke Bos and Johan Hoogstraten

ACTA, Amsterdam, The Netherlands

Objective: To investigate the expectations of children and their primary care-givers towards orthodontic treatment and to compare the results with those of a UK sample.

Design: A questionnaire survey of children and their primary care-givers attending for their first consultation.

Setting: The Department of Orthodontics at the Academic Centre for Dentistry Amsterdam (ACTA), the Netherlands.

Subjects and methods: A total of 168 subjects (84 patients and 84 parents) completed the questionnaire. The children were aged 10 to 14 years. The responses of the children and parents and differences between boys and girls were examined using parametric statistical methods. The data from the Dutch sample were compared with a similar UK sample.

Results: Patients and parents shared similar expectations of orthodontic treatment, with the exception of expectations of having a brace fitted at the first appointment, orthodontic treatment involving headgear, any problems with orthodontic treatment, duration of orthodontic treatment and concerning reactions from the public. Among the child participants, boys and girls only differed in their expectations of orthodontic treatment involving jaw surgery. Differences between Dutch and English participants were found regarding the first visit, type of orthodontic treatment, reactions from the public, and pain and problems with orthodontic treatment.

Conclusions: Since the expectations of patients and their parents differ on several aspects, effective communication between the orthodontist, patient and parent is considered to be essential. Our hypothesis that Dutch patients' and parents' expectations of orthodontic treatment differ from the expectations of English patients and parents was supported.

Key words: Orthodontic treatment, patient and primary care-giver expectations

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Introduction

An important factor in a person's decision to seek orthodontic treatment is the desire to improve dentofacial aesthetics.¹ Improvements in social life and self-confidence are additional potential benefits as seen by patients.² It has been recognized that individuals with malocclusions might develop feelings of shame about their dental arrangement and may feel shy in social contacts. Occlusal corrections have been shown to improve the body image of dental and facial appearance.³ People who are satisfied with their face appear to be more self-confident and have a higher self-esteem.⁴ Because of these psychological aspects, it is important to further consider patients' motivation for and expectations of orthodontic treatment.⁵

Phillips *et al.*⁶ found that patients' main reason for seeking orthodontics is to correct dentofacial disharmony. Males have different expectations of orthodontic treatment than females. Males have a strong social well-being motivation, while females focus on improved appearance as its own reward.

Females are generally more dissatisfied with the appearance of their dentition and perceive a need for braces more often than males.^{5,7,8} Also, satisfaction with facial body image decreases with age, adults are more dissatisfied with their dentofacial appearance than children.^{7,9} Patients who are satisfied with the appearance of their teeth have different expectations of orthodontic treatment than patients who are dissatisfied and older patients expect more improvement in self-image than younger patients.⁹

Bernabé *et al.*¹⁰ reported that it is widely known that orthodontic treatment occasionally causes pain, discomfort and functional limitations.^{2,11–13} Patients' self-confidence during treatment might be affected by speech impairment and the visibility of the appliance.¹⁴ Also, discomfort caused by orthodontic treatment may affect patients' compliance, satisfaction with treatment and it might lead to stress between patient and practitioner.^{11,13}

Previous studies have measured subjects' expectations of orthodontic treatment after their initial consultation or during treatment,^{15,16} or measured only parents'

expectations of orthodontic treatment and not the expectations of the children.¹⁷ Few studies have measured both patients' and parents' expectations prior to their first consultation.^{9,18,19} In a recent study, patients' and their parents expectations of orthodontic treatment were measured using a validated questionnaire, prior to their initial appointment.¹⁸ Patients and parents showed similar expectations of treatment, except for having an orthodontic appliance fitted at their first visit, the expectations of duration of orthodontic treatment and dietary and drinking restrictions as a result of orthodontic treatment.¹⁸

Several studies have shown that a higher percentage of the population aged 12 to 15 years, receive orthodontic treatment in the Netherlands compared to the United Kingdom.^{20,21} Also, there is a difference in the health care system. Dutch patients need a supplementary insurance for orthodontic treatment, while in the UK there is a national dental health service, which pays the complete cost of orthodontic treatment for children. We therefore hypothesized that Dutch patients' and parents' expectations of orthodontic treatment differed from the expectations of English patients and parents.

The aim of this study was to examine patients' and their primary care-givers' expectations of orthodontic treatment in the Netherlands, prior to their first consultation. We used a questionnaire originally developed by Sayers and Newton.^{18,19}

Materials and methods

The study was subjected to the ethical rules and guidelines of the Netherlands Institute of Dental Sciences (IOT). In line with the policy of the orthodontic department of ACTA, patients and parents explicitly agreed to participate.

Questionnaire

A questionnaire was used to measure patients' and their primary care-givers' expectations of orthodontic treatment (see Appendix 1). The questionnaire, developed by Sayers and Newton,¹⁹ was translated into Dutch by two orthodontic residents. The two residents, both working at the Department of Orthodontics in Amsterdam (ACTA), combined their translations into one version. This version was translated back into English by a native speaker, who was masked as to the original questionnaire. The two versions, the original and the translated version of the native speaker, were then compared. The final Dutch version was tested on 10 new patients and 10 parent participants.

Like Sayers and Newton,^{18,19} a visual analogue scale marked at 10-mm intervals was used as the response scale for all questions, except questions 8 and 9. Scores on the visual analogue scale were calculated by measuring the distance to the mark in mm from the left hand side of the VAS. '0' represented 'extremely unlikely' and '100' represented 'extremely likely'. Question 8 and 9 had different response options. Item 8 read 'How long do you expect orthodontic treatment to take?' The respondent had 11 options ranging from 'don't know', '1 month', '3 months' up to '2.5 years' and '4 years'. Item 9 read 'How often do you think you will need to attend for check up?' On this item there were 10 response options ranging from 'don't know', 'twice a week', 'once a week' up to every '6 months' and 'every 8 months'.

Sample

All patients who applied for their first consultation at ACTA during the period October 2007 until January 2008 participated in this study, resulting in a sample of 84 patients and 84 parents. Patients were aged 10 to 14 years and had no history of previous orthodontic treatment. They completed the questionnaire separately from their accompanying parent under the supervision of one of the orthodontic residents. Following completion of the questionnaire, they continued their first consultation with an orthodontist working at the Department of Orthodontics.

Statistical analysis

The responses provided by patients and their parents to the questionnaire were entered and analyzed using SPSS (v14; SPSS Corporation, Chicago, IL, USA). The data were examined and the differences in the responses to each item of the questionnaire between patients and parents were tested using paired sample *t* tests. The differences between boys and girls were tested using independent sample *t* tests. Furthermore, differences between Dutch patients and English patients and between Dutch parents and English parents were analyzed, using one-sample *t* tests. The responses to questions 8 and 9 were categorical and not answered on a visual analogue scale. Item 8 and 9 had 11 and 10 response options, respectively. When analyzing results of item 8 and 9, using Wilcoxon Signed Ranks tests and Mann-Whitney U tests, the response options were combined to six answering options. This was done, because some response options were not used by one of the participants at all. The 'Don't know' responses are presented in Tables 1 and 2. Like Sayers and Newton,^{18,19} these responses were excluded from the analysis.

Table 1 Expectations as to the duration of orthodontic treatment (question 8)

Duration of treatment	Patients (n=84)	Parents (n=84)	Total number (n=168)
<1 year	4	2	6
1–1.5 years	17	15	32
1.6–2 years	18	22	40
>2–3 years	11	21	32
>3 years	3	5	8
Don't know	31	19	50

Results

Eighty-four patients (45% females) and their parents (82% females) completed the questionnaire, no one refused to participate. The mean age of the children was 11.4 years (SD 1.3).

Comparison of patient and parent expectations

Table 3 shows the comparison of responses to each questionnaire item for the children compared with their parent. Patients, as well as parents, had low, but realistic expectations with regard to having a brace fitted at their initial appointment (question 1a); requiring orthodontic treatment involving dental extractions (question 2c) and jaw surgery (question 2e). In contrast to these questions, the mean values on questions 1b (a check-up and diagnosis at their initial appointment) and 10a (expectation that orthodontic treatment would straighten their teeth) were rather high for both patients and parents.

In general, much consensus was found between patients and their parents. Although both patients and their parents had relatively low expectations on having a brace fitted at their first appointment, (question 1a) parents had lower expectations compared to patients ($P=0.041$). Answers to question 2d showed that patients had lower expectations with regard to orthodontic treatment involving headgear ($P=0.018$). Also, parents had lower expectations of any problems from orthodontic treatment (question 3) ($P=0.022$) and lower expectations concerning positive reactions from the

public (question 7) ($P=0.034$) compared with their children.

Table 1 and 2 shows the descriptive statistics for question 8 and 9. Thirty-one patients had no idea about the duration of orthodontic treatment compared to 19 parents. Nearly twice as many parents as patients expected orthodontic treatment to be finished within 2–3 years. Table 2 shows that 25% did not know the frequency of appointments and patients were more ignorant compared to parents. Results for question 8 and 9 were tested using Wilcoxon Signed Ranks tests. Only for question 8 was a significant difference found between patients and parents ($z=3.09$, $N - \text{Ties}=54$, $P=0.002$, two-tailed). Parents expected orthodontic treatment to take longer compared to patients.

Comparison of boys and girls

Surprisingly, only one significant difference was found between boys and girls (question 2e; $M\sigma=8.1$, $M\sigma=15.3$, $t=7.05$, $P=0.010$). Boys had significantly lower expectations with regard to orthodontic treatment involving surgery, compared to girls. Question 8 and 9 showed no significant differences between boys and girls, using Mann-Whitney U tests.

Comparison of Dutch and English patients

Many significant differences were found between the responses from the Dutch sample compared with the UK sample (Table 4). Dutch patients had lower

Table 2 Expectations as to the frequency of appointments (question 9)

Frequency of appointments	Patients (n=84)	Parents (n=84)	Total number (n=168)
<1 month	6	4	10
1–2 months	37	52	89
>2–3 months	5	4	9
>3–6 months	7	7	14
>6 months	3	0	3
Don't know	26	17	43

expectations of having a brace fitted (question 1a) and having a discussion about treatment (question 1c), while they had higher expectations of a check-up and diagnosis (question 1b) at their initial visit. Also, Dutch patients expected more orthodontic fixed appliances (question 2b) and headgear (question 2d) and less orthodontic treatment involving teeth extracted (question 2c) and jaw surgery (question 2e). They expected that wearing braces would more frequently be painful (question 4), there would be more dietary and drinking restrictions (question 6) and more positive reactions from the public (question 7). Furthermore, they expected a higher increase in career prospects as a result of treatment (question 10f), compared to English patients.

Comparison of Dutch and English parents

The comparison of responses from Dutch and English parents is shown in Table 5. Dutch parents had greater expectations of a check-up and diagnosis (question 1b) and lower expectations of having a discussion about treatment (question 1c) at their first appointment. They expected

more orthodontic fixed appliances (question 2b) and headgear (question 2d), and less teeth extraction (question 2c) and jaw surgery (question 2e). Also, Dutch parents expected more often that wearing braces would be painful (question 4), there would be eating problems (question 5), dietary and drinking restrictions (question 6) and they expected more positive reactions from the public (question 7). Furthermore, they did not expect that orthodontic treatment would make it easier to eat (question 10c) and they expected less improvement in social confidence (question 10g), compared to English parents.

Responses from Dutch and English patients, and from Dutch and English parents on question 8 and 9, were analyzed using Mann-Whitney U tests. No significant differences were found.

Discussion

This study found some differences in the expectations of orthodontic treatment between Dutch patients and parents. There were also differences between Dutch patients' and parents' expectations and patients and parents completing the same questionnaire in the UK.

Table 3 Mean item response scores (M) and standard deviations (SD) from the Dutch patients and parents with the outcome from the paired *t* test (*t*-value and *P*)

Questions	Patients (M)	SD	Parents (M)	SD	<i>t</i> -value	<i>P</i>
1. At your initial appointment do you expect to:						
a. Have a brace fitted?	29.0	24.6	22.5	28.4	2.08	0.041
b. Have a check-up and diagnosis?	80.9	19.9	86.2	17.9	-1.78	0.079
c. Have a discussion about treatment?	58.7	26.3	65.8	27.1	-1.74	0.086
d. Have X-rays?	51.2	27.8	55.2	30.2	-0.97	0.336
e. Have impressions?	52.0	27.5	51.0	31.6	0.23	0.819
f. Have oral hygiene checked?	61.5	27.8	69.4	29.2	-2.02	0.047
2. What type of orthodontic treatment do you expect?						
a. Braces, don't know what type?	64.9	27.0	70.6	25.0	-1.51	0.134
b. Train track braces?	61.3	27.3	63.2	24.3	-0.63	0.534
c. Teeth extracted?	25.8	26.5	29.7	25.6	-1.10	0.276
d. Head brace?	29.1	26.2	37.4	24.2	-2.42	0.018
e. Jaw surgery?	12.1	15.4	15.8	20.3	-1.41	0.162
3. Do you think orthodontic treatment will give you any problems?	34.5	27.7	43.7	26.8	-2.33	0.022
4. Do you think wearing braces will be painful?	53.9	28.1	54.1	24.1	-0.05	0.957
5. Do you think orthodontic treatment will produce problems with eating?	57.5	24.7	57.5	23.1	0.01	0.995
6. Do you expect orthodontic treatment to restrict what you can eat or drink?	67.1	27.1	63.3	26.0	0.90	0.374
7. How do you think people will react to you wearing a brace?	57.1	18.6	62.9	17.9	-2.16	0.034
10. Do you expect orthodontic treatment to:						
a. Straighten your teeth?	80.6	20.4	81.3	17.7	-0.24	0.812
b. Produce a better smile?	67.1	26.9	64.4	30.0	0.67	0.504
c. Make it easier to eat?	39.2	28.1	36.9	29.2	0.56	0.576
d. Make it easier to speak?	39.5	30.8	35.6	29.7	0.90	0.369
e. Make it easier to keep my teeth clean?	53.6	31.6	55.0	30.0	-0.37	0.713
f. Improve my chances of a good career?	46.4	30.9	45.1	30.2	0.32	0.747
g. Give you confidence socially?	52.9	31.0	52.2	30.2	0.18	0.855

There were some limitations to the study. The findings reflect the responses of patients attending ACTA for orthodontic treatment; therefore, the results may not reflect the views of orthodontic patients in general. Secondly, the lack of significant differences between patients and parents, boys and girls, and between Dutch and English participants for some of the responses could be due to the sample size. There were some differences in age categories between the Dutch and UK samples. The Dutch patients were aged 10 to 14 years and the English patients were aged 12 to 14. There were therefore more subjects in the age category 13 and 14 years in the UK sample and there may have been more differences in the answers between boys and girls. Also, some patients could have friends or classmates wearing braces and parents may have had orthodontic treatment themselves and this might have changed their expectations.

Concerning the reliability and validity of the questionnaire, it can be said that the questionnaire used in the study of Sayers and Newton is both valid and reliable.^{18,19} It is not enough to translate a questionnaire literally. The additional challenge is to adapt it in a culturally relevant and comprehensible form while maintaining the meaning and intent of the original

items;²² however, even when the translation process is successfully implemented, the validity of the results might be suspect. To increase the validity of our study, a pilot study was carried out before the questionnaire was distributed to all participants. The study was designed so that parents could not assist their children in answering the questionnaire, as they were observed by one of the residents. We therefore feel confident to say that the responses of the children reflect their true feelings and not what their parents expected.

Several results from the present study are different to results found in previous studies. Klages *et al.*³ reported that regularity of dental arches might facilitate oral hygiene, preventing caries and periodontal disease. In contrast to these findings, in the present study participants did not expect an improvement in cleaning teeth, eating, speaking, career prospects and self-confidence after orthodontic treatment.

Tung and Kiyak¹⁵ stated that parents expected a higher increase in the social confidence of their children as a result of orthodontic treatment, than their children. This was not found in the present study. Also, a considerable amount of discomfort during orthodontic treatment was anticipated by patients in previous

Table 4 Mean item response scores (M) from the Dutch and UK patients, with the outcome from the one-sample *t* test (*t*-value and *P*)

Questions	Patients NL (M)	Patients UK (M)	<i>t</i> -value	<i>P</i>
1. At your initial appointment do you expect to:				
a. Have a brace fitted?	29.0	35.5	-2.42	0.018
b. Have a check-up and diagnosis?	80.9	71.5	4.31	<0.001
c. Have a discussion about treatment?	58.7	77.7	-6.61	<0.001
d. Have X-rays?	51.2	54.7	-1.16	0.248
e. Have impressions?	52.0	47.5	1.50	0.138
f. Have oral hygiene checked?	61.5	59.8	0.54	0.588
2. What type of orthodontic treatment do you expect?				
a. Braces, don't know what type?	64.9	61.5	1.16	0.250
b. Train track braces?	61.3	51.8	3.14	0.002
c. Teeth extracted?	25.8	45.0	-6.66	<0.001
d. Head brace?	29.1	16.4	4.42	<0.001
e. Jaw surgery?	12.1	19.4	-4.35	<0.001
3. Do you think orthodontic treatment will give you any problems?	34.5	36.5	-0.66	0.514
4. Do you think wearing braces will be painful?	53.9	43.8	3.27	0.002
5. Do you think orthodontic treatment will produce problems with eating?	57.5	52.5	1.86	0.067
6. Do you expect orthodontic treatment to restrict what you can eat or drink?	67.1	58.1	3.06	0.003
7. How do you think people will react to you wearing a brace?	57.1	49.0	4.01	<0.001
10. Do you expect orthodontic treatment to:				
a. Straighten your teeth?	80.6	76.5	1.85	0.067
b. Produce a better smile?	67.1	61.5	1.89	0.062
c. Make it easier to eat?	39.2	41.3	-0.68	0.501
d. Make it easier to speak?	39.5	37.2	0.67	0.505
e. Make it easier to keep my teeth clean?	53.6	49.9	1.06	0.293
f. Improve my chances of a good career?	46.4	35.5	3.23	0.002
g. Give you confidence socially?	52.9	55.5	-0.76	0.449

Table 5 Mean item response scores (M) from the Dutch and UK parents, with the outcome from the one-sample *t* test (*t*-value and *P*)

Questions	Parents NL (M)	Parents UK (M)	<i>t</i> -value	<i>P</i>
1. At your initial appointment do you expect to:				
a. Have a brace fitted?	22.5	22.9	-0.12	0.904
b. Have a check-up and diagnosis?	86.2	77.9	4.23	<0.001
c. Have a discussion about treatment?	65.8	83.0	-5.81	<0.001
d. Have X-rays?	55.2	61.7	-1.98	0.052
e. Have impressions?	51.0	50.0	0.30	0.765
f. Have oral hygiene checked?	69.4	67.9	0.46	0.649
2. What type of orthodontic treatment do you expect?				
a. Braces, don't know what type?	70.6	58.1	4.56	<0.001
b. Train track braces?	63.2	52.4	4.07	<0.001
c. Teeth extracted?	29.7	44.6	-5.35	<0.001
d. Head brace?	37.4	21.2	6.11	<0.001
e. Jaw surgery?	15.8	24.0	-3.71	<0.001
3. Do you think orthodontic treatment will give you any problems?	43.7	37.9	1.98	0.052
4. Do you think wearing braces will be painful?	54.0	44.0	3.82	<0.001
5. Do you think orthodontic treatment will produce problems with eating?	57.5	47.3	4.03	<0.001
6. Do you expect orthodontic treatment to restrict what you can eat or drink?	63.3	47.5	5.58	<0.001
7. How do you think people will react to you wearing a brace?	62.9	49.7	6.76	<0.001
10. Do you expect orthodontic treatment to:				
a. Straighten your teeth?	81.3	80.9	0.20	0.842
b. Produce a better smile?	64.4	65.1	-0.21	0.835
c. Make it easier to eat?	36.9	45.6	-2.73	0.008
d. Make it easier to speak?	35.6	39.8	-1.28	0.203
e. Make it easier to keep my teeth clean?	55.0	54.2	0.24	0.810
f. Improve my chances of a good career?	45.1	45.6	-0.14	0.890
g. Give you confidence socially?	52.2	67.8	-4.75	<0.001

studies,^{2,11-13} which was not found in this study. Some of our results agree with previous studies. Many children in the Netherlands are wearing braces.²¹ It has been shown before that the wearing of orthodontic appliances becomes more acceptable in communities where large numbers of children are undergoing orthodontic treatment.²³ In the present study, we found no expectations of negative reactions from the public on wearing braces. Nurminen *et al.*⁵ reported a typical gender distribution for patients undergoing orthodontic-surgical treatment was twice as many females as males.^{5,24} This is in agreement with the difference we found between boys and girls with regard to the likelihood of their orthodontic treatment involving jaw surgery.

In clinical practice, age-appropriate communication concerning what can be expected from orthodontic treatment is essential to achieve good cooperation from the patient. Effective communication is needed, because of the differences in cognitive development among children and their parents. It is fundamental for the clinician to direct the attention to the person in the chair and not only to the accompanying parent.²⁵ Before starting treatment, orthodontists should always ask their patients how they feel about their dental appearance and what they expect from

orthodontic treatment. They should give extensive instruction on what people in fact can expect with regard to pain, limitations and discomfort. This strategy may lead to less disappointment, more satisfied patients and may improve the quality of orthodontic care.

Conclusions

- Significant differences between patients and parents were found for several topics. Expectations of patients differ from their parents with regard to having a brace fitted at their initial appointment, orthodontic treatment involving headgear, problems caused by orthodontic appliances, duration of orthodontic treatment and reactions from the public on wearing braces.
- Our hypothesis that Dutch patients' and parents' expectations of orthodontic treatment differ from the expectations of English patients and parents was supported.

Contributors

Renske Hiemstra was responsible for the recruitment of participants, data collection, content analysis,

translating the questionnaire and drafting the article. Annemieke Bos was responsible for study design, content analysis and statistical data analysis. Professor Johan Hoogstraten was responsible for critical revision, expert advice and final approval of the article. Annemieke Bos is the guarantor.

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Appendix 1

1. At your initial appointment do you expect to:

a. Have a brace fitted?



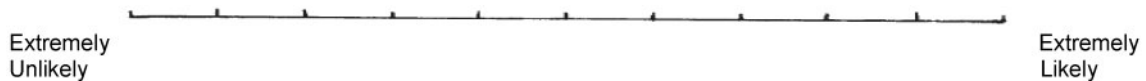
b. Have a check-up and diagnosis?



c. Have a discussion about treatment?



d. Have X-rays?



e. Have impressions?



f. Have oral hygiene checked?



2. What type of orthodontic treatment do you expect?

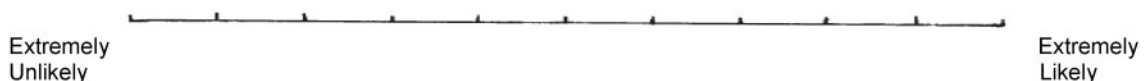
a. Braces, don't know what type?



b. Train track braces?



c. Teeth extracted?



d. Head brace?



e. Jaw surgery?



3. Do you think orthodontic treatment will give you any problems?



4. Do you think wearing a brace will be painful?



5. Do you think orthodontic treatment will produce problems with eating?



6. Do you expect orthodontic treatment to restrict what you can eat or drink?



7. How do you think people will react to you wearing a brace?



8. How long do you expect orthodontic treatment to take?

- 4 years
- 3.5 years
- 3 years
- 2.5 years
- 2 year
- 1.5 years
- 1 year
- 6 months
- 3 months
- 1 month
- Don't know

9. How often do you think you will need to attend for check up?

- Every 8 months
- Every 6 months
- Every 3 months
- Every 2 months
- Every 6 weeks
- Every 4 weeks
- Every 2 weeks
- Once a week
- Twice a week
- Don't know

10. Do you expect orthodontic treatment to:

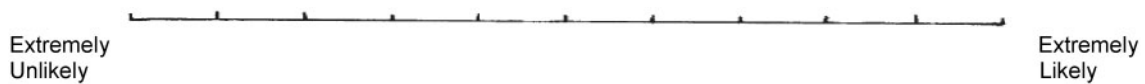
a. Straighten your teeth?



b. Produce a better smile?



c. Make it easier to eat?



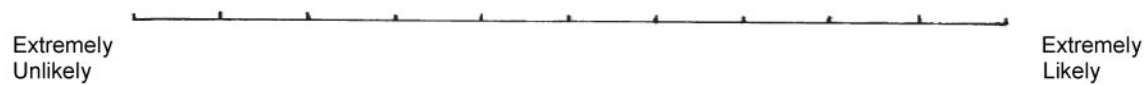
d. Make it easier to speak?



e. Make it easier to keep my teeth clean?



f. Improve my chances of a good career?



g. Give you confidence socially?

