# Dental aesthetics, self-awareness, and oral health-related quality of life in young adults

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SUMMARY The aim of the present study was to explore the putative relationship between dental aesthetics and oral health-related quality of life (OHRQoL), taking into consideration the potential direct and moderating influence of private and public self-consciousness.

The subjects of this cross-sectional survey were 148 university students. Dental aesthetics were assessed by means of the aesthetic component (AC) of the Index of Orthodontic Treatment Need (IOTN). OHRQoL was estimated using a modification of the scales 'social appearance concern' and 'appearance disapproval', and a novel dental self-confidence scale. In addition, the private and public self-consciousness scales were used. Two-factor analyses of variance were carried out with high and low levels of dental aesthetics and private and public self-consciousness as the independent variables and the OHRQoL scales as the dependent variables.

It was found that dental aesthetics had a direct effect on all OHRQoL scale values. Private self-consciousness was related to social appearance concern, while public self-consciousness was associated with both social appearance concern and appearance disapproval. An interaction effect was identified which showed that the impact of dental aesthetics on social appearance concern was stronger in respondents with high private and public self-consciousness than in low scoring subjects.

The findings of the study suggest that minor differences in dental aesthetics may have a significant effect on perceived OHRQoL. This effect was more significant in subjects with high self-consciousness.

## Introduction

According to the concept of oral health-related quality of life (OHRQoL), good oral health is no longer seen as the mere absence of oral disease and dysfunction. The definition of OHRQoL includes the absence of negative impacts of oral conditions on social life, and a positive sense of dentofacial self-confidence (Inglehart and Bagramian, 2002). It has been recognized that individuals with malocclusions might develop feelings of shame about their dental arrangement, and may feel shy in social contacts, and that facial appearance-related body self-concept might be affected (Shaw, 1981; Albino et al., 1990). Therefore, the expected psychosocial benefits of orthodontic treatment would include an enhancement of self-esteem and a reduction in social anxiousness (Albino et al., 1994; Bennet et al., 1995; Birkeland et al., 1997).

It has been shown that there is a relationship between physical attractiveness on the one hand and social success and higher self-esteem on the other (Eagly *et al.*, 1991; Feingold, 1992). Orthodontic studies have found that observers tend to attribute more favourable personality traits to fictitious persons with regular dentitions shown on portrait photographs as compared with those with noticeable malocclusions (Shaw, 1981; Kerosuo *et al.*, 1995). However, there is little evidence as to how persons themselves experience the impact of their dentition on their own OHRQoL. The latter might be influenced by social concern about appearance, by one's own approval of appearance or by dentally related self-confidence. This issue was the first topic of the present investigation.

Both research and subjective clinical experience suggest that patients and dentists differ in their evaluation of dental aesthetics and the perception of malocclusion (Burden and Pine, 1995; Giddon, 1995; Ahmed *et al.*, 2001; Hunt *et al.*, 2002). Some patients with severe malocclusions are satisfied or indifferent about their dental aesthetics, while others are very concerned about minor irregularities. Birkeland *et al.* (1997), in their study of the psychosocial effects of orthodontic treatment, concluded that some patients were dissatisfied with their dental aesthetics both before and after treatment, while others were content at either time.

The theory of self-awareness (Duval and Wicklund, 1972; Buss, 1980; Carver and Scheier, 1981) might help to explain such a variation in the evaluation of physical appearance. According to this theory, persons with a tendency to raised private self-awareness constantly monitor their thoughts and feelings, and are inclined to exaggerate their emotions. On the other hand, subjects

exhibiting raised public self-awareness tend to focus on the social impact of their own behaviour and appearance, and might be more vulnerable to feelings of shame and negative self-regard when they register minor deviations of their own physical appearance from the ideal norm (Taylor et al., 2000). The personal disposition of individuals who are habitually in a state of selfawareness is called 'self-consciousness'. It has been shown that persons exhibiting raised private selfconsciousness have a better knowledge of their own personality, and have a more distinctive concept of their personal values (Shrum and McCarty, 1992). On the other hand, these persons are more readily disposed to self-criticism and self-dissatisfaction (Hass and Eisenstadt, 1991). In extreme cases, chronic, pessimistic, self-focused attention might interfere with the ability to perform effectively in everyday life, which is a symptom of depressive disorders (Pruzinsky, 1990; Salovey, 1992).

Individuals exhibiting raised public self-consciousness are orientated towards seeking approval by others (Doherty and Schlenker, 1991), are sensitive about possible rejection and criticism, and vulnerable to the development of social evaluation anxiety (Fenigstein, 1979; Buss, 1980). In general, public and private selfconsciousness are not opposing concepts but complementary to each other.

According to the self-regulation theory of selfawareness (Carver and Scheier, 1981), in everyday life most attention of an individual is directed towards the environment, and her/his behaviour is mostly automatic and habitual without an awareness of personal appearance or emotions. Certain events in the environment may, however, trigger self-awareness, and personal behaviour, emotions, or appearance might then be compared with rules and standards. With respect to dentofacial aesthetics, for instance, when an individual sees her/his own image in the mirror or is being photographed, a feeling of being observed or evaluated might arise, and the individual might become self-aware. Some individuals perceive their own physical appearance as less perfect than that of attractive appearances seen in films and magazines. This may prove upsetting (Worchel et al., 1988).

Psychosocial attractiveness research has demonstrated that persons with increased public self-consciousness are rated as more attractive by others (McDonald and Eilenfield, 1980; Turner *et al.*, 1981), and are more likely to enhance their appearance by facial cosmetics (Cash and Cash, 1982) and clothing (Solomon and Schopler, 1982). Dion *et al.* (1990) found that public self-consciousness was associated with social evaluation anxiety about physical appearance. On the other hand, a study by Cash *et al.* (1983) showed that body satisfaction and self-perceived attractiveness might be related to private self-consciousness. The second aim of the present study was to investigate the influence of

public and private self-consciousness on experienced OHRQoL.

It has been suggested that self-consciousness might serve as a moderator of the relationship between objective conditions and psychological reactions (Buss, 1980). A variable has a moderating effect if it influences the strength of the relationship between an independent and a dependent variable (Baron and Kenny, 1986), such as for instance dental aesthetics and OHROoL, respectively. It is hence conceivable that self-consciousness might moderate the relationship between dental appearance and OHRQoL. Subjectively, individuals differ in the evaluation of their dental condition and the perceived psychological consequences. The assumption tested in the present study was that subjects with an attentional focus on internal processes or on their public self-presentation might experience a higher impact of their dentofacial aesthetics on social concern, appearance appraisal and dentally related self-confidence.

To achieve the above aims of this investigation, the following three hypotheses were tested:

- 1. In contrast to individuals with less favourable dental aesthetics, subjects with highly aesthetic dentitions experience higher levels of OHRQoL with regard to the variables social appearance concern, facial disapproval, and dental self-confidence.
- 2. Subjects with high and low private and public selfconsciousness differ in their experienced OHRQoL.
- The association of dental aesthetics with OHRQoL is stronger in those with raised private and public selfconsciousness.

### Subjects and methods

The subjects were 148 university students from various departments. Of the sample, 23.6 per cent were medical students, 16.9 per cent were students of media/design, and 10.8 per cent were dental students. Other courses (law, economics, social sciences, sports, etc.) were represented, but each below 10 per cent. The mean age of the subjects was 24.6 years [standard deviation (SD) 3.22, minimum 18, maximum 30], 58 per cent were female, 42 per cent male. They were approached on the campus and asked to participate in a study on OHROoL and self-perception of dental aesthetics. The interviewer was a male postgraduate dental student. The questionnaires were administered individually. Only subjects who were not undergoing orthodontic treatment at the time of the study were included. The refusal rate was approximately 30 per cent, the main reason being lack of time. From 153 questionnaires, five were discarded because of incomplete data.

Dental aesthetics was assessed using the aesthetic component (AC) of the Index of Orthodontic Treatment Need (IOTN; Brook and Shaw, 1989). The subjects were

presented with 10 black and white photographs of anterior teeth displaying varying degrees of malocclusion, and were asked to indicate which photograph resembled most closely their own dentition. There was no time limit for studying the photographs, and subjectively the respondents needed about 2 minutes to give an evaluation of their dentition.

It has been argued that the majority of existing OHRQoL measures are not applicable to orthodontics (O'Brien et al., 1998; Cunningham and Hunt, 2001). Among OHRQoL scales, the Orthognathic Quality of Life Questionnaire (Cunningham et al., 2000) is mainly concerned with the psychosocial impact of dental aesthetics. In that questionnaire the respondent was asked to indicate to what degree each statement bothered her/him on a 1-4 format. In the present investigation the answering format was changed to an indication of agreement with each statement from 0 'not at all' to 5 'exactly'. The first scale 'social appearance concern', which in the original version was called 'social aspects of deformity', included items with regard to shame and anxiety about one's own appearance. Examples of these items are 'I worry that people will make hurtful comments about my appearance', or 'I do not like smiling when I meet people'. The internal consistency of this scale in the present investigation as shown by Cronbach's alpha, was 0.68. The second scale 'appearance disapproval', which in the original version was called 'dentofacial aesthetics', referred to aversion to being confronted with one's own image. Example items are 'I do not like seeing a side view of my face or my profile', or 'I dislike having my photograph taken'. In this subtest Cronbach's alpha was 0.60. The function scale of the Orthognathic Quality of Life Questionnaire (Cunningham et al., 2000) was excluded from the analysis of this investigation, as there were very few reports of impairments of oral function in the present sample, and 52 per cent of the respondents achieved a value of zero on this scale. The scale 'awareness of facial deformity' from the original questionnaire (Cunningham et al., 2000) was considered to be too closely related to the concept of self-awareness and was therefore omitted in the present investigation.

A novel scale 'dental self-confidence' was specially designed for the purposes of this study. It contained items found in the literature which deal with the positive sense of well-being related to one's own dental arrangement. Example items are 'I like to show my teeth when I smile', and 'I am pleased when I look at my teeth in the mirror'. The calculated Cronbach's alpha value of 0.89 indicated a high internal consistency of this scale. Two subtests of the 'self-consciousness' inventory described by Fenigstein *et al.* (1975) were applied. 'Private self-consciousness' refers to a tendency to keep under close observation one's own feelings and internal processes. Example items of this scale are 'I am generally attentive to my inner feelings' and 'I always try to figure myself out'. Cronbach's alpha for this subtest in the present study was 0.75. 'Public selfconsciousness' is concerned with a habitual focus on reactions of others to one's own behaviour or appearance. Sample items are 'I am usually aware of my appearance' and 'I am concerned about what other

Considering that public self-consciousness might be related to social anxiety (Fenigstein *et al.*, 1975; Heinemann, 1979), it is conceivable that OHRQoL might also be related to social anxiety. Thus, the third subscale of the self-consciousness inventory 'social anxiety' was used to assess potential associations between public self-consciousness and OHRQoL. Example items of the scale are 'It takes me time to overcome my shyness in social situations' and 'I get embarrassed very easily' (Cronbach's alpha 0.64).

people think of me' (Cronbach's alpha 0.72).

Two-factor analyses of variance were performed using ANOVA (SPSS for Windows Release 10, Statistical Package for the Social Sciences, SPSS Inc., Chicago, Illinois, USA). Type III sums of squares were used. The independent variables were dental aesthetics, private selfconsciousness and public self-consciousness. The dependent variables were social appearance concern, facial disapproval and dental self-confidence. High versus low factor levels were obtained by median splits of the scale values for the independent variables, and the subjects were assigned into either high- or low-ranking groups.

In addition an ANCOVA was performed with social anxiety as a covariate to control for possible confounding between the constructs public self-consciousness and OHRQoL. Contrasts were analysed determining the differences in OHRQoL between respondents with low-and high-ranking dental aesthetics under the conditions of low and high self-consciousness, when tendencies for an interaction effect were found. Effect sizes were determined by standardized differences. According to Cohen (1977), a standardized difference of d = 0.20 was considered a 'small', d = 0.50 a 'medium' and d = 0.80 a 'large' effect.

## Results

Of the respondents, 53.4 per cent indicated that their own dental arrangement matched the ideal occlusion of AC grade 1, 31.1 per cent recorded grade 2, 11.5 per cent grade 3, 3.3 per cent grade 4, and 0.7 per cent grade 5. Furthermore, 62.8 per cent of the subjects indicated that they had previously had orthodontic treatment 9.17 years ago (SD 3.89), the mean duration of which was 3.93 years (SD 1.97). There was no effect of the history of orthodontic treatment on the distribution of the aesthetic grades. There were no differences in the three OHRQoL scales between the respondents with and without an orthodontic history nor was there any relationship between the respondent's age and the OHRQoL variables tested (results not shown in detail). Female subjects reported higher 'appearance disapproval' than males (P < 0.01, *t*-test).

For the subsequent analyses, all data were assigned into two groups, one comprising subjects with highranking dental aesthetics of AC grade 1, and the other including all other respondents with lower-ranking dental aesthetics of AC grades 2 and higher. The results of the variance analyses relevant to private self-consciousness are shown in Table 1. The number of subjects in each cell was proportional to the frequencies in the categories of the independent variables in the entire sample ( $\chi^2$  test P = 0.20). In view of this and because there was a sufficiently large sample size ANOVA may be considered as sufficiently robust against violations of the normality assumption (Glass et al., 1974). The distribution of the residuals of the fitted model did not deviate from the hypothesis of a normal distribution in the variables 'social appearance' concern and 'dental self-confidence' (P > 0.05 each, Kolmogoroff–Smirnov test). A deviation of the residuals from the normal distribution was found for the variable 'appearance disapproval' (P < 0.01). This, however, may be ranked as negligible when the characteristics of the present sample are taken into account.

Dental aesthetics had a statistically significant effect on all three OHRQoL measures. It can be seen from Table 1 that, in contrast to the subjects with highranking dental aesthetics, respondents with lower-ranking dental aesthetics reported statistically significantly higher social appearance concern (F = 5.82, P = 0.017) and appearance disapproval (F = 4.57, P = 0.034) and, at the highest level of statistical significance, lower dental self-confidence (F = 27.16, P < 0.001). The only direct influence of the variable 'private self-consciousness' on the OHRQoL measures was the one calculated for 'social appearance concern' (F = 10.34, P = 0.002).

There was a statistically significant interaction effect of both independent variables on 'social appearance concern' (F = 5.75, P = 0.018). Examination of contrasts revealed that dental aesthetics had no statistically significant effect on 'social appearance concern' in subjects with low private self-consciousness. However, in high scorers on private self-consciousness there was a significant difference in 'social appearance concern' between respondents differing in their grade of dental aesthetics. The value of the contrast estimate (CE) was -2.96. The lower limit of the 95 per cent confidence interval (CI) was -4.59 and the upper limit was -1.31. The CI therefore did not transgress the zero line, suggesting that there was a 'real' difference at P < 0.001. The standardized difference or effect size was d = 0.65, which according to Cohen (1977) may be considered as a medium size effect.

The interaction effect of both independent variables on 'dental self-confidence' was in the range of statistical tendency (F = 2.82, P = 0.095). The contrast analysis in subjects with low scores in private self-consciousness revealed a medium effect (d = 0.57) of dental aesthetics on 'dental self-confidence' with a probability of P < 0.001(CE = 2.89; CI = 0.50–5.28). When private selfconsciousness was high, the difference in 'dental selfconfidence' between the respondents with differing grades of dental aesthetics increased (CE = 5.64, CI = 3.46–7.82, P < 0.001). There was a standardized difference (d = 0.98) indicating a large size effect (Cohen, 1977).

Table 2 shows the results of the analyses of variance carried out in relation to public self-consciousness. The influence of dental aesthetics on the OHRQoL measures showed similar trends to those described above. In detail, dental aesthetics had significant effects on social appearance concern (F = 8.40, P = 0.004), appearance disapproval (F = 6.12, P = 0.015), and dental self-confidence (F = 30.66, P < 0.001). Public

**Table 1** The results of two-factor analyses of variance with private self-consciousness and dental aesthetics as the independent variables and the oral health-related quality of life measures social appearance concern, appearance disapproval and dental self-confidence as the dependent variables. The results are expressed as means and standard deviations of the scale values which were obtained from the subjects assigned to high- and low-ranking groups, and the *F* and *P* values calculated for the influence of the independent variables and their interaction.

|                                 | Social appearance concern         |                                  | Appearance disapproval            |                                  | Dental self-confidence            |                               |
|---------------------------------|-----------------------------------|----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|-------------------------------|
|                                 | High-ranking<br>dental aesthetics | Low-ranking<br>dental aesthetics | High-ranking<br>dental aesthetics | Low-ranking<br>dental aesthetics | High-ranking<br>dental aesthetics | Low-ranking dental aesthetics |
|                                 | 1 12 (2 (1) 25                    | 4.44.(2.02) 22                   | 4.5.4 (2.5.6) 25                  | 5 40 (2 25) 22                   | 15.14.(1.15) 25                   | 10.05 (5.07) 00               |
| Low private self-consciousness  | 4.42(2.61) n = 35                 | 4.44(2.98) n = 32                | 4.54(3.76) n = 35                 | 5.12(3.25) n = 32                | 15.14(4.45) n = 35                | 12.25(5.27) n = 32            |
| High private self-consciousness | 4.93(3.68) n = 44                 | 7.89 (4.99) <i>n</i> = 37        | 4.54(2.94) n = 44                 | 6.35(3.56) n = 37                | 17.73 (4.85) n = 44               | 12.08(5.22) n = 37            |
| Dental aesthetics               | F = 5.82                          | P = 0.017                        | F = 4.57                          | P = 0.034                        | F = 27.16                         | P < 0.001                     |
| Private self-consciousness      | F = 10.34                         | P = 0.002                        | F = 1.21                          | P = 0.273                        | F = 2.17                          | P = 0.143                     |
| Interaction                     | F = 5.75                          | P = 0.018                        | F = 1.20                          | P = 0.275                        | <i>F</i> = 2.82                   | P = 0.095                     |

**Table 2** The results of two-factor analyses of variance with public self-consciousness and dental aesthetics as the independent variables and the oral health-related quality of life measures social appearance concern, appearance disapproval and dental self-confidence as the dependent variables. The results are expressed as means and standard deviations of the scale values which were obtained from the subjects assigned to high- and low-ranking groups, and the *F* and *P* values calculated for the influence of the independent variables and their interaction.

|                                | Social appearance concern      |                               | Appearance disapproval            |                               | Dental self-confidence         |                               |
|--------------------------------|--------------------------------|-------------------------------|-----------------------------------|-------------------------------|--------------------------------|-------------------------------|
|                                | High-ranking dental aesthetics | Low-ranking dental aesthetics | High-ranking<br>dental aesthetics | Low-ranking dental aesthetics | High-ranking dental aesthetics | Low-ranking dental aesthetics |
| Low public self-consciousness  | 4.20(3.00) n = 39              | 4.68(3.69) n = 38             | 3.53(2.29) n = 39                 | 5.02(3.10) n = 38             | 16.48(4.42) n = 39             | 13.26(5.00) n = 38            |
| High public self-consciousness | 5.20(3.43) n = 40              | 8.25(4.66) n = 31             | 5.52(3.41) n = 40                 | 6.71(3.67) n = 31             | 16.67(5.39) n = 40             | 10.80(5.20) n = 31            |
| Dental aesthetics              | F = 8.40                       | P = 0.004                     | F = 6.12                          | P = 0.015                     | F = 30.66                      | P < 0.001                     |
| Public self-consciousness      | F = 14.02                      | P < 0.001                     | F = 11.53                         | P < 0.001                     | F = 1.90                       | P = 0.169                     |
| Interaction                    | F = 5.48                       | P = 0.021                     | F = 0.08                          | P = 0.779                     | F = 2.59                       | P = 0.109                     |

self-consciousness had statistically significant effects both on 'social appearance concern' (F = 14.02, P < 0.001) and 'appearance disapproval' (F = 11.53, P < 0.001). A significant interaction of dental aesthetics and public self-consciousness was identified when the dependent variable 'social appearance concern' was analysed (F = 5.48, P = 0.021).

Additional ANCOVA tests revealed significant effects of the covariate social anxiety on 'social appearance concern' (F = 15.71, P < 0.001) and appearance disapproval (F = 9.09, P = 0.003), but not on dental selfconfidence. When social anxiety was controlled, the test showed that the effect of public self-consciousness on 'social appearance concern' was still significant (F = 7.81, P = 0.006) as was its influence on 'appearance disapproval' (F = 6.82, P = 0.010). F-statistics of the effects of dental aesthetics and interaction did not change when the covariate 'social anxiety' was controlled in the testing.

Analyses of contrasts demonstrated that the difference between the respondents achieving grade 1 in dental aesthetics and those with AC grades 2–5 was not significant under the condition of low public self-consciousness (P > 0.05). However, it proved to be significant when the respondents exhibited raised public self-consciousness (CE = -3.06, CI = -4.80 to -1.31, P < 0.001). The standardized difference of the latter reached the value of 0.71, suggesting a medium size effect (Cohen, 1977).

The influence of the interaction of the independent variables on the dependent measure 'dental self-confidence', approached the range of statistical significance. At d = 0.90 the contrast analyses revealed a large effect of dental aesthetics on dental self-confidence, when public self-consciousness was high (CE = 5.86, CI = 3.51–8.21). A medium size effect (Cohen, 1977) of d = 0.66 was found under the condition of low self-consciousness (CE = 3.22, CI = 1.98–5.46).

#### Discussion

The AC of the IOTN has been widely used in the assessment of dental aesthetics for public health purposes, such as the estimation of public health, orthodontic treatment need, and the evaluation of treatment success (Miotti, 1995; Birkeland et al., 1997; O'Brien et al., 1998; Kerosuo et al., 2000). Although it is recognized that the AC as it currently stands may not completely reflect contemporary societal aesthetic expectations (Hunt et al., 2002), it appears suitable for the purpose of discriminating between the levels of self-assessed dental aesthetics, as employed in the present investigation. Using the median split of the AC grades reported by the subjects, two groups with high- and lower-ranking dental aesthetics were created for the analysis of potential associations between dental aesthetics and OHRQoL, taking into account the influence of the personality variable 'self-consciousness'.

In contrast to the subjects with AC grade 1, those who recorded AC grade 2 or higher reported higher social appearance concern and appearance disapproval, and lower dental self-confidence. The strongest effect shown by the variable 'dental aesthetics' was found for the novel 'dental self-confidence scale', which comprises positively phrased formulations closely related to dental appearance and indicating a sense of well-being and self-assertion with regard to one's own dental appearance. This scale was designed specially for the purpose of the present investigation in order to estimate the significance of dental aesthetics in individuals with variations within the normal range. Both other scales used as OHRQoL measures included statements which, in addition to the appearance of teeth, are related to the facial and general physical appearance. These scales were originally constructed in the context of research on orthognathic surgery patients (Cunningham et al., 2000) for whom facial and general appearance is likely to be more important.

At present no data are available in the literature for comparison of the descriptive statistics of OHRQoL scales obtained in the present study. The mean values of the two self-consciousness scales in the present sample matched the values reported by Fenigstein *et al.* (1975) and Heinemann (1979). The private self-consciousness scale mean value did not differ substantially from the mean value of a sample of 328 patients with inflammatory rheumatic disease (Klages, 2001).

It appears from the results of the present investigation that self-perceived minor irregularities in dental aesthetics might have a considerable impact on OHRQoL as measured by means of the scales 'social appearance concern', 'appearance disapproval', and 'dentally related self-confidence'. These results lend support to the 'what is beautiful is good' hypothesis advanced by psychosocial research on physical attractiveness (Feingold, 1992), and confirm the relevance of this hypothesis to orthodontics, as suggested previously (Shaw, 1981; Kerosuo *et al.*, 1995).

The second factor with potential influence on OHRQoL examined in the present research was selfconsciousness, private and public, which are characterized by an attentional focus of an individual on her/his internal sensations and processes, and a bias to self-presentation in public, respectively. This study revealed that subjects with raised private selfconsciousness exhibit more concern about their social appearance than low scorers on the private selfconsciousness scale, and that this concern tends to be more intense in individuals with raised public selfconsciousness. It also appears from the results of this investigation that subjects with high public selfconsciousness demonstrate more disapproval of their own appearance. These results parallel the observation of Dion et al. (1990) that public self-consciousness might play an important role in creating concern about one's own social appearance.

The broader implication of these findings is the significance of personality traits of an individual to the experience of OHRQoL. The concept of self-consciousness might help explain the clinical observation that some patients are dissatisfied with their dental aesthetics both before and after treatment, while others are content or indifferent at either time (Birkeland et al., 1997). Individuals with marked self-attention and intense management of their impression in public might be aware of having minor dental irregularities and be more apprehensive about potential rejection by others. Such individuals might never be satisfied with their own dental aesthetics and/or orthodontic treatment results. On the contrary, subjects with less acute social awareness might be less able to register a difference or improvement in dental aesthetics and anticipated social reactions.

According to the self-awareness theory, individuals with raised private self-consciousness are better observers

of their internal processes and have a more differentiated concept of their personal values (Shrum and McCarty, 1992). The results of the present work support the assumption that private self-consciousness is a moderator of the relationship between dental aesthetics and social appearance concern. This was shown by the significantly higher values of the social appearance concern scale, associated with self-recorded low-ranking dental aesthetics in the group of subjects with highranking private self-consciousness, that is the individuals graded to be highly aware of their emotions and thoughts. The effect of dental aesthetics on social appearance in this group proved to be in the medium range (Cohen, 1977), which is remarkable as the variations in aesthetics were very small and within the normal range. Correspondingly, no association between dental aesthetics and social appearance concern was revealed in the group of low scorers on private self-consciousness. Although not statistically significant, at P = 0.095 (Table 1), the moderating effect of private self-consciousness on the relationship between dental aesthetics and dental selfconfidence was within the range of statistical significance, lending further support to the above assumption. Whereas in the case of low private self-consciousness a medium effect of dental aesthetics on dental selfconfidence was found, this effect was large in respondents with raised private self-consciousness.

The personality trait 'public self-consciousness' also showed a moderating effect on the relationship between dental aesthetics and social appearance concern. Subjects ranked as highly attentive to public self-presentation exhibited a stronger association between dental aesthetics and social concern about their own appearance. This effect was of a medium size. No association between dental appearance social concerns was identified in the subjects with low public self-consciousness. Persons with raised public self-consciousness have been characterized as striving for approval by conforming to social norms, and as being particularly sensitive to rejection (Fenigstein, 1979; Buss, 1980: Doherty and Schlenker, 1991). On the basis of this model it was predicted that such subjects might be more apprehensive if they cannot meet the ideal norms of dental aesthetics, compared with the subjects exhibiting low public self-consciousness who are not preoccupied with gaining approval. This assumption was supported by the results of the present study.

It might be feasible to use the concept of selfawareness for understanding why some individuals with severe malocclusions are indifferent about their appearance, while others with marginally affected dental aesthetics appear greatly apprehensive. The results of the present investigation warrant further work aimed at elucidating the moderating role of self-consciousness in subjects with severe malocclusion seeking or rejecting orthodontic treatment.

#### AESTHETICS AND QUALITY OF LIFE

Several methodological limitations have to be taken into account when the general relevance of the results of the present investigation are considered. First, the young adults interviewed in this investigation, having received higher education, are not representative of the whole population which includes a large proportion of subjects with lower levels of education. As orthodontic patients with different social and cultural backgrounds differ in their dental health behaviour (Miotti, 1995; Ahmed et al., 2001), further research is needed to explore the impact of dental aesthetics on OHRQoL in respondents with different educational levels and cultural backgrounds. Second, the relevance of observations of young adults for older individuals is limited, as the importance of physical attractiveness in young adults, many of whom are in the stage of developing and testing sexual partnerships, appears obvious. For older individuals and their social interactions, dental aesthetics is likely to be less important. However, further research is needed to substantiate this conjecture. Third, it might be argued that highly educated subjects might exhibit higher private and public self-consciousness. As there is currently no evidence in the literature to support this argument, further research is required to clarify this issue.

Some practical suggestions for clinical practice seem justified on the basis of the results of this investigation. When the clinician and the patient differ in the evaluation of treatment results, it might be helpful to consider the concept of self-consciousness. Instead of further refining orthodontic appliances and striving for elusive aesthetic perfection, it might appear more reasonable for the clinician to counsel the patient about the role of their self-consciousness in reacting to her/his own aesthetic appearance.

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