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Perception of Dental Appearance and its Implication for Workers in Dental Organizations: A Review of Literature

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ABSTRACT Perception has a psychological basis and it is necessary to appreciate its application that it is not simply allied with 'sensation'. There is a gap in the knowledge of the perception of dental appearance by patients, which has implication for workers in dental organizations. This narrative review of literature highlights these perceptions and their importance/ implications for dental workers. The search strategies used related published articles from 1969 and 2010. Within the limits of the narrative review done in this paper, dental patient's perception is an important factor in the diagnosis and eventual successful management of the condition by dental professionals.

INTRODUCTION

Major medical or physical problems often lead people to visit health care consultant. In the same vein, psychological state of an individual can result in similar behaviour. For instance, research has demonstrated that several non-disease factors such as attitude, behaviour, dental attendance, and characteristics of the health care system play an important role in the decision (Shigli et al. 2007). That is, the individual result in locating his/her medical or physical problems on issues psychological state such as perception, cognitive world view. Such factors are the characteristics of the perceiver - individuals outside the patient and the dentist; the characteristics of the person being perceived- internal predisposition of the patient; and the situational context- the environment of the individual patients, in which the event occur. One important component in the use of service is self-perceived need (Babalola 1999). This is supported by the study that stated that self-perception is influenced by service use, which is greater among those who use dental services and the self-perceived need for treatment that partly reflects the impact of the disease on the individual (Atchison and Dubin 2003). Similarly, Gift et al. (1998) also found that individuals' perceptions and attitudes affected the degree of deficiencies and dysfunctions resulting from health condition. According to Dosunmu et al. (2005) facial appearance result in a typical appearance of premature aging after tooth loss some changes in. This apparent premature aging often causes adolescent patients to be psychologically depressed and withdrawn.

Perception involves interpretation of a stimulus and recognition of the object that produces a sensation (Calow 1969). It is based on earlier experience and is the process by which one becomes acquainted with his/her environment (Grainger 1971). Perception has a psychological basis and it is necessary to appreciate its application that, it is not simply allied with 'sensation'. 'Sensation' implies a physiological anatomical process, whereby the stimulus of dental procedure is registered by sensory receptors, and transmitted by 'pain' conducting fibres. Perception control for dental patient is not primarily concerned with the control of the sensation, which may arise in dental or oral surgical procedures, but with the consideration of patient tolerance to these procedures, that is largely based on expectation. It can also be equated with the

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level of apprehension, which may be evident prior to the dental appointment. The knowledge of the perception of dental appearance by patients and its implication/importance among dental practitioners is highlighted in this review.

OBSERVATIONS AND DISCUSSION

A comprehensive perception of oral health model based on sociological interaction models and behavioural health model assumed that self-perceived need for dental treatment is the result of the individual's oral health conditions in terms of number of decayed, missing and filled teeth; periodontal condition; and normative treatment needs (Andersen and Davidson 1997; Gift et al. 1998). Treatment needs are determined by demographic characteristics (such as age, gender), resource availability and predisposition while aesthetic motives were the most frequently reported subjective reason for orthodontic care (Birkeland et al. 1999).

Sociological interaction models conceptualize "need" along two lines: subjective and objective (Locker and Miller 1994). Subjective need expresses the self-perceived need for treatment and varies from one individual to another, according to the sociocultural and historical context applicable (Gjermo 1991). Objective need, also known as normative need, comes from the dentist's assessment, through identifying the signs of disease at an early stage, at a time when no symptoms of oral disease have yet been noticed (Gilbert et al. 1993). Subjective needs are not considered in assessing needs and professionals' interventions, although objective needs are not immune to subjective influences, since dentists are also guided by their own norms, values and beliefs (Gjermo 1991).

Studies have reported a lack of association between self-perceived need for treatment and the presence of soft-tissue abnormalities, which could be termed a reflection of accommodation of such abnormalities (Ekanayake and Perera 2005; Heft et al. 2003; Slauther and Taylor 2005). Individuals that are poor or on social assistance are found not to put tremendous value on dental appearance and rarely consult dentists which make perception of oral health strongly influencing treatment preference and by implication explain low and selective use of dental services among the disadvantaged population (Bedos et al. 2009). This might have been the reason why the underprivileged people rarely consult dentist both in countries with emerging economy like Nigeria and in countries with developed economy such as Canada and USA (RAMQ 2005; US General Accounting Office 2000). Perception of oral health has therefore been listed as part of the reason why poor people do not use dental services or seek dental care (Bedos et al. 2005).

Access to health education may also be influenced by self-perceptions of health conditions. This is because; the perception of the need for treatment was lower among individuals who had not been given information on how to avoid oral problems (Martins et al. 2008). Researches showed that individuals usually give greater importance to the symptoms, functional and psychological impact of oral diseases than to the visible signs of the disease (Ekanayake and Perera 2005; Heft et al. 2003; Martins et al. 2008). Just as Dosumu et al. (2005) in their study found that psychotherapy helped in improving patients' acceptance of the removable partial denture as an acceptable alternative to their missing teeth.

It has also been noted that men and women emotional display differ in many ways (Hess et al. 2004). Women are reported to smile more than men while men's display of anger has been reported to be both more pervasive and are generally more acceptable (Brody and Hall 2000). Hence in the absence of facial cue information, the perceptions of the behaviour may well be driven primarily by the different stereotypes for men and women.

In self-perception and satisfaction with one's teeth, study showed that females and older school children considered their teeth to be more attractive than those of their male counterparts and younger children (Elham et al. 2005). Besides Tuominen et al. (1994) reported that men were more often satisfied with their dentition than Finnish women. On the motives for seeking orthodontic treatment, there was a strong social motivation occurring among males more than females with a higher proportion of females focused on improving appearance (Phillips et al. 1997). However, both male and female participants in a study insisted on tremendous importance of appearance with little emphasis on dental disease (Bedos et al. 2009). This might not imply that they considered diseases and their symptoms as minor issues but an indication that appearance was more important. A bright smile in which well-proportioned teeth are clearly displayed is associat-

ed with favoured male qualities such as dominance, maturity, masculinity, strength, and social competence. Research indicated that females have a higher demand and need for subjective orthodontic treatment (Hagg et al. 2001). In the same vein, Du et al. (2008) reported that higher percentage of women showed teeth concerns than men while gender and psychosocial factors played an important role in orthodontic treatment of adolescents (Wang et al. 1998).

A study of children regarding their feelings about dental appearance showed that dissatisfaction with dental appearance was more common among girls than boys (Shaw 1981) and this dissatisfaction was associated with increasing age (Li et al. 2010). This means that higher dental demands and needs by young people should not be neglected, as there is a tendency that aesthetics of dental appearance are receiving more and more attention.

Most people in social and non-biomedical perspective have seen oral health, as the "visible" taking over the "invisible". Interpretation from this perspective may have led to devastating impact on self-esteem and social interaction due to progressive decline of dental appearance as one age (Kelly et al. 2005). It should be noted also that individuals with missing, discoloured, crooked or unattractive teeth reported devastating repercussions on self-image and sociability. For instance, Omar et al. (2003) reported that tooth loss is very traumatic and upsetting. It is regarded as a serious life event that requires significant social and psychological readjustment (Fiske et al. 1998). This group of people most of the time develop various concealment strategies, such as avoiding smiling or altering their smile, covering their mouths with a hand, turning the head, or placing the tongue in front of the space left by missing tooth/teeth while they consider straight and white tooth/teeth as the most important element of appearance. That is, unsatisfying dental appearance weakened individual's self-esteem, which in turn limits their ability to be socially and professionally active (Bedos et al. 2009). The fact that tooth colour is one of the most important factors in satisfaction with oral appearance, is in accordance with the self-perception study (Neumann et al. 1989). Report also showed that people who express dissatisfaction with their teeth might have some psychological problems, which might impact their social behaviour while those that are satisfied with their teeth seem to be more self-confident and have higher self-esteem (Cash and Fleming 2002).

According to Van der Gelda et al. (2007), attractiveness theories predict that a person's attractiveness can influence judgments and treatments by others, which in return can influence a person's behaviour and traits. A study on the attractiveness of teeth concluded that children with normal dental appearance would be judged to be better looking, more desirable as friends, more intelligent, and less likely to behave aggressively (Shaw et al. 1985). In the review of three studies, findings showed that children aged 10 - 17 years readily recognise "very mild" and "mild" dental fluorosis and that even mild change in colouration cause embarrassment and self consciousness with negative psychosocial impacts (Spencer et al. 1996). Researchers found that the public commonly perceive people with dental abnormalities to have: poor health, low intelligence, poor psychological adjustment, poor personal hygiene, and lack of social skills (Astrom and Mashoto 2002; Levy et al. 2002). Facial attractiveness is reported to play a key role in social interaction because it influences mating success, kinship opportunities, personality evaluations, performance, and employment prospects (Flanary 1992). This is probably the reason why attractive children and adults are judged and treated more positively than unattractive children and adults, even by those who know them.

Perception of attractiveness and satisfaction with appearance are the two distinct dimensions in self-perception of the smile (Van der Gelda et al. 2007). The first dimension is defined by the opinions of others and cultural norms, which can be called social psychological dimension and a bright smile, have become an important aspect of facial attractiveness. The second dimension of perception originates from the internal view, the inner experience of the individual by himself/herself, which forms the individual personality. Facial and smile attractiveness strongly appear connected to each other because in social interaction, attention is mainly directed toward the mouth and eyes of the speaker (Thompson et al. 2004). The mouth, which is the centre of communication in the face and smile, plays an important role in facial expression and appearance. No wonder therefore that the attractiveness of the dentofacial area contributes to the total perception of attractiveness of the face (Shaw et al. 1985).

Study had demonstrated that higher intellectual and social abilities were attributed to individuals with aesthetic smiles (Newton et al. 2003). It should be noted also that an aesthetically pleasing smile is not only dependent on components such as tooth position, size, shape, and colour, but also on the amount of gingival display and the framing of the lips. The lips are the controlling factor in which portions of the teeth, gingiva, and oral cavity will be seen in an individual's smile (Moskowitz and Nayyar 1995) because the higher the upper lip is elevated when smiling, the more visible the teeth and gingivae become, which lead to greater role in the aesthetic value of the smile.

Over the past decade, the psychological and functional perceptions of patients toward treatments rendered for oral diseases, un-aesthetic dental appearance and malocclusion have drawn increased attention of clinicians and researchers (Kiyak 2008). Malocclusion causes difficulty in chewing food; it has the tendency to cause cheek bite, speech defects, and pain in the facial muscles (Nicodemo et al. 2008). The expected benefits of the treatment of malocclusion are related to improvements of oral function and appearance that can help in improving the psychological and social well being of the individual which is a subjective perception that plays a key role in demarcating between an acceptable and unacceptable occlusion influenced by idiosyncratic judgments (Reddy et al. 2010).

The identified influencing factors in seeking orthodontic treatment are self-esteem, self-image, gender, age, self-perception of dental appearance, desire to look attractive, self-confidence, as well as parental advice (Li et al. 2010; Riedmann et al. 1999). For example, a study indicated that aesthetic rather than functional factors determined an individual's subjective need for the replacement of missing teeth (Osterberg et al. 1984). Possibly that is why Shigli et al. (2007) stated that replacement of missing posterior teeth, and cosmetic dental treatment in general, depends on the perception of the patient. Others further confirmed that the prospect of a good aesthetic result often motivates the patient to wear a new denture, as aesthetics can be more important than function for many individuals (Mazurat and Mazurat 2003; Roessler 2003).

Annemieke et al. (2003) likewise found significant correlations between satisfaction with dental appearance and patients' expectations. Psychosocial influence of malocclusion has also been suggested to be a significant factor that affects subjective orthodontic treatment needs (Cunningham and Hunt 2001; Hunt et al. 2001; Langlois et al. 2000). Because malocclusions may result in impaired craniomandibular function and have an unfavourable influence on facial and dental attractiveness, a study concluded that this might in turn have psychological and socio-behavioural implications for the individual concerned (Linder-Aronson et al. 2002). Research showed that eighty-five per cent of halitosis (bad breath) cases are the result of microbial activity in the mouth (Delanghe et al. 1997) while it was reported that qualitative judgments of odours largely depend on a person's experience and personality traits (Gabassi and Zanuttini 1992). For instance, "halitophobics" spend their entire lives obsessed with the thought that others perceive them as having bad breath. This obsessive behaviour makes them to severely restrict their behaviour, avoid social interactions and regularly attempt to cover up a problem that does not exist. In a Japanese study, the majority of patients with primary complaints of halitosis at the dental clinic did not actually have halitosis, but suffered from an imaginary halitosis due to presumptions based upon others' attitudes (Iwakura et al. 1994). Many halitophobic patients however may not agree to seek psychological counsel for self-perceived bad breath (Yaegaki and Coil 1999).

CONCLUSION

Perception generally has a psychological basis and it is very important to appreciate its importance because it is not simply allied with "sensation". Self-perception is influenced by service use and self-perceived need for treatment, which partly reflects the impact of the disease on the patient and access to the treatment. Health education and psychotherapy may also be influenced by the individual's self-perception of the health condition. Self-perceived need for treatment may either be subjective or objective depending on the socio-cultural context or the dentist's assessment of the condition.

Gender is a factor that affects individual's self-perception because of its reported influence on emotional display. Other factors that influence self-perception in dental patients are dental appearance, bright smile, patient's age, psy-

cho-social factors, self-esteem, attractiveness and traits, public perception, intellect and social abilities, lip position, malocclusion and obsessional behaviours.

RECOMMENDATIONS

Several factors are identified in this paper under the psychological and social issues that affect dental appearance perception include visibility of teeth and upper lip position, self-perception of smile attractiveness, tooth/teeth colour, gingival display, gender cultural and educational backgrounds.

Suggestions from this paper therefore are both for the dental practitioners and the individual patients for meaningful and positive realization of desired satisfaction without compromising the health concerns. From a public health perspective, poor oral health should be considered a serious problem that goes beyond the frontiers of the dental field, as it could sometimes impedes ones self-esteem and mental health. Oral health promotion programs should target children first; to prevent pathological processes that are cumulative and may be irreversible by the time they reach adulthood. Oral health education is necessary in order to improve individuals' capacity to identify non-painful signs and symptoms of oral diseases and to link such with the need for dental treatment.

In diagnosing most dental related problems, dentists should consider the physiological as well as the psychological factors and the profession should be responsive to these concerns by adopting a patient-centred approach to find a common ground when planning treatment. For instance, when treating patients with complain of having bad breath, clinicians should investigate physiological odour and associated parameters as well as the nature of the subjective complaint. In addition, changes in public perceptions of what is cosmetically acceptable could influence support for effective oral disease prevention measures.

Within the limits of the narrative review done in this paper, dental patient's perception is an important factor in the diagnosis and eventual successful management of the condition by dental professionals. It is suggested that dental workers/practitioners should consider attitudes, beliefs, and values regarding aesthetics and function when presenting treatment options.

REFERENCES

Andersen RM, Davidson PL 1997. Ethnicity, aging, and oral health outcomes: A conceptual framework. *Adv Dent Res*, 11(2): 203-209.

Annemieke B, Johan H, Birte PA 2003. Expectation of treatment and satisfaction with dento-facial appearance in orthodontic patients. *Am J Orthod Dentofacial Ortho*, 123(2): 127–132.

Astrom AN, Mashoto K 2002. Determinants of self-rated oral health status among school children in northern Tanzania. *Int J Paedia Dent*, 12(2): 90-100.

Atchison KA, Dubin LF 2003. Understanding health behaviour and perceptions. *Dent Clin North Am*, 47(1): 21-39.

Babalola SS 1999. Social psychology: Basic principles and approaches. In: B Udegbe, S Balogun, H Osinowo, G Sunmola (Eds.): *Psychology: Perspectives in Human Behaviour.* Nigeria, Ibadan: University of Ibadan, Psychology Department Publication, pp. 189-213.

Bedos C, Brodeur JM, Levine A, Richard L, Boucheron L, Mereus W 2005. Perception of dental illness among persons receiving public assistance in Montreal. *Am J Public Health*, 95: 1340-1344.

Bedos C, Levine A, Brodeur JM 2009. How people on social assistance perceive, experience, and improve oral health. *J Dent Res*, 88(7): 653-657.

Birkeland K, Katle A, Løvgreen S, Bøe OE, Wisth PJ 1999. Factors influencing the decision about orthdontic treatment: A longitudinal study among 11 and 15-year-olds and their parents. *J Orofac Orthop*, 60(5): 292–307.

Brody LR, Hall JA 2000. Gender, emotion, and expression. In: M Lewis, JM Haviland (Eds.): *Handbook of Emotions*. 2nd Edition. New York: Guilford Press, pp. 447–460.

Calow P (Ed.) 1969. *Use the Right Word.* Adelaide: Griffln, P. 520.

Cash TF, Fleming EC 2002. Body image issues and social relations. In: TF Cash (Ed.): *Body Image: A Handbook of Theory, Research, and Clinical Practice*. New York: Guilford, pp. 277–286.

Cunningham SJ, Hunt NP 2001. Quality of life and its importance in orthodontics. *J Orthod*, 28: 152–158.

Delanghe G, Ghyselen J, van Steenberghe D, Feenstra L 1997. Multidisciplinary breath-odour clinic. *Lancet*, 350: 187-188.

Dosunmu OO, Dosunmu EB, Arowojolu MO, Babalola SS 2005. Rehabilitative management offered Nigerian localized and generalized aggressive periodontitis patients. *J Contemp Dent Pract*, 6(3): 40-52.

Du H, Bai YX, Zhu H 2008. An investigation of the knowledge about malocclusions and orthodontic treatment in Beijing area. *Beijing J Stomato*, 16(6): 329–331.

Ekanayake L, Perera I 2005. Perceived need for dental care among dentate older individuals in Sri Lanka. *Spec Care Dentist*, 25(4): 199-205.

Elham SJ, Alhaija A, Kazem S 2005. Self-perception of malocclusion among north Jordanian school children. *European J Orthod*, 27(3): 292–295.

Fiske J, Davis DM, Frances C, Gelbier S 1998. The emotional effects of tooth loss in edentulous people. *Br Dent J,* 184: 90-93.

Flanary C 1992. The psychology of appearance and psychological impact of surgical alteration of the face. In: WH Bell (Ed.): *Modern Practice in Orthognathic and Reconstructive Surgery.* Philadelphia, Pa: Saunders, pp. 3–21.

Gabassi PG, Zanuttini L 1992. Self-monitoring and identification of olfactory dimensions. *Percept Mot Skills,* 75: 787-795.

Gift HC, Atchison KA, Drury TF 1998. Perceptions of the natural dentition in the context of multiple variables. *J Dent Res,* 77(7): 1529-1538.

Gilbert GH, Branch LG, Longmate J 1993. Dental care use by U.S. veterans eligible for VA Care. *Soc Sci Med,* 36(3): 361-370.

Gjermo P 1991. Factors influencing assessment of treatment needs. *J Clin Periodontol,* 18(6): 358-361.

Grainger JK 1971. Pain control in dental procedures: The significant of perception. *Anaesth Prog,* 18(5): 95-99.

Hagg U, Yip ACK, Rabie AB 2001. The orthodontic treatment need and demand of young Chinese adults versus children. *Chin J Dent Res,* 4(4): 7–15.

Heft MW, Gilbert GH, Shelton BJ, Duncan RP 2003. Relationship of dental status, socio-demographic status, and oral symptoms to perceive need for dental care. *Community Dentist Oral Epidemiol,* 31(5): 351-360.

Hess U, Adams Jr. RB Kleck RE 2004. Facial appearance, gender, and emotion expression. *Emotion,* 4(4): 378–388.

Hunt O, Hepper P, Johnston C, Stevenson M, Burden D 2001. Professional perceptions of the benefits of orthodontic treatment. *Eur J Orthod,* 23(3): 315–323.

Iwakura M, Yasuno Y, Shimura M, Sakamoto S 1994. Clinical characteristics of halitosis: Differences in two patient groups with primary and secondary complaints of halitosis. *J Dent Res,* 73(9): 1568-1574.

Kelly SE, Binkley CJ, Neace WP, Gale BS 2005. Barriers to care-seeking for children's oral health among low-income caregivers. *Am J Public Health,* 95: 1345-1351.

Kiyak A, 2008. Does orthodontic treatment affect patient's quality of life? *J Dent Educ,* 72(8): 886-894.

Langlois JH, Kalakanis L, Rubenstein AJ, Larson A, Hallam M, Smoot M 2000. Maxims or myths of beauty? A meta-analytic and theoretical review. *Psychol Bull,* 126(3): 390–423.

Levy SM, Warren JJ, Jakobsen JR 2002. Follow-up study of dental students' aesthetic perceptions of mild dental fluorosis. *Community Dent Oral Epidemiol,* 30(1): 24-28.

Li X, Tang Y, Huang X, Wan H Chen Y 2010. Factors influencing subjective orthodontic treatment need and culture-related differences among Chinese natives and foreign inhabitants. *Int J Oral Sci,* 2(3): 149–157.

Linder-Aronson S, Bjerrehorn K, Forsberg CM 2002. Objective and subjective need for orthodontic treatment in Stockholm County. *Swed Dent J,* 26(1): 31–40.

Locker D, Miller Y 1994. Evaluations of subjective oral health status indicators. *J Public Health Dentist,* 54(3): 167-176.

Martins AMEBL, Barreto SM, Pordeus IA 2008. Factors associated to self-perceived need of dental care among Brazilian elderly. *Rev Saúde Pública,* 42(3): 1-9.

Mazurat NM, Mazurat RD 2003. Discuss before fabricating: Communicating the realities of partial denture therapy. Part I: patient expectations. *J Can Dent Assoc,* 69(2): 90 - 94.

Moskowitz M, Nayyar A 1995. Determinants of dental aesthetics: A rationale for smile analysis and treatment. *Compend Contin Educ Dentist,* 16: 1164–1166.

Neumann LM, Christensen C, Cavanaugh C 1989. Dental aesthetic satisfaction in adults. *J Am Dent Assoc,* 118: 565–570.

Newton JT, Prabhu N, Robinson PG 2003. The impact of dental appearance on the appraisal of personal characteristics. *Int J Prosthodont,* 16: 429–434.

Nicodemo D, Domingues PM, Masako FL, 2008. Self-esteem and depression in patients presenting angle class III malocclusion submitted for orthognathic surgery. *Med Oral Patol Oral Cir Bucal,* 13(1): 48-51.

Omar R, Tashkandi E, Abduljabbar T, Abdullah MA, Akeel RF 2003. Sentiments expressed in relation to tooth loss: A qualitative study among edentulous Saudis. *Int J Prosthodont,* 16: 515-520.

Osterberg T, Hedegard B, Sater G 1984. Variation in dental health in 70–year-old men and women in Goteborg, Sweden: A cross-sectional epidemiological study including longitudinal and cohort effects. *Swed Dent J,* 8: 29-48.

Phillips C, Broder HL, Bennett ME 1997. Dentofacial disharmony: Motivations for seeking treatment. *Int J Adult Orthod Orthog Surg,* 12(1): 7–15.

RAMQ 2005. *Statistiques Annuelles 2004*. Montréal: Régie de l'Assurance Maladie du Québec (RAMQ), Direction des communications.

Reddy S, Sarvanan JJS, Arumugham IM 2010. Normative and perceived orthodontic needs among 12-year-old school children in Chennai, India: A comparative study. *Appl Innov Techno,* 3(3): 40- 47.

Riedmann T, Geog T, Berg R 1999. Adult patient's view of orthodontic treatment outcome compared to professional assessment. *J Orofac Orthop,* 60(5): 308–320.

Roessler DM 2003. Complete denture success for patients and dentists. *Int Dent J,* 53: 340-345.

Shaw WC 1981. Factors influencing the desire for orthodontic treatment. *Eur J Orthodont,* 3: 151–162.

Shaw WC, Rees G, Dawes M, Charles CR 1985. The influence of dentofacial appearance on the social attractiveness of young adults. *Am J Orthodont Dentofac Orthopaed,* 87: 21-26.

Shigli K, Hebbal M, Angadi GS 2007. Attitudes towards replacement of teeth among patients at the Institute of Dental Sciences, Belgaum, India. *J Dent Educ,* 71(11): 1467-1475.

Slauther A, Taylor L 2005. Perceptions of dental care need among African-American elders: Implications for health promotion. *Spec Care Dentist,* 25(3): 158-163.

Spencer AJ, Slade GD, Davies M 1996. Water fluoridation in Australia. *Community Dent Health,* 13(2): 27-37.

Thompson L, Malmberg J, Goodell N, Boring R 2004. The distribution of attention across a talker's face. *Discourse Process,* 38: 145–168.

Tuominen ML, Tuominen RJ, Nyström ME 1994. Subjective orthodontic treatment need and perceived dental appearance among young Finnish adults with and without previous orthodontic treatment. *Community Dent Health,* 11(1): 29–33.

US General Accounting Office 2000. *Oral Health: Dental Disease is a Chronic Problem Among Low-income Populations.* Washington, DC: Publication GAO/ HEHS-00-72.

Van der Gelda P, Oosterveldb P, Van Heckc G, Kuijpers-Jagtmand AM 2007. Smile attractiveness: Self-perception and influence on personality. *Angle Orthodont,* 77(5): 759-765.

Wang XR, Ye XY, Niu BP 1998. The influential factors to the motivation of orthodontic treatment in Chinese adolescent. *J Pract Stomato,* 14(3): 214–216.

Yaegaki K, Coil JM 1999. Clinical dilemmas posed by patients with psychosomatic halitosis. *Quintess Int,* 30(5): 328-333.