Original Article

DOI: 10.7860/JCDR/2020/42560.13504

Assessment of Association Between Tooth Morphology and Psychology

Dentistry Section

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ABSTRACT

Introduction: Visagism is the science which explores the possible connection between one's personality and teeth shape. Clinicians maybe able to design a smile that blends with physical appearance, personality and desire of the patient.

Aim: To evaluate the association between tooth morphology and psychological traits.

Materials and Methods: A total of 102 participants aged between 20 and 35 years among medical professionals were selected for the study conducted from November 2018 to March 2019. The tooth forms, long axis, and occlusion lines were drawn using photograph editing software after capturing the photographs of frontal view of teeth in centric occlusion of the participants. And this was assessed with questionnaire. Temperaments of the participants were identified using a self-reporting questionnaire and classified according to Big Five Personality Traits. The type of temperament obtained from the questionnaire for each participant was compared with tooth form (oval, square, rectangle and triangular) obtained from photographic evaluation. Statistical analysis used were One-way ANOVA followed by post-hoc and Chi-Square test by keeping level of significance ≤0.05.

Results: Females (82.4%) were more than males with a mean age of 23 years. Extraversion had square tooth form (34.1%). Conscientiousness trait had oval tooth form (31.6%). The Chi-square test presented that square tooth form showed extraversion trait (34.1%) and neuroticism (29.7%). However, the results were statistically insignificant (p>0.05).

Conclusion: Although the concept of visagism is an appreciable idea, it lacks a practical approach to create a personalised smile.

Keywords: Personality traits, Tooth shape, Visagism

INTRODUCTION

Morphopsychology is a branch of science which accept as truth, that a person's facial features have some relation with his personality [1]. Derived from the French visage, meaning face, the concept of Visagism was well explained by the artist Philip Hallawell [2,3]. This is known as Morphopsychology-Visagism and it's the probable association between temperament and teeth morphology. Dentogenic concept involves gender, personality, and age in evaluation and harmonising the shapes of teeth with the face [4,5]. An individual has unique personality and is difficult to determine [4]. Unveiling the personality traits, pleas of the patient and decoding them into natural tooth shapes to preserve the psycho-dentofacial synchronisation is a major challenge to the clinician in crafting an aesthetic smile [6].

Personality refers to the individual's meticulous behaviour in multiple set of circumstances in life. It shows an individual's tendency to act or react in variety opinion, thoughts, moral values and actions. Personality is rational eventually on actions and reactions. Personality deals with behaviour outlines, perception and sentiments. It has an impression on interpersonal bonds, society, career and self-esteem [7]. Stresses and endeavors of life is not accepted by skeptics [8]. Visagism is an innovative concept that applies the philosophies of visual art to a customised smile [4] Visagism proposes a relationship between temperament, determined by a questionnaire and dentofacial appearance, which are estimated by three factors, i.e., tooth form, the long axis of maxillary anterior teeth, and the occlusion line [9].

There are many ways to measure personality but psychologists focus on personality traits. The most widely accepted of these traits are the Big Five personality traits viz., Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness [10,11]. Due to the availability of few studies regarding visagism [12], a need was felt to investigate whether the same is applicable to dentate individuals of various age groups, education levels, similar profession, and socioeconomic status in both the genders.

Understanding the patient's psychology is an integral part of the communication with patients [13]. Studies have shown that there exists a relationship between the morphology of teeth and patient's psychology [14]. Smile is one of the primary expressions of variety of human emotions. The clinician practicing aesthetic dentistry can utilise the concept of visagism which infers that there exists relationship between emotions and personality traits. Utilising this concept, the clinician can apply the artistic creativity combined with scientific discretion to the dentofacial complex resulting in an aesthetic smile design which is in harmony with the temperament of the patient [12]. The outcome of such treatment would prove to be more acceptable and satisfying to the patient. As the psychology changes with the region along with the personal appearance, values and attitudes, there is need to investigate how well this concept fits. Therefore, this study was conducted with the aim to evaluate the association between tooth morphology and psychological traits.

MATERIALS AND METHODS

The present cross-sectional study was conducted on dental and medical final year under-graduates and interns of a private tertiary care health centre from the month of November 2018 to March 2019. Ethical clearance was obtained from the Institutional Ethical Committee {DMIMS(DU)/IEC/2018-19/7571}.

Inclusion Criteria

Subjects with an even face (examined by keeping a ruler vertically on peak of the forehead and bottom of the chin and each side of the face was examined and compared with the other aspects of the other side) and properly aligned natural teeth i.e., the incisal edges of maxillary anteriors parallel to each other.

Exclusion Criteria

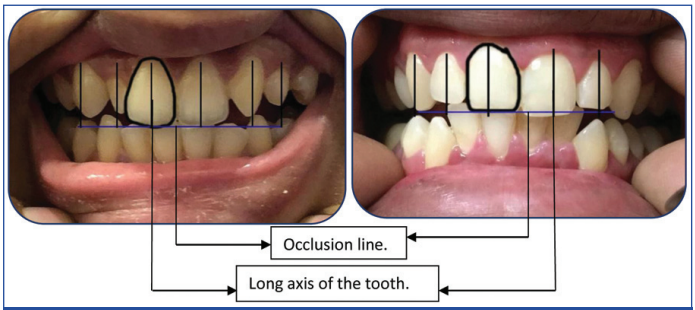
Subjects who had undergone any fixed or removable prosthodontic or orthodontic treatment, history of oral destructive habits.

A total of 600 study population existed at the time of data collection in the afore mentioned institute. Out of these, 102 fulfilled all the inclusion criteria and thus, finally selected for the study.

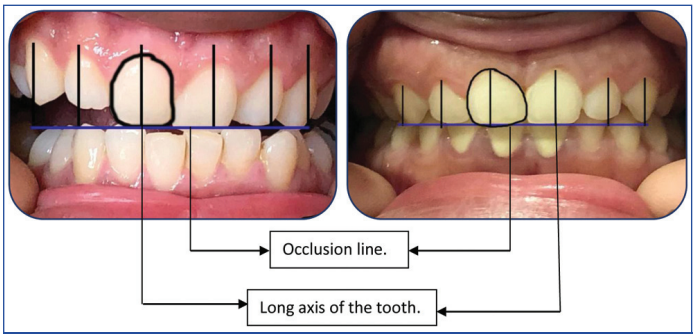
The purpose of the study was explained, and informed consent was taken from participants. The subjects were assured of the confidentiality of their response and that their participation was on a voluntary basis. The data for the study was collected through a pre-validated self-reporting questionnaire and clinical examination.

The Big Five Inventory Personality Test (BFIPT) developed by Digman JM was used for the study [15]. Demographic details of the subjects were recorded like age and gender followed by 44 questions assessing the personality traits [16,17]. The questions were asked on a five-point Likert scale i.e., 1=Disagree strongly, 2=Disagree a little, 3=Neither agree nor disagree, 4=Agree a little, 5=Agree strongly. If required, the investigator was asked to help in understanding the questions to the selected subject. Each question in the questionnaire indicated a specific temperament.

The clinical examination of the participants was done to assess the morphology of tooth by making them seated upright in a comfortable position on a dental chair. Then with the help of a cheek retractor by the single investigator, the photographs of frontal view of 11 21 31 21 22 23 teeth in centric occlusion were captured using a 12-megapixel camera with f/2.4 wide angle aperture (iPhone X, April 2018) in natural illumination. The image was printed and then edited in adobe photoshop and occlusion line was marked with blue ink and with the help of black ink the shape of the tooth which is classified as choleric, sanguine, melancholic and phlegmatic in M.M. House classification and the lines were drawn which shows long axis of the tooth [Table/Fig-1,2] [12]. All the images were evaluated by a single investigator.



[Table/Fig-1]: Choleric and sanguine tooth form.



[Table/Fig-2]: Melancholic and phlegmatic tooth form.

STATISTICAL ANALYSIS

Data was entered in Microsoft Excel 2016 (by Microsoft Corporation) and was analysed using Statistical Package for Social Sciences version 11.5 (by International Business Machines Corporation) by using one-way ANOVA followed by post-hoc and Chi-Square test.

RESULTS

Out of 102 participants, it was found that females were more (82.4%) than males (17.6%) and the mean age was 23.10 years [Table/Fig-3].

Variables		Frequency	Percentage
Gender	Male	18	17.6%
	Female	84	82.4%
Mean age (in years)		23.10±4.17	

[Table/Fig-3]: Demographics of the study participants.

[Table/Fig-4] shows that personality trait extraversion had the highest value with square tooth form (26.79±3.81) and lowest with the triangle. Conscientiousness trait of personality can be related with oval tooth form as it had the maximum mean value. However, the result shows that almost equal mean scores of agreeableness, neuroticism and openness personality traits were found for all the tooth form. All these differences were statistically non-significant when compared by one-way ANOVA (p>0.05)

Personality	Tooth form				p-value
	Triangle	Oval	Square	Rectangle	
Extraversion	24.63±5.23	26.35±4.66	26.79±3.81	26.59±4.72	0.43
Agreeableness	31.84±4.15	32.61±4.14	32.86±4.33	33.06±4.51	0.80
Conscientiousness	27.89±4.61	31.04±4.85	29.89±5.68	28.53±3.53	0.11
Neuroticism	24.68±4.92	24.65±5.08	25.14±5.25	23.56±5.36	0.68
Openness	35.11±4.52	36.74±5.15	36.96±4.82	36.50±4.13	0.57

[Table/Fig-4]: Comparison of mean (±SD) scores of BFIPT scores in various tooth form by one-way ANOVA.
BFIPT: Big five inventory personality test

[Table/Fig-5] shows type of tooth form in each personality trait. For the sake of convenience, subjects scores were divided in 3 categories- below 33.33%, between 33.34% to 66% and above 66%. The subjects scoring more than 66% in specific BFIPT were considered to have the specified personality. Extraversion personality shows square tooth form (34.1%). Agreeableness shows rectangle tooth form (30.4%). Conscientiousness shows same value with oval and square tooth form (31.6%). Neuroticism shows square tooth form (29.7%). Openness shows rectangle tooth form (30.8%). However, the results were statistically insignificant (p>0.05).

DISCUSSION

An attempt was made in this study to find an association between the personality obtained through a pre-verified questionnaire answered by the participants and photographic evaluation. The most accepted personality trait which is Big Five John Personality Trait was used in this study. Universal tooth form was used which showed no specific association between personality and the tooth form (p>0.05).

Rambabu T et al., cited similar outcomes that there is no link (kappa value: 0.023) between the temperament acquired by the questionnaire and that in photographic evaluation [9]. Out of 190 participants positive matching was discovered in 52 participants (27.36%) and adverse matching was discovered in 138 participants (72.63%), suggesting that there is no connection between the temperaments acquired by the questionnaire and photographic evaluation.

These results were in contrast with the study done by Sharma A et al., in which only 50 participants were chosen, whose socioeconomic background was unknown, aged between 18 and 30 years without any information regarding their gender distribution [12]. The uniformity of the sample with respect to distinct age groups may be questionable due to the small sample size and wider variety of age groups. The participant's background has not been disclosed in their study and therefore their level of comprehension and ability to respond to the questionnaire remains unknown.

In this study, the subjects scoring more than 66% in BFIPT showed oval, square and rectangle tooth forms. The notion of combining concepts of smile design for example the tooth form, the long axes of maxillary anterior teeth, the connection line of embrasures,

Personality	Scoring out of 100	Triangle	Oval	Square	Rectangle	Chi-square value	p-value
Extraversion	<33.33%	100.0%	0.0%	0.0%	0.0%	6.410	0.379
	33.34%-66%	21.1%	22.8%	22.8%	33.3%		
	>66%	13.6%	22.7%	34.1%	29.5%		
Agreeableness	<33.33%	0.0%	0.0%	0.0%	0.0%	2.070	0.558
	33.34%-66%	24.2%	15.2%	27.3%	33.3%		
	>66%	15.9%	26.1%	27.5%	30.4%		
Conscientiousness	<33.33%	0.0%	0.0%	0.0%	0.0%	5.193	0.158
	33.34%-66%	23.4%	17.2%	25.0%	34.4%		
	>66%	10.5%	31.6%	31.6%	26.3%		
Neuroticism	<33.33%	25.0%	25.0%	0.0%	50.0%	2.334	0.887
	33.34%-66%	16.4%	23.0%	27.9%	32.8%		
	>66%	21.6%	21.6%	29.7%	27.0%		
Openness	<33.33%	0.0%	0.0%	0.0%	0.0%	2.892	0.409
	33.34%-66%	29.2%	16.7%	20.8%	33.3%		
	>66%	15.4%	24.4%	29.5%	30.8%		

[Table/Fig-5]: Distribution of participants based on overall BFIPT scores in various tooth form.

and the human psychology as proposed by Paulocci B et al., is innovative, but yet to be established thoroughly [3]. Further studies can be conducted to harmonise psychology and dental esthetics for overall better outcome of any treatment on a larger population and on other professionals also. As far the author knows, this study is the first study to determine the association between John big five personality traits and the tooth forms.

Limitation(s)

In this study the subjects were asked to solve the self-reporting questionnaire. Being human nature, the subjects might not be comfortable in solving the questionnaire to avoid criticism. This might be one of the bias and hence a limitation of the study. The other limitation of the study could be time constraint as it was presumed that self-interpretation to situations remain constant and unchanged, documents of longitudinal research states that personality may and does change slightly, possibly because of understanding towards life, past experiences and moral values changes in young adulthood.

CONCLUSION(S)

The findings of the conducted study suggested that there is no existing association between various personality and tooth forms. In future, trials should be performed to validate the present verdicts. Presently, visagism concept is in very primitive state, so this may not be a practical approach in maintaining harmony to design a personalised smile for individuals. The recommendations for further studies are longitudinal study should be tried on a large population.

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PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Aug 01, 2019
- Manual Googling: Nov 19, 2019
- iThenticate Software: Jan 25, 2020 (3%)

ETYMOLOGY: Author Origin

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. NA

Date of Submission: **Aug 01, 2019**
Date of Peer Review: **Aug 23, 2019**
Date of Acceptance: **Dec 28, 2019**
Date of Publishing: **Feb 01, 2020**