Facial and Personality Analysis For A Sample of Yemenis and Ethiopians in Sana'a City, Yemen

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Abstract

*Background: Our appearance, including facial features, teeth design, and even how they're perceived, can be influenced by where we come from (geography), cultural background, and ethnicity. Yemenis and Ethiopians may also have different social expectations for how their features look. **Aims**: This study evaluated the dominant facial and personality types and their correlation among Yemenis and Ethiopians in Sana'a city, Yemen. **Subjects and Methods:** Researchers examined the link between facial features and personality by analyzing digital "facial maps" generated from full-face photos (including a broad smile) of 120 participants. These participants also completed a personality questionnaire. Both facial features and personalities were categorized as strong, dynamic, delicate, or calm, and the researchers then used statistical tests to see if there was a connection between these classifications. **Results:** This study investigated the link between facial features and interview communication style in Ethiopians and Yemenis. The researchers found no statistically significant connection in either group. While there was a weak association between a "calm" facial type and a specific communication style for some participants, this wasn't consistent. Overall, facial features provided little insight into communication style in this study. **Discussion and conclusion:** This study investigated the potential link between facial appearance and communication style during interviews, focusing on Ethiopian and Yemeni patients. The findings suggest a weak overall connection between these two factors.*

Introduction

The first time we meet someone, we make snap judgments based on their appearance. This is especially true today, in a world where image is everything. Our confidence, how we perceive ourselves, and even our facial features all influence these initial impressions. Personality, that complex mix of our nature and experiences, defines who we are. A French psychiatrist believed there might be a link between our face and personality. The fancy French word for face is "visage," and this concept is called Visagism. Even dentists use Visagism! By considering a patient's face and personality, they can create dental work that not only looks good but also complements the patient's self-image and boosts their confidence. After all, our mouth is a key part of communication, both verbally and nonverbally. Visagism helps us understand this nonverbal communication through facial features [1,2].

According to Carl Jung, there are universal patterns that influence us all, and these can even be seen in our smiles. The shape, size, and arrangement of our teeth can hint at our personality. To create the perfect smile makeover, dentists consider more than just fixing the teeth themselves. First, they carefully analyze the proportions, sizes, and shapes of your teeth to design a smile that complements your unique features. Research has been ongoing for years to understand how these dental traits can be linked to factors like gender, age, and even personality [10,11].

Material and methods

This analytical study took place in Sana'a, Yemen between January 7th, 2023, and September 30th, 2023. The research was approved by the relevant ethics committee.

Researchers recruited 120 participants, with 60 Yemeni and 60 Ethiopian men, aged 20-35. Selection wasn't random, but based on finding convenient volunteers who met specific criteria:

- Facially symmetrical features
- Naturally straight teeth up to the first molars (back teeth)
- Healthy gums with no signs of gum disease
- No cavities

Participants hadn't undergone any prior fixed prostheses or orthodontic treatment (braces, retainers, etc.). Everyone involved signed consent forms agreeing to participate.

Standardized photo protocol

A special software called VisagiSMile was used to analyze facial features. Researchers followed the program's specific guidelines to capture optimal images. Here's how they took the photos:

1. Participants sat comfortably in a straight upright position.
2. A digital camera captured a full-face photo with a wide smile, ensuring all teeth were visible.
3. The participant's head was carefully positioned to ensure the camera lens and a specific facial plane (Frankfurt horizontal plane) were perfectly level (Figure 1).
4. The photo was focused on a point near the forehead (glabella) while keeping both eyes and mouth sharp.

5. The participant faced directly forward, with both earlobes visible.

Once captured, the photos were uploaded to the software for calibration. Automatic facial landmark identification was performed by VisagSMile software (Figures. 2 and 3).

This study investigated the relationship between facial features and perceived personality. Researchers digitized 27 facial landmarks (points and lines) on participants' faces to create digital facial maps. These maps were used to categorize faces into five types: strong, dynamic, delicate, calm, and combinations.

Participants also completed a personality questionnaire with four questions. The first question, based on Dellinger's work [3], used a visual component to enhance credibility. The remaining questions were adapted from Eysenck's questionnaire [4] and allowed participants to choose at least three options per question. A computer algorithm analyzed the questionnaire responses to categorize the participant's perceived personality using the same five categories (strong, dynamic, delicate, calm).

The researchers identified the first dominant facial type and personality type for each participant. These were highlighted in red (Figure 4), the study focused only on these dominant type.
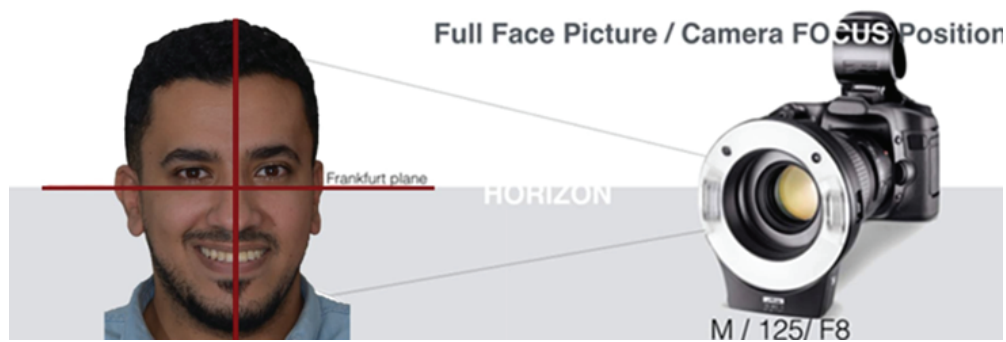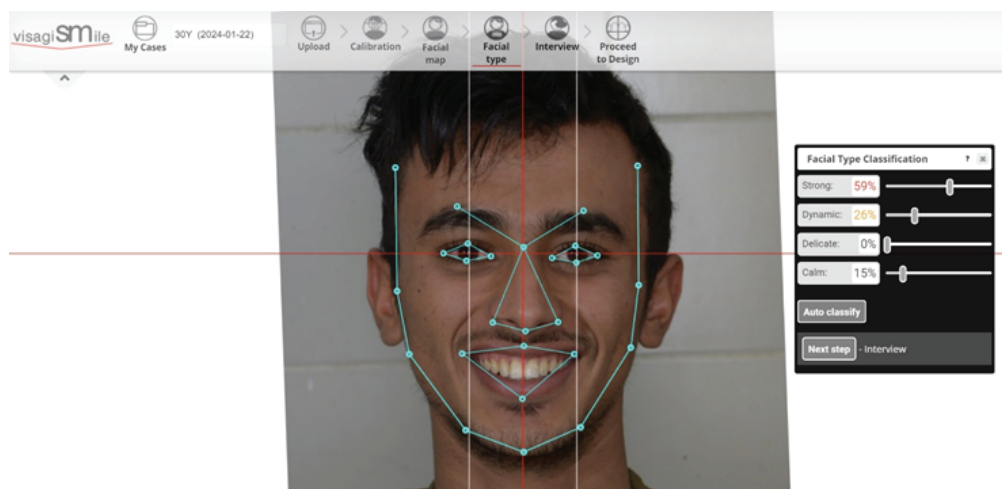

Figure 1. *Frankfurt Horizontal Plane (FH)*

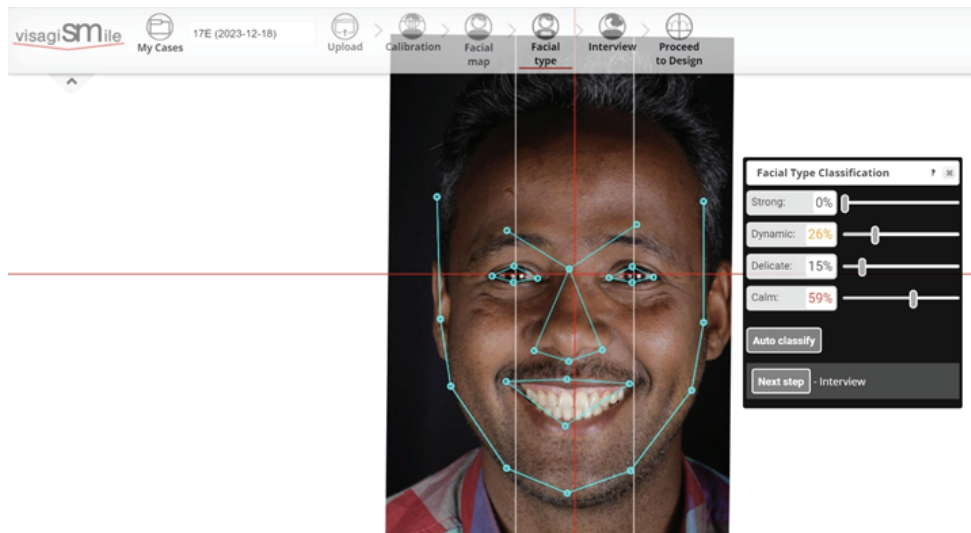**Figure 2.** *Example of the facial map for Yemeni participants.*

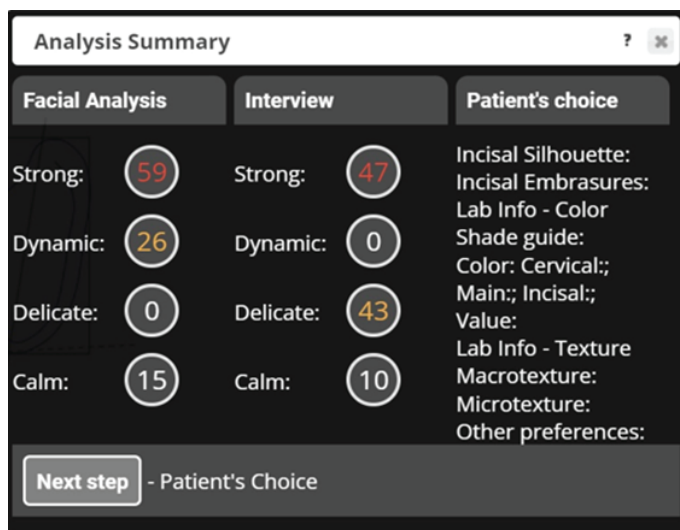**Figure 3.** *Example of the facial map for Thiopian participants.*

Figure 4. *Facial and Personality Analysis.*

Statistical analysis

The researchers analyzed the tabulated data using descriptive statistics. They also assessed agreement between categories with the Kappa statistic and tested for associations between variables using the Chi-square test. All statistical analyses were performed in SPSS version 22.0 and GraphPad Prism version 6.0. A significance level of $p < 0.05$ was used.

Results

The results which were obtained from the present study were analyzed, documented, and presented in the following tables:

Study Participants

The table 1 summarizes the characteristics of the 120 participants enrolled in the study. The participants were divided into two equal groups: 60 Ethiopians and 60 Yemenis.

Table 1. *Age distribution of patients*

		Ethiopian	Yemeni
Age	Mean ± SD	24.3±4.4	22.0±1.9
	Range	20.0-34	19.0-30.0
	≤ 20	21(35.0)	22(36.7)
	22-23	11(18.3)	30(50.0)
	≥ 24	28(46.7)	08(13.3)
Total		60 (100.0)	60(100.0)

Age

- **Ethiopians:** The average age was 24.3 years old (standard deviation ± 4.4 years), with a range of 20.0 to 34.0 years old. The age distribution was as follows:
  - o 35.0% ≤ 20 years old
  - o 18.3% between 22 and 23 years old
  - o 46.7% ≥ 24 years old

- **Yemenis:** The average age was 22.0 years old (standard deviation ± 1.9 years), with a range of 19.0 to 30.0 years old. The age distribution was as follows:
  - o 36.7% ≤ 20 years old
  - o 50.0% between 22 and 23 years old
  - o 13.3% ≥ 24 years old

In table 2: 45 (37.5%) were facial Calm 25 (41.7%) of them were Ethiopian subjects while 20 (33.3%) were Yemeni patients, and 26 (21.7%) were facial Delicate of them 15 (25.0%) were Ethiopian patients while 11 (18.3%) were Yemeni patients also 27 (22.5%) were facial Dynamic of them 15 (25.0%) were Ethiopian patients while 12 (20.0%) were Yemeni patients, finally 22 (18.3%) were facial strong of them 05 (8.3%) were Ethiopian subjects while 17 (28.3%) were Yemeni patients. "It was shown from Table 4.2 that there was a statistically significant difference between Ethiopian and Yemen subjects in facial form, where p=0.04.

Table 2. Dominant facial form in Ethiopian and Yemeni

Variable		Ethiopian		Yemeni		Total	%	χ^2	P value
		No.	%	No.	%				
Facial	Calm	25	41.7	20	33.3	45	37.5	**8.1**	**0.04**
	Delicate	15	25.0	11	18.3	26	21.7		
	Dynamic	15	25.0	12	20.0	27	22.5		
	Strong	05	8.3	17	28.3	22	18.3		
Total		**60**	**50.0**	**60**	**50.0**	**120**	**100.0**		

Table 3. Interview type in Ethiopian and Yemeni

Variable		Ethiopian		Yemeni		Total	%	χ^2	P value
		No.	%	No.	%				
Facial	Calm	43	71.7	30	50.0	73	60.8	**9.5**	**0.02**
	Delicate	00	00	06	10.0	06	5.0		
	Dynamic	11	18.3	16	26.7	27	22.5		
	Strong	06	10.0	08	13.3	14	11.7		
Total		**60**	**50.0**	**60**	**50.0**	**120**	**100.0**		

Table 4. The association between facial form and interview form for Ethiopian participants

Ethiopian		Interview form				Total		χ^2	P value	Concordance rate %
		Calm	Delicate	Dynamic	Strong	No.	%			
Facial form	Calm	17(68.0)	00	6(24.0)	2(8.0)	25	41.7	4.8	0.6	68.0
	Delicate	13(86.7	00	1(6.7)	1(6.7)	15	25.0			00
	Dynamic	9(60.0)	00	4(26.7)	2(13.3)	15	25.0			26.7
	Strong	4(80.0)	00	00	1(20.0)	05	8.3			20.0
Total		43(71.7)	00	11(18.3)	6(10.0)	60	100.0			36.7
Kappa = 0.02 means: slight agreement										

In table 3 120 participants (100%) were interviewed. Among those interviewed, 43 (35.8%) were Ethiopian subjects were calm, while 30 (25.0%) were Yemeni subjects. There were also 6 (5.0%) who were interviewed in a delicate manner (with whom none were Ethiopian and all 6 were Yemeni), 27 (22.5%) interviewed dynamically (with 11 Ethiopians and 16 Yemenis), and 14 (11.7%) interviewed strongly (with 6 Ethiopians and 8 Yemenis). There was a statistically significant difference between Ethiopian and Yemeni subjects and the interview format (p=0.02).

The Tables illustrate the association between the most dominant facial and interview form among Ethiopian patients.

- There is no statistically significant link between facial features and interview form in Ethiopian patients (p-value = 0.6).

- Among the participants, the most common facial type ("calm") corresponded with a specific interview form in 68% of cases.

- Dynamic, strong, and delicate facial types were observed less frequently (26.7%, 20%, and 0%, respectively) and showed weaker associations with interview form.

- The overall agreement between facial type and interview form was low (36.7%).

- Cohen's Kappa statistic (0.02) suggests slight agreement between facial features and interview form in this study.

In simpler terms:

This study looked for a connection between facial appearance and how Ethiopian patients communicated during interviews. The researchers found no strong relationship between the two. While a specific facial type (calm) was somewhat linked to a particular communication style in some cases, this wasn't consistent across the board. Overall, facial features provided little information about communication style in this study.

Table 5. *The association between the facial form and interview form for Yemeni participants.*

Ethiopian		Interview form				Total		χ^2	P value	Concordance rate %
		Calm	Delicate	Dynamic	Strong	No.	%			
Facial form	Calm	12(60.0)	00	6(30.0)	2(10.0)	20	33.3	14.2	0.1	60.0
	Delicate	6(54.5)	1(9.1)	4(36.4)	00	11	18.3			9.1
	Dynamic	8(66.7)	2(16.7)	1(8.3)	1(8.3)	12	20.0			8.3
	Strong	4(23.5)	3(17.6)	5(29.4)	5(29.4)	17	28.4			29.4
Total		30(50.0)	6(10.0)	16(26.7)	8(13.3)	60	100.0			31.7
Kappa = 0.06 means: slight agreement										

The Table 5 illustrate the association between the most dominant facial and interview form among Yemeni patients.

There was no statistically significant association between facial form and interview form for Yemeni patients (p=0.1). Among all Yemeni participants, the concordance rate for the calm type was highest (60.0%), followed by strong (29.4%), delicate (9.1%), and dynamic (8.3%) types. The overall concordance rate was 31.7%. Cohen's

Discussion

Discussion Points on the Relationship Between Facial Features and Interview Communication in Ethiopian and Yemeni Patients

This study investigated the potential link between facial appearance and communication style during interviews, focusing on Ethiopian and Yemeni patients. The findings suggest a weak overall connection between these two factors.

Key Points:

- No significant relationship for Ethiopians: The study found no statistically significant association between facial features (calm, delicate, dynamic, strong) and interview style (calm, delicate, dynamic, strong) in Ethiopian patients.

- Limited consistency for Yemenis: While a statistically significant association was absent for Yemeni patients as well, a trend emerged. The "calm" facial type showed the highest concordance (agreement) with a specific communication style (calm interview), followed by "strong," "delicate," and "dynamic" types.

- Low overall agreement: Regardless of ethnicity, the overall agreement between facial features and interview style remained low. This indicates that facial appearance offered little insight into communication style for most participants.

- Slight agreement statistically: Both Cohen's Kappa values (0.02 for Ethiopians and 0.06 for Yemenis) suggest a very weak level of agreement between facial features and interview communication.

Possible Explanations

- Cultural and individual factors: Communication styles might be more influenced by cultural norms, personality traits, or interview preparation than facial features.

Designing a smile starts with understanding the face. This concept, called visagism, connects facial features to personality. There are many theories about personality, but one key idea is that culture plays a huge role in shaping who we are. Western ideas about personality might not work for everyone, and research shows that personality traits vary depending on where you grow up [5,6].

- Sample size: The study may have needed a larger sample size to detect more subtle relationships, especially for less frequent facial types.

Both facial features and communication styles might be subjective in their categorization, leading to inconsistencies.

Our study suggests that facial types aren't clear-cut categories. Instead, they're a blend of different features, with some being more prominent than others. It's rare to find a face that's perfectly round or square. A round face might have some angularity, and a square face might be slightly narrower at the forehead or chin.

Similarly, personality isn't neatly divided into distinct traits. People are usually a mix of various characteristics, such as being strong, dynamic, delicate, and calm. The results of this study are consistent with the previous study [7]. The present study is unique as it analyzes facial and personality types using Visagism concept among Yemeni and Ethiopian populations. In the present study, a statistically significant correlation did not exist in natural dentition. Facial attractiveness is associated with psychological characteristics such as extroversion, and confidence/self-esteem [8].

Future research should involve larger, more diverse groups of people. This would allow us to establish baseline data for different cultures and races. Additionally, it could help identify consistent mathematical relationships between facial features and personality traits. This knowledge could then be used to predict what kind of facial changes would result in the most natural-looking and aesthetically pleasing outcomes after oral rehabilitation procedures.

Conclusion

This study suggests that facial features provide limited information about communication style during interviews, particularly for Ethiopian patients. While a slight trend emerged for Yemeni patients, the overall agreement remained low. Further research is needed to explore the factors that influence communication styles during interviews.

The most typical temperament for the studied group is a combination of strong, dynamic, delicate, and calm. After a detailed mathematical analysis of the data, the facial type was found to be a combination of several types of characteristics with varying degrees of dominance of one type over the other [9].

In conclusion, this clinical study highlights the advantages of combining traditional esthetic dentistry practices with modern digital technologies like VisagiSMile software for smile design. This approach offers several benefits, including:

- More natural and personalized smiles tailored to the patient's facial features and personality.

- A more conservative treatment plan through the use of digital tools for 3D modeling and prosthesis design.

- Increased efficiency with AI-powered VisagiSMile software that generates personalized smile designs in minutes.

- Improved communication and patient satisfaction through provisional restorations for design verification.

By integrating these advancements, dentists can achieve predictable and successful esthetic outcomes, fulfilling patient expectations for a perfect smile.

Acknowledgment

Financial support and sponsorship

Conflicts of interest

There are no conflicts of interest.

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