



Original research:

Assessment of child personality attributes using Pictorial Personality Traits Questionnaire (PPTQ-C) for prediction of child behavior at the first dental visit and its co-relation with the Frankl behavior rating scale

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Abstract:

Aim: To assess child personality attributes using Pictorial Personality Traits Questionnaire Children (PPTQ-C) for prediction of child behavior at the first dental visit and its co-relation with the Frankl behavior rating scale.

Methodology: A sample size of 110 children between the ages 6-9 years requiring preventive treatment was included and they were asked to fill out the PPTQ-C before the treatment. The personality trait was evaluated. The Frankl behavior rating of the subjects was noted at the time of the treatment. A correlation was established between the personality trait and Frankl behavior rating scale. The Pearson correlation test was used to obtain a correlation between the Frankl behavior rating scale and the personality traits. **Results:** A positive correlation was found between the trait of Extraversion and a negative correlation between Neuroticism and the Frankl behavior rating scale. **Conclusion:** The PPTQ-C can be used to assess child personality attributes for the prediction of child behavior at the first dental visit. However, the findings are preliminary and need to be validated with bigger sample sizes across varied groups.

Keywords: behavior prediction, behavior management, Pictorial personality traits questionnaire children

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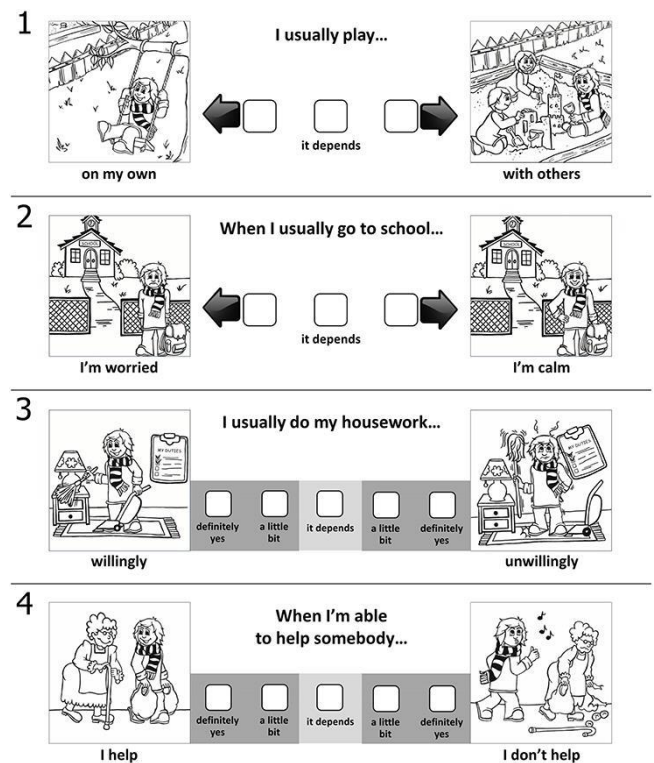
Introduction

Dental anxiety is a global condition that affects people of all ages in various nations. The disorder affects the oral health-related quality of life in both children and adults.^[1] Furthermore, dental fear, anxiety, and low pain tolerance are associated with increased levels of dental caries. The worldwide measured prevalence of dental anxiety and dental fear among adolescents ranges between 3.3 and 19.0%.^[2-5] Thus, prediction of a child's behavior in a dental setting before starting any treatment can be of great help and work as a guide to carry out a smooth procedure. The literature reveals that limited studies investigated the relationship between child mental health and the behavioral patterns of a child in the dental clinic.⁶ Several psychological factors might affect a child's behavior, such as medical problems, traumatic experiences in the past, maternal anxiety, and more. Personality has been conceptualized from numerous theoretical approaches, at varying levels of abstraction or breadth,^[7] which has created distinctive contributions to our understanding of individual behavioral and experiential characteristics. Using these personality traits, one can predict one's behavior or ways of expressing oneself. The 'Big Five model' is a generally acknowledged model of personality description based on attributes.^[8] The dominant 'Big Five' form in the literature believes that the universal personality structure consists of five key traits: Extraversion, Agreeability, Conscientiousness, Neuroticism, and Openness to new experiences. Traditional research on personality traits based on the 'Big Five model' has related mainly to adulthood. However, there has been a major increase in the testing of personality structure at earlier stages of development, ranging from childhood to adolescence. Several attempts have been made to develop a system to identify features in youngsters. In the third research method, psychologists attempted to design self-report questionnaires suitable for children and adolescents.^[8,9] The Hierarchical Personality Inventory for Children (HIPiC), a questionnaire designed by Mervielde and De Fruyt, is one of the alternatives.^[10] To address the challenges of measuring personality in children, the Pictorial Personality Traits Questionnaire for Children (PPTQ-C) was devised to take into account the cognitive development of the respondents. The main concept behind this instrument is that personality qualities are represented by visuals that depict behaviours. Depending on the response, scores are assigned, and a personality trait is derived. The major advantage of this scale is that it is picture-based, which allows the youngster to grasp and relate to it more easily.^[11]

The PPTQ-C consists of 15 items-three items for each scale: Extraversion, Neuroticism, and Openness to experience, Agreeableness, and Conscientiousness.

Each item consists of three pictures: the first is an indicator of a low level of a given trait, and the third indicates a high level of the same trait. The same main character is presented in each picture, although the character behaves differently.

Figure 1: Pictorial personality traits questionnaire



The child selects the picture in which the main character behaves like he or she would and indicates his or her similarity to the main character on a 3-point (for younger children, 6-9 years old) or 5-point scale (for older children, 10-12 years old). The main character is gender neutral so children of both genders can relate with it. (Figure:1)^[11] This study attempts to find out a correlation between these personality traits and how they can be used to predict a child's behavior in a dental office using the pictorial personality questionnaire for children (PPTQ-C).

Methodology

The following study was carried out in the Department of Paediatric and Preventive Dentistry. Children aged between 6 and 9 years having their first dental visit were selected for the study. Those requiring oral prophylaxis and preventive treatment, such as pit and fissure sealants, and fluoride application, were included in the study. Children undergoing extraction, pulp therapy, and procedures requiring local anaesthesia were excluded. Children who were



medically compromised, whose parents refused to participate in the study, or who came to the diagnosis clinic with a dental emergency were also excluded from the study. The oral prophylaxis procedure was done with the help of ultrasonic tips, and a saliva ejector was used. The pit and fissure sealant was used. Isolation was obtained with cotton rolls. Initially, the tooth was dried, and etchant gel was applied for 10 seconds. It was washed off and dried till a chalky white appearance of enamel was obtained. A thin layer of sealant was placed and cured for 30 seconds. Acidulated phosphate gel was used for fluoride application using foam trays. The sample size of 105 was calculated using the following formula: $n = z^2 p (1-p)/L^2$.

A total of 147 patients were screened, out of which 110 were included in the study. Parental consent was obtained before the study. The children who were selected for the study were given a sheet of the PPTQ-C questionnaire (Supplementary data 1) and were asked to fill it out without the help of their parents. The first operator was allowed to guide the children wherever required. The questions were translated into the local language for better understanding. After answering the questions, the treatment procedure was carried out by a trained operator, and the Frankl behavior rating score was noted. The scoring for the PPTQ-C was calculated, (Supplementary data 2) and the personality trait of the subject was deduced. A correlation was obtained between the Frankl behavior rating scale and the personality traits of the child. The data of the calculated personality trait and the Frankl behavior rating of the subject was compiled, and a correlation between the two was obtained. SPSS version 26.0 software was used for the statistical analysis of the results, and the Pearson correlation test was used.

Results

Among all the subjects, 16.1% subjects identified as 'Definitely negative', the average score observed for the Extraversion trait was 5.27; 6.82 for Neuroticism trait, 6.36 for Openness to new experiences, 7.09 for Conscientiousness, and 7.36 for Agreeableness. Among the 27.9 % 'Negative' behavior identified subjects, a mean score of 6.37 showed the Extraversion trait, 6.58 Neuroticism trait, 6.89 had Openness to new experience trait, 6.89 had Conscientiousness trait, and 7.05 had the Agreeableness trait. Among the 35% showing 'Positive' Frankl's behavior mean score of 6.25 subjects showed the Extraversion trait, 5.54 for the Neuroticism trait, 7.21 for the Openness to new experiences trait, 6.96 for the Conscientiousness trait, and 7.29 showed the Agreeableness trait. Amongst the 20.5% of children showing 'Definitely positive' behavior, a mean of 7.36 subjects showed Extraversion traits, 6.14 the Neuroticism trait, 7.71 the Openness to new experiences trait, 7.36 the Conscientiousness trait and 7.14 had the Agreeableness trait. (Table 1). When the correlation between the personality traits and the Frankl behavior rating scale was done, a positive correlation was found between the traits of Extraversion and the Frankl behavior rating scale. A negative correlation was observed with that of Neuroticism. A low positive correlation was seen with that of the Openness to new experiences trait. The trait of Conscientiousness showed a positive correlation, which was statistically not significant. Lastly, the trait of Agreeableness showed a negative correlation, which also was statistically insignificant. (Table 2, Figure 2-6)

Table 1: Descriptive statistics of scores for different traits according to behavior

Behavior	Traits					
	Extraversion	Neuroticism	Openness	Conscientiousness	Agreeableness	
Definitely negative	Mean	5.27	6.82	6.36	7.09	7.36
	SD	1.555	0.982	1.433	0.701	0.674
Negative	Mean	6.37	6.58	6.89	6.89	7.05
	SD	1.3	1.02	1.2	1.45	1.65
Positive	Mean	6.25	5.54	7.21	6.96	7.29
	SD	1.29	1.29	1.06	1.23	1.12
Definitely positive	Mean	7.36	6.14	7.71	7.36	7.14
	SD	1.34	1.1	0.99	1.82	1.99

Table 2: Correlation between different traits and Frankl behavior

Trait	r value	p-value	Interpretation
Extraversion	0.385	<0.001*	Positive correlation
Neuroticism	-0.279	0.021*	Negative correlation
Openness	0.353	0.003*	Positive correlation
Conscientiousness	0.069	0.578	Negligible positive correlation
Agreeableness	-0.015	0.902	Negligible negative correlation



*Pearson correlation coefficient test; * indicates significant difference at $p \leq 0.05$

Figure 2: Correlation between Frankl behavior rating scale (X-axis) vs Extraversion trait showing a positive correlation (Y-axis)

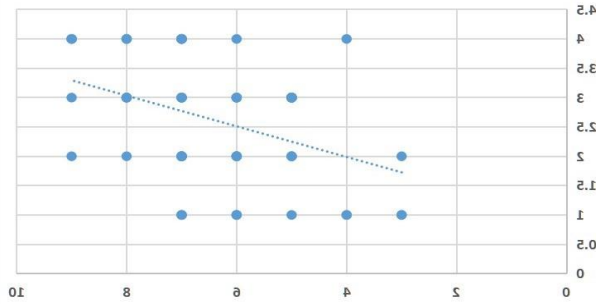


Figure 3. Correlation between Frankl behavior rating scale (X-axis) vs Neuroticism trait (Y-axis).

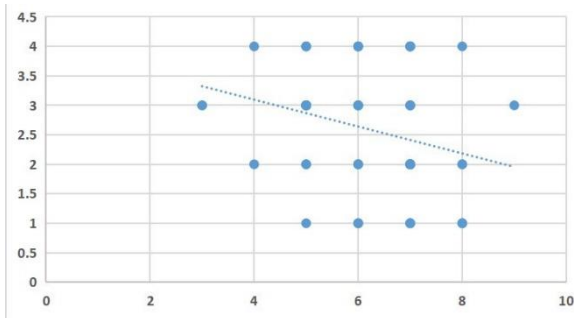


Figure 4. Correlation between Frankl behavior rating scale (X-axis) vs Openness to new experiences trait (Y-axis)

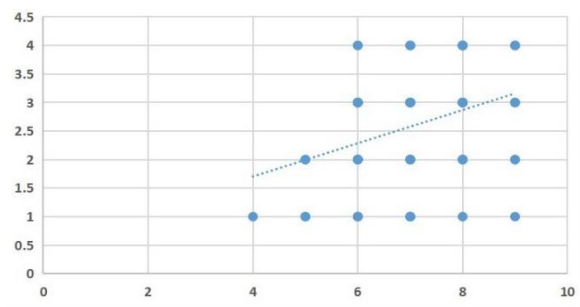


Figure 5. Correlation between Frankl behavior rating scale (X-axis) vs Conscientiousness trait (Y-axis)

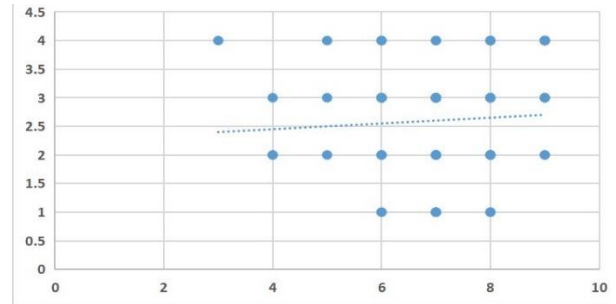
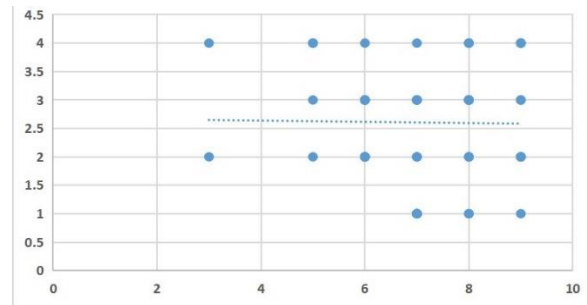


Figure 6. Correlation between Frankl behavior rating scale (X-axis) vs Agreeableness trait (Y-axis).



Discussion

Predicting a child's behavior before the first dental visit is seen as an effective strategy that allows the dentist to guide the child's behavior throughout treatment.^[12] Assessing the child's development, experiences, and current emotional state enables the dentist to create a behavior modification strategy to provide the appropriate dental health care. Each of the Big Five represents a wide range of linked behavioral traits. For example, Extraversion represents individual differences in social engagement, assertiveness, and energy level. Highly extroverted individuals enjoy socializing with others, are expressive, and frequently experience positive emotions such as enthusiasm and excitement. Agreeableness includes variances in compassion, respect, and acceptance of others. Conscientiousness reflects differences in organization, productivity, and responsibility. People who are very neurotic are more likely to experience worry, melancholy, and mood swings. Finally, Openness to Experience (also known as intellect) describes distinctions in intellectual curiosity, artistic sensitivity, and imagination. Highly open individuals enjoy thinking and learning, are sensitive to art and beauty, and generate original ideas.^[13] Few studies have been carried out to find the association between the mental states of the child and the child's conduct in a dental operator.^[6,14] The strengths and difficulties questionnaire (SDQ) is one of the scales used for the



same. A previous study ^[6] carried out to assess the child's psychological attributes using a strength and difficulties questionnaire for the prediction of the child's behaviour at the first dental visit, found a significant negative association between total difficulty scores and child conduct. As a result, SDQ demonstrated the ability to predict the child's behaviour during the first dental visit. However, the drawback of the questionnaire used was that the parent was made to fill it out, and was lengthy. In the present study, the Pictorial Personality Trait Questionnaire –for children was used. It is a simple, visually appealing scale that patients can complete on their own. It is a visual scale, so it is more suitable than verbal ones because representations represent real circumstances, behaviours, and people with whom the kid may easily identify. Every trait was scored on a scale of 3 to 9. The greater the score, the stronger the trait is. Children with a greater Extraversion score, which includes attributes such as talkativeness and socialization, demonstrated a better level of cooperation with the dentist, indicating a positive association. (Figure 1) Similarly, youngsters with greater Neuroticism scores who exhibited traits such as fast anger and irritability demonstrated poor dental cooperation. The higher the score of Neuroticism, the lower their cooperation. (Figure 2) This results in a negative correlation. Finally, children who showed higher scores of openness to new experiences traits; who showed higher levels of curiosity, and creativity showed higher cooperation for the dental procedure. (Figure 3) A negligible positive correlation was found between Consciousness and Frankl's behavior rating scale. (Figure 4) A negligible negative correlation was found between the Agreeableness trait and Frankl's behavior rating scale. (Figure 5) Both the scores were statistically non-significant.

Conclusion

Very little research has been conducted to predict child behavior in a dental office. The PPTQ-C is simple to implement as the youngster waits to begin his treatment in the waiting room and can help to reduce the patient's anxiety as well. Thus, it can be concluded that the PPTQ-C can be used for the assessment of child personality attributes for the prediction of child behavior at the first dental visit. It can be successfully used to acquire a general grasp of the patient's personality features, thereby assisting in forecasting a child's conduct and deciding on a behavior management strategy. This exploratory clinical study's minuscule sample size of young children makes it difficult to compare outcomes. Further research is needed to corroborate this model with children of all ages. A larger sample size, including community and clinical samples, should be considered.

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Supplementary data 1:

What kind of person are you? What do you usually do?

PPTQ-Cv1, Marta Rogoza, Jan Ciecich

On the next pages, you'll find descriptions of different situations.
Here is one example:
"When it rains..."

The situations are shown in pictures. In each picture,
the leading character is wearing a striped scarf.



The leading character is doing two completely different things, e.g.

When it rains...

I play computer games I watch TV

Think about it, what do you do most often in such a situation?
Are you more similar to the person with the scarf
in this picture or in this picture?

Next, tick the box beside your chosen picture

This is important!

In every situation you can only choose one small square.

If sometimes you behave in one way and other times in another way,
circle the square in the middle ("IT DEPENDS").

What do you usually do?

1. I usually play...

on my own with others

2. When I go to school...

I often feel worried I don't feel worried

3. When I see birds flying...

it doesn't impress me it impresses me a lot

4. When I am asked to do housework...

I am usually willing to do it I am unwilling to do it

- 2 -

What do you usually do?

5. When a classmate needs something...

I don't notice it I notice it and help them

6. When other children play...

I join them I don't join them

7. When something goes wrong...

I stay calm I get nervous quickly

8. When I am on a trip, I mostly enjoy...

exploring and discovering new things having fun and relaxing

- 3 -

What do you usually do?

9. My bedroom is...

messy tidy

10. When I see that I can help somebody...

I help them I don't help them

11. When someone jokes...

it doesn't make me laugh I laugh with them

12. Usually...



I worry about things I don't worry about things

- 4 -





What do you usually do?

13. Learning new things...

 ← IT DEPENDS → 



is not enjoyable for me is enjoyable for me

14. When I am given money...

 ← IT DEPENDS → 

I save it for later I spend it straight away

15. When I have something new...

 ← IT DEPENDS → 

I don't lend it to anybody I lend it to others

Supplementary data 2: STEPS FOR CALCULATION OF PERSONALITY SCORES

- Extraversion: 1, 6R, 1
- Neuroticism: 2R, 7, 12R
- Openness: 3, 8R, 13
- Conscientiousness: 4R, 9, 14R
- Agreeableness: 5, 10R, 15

Each item on the PPTQ-C (older children's version) is rated on a 3-point scale where:

- Definitely (left side) = 1 (3 for reverse scored items indicated by R)
- It depends = 2
- Definitely (right side side) = 3 (1 for reverse scored items)

Step 1: Reverse score the following items: 2, 4, 6, 10, 12, 14

Step 2: Compute scale scores by summing the items for each dimension