

Perception of dental aesthetics in paediatric dentistry

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ABSTRACT. ***Aim** Assessing the perception of the aesthetic components of the oral health by paediatric patients at different stages of the child psychological development of Piaget. **Materials and methods** Twenty children aged between 21 months and 11 years, of both sexes, patients of a private clinic, were selected. The present study group consisted of patients treated for oral pathologies. A set of similar supplies was given to all children and they were asked to do a drawing, whose theme was “beautiful teeth and ugly teeth”. The drawings were evaluated according to the classification of the cognitive development of Piaget. **Results** Children of all ages clearly represent their perception of what “beautiful teeth” and “ugly teeth” are. These representations provide the dental professional a clear vision of the child’s feeling about dental aesthetics. **Conclusion** The drawings are a useful source of information for assessing the aesthetic perception of paediatric patients. The knowledge of the children’s aesthetic perception is relevant to paediatric dentists because children are conscious about their dental aesthetic appearance and that of the other children.*

Key words: Children; Dental aesthetics; Cognitive development; Child psychology.

Introduction

In the development of the Psychology of art, experimental aesthetics was born in the nineteenth century, with Gustav Fechner [1871], who defined the feasibility of studying the aesthetic skills through the use of very simple stimuli allowing to establish some rules, a golden rule, based on the preference for certain spatial dimensions. For Rudolf Arnheim [1966], the aesthetic experience is something much more complex than a simple expression of preferences for squares or rectangles; perception takes into account much more than simple forms [Marty, 2002; Marty et al.,2003].

To investigate the aesthetic perception in a scientific way, objects that belong to a very complex artistic world, such as sculptures and drawings, should be used as stimuli [Marty, 2002].

The perception of dental aesthetics by paediatric patients, and children in general, is one of the topics of interest in paediatric dentistry. Among the few studies mentioned in the literature on dental aesthetics, as it is seen during childhood, the majority refers to the patients’ perception of an eventual need for

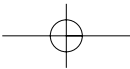
orthodontic treatment. This perception, often expressed through a visual scale or a questionnaire, was measured in adolescents, who are at the development stage that Piaget defined as the period of formal operations [Bjorklund, 1997; Cameron et al., 1998; Mugonzibwa et al., 2004; Onyeaso and Sanu, 2005; O’Brien et al., 2006; Moura et al., 2007].

The knowledge of the development of the child psychology is important for the paediatric dentist for establishing a good communication. Piaget’s “Four stages of development” are infancy, preschool, childhood, and adolescence. Each stage is characterised by a general cognitive structure that affects all of the child’s thinking (Table 1). The younger children are also very aware of the aesthetic appearance of their oral cavity and that of the surrounding people. However, the expression of this aesthetic perception is difficult to assess.

Drawing is a non-verbal communication means widely used in child psychology to assess the affective ties. Long before the children can convey their feelings and thoughts into words, they can express both conscious and unconscious attitudes, desires and concerns through drawings. Children’s drawings are considered as a productive source to capture the representations of affection [Fury et al., 1997].

The child psychology and paediatrics use various tests to assess the cognitive and motor development of the child. Thus, they also resort to tests that also

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Operational Stages
<p>Sensorimotor stage 0 - 2 years</p> <p>Infants mainly make use of senses and motor capabilities to experience the environment. For instance, if infants cannot see or touch an object, they stop trying to find it. Once infants develop the capability to recognize that a hidden object still continues to exist, they start searching for it. The characteristic limitation of this stage is 'thinking only by doing'.</p> <p>The Sensorimotor infant gains physical knowledge.</p>
<p>Preoperational stage 2 - 7 years</p> <p>Children start to use symbols such as language to represent objects. For instance, the child understands the word "apple" although a real apple is not seen. However, the Preoperational child still learns from concrete evidence while adults can learn in abstract way.</p> <p>The Preoperational child is also unaware of other persons' perspective.</p> <p>The children exhibit egocentric thought and language.</p>
<p>Concrete operational stage 7- 11 years</p> <p>Operations are associated with personal experience. Operations are in concrete situation, but not in abstract manipulation. Concrete operations allow children to classify several classes into a larger group or to combine a number of classes in any order. Although objects are moved or reordered, no change takes place. The limitation of the third stage of cognitive development is that operations are only carried out on concrete objects, and limited to two characteristics at the same time.</p> <p>The child is no longer egocentric.</p>
<p>Formal operational stage 11- 15 years</p> <p>Ability to consider many possibilities for a given condition. Children are able to deal with propositions that explain concrete facts. They have the ability to use planning to think ahead.</p> <p>Ability to think abstractly. They can solve complex and hypothetical problems involving abstract operations.</p> <p>Formal operational thinkers can recognize and identify a problem. They can state several alternative hypotheses, execute procedures to collect information about the problems to be studied, and test the hypotheses</p>

TABLE 1 - Cognitive structure in the four stages of development.

include the task of copying a variety of drawings in order to assess the development of the child (Fig. 1) [Feldman, 2002].

The "Goodenough test", published in 1926, which consists in drawing the human figure, stands out for its great ease of application. Florence Goodenough based the test on the known fact that the evolution of the child's drawing recapitulates, the phases of the body pattern formation at distinct time frames [Rodrigues et al., 1992].

A body scheme defines the representation that each one has of its own body, an image fairly stable that allows situating the body in time and space in many different postures.

The body scheme, which is gradually formed over several phases, is completed around 3 years of age [Rodrigues et al., 1992].

The stages of children drawing are as follows:

- Scribbling stage (until 3 years old): the drawing consists of several scribbles to which the child attributes an anthropomorphic significance "it's daddy" or "it's mummy".
- Circle stage (until 4 years old): the human figure is represented by a circle which is more or less deformed in an oval fashion.
- Octopus stage (until 6 years old): drawing of a head with a mouth, nose, eyes, and ears from which arms and legs come straight out. It is not uncommon to see the representation of the belly button as a dot in between two traces that represent the legs.
- Girino stage (6 years): interposition of an ovoid form, below the head from which the extremities are drawn.
- Logical realist stage (school age): approximation to the human anatomy, to reality, with a rectangular neck and torso with emphasis to the correct placement of the arms on the shoulders. The implantation of the legs is also correct; secondary elements such as eyelashes, teeth, clothes and fingers.
- Sensorial realist stage (9-10 years): the children stop drawing what they think and begin to draw what they really see, first depicting a frontal view, later a profile view. Drawings are indicative of gender (or identify gender).

The result of the test encompasses the sum of the represented elements. A 4-year-old child includes five elements in a person's drawing: eyes, nose, mouth, hair and legs. A 5-year-old already includes arms in the

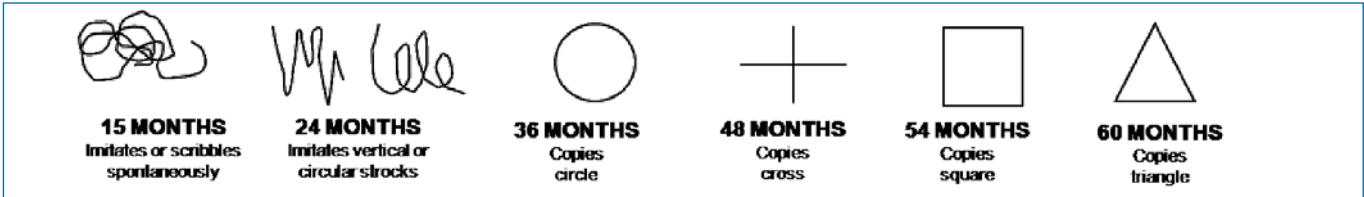


FIG. 1 - Tasks for assessing the motor development [Feldman, 2002].

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drawings (Fig. 2, 3). To calculate the equivalent age of the child based on its drawings, to a basic age of three years is added a quarter of a year for each drawn structure [Rodrigues et al., 1992; Feldman, 2002].

Materials and methods

Sample: 20 children aged between 21 months and 11 years old, of both sexes, patients of a private clinic were selected. The present study group consisted of patients treated for oral pathologies and children that accompanied their parents to the appointment.

Method: similar supplies were given to all children

and they were asked to make a drawing, whose theme was “beautiful teeth and ugly teeth”. The drawings were evaluated according to the classification of the cognitive development of Piaget. Each children of school age was also subjected to a question about aesthetics, which was answered in writing.

Results

According to the developmental stages of Piaget, the images of “beautiful teeth” and “ugly teeth” were obtained depending on the aesthetic perception of the child: sensorimotor period (0-2 years) (Fig. 4); pre-operative period (2 to 7 years) (Fig. 5, 6); concrete



FIG. 2 - Representative drawing of a person made by a 5-year-old child.



FIG. 3 - Representative drawing of the dental appointment, made by a 6-year-old child.



FIG. 4 - Drawings made by a 21-month-old child. They represent beautiful teeth (A), and ugly teeth (B).



FIG. 5 - Drawings made by a 3-year-old child. They represent beautiful teeth (A), and ugly teeth (B).

operations period (7 to 11 years) (Fig. 7, 8).

When asked "What is for you the aesthetics in dentistry?", the children replied in writing:

- "Tooth in good condition" (8 years);
- "It is the dentist" (9 years);
- "Clean teeth" (9 years);
- "The aesthetics is white, straight and beautiful teeth" (9 years);
- "It is to feel comfortable with ourselves" (10 years);
- "Clean mouths" (10 years);
- "For me the aesthetics in dentistry is having good and beautiful teeth" (11 years).

Period of formal operations (11-15 years): With the beginning of adolescence there is the possibility of achieving the maximum level of intellectual development, the capacity for abstract thought. This phase was not included in our study.

Discussion

During the sensorimotor period (0-2 years), the child learns through the senses - taste, touch, sight, hearing and handling. The frequent introduction of

objects in the mouth is a learning means. At this stage, the child has a reflective thought. Although the child in the sensorimotor period doesn't have a great manual dexterity, he/she is already capable of representing what he/she perceives as being beautiful and ugly (Fig. 4).

In the pre-operative period (2 to 7 years), intelligence is based on perception. Children in the pre-operative phase believe in what they see and hear. The child, in general, has the perception that beautiful teeth are shaped and white, and ugly teeth are those which are shapeless with cavities or bacteria, as represented in their drawings (Fig. 5). In this period, from school age, children were solicited to answer the question "What is for you the aesthetics in dentistry?", to which a child of 6 years of age answered by writing "white and very clean teeth." Thus we evaluated the concern with oral hygiene and the perception of colour - white teeth, which is also implicit in the drawings (Fig. 6).

In the concrete operations period (7 to 11 years) children have the ability to reverse the thinking and use fundamental logic. They start questioning



FIG. 6 - Drawings made by a 6-year-old child. They represent beautiful teeth (A), and ugly teeth (B).



FIG. 7 - Drawing made by a 9-year-old child. They represent beautiful teeth (A), and ugly teeth (B).



FIG. 8 - Drawing made by an 11-year-old child. They represent beautiful teeth (A), and ugly teeth (B).

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FIG. 9 - Drawings made by children of 9 and 6 years of age, respectively, offered as a gift to the paediatric clinician.

themselves whether their perceptions are true. Through the drawing the representation is logic, passing from the perception and drawing of isolated teeth, to the representation of both arches with closed teeth, similarly to an intraoral photo in maximum intercuspitation (Fig. 7, 8).

From the drawings it emerges a general concern with the colour and shape of the teeth, representing conical teeth as ugly teeth. Note that Figure 8 B is allusive to orthodontic problems, i.e., the perception of wrong dental position, such as the open bite represented in this figure.

With the beginning of adolescence there is the possibility of achieving the maximum level of intellectual development, the capacity for abstract thinking: this is the period of formal operations (11-15 years). As it is logical this phase did not enter our study.

For the paediatric clinician the drawings are also a work tool due to the psychological component of the appointment. This way we can assess the acceptance of medical appointments and dental treatments by observing what the child shows through the drawings. Often the drawing also serves as positive reinforcement for the paediatric clinician, for his/her commitment and dedication (Fig. 9).

Conclusions

Drawings are a useful source of information for assessing the aesthetic perception of the paediatric patient. The drawings may also be useful for evaluating the child's feeling as well as his/her fears and concerns regarding the dental appointments, allowing the paediatric dentist to adopt a more personalised approach with each child.

The knowledge of the aesthetic perception of the

children is important and relevant to the paediatric dentists in their daily practice, because children care about their appearance and that of the others.

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