Treat Faces: Child Affective Facial Expressions as an Indicator for Degree of Illness?

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Abstract

A good anamnesis and child affective facial expressions are important skills that allow pediatricians to share, adopt and interpret emotions and help to judge the degree of illness in the face of a child in an urgent pediatric diagnostic setting. Ekman described the emotional states of a child in 7 different types. This manuscript focuses on analyzing childhood facial expressions of a child in daily pediatric work to assess the degree of illness in a child. To treat faces is of upmost importance in daily pediatric emergency care. The face of the child and their emotions are very important in deciding as a pediatrician if a child is ill or not. Then, further parameters like fever state, paleness, agitation and other signs are important to make any decision towards degree of a child's illness. Are the child affective facial expressions are an indicator for the degree of illness?

Keywords: Facial expression; Anamnesis; paralinguistic.

Introduction

Emotions often cannot be hidden. For example, anger, annoyance or joy are reflected in facial features, even if the person speaking may want to suggest a different impression [1-4]. Even children older than one year learn to pretend [2,3,5]. By their third birthday at the latest, children are quite capable of convincingly pretending false facts. In addition to what is said, how this is done is equally important. It is well known from communication theory that, in addition to the linguistic message, the nonverbal "accompanying messages" play a significant role in determining how a message is understood by the recipient [6-9,4]. Nonverbal communication takes place on various channels, both via paralinguistic features such as volume, modulation or speaking rate of word utterances and via expressive movements in the face and body, or via gestures, postures and motor reactions such as walking back and forth [10,11,9,12]. It

is difficult, for example, to completely suppress an emotion in expressive behavior [13]. Although the choice of words may seem well controlled, the feeling shimmers through in many other ways, such as nervously sliding back and forth on a chair, fingering pens, earrings, or coffee cups, or, more covertly, the telltale rocking of a toe. Advice books often give tips on the supposed meaning of such nonverbal signs. Unfortunately, these interpretations are hardly backed by scientific evidence. How can nonverbal communication be researched in a scientifically sound manner? By first limiting oneself to one communication channel. This paper focuses on visually mediated nonverbal expressive behavior and there in particular on the expression of emotions in the face [2,3]. Second, it is necessary to have a system to adequately map expressive behavior - "words" to describe facial expressions, so to speak [1-32]. This is no easy task in view of the diverse and dynamic facial movements, which are controlled by different muscles, which can influence each other almost without limit, and which leave different marks on young and old faces [14-17,2,4]. Child affective facial expressions (CAFEs) are useful skills for children to get in contact with their surroundings, to express emotions and adapt emotions during social interaction [18,3,4]. These important skills are diminished in ill children. The development of these facial expressions in children are not yet clearly ruled out in detail [14,15]. This study aimed to analyze facial expressions of children in the condition of illness to help pediatricians to be aware of the degree and the extent of the problem the child arrives at the pediatric department. It is well known that the age, gender and emotion subtype (sadness, anger,

joy, neutral) of the child and their surrounding at house play an important role in the development of facial expression. To produce facial emotions, it is a complex developmental process based on different factors not clearly analyzed in detail yet [8,17]. Children with stronger face-reading skills may achieve more popularity at school and do have more friends [19]. They tend to develop later better in an academically setting at university or higher degree education. In addition, experiments hint that people who are better at identifying fearful expressions are kinder and more generous [1]. From early childhood through the whole lifespan, emotional skills are essential to do a communication to other people to dive [20]. Child affective facial expressions express emotions and social motivations and therefore very important in daily social relation. Especially in childhood diseases, child affective facial expressions can help to judge the degree of illness in an ambulatory setting of a pediatric diagnostic setting. Recognizing facial expressions has been updated over years in numerous studies and it has been emphasized that many different factors can influence the interpretation of child affective facial expressions [20]. In general, one has to divide facial expression production and FE recognition. Facial expression production can be measured by two methods in general: the Facial Action Coding System (FACS-Human), developed by Gilbert et al. and published in 2021 [13]. The second and the most commonly method used in the establishment of a dataset is the judgment approach, which is based on the fact that everyone can relate a CAFE to an emotion. This method consists of presenting CAFE to a sample of judges, and the accuracy

of the FE is inferred thanks to their rating. Other studies try to rate the quality of the emotion, and the way to do it is not consensual. The different types of nonverbal signs of the face and body form a continuum in terms of their ability to be influenced: thus, there are emblems, nonverbal actions that have a direct verbal counterpart, illustrators, which are directly related to speech, and regulators, which regulate the back and forth of exchanges between sender and receiver. These classes of nonverbal signs are certainly more or less learned. The link between them and emotional experience is regulated by convention and random. These types of signs are therefore likely to be quite easy to influence with the will. An intermediate position with respect to volitional control is likely to be occupied by conventionalized displays of emotion, such as feigning anger through threatening gestures, which may turn out to be more or less convincing. At the other end of this continuum are adaptors, i.e.,

fragments of previously learned adaptive actions, such as self-touch, as well as facial emotional expressions, which are often not conscious and which are modulated by means of presentation rules.

Anamnesis

The anamnesis is of upmost importance. The age of the child plays an important role. Furthermore, the presence of fever state is very important to evaluate the degree of disease in a child. Each child should get a temperature measurement first of all. Paleness, sweating, apathy, failure to thrive, restlessness, peripheral coldness and touch sensitivity can be signs of infection and disease. Moreover, what the parents tell about the child is of great importance. The eyes play an important role, they show degree of disease, sadness or fear are emotional features to describe the degree of physical involvement and possible disease.

Interpretation of cafe	Emotional states
Sadness	ill
Happiness	not ill
Surprise	+/-
Anger	ill
Disgust	+/-
Fear	+/-
Neutral	+/-

Table 1: Interpretation of cafe emotional states.

Discussion

A child's world is colorful and varied, full of exciting experiences and formative adventures [18,4]. The daily new impressions bring with them a wide range of emotions, which the child is usually unprepared to face [3,21,12,14]. In these moments, we are often

amazed to discover the intensity with which a child experiences emotions, and how difficult it is for us to empathize with this little being. This is by no means easy, but it is always worthwhile to take up this challenge, to find out how emotional development takes place

in early childhood, what skills and abilities our charges are supposed to learn, and how we can support them in this process. With this knowledge, we can help children become aware of their emotions and how to deal with them, thus laying the foundation for healthy emotional relationships [6,22,7,16,23]. Everyone thinks they know what an emotion is. However, if one tries to describe the concept, the right words are missing [17]. Although emotions are felt, they are more than feelings. Emotions are composed of what is actually felt, the occasion of the feeling, the evaluation of what is experienced, the physical reaction, and the expression of the emotion [15,22,8,23]. Thus, an emotion is a complex pattern of changes involving physical arousal, feelings, cognitive processes, and behaviors that occur in response to a situation that an individual has perceived as personally significant [23]. One emotion is joy. When we feel joy, we feel good (emotion), for example, because we have received a gift (occasion) that we like (evaluation of the experience). This then shows itself, for example, in a tingling sensation (physical reaction) and beaming smile (expression of emotion). Also, to be distinguished from emotion is mood. A mood is a longer-lasting state that does not have to follow a specific event but arises from a feeling or thought. The importance of emotions should not be underestimated. Emotions affect our lives by motivating our actions, controlling our expression of feelings, regulating interactions, and influencing our thinking. For this reason, it is important to monitor a child's emotional development from birth and to support the child in his or her developmental steps. In addition, it should not be forgotten that emotional development

is closely related to a child's cognitive, social, and language development, and therefore its influence on these should not be underestimated. The path that the child follows in the course of its emotional development begins even before birth. In the womb, a child learns (at best) what it means to feel secure and safe [19,1,24,11]. This feeling arises from the mother's behavior and emotions, which are reflected in her heartbeat and blood flow, among other things. In addition, the sounds that reach the unborn child's ear convey an impression of what is happening in its mother's life. These impressions create the basis for the child's emotional relationships with its mother and other caregivers [9,18,3]. The social bonds, in turn, affect how the child thinks, feels and acts, thus completing a recurring cycle. This shows how important positive experiences and emotions are long before birth, because they influence the child's entire development. Just as important as the mother's attitude towards her unborn child is how she deals with it after birth. The birth process is also associated with fear, which can only be regulated by a lot of attention and care. Only through this can the newborn baby find its emotional balance again [18,2]. In addition, security is the key to optimal support of the child's learning. The brain needs challenges in order to develop. However, experiences can only be seen as challenges - and not as threats -if the child is in a secure network of social and emotional relationships. This network offers him or her support and protection. Feeling safe also means building self-confidence and learning to trust in oneself [14-16,8,17]. Giving this to the child on its way requires caution and faith in the child. Unfortunately, some parents lack this as well

as empathy and a sense of responsibility, so that they are unable to build secure bonds with their children. They then lack the role models who should help them reflect on their own actions, recognize mistakes and learn from them. In conclusion, child face emotions are the former basis for intensive research in the field of pediatrics. Pediatricians use this tool in a subconscious manner to treat children and get first impression about the degree of illness when the child attends the ambulatory pediatric department.

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