# Teaching the Skill of Reading Facial Expressions to a Child with Autism Using Musical Activities: A Case Study

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**Abstract**

Reading facial expressions is one of the non-verbal communication skills and is considered as being essential for children with Autism Spectrum Disorder (ASD) in terms of having effective communication and social interaction with others. Information from relevant literature indicates that musical activities can be used for teaching skills to this population. Therefore, it can be used for teaching the skill of reading expressions. The aim of this study was to investigate the effect of musical activities on teaching the skill of reading facial expressions to a child with ASD using musical activities. The study was conducted with a 5- year-old boy diagnosed with ASD attending a Special Education and Rehabilitation Center in Turkey. One-to-one music sessions were carried out once a week for 3 months. Interventions focusing on the emotion sadness consisted of a variety of musical activities. A descriptive analysis was used for all videotaped sessions. After 12 sessions, he showed success in the targetted behaviors. These results suggest that the therapeutic use of musical activities can be considered as an acceptable treatment option for teaching non-verbal communication skills to children with ASD.

**Keywords:** music therapy, facial expression, autism spectrum disorder

## 1. Introduction

Autism spectrum disorder (ASD) is a complex developmental disorder that can cause problems with thinking, feeling, language and the ability to relate to others. It is a neurological disorder, which means it affects the functioning of the brain. The effects of autism and the severity of symptoms are different in each person (APA, 2016). Characteristics of ASD fall into three categories that include communication problems, difficulty in relating to people, things, and events and repetitive body movements or behavior. Individuals with autism are limited and insufficient when it comes to non-verbal actions, social interaction and the matter of communication, which are all integral when it comes to social interaction (MEB, 2006; Diken, 2008). Within these limitations difficulties such as recognising and understanding displays and expressions of emotion, being able to show empathy, limited in an attempt to show/understand non-verbal communication skills such as mimics and gestures, difficulties in making eye contact, and the understanding of the emotions, views and beliefs, or the motivations of others have importance for social integration (Smith, 2007).

A number of studies have taken place to establish the different methods used to direct the development of social skills of individuals with autism. This research shows that the inability of individuals with autism to effectively recognize and decipher the social clues/signs given to them through different channels could be the real reason as to their social adaptation problems (Özdemir, 2007). One theory that explains the starting point of the reasons for this insufficiency in social interaction and communication is the "mind theory insufficiency (Attwood, 2008). "Mind theory" is defined as being able to infer mental situations such as belief, desire, intention, dreams and emotion (Wellman ve Estes, 1986). It can also be expressed as the restricted/limited ability in being able to understand and then predict what is to come from the emotions of others, their thoughts, beliefs and desires and their difficulty in placing a meaning to this information (Baron-Cohen, 1995; Howlin, Boren-Cohen ve Hadwin, 1998). This situation is also called *mindblindness* or *social blindness*. Another approach that explains the problems in the areas of social interaction and verbal and non-verbal communication is the *neurological approach*. The neurological approach associates the interpersonal relationships and social functions with the brain structure and the skill of recognizing the human face. For individuals with autism, this association is concentrated on the subcortical and cortical areas of the brain, specifically in neural connections, fusiform gyrus,

and amygdala, where the skill of facial processing functions is processed. These areas of the brain realize the functions of determining faces and directing the visual attention on the facial area. Disorders in these functions reveal the inability of facial processing and this can cause problems in social interaction (Kadak, Demir & Doğangün, 2013).

At home, at school or at work, to be successful in different areas that life presents to us, social skills play a huge role (Scheuermann, 2002). The problems faced by people with autism, from the angle of being able to socialize, comes from their insufficiencies in the ability to socially communicate, interact and recognize emotions of others and how to respond to these emotions (Scheuermann, 2002). This creates an obstacle fort he basic need of the individuals with autism to integrate to the social life. Therefore, the development of these skills, considered among the basic insufficiencies of individuals with autism, is important to turn a mutual social interaction with others into a positive experience and to support their acceptance socially.

Facial processing and understanding facial expressions while giving meaning to these expressions are top of the list of non-verbal communication skills, which are one of the social skills. Reading facial expressions and recognizing emotions from these expressions not only comes from a basic genetic ability to read facial expressions but is also part of a general system of a natural learning process from birth. Additionally, we know that this ability in children is correlated to age and thereby it develops, as the child gets older. Nevertheless, unlike children who develop normally, a child with autism due to the neurological function disorder and the lack of mind theory has an important degree of difficulty in reading and processing facial expressions. The difficulties they face include; problems with making eye-contact, difficulty to perceive the pattern of eye, nose and mouth triangle, focusing only on the lower part of the face, not seeing the face as a whole, coding piece by piece and therefore having problems in perceiving the look of intent and purpose reflected on faces (Kadak, Demir & Dogangun, 2013). This situation affects the individual negatively in the area of social interaction and communication with other people.

There are a number of different methods and approaches to teaching social skills to individuals with autism. The *Evidence-based Practice* that includes scientifically proven education and treatment methods and approaches specifically used for children with autism are listed in the National Standart Report published by the National Autism Center (NAC) in 2009. Within the same report is also listed *Emerging Treatments* that are not yet accepted evidence-based due to lack of scientific results but considered as promising methods and approaches. "Music therapy" is found within this list.

According to the American Music Therapy Associations (2017) definition, music therapy is the clinical and evidence-based use of music interventions to accomplish individualized goals within a therapeutic relationship between client and therapist. There are numerous research within literature related to the helping of children with autism in gaining the skills of perceiving, differentiating and expressing emotions. Loth, Garrido, Ahmad, Watson, Duff, and Duchaine (2018) examined in their research whether expression recognition may serve as a diagnostic marker. The results indicated that the majority of people with ASD have severe expression recognition deficits. Owada, Kojima, Yassin, Kuroda, Kawakubo, Kuwabara, Kano and Yamasue (2018) examined whether a computerized analysis of quantitative facial expression measures could act as a marker for core ASD social symptoms. The findings indicated that their method for quantitatively measuring reduced facial expressivity during social interaction can be a promising marker for core ASD social symptoms. Sato, Sawada, Uono, Yoshimura, Kochiyama, Kubota, Sakihama and Toichi (2017) examined the detection of emotional facial expressions in children with autism and in typically developing children. The results suggested that the detection of happy facial expressions is impaired in individuals with autism. Elicin and Avcıoglu (2014), report the effectiveness of script fading procedures in helping children with autism to gain the ability in differentiation emotions. Kadak, Demir, and Dogangun (2013), in their research headed "Face and emotional facial expression recognition in autism", looked at the insufficiencies of individuals with autism from a neurological perspective. Girli and Sabırsız (2011) report the progression of ability in different general sets and the effectiveness of a teaching programme where teaching emotions to children diagnosed with autism are applied by using pictures is examined. Saymaz (2008), in his study headed "Understanding and expressing emotions", made a qualitative presentation of the meetings with a 13-year-old boy with autism. Atasoy and Uylaş (2005) aimed at teaching children how to recognize different emotions using a five-step application based on a short educational programme. This study focused on their ability in pairing emotions and differentiating and showing the emotion and expressing the emotion (Girli & Sabırsız, 2011).

Wit, Flack-Ytter and Hoftsen (2008), examined the ways that individuals with autism follow while perceiving faces with positive and negative emotional expressions. They concluded that individuals with autism, compared to those with normal development, focus on different points of the face as well as using different strategies when

perceiving positive and negative expressions. Balconi and Carrera (2007), spent time researching individuals with autism and those showing normal development and the period in which they form words and comprehend using clues from emotions showing facial expressions. They concluded that normal developing individuals and high functioning autistics, compared to low functioning autistics, show a clearer and closer understanding in the context of emotions. However, individuals with autism, compared to those that show normal development, are less successful when it comes to the understanding of primary emotions such as happiness and sadness.

Within relevant literature, it is possible to come across a couple of studies researching the relationship between music therapy and being able to perceive, differentiate and express emotions. Kim, Wigram, and Gold (2009), in their study that include 10 children with autism, examined the results of comparing the sessions of music therapy and sessions of playing with toys, with the variables of the time of the entertainment, emotional synchronization and initiating activity. According to the results, children with autism who were taking part in the music therapy sessions showed more of a positive reaction/response in direct correlation to these variables. Another study, Drrapeau, Gosselin, Gragnan, Peretz, and Lorrain (2009) examined coordination problems of patients with Alzheimer's disease when it comes to perceiving the emotions in voices and facial expressions. Similar to the neurological problems faced in autism, it was concluded that patients with Alzheimer's disease, although being able to successfully understand the emotion in a human voice or in a piece of music, faced problems in perceiving the emotion of a facial expression. Lastly, it was concluded that in the research of Quintin, Bhatara, Posisant, Fombonne and Levitin (2011), after comparing and measuring the normal developing and high functioning autistic teenagers' skill to perceive four emotions, (happy, sad, content and scared), in musical pieces, it showed that the results from the two groups worked in parallel.

*1.1 Purpose of the Study*

The purpose of this research is to present a case study of the period in which it takes a male child diagnosed with autism gain the ability to read facial expressions using multidisciplinary musical activities. In this case, the emotion "sadness" was chosen from amongst the emotional expressions and the facial expression related to this emotion.

*1.2 Research Questions*

Taking the above information into account, the research questions below have been searched:

1- Can the child with autism find the answers the question of "why/for what reason a person becomes sad" questions using musical activities

    a.   in a real-life situation? (Stage 1)

    b.   in a made-up story? (Stage 2)

2- Can the child with autism notice and show the characteristics of the facial expressions of sadness within musical activities

    a.   from a photo of a human? (Stage 3)

    b.   from an illustration? (Stage 4)

3- Can the child with autism express sadness within musical activities

    a.   drawing a sad face? (Stage 5)

    b.   mimicking a sad face? (Stage 6)

*1.3 Limitations*

This study is limited to (i) only one child with autism, (ii) the facial expression of sadness, (iii) the musical activities developed by the researcher that consists of 6 stages.

## 2. Method

*2.1 Research Design*

This research is designed as a case study. A case study is an in depth study where we examine the form of a situation or phenomena are with an appropriate method (qualitative, quantitative, mixed) (Zainal, 2007). The researcher of a case study observes the characteristics of a child, a class, a school or unit of society and analyses these units to meet generalizations regarding the universe where these units belong.

An example case study answers the questions of "how" and "why" more than the question "what". A "holistic case study design" was used in this research. A holistic case study design is used for testing, confirming or refuting a well-formulated theory (for this research music therapy); studies of special situations that do not

conform to general standards (in this study using music therapy to help a child with autism gain the ability to read the emotion of a facial expression). In addition to the notes taken by the researcher during sessions as a participant observer/music therapist, video recordings were made and then analyzed descriptively.

## 2.2 Participant

The research was undertaken with a 5-year-old boy diagnosed with autism. He was given the nickname of "Eray" and his personal details were kept concealed. Eray attends a special education and rehabilitation center and participates in both one to one special education sessions and activities within a group setting. Aside from the special education and rehabilitation center, he also attends a preschool in a part-time inclusion programme.

Eray's assessment was based on the Special Education & Evaluation report, interviews with his special education teacher and his mother. According to the report, Eray showed a high level of receptive language skills by distinguishing and showing objects when he was asked, following the directions given, and accomplishing basic directives asked for; however, he demonstrated a low level of expressive language skills by giving short and repetitive answers when he was asked. Within the same report, when the targeted achievements for Eray were reviewed, we can see that they coincide with some of the achievements the research planned to aim for such as (i) making evident that he is listening to the person that is speaking using mimics and gestures, (iii) directing his attention to the person that is speaking, (iii) designating an action or picture of an action; (iv) forming a meaningful dialogue during a face to face conversation, (v) imitating the 3-step-motor activity, (vi) imitating the facial expressions, (vii) imitating fine and gross motor activities, (viii) accomplishing 2, 3 or more steps instruction that addresses an action.

During the meeting with his mother to get detailed information about Eray, she emphasized that she personally observed Eray's difficulty in perceiving and expressing emotions. The mother shared an anecdote about a time when Eray saw her one day when she was very upset and crying. "*He sat on my lap and started to laugh at me while pointing out my tears and said that something is coming out of my eyes, all wet. He found this situation strange and in fact funny, and the laughing made me even more upset as a mother because of the fact that he could not even understand my emotional state.*" This information became fundamental for this research while deciding the emotional expression we were going to work on.

## 2.3 The process of Selecting Target Behaviour

The basic fundamental behavior chosen for Eray was to read the emotion of a facial expression. Because it is thought that it would support the cause-and-effect correlation, perceiving and expressing the emotion was also determined as a basic target. Eray's special education teacher declared that the listed targeted skills were also a part of social skills within his IEP. It was thought that, due to the principles of special education, it would be an appropriate strategy if the emotional expressions were given one by one. Based on the anecdote mentioned previously by the mother, it was decided to focus on the emotional state "sad" from amongst the fundamental emotions, which was also the preference of the mother as a starting point.

## 2.4 Settings

The environment in which the research process took place was a group room within the special education and rehabilitation center of which Eray attends. The room was a space of $12m^2$. The floor was a light colored laminate. The room had a window with an outside view; it was bright and had an observation mirror on the door. Already present in the room was a cupboard for office equipment, a U shaped table, a child's chair, a wheeled adult chair, and a small rug.

## 2.5 Materials

Equipment used for musical activities were as follows; (i) musical activities to teach the skill to read facial expressions which were developed by the researcher that consists of different activities within 6 stages (see *Table 1*), (ii) a sound system and an I-pod which was loaded with different types of educational music, (iii) a children's song composed by the researcher, called "I am sad", (iv) pencils and an A4 sized piece of paper for drawing a sad face, (v) hand mirror, (vi) emoji stickers showing sad facial expressions and a sticker chart, (vii) photos and illustrations of various facial expressions, (viii) a Winnie the Pooh storybook, (ix) toys that give out sound to create a cause-and-effect situation in real life,

Equipment used for data collection were as follows; (i) a video camera and a tripod were used to record the applications that took place with the participant in this research, (ii) notebooks/diaries of the participant observer's notes, (iii) video analysis reports and (iv) a semi-structured interview form to evaluate the social validity of the study.

In addition to these, potato chips were used as a reinforcement.

## 2.6 Data Collection

During the process of the data collection of this research participant observation, video analysis and semi-structured interview were used. The music therapy sessions consisted of 45 minutes sessions once a week over a period of 3 months and were recorded by the participant observer in the form of a period observation log. So as to not give an opportunity for data to be lost, during the data collection process all sessions were also recorded by video and these recordings later formed into a report and compared with the notes of the participant observer. After 12 sessions the researcher concluded that Eray had attended enough sessions and his reactions showed that of a level of satisfaction.

In its continuation, a semi-structured interview took place with the mother and data collected in relation to the applications social validity and recorded on a form.

## 2.7 Data Analysis

In order to prevent any data loss, the video analysis and the participant observer's observation log notes for the sessions were gathered and analyzed complimentarily. The data that was gathered using these two sources were dictated by the detail and using the research questions as a foundation, were categorized and separated into codes. They were then analyzed using descriptive analysis. Within the analysis, the details in relation to the period the music therapy were applied and Eray's reactions/responses during this period were categorized and reported. The semi-structured interview that took place with the mother was analyzed in a descriptive form and put into a report as social validity data.

## 3. Process and Findings

A group of musical activities was prepared by the researcher to reach the determined targets that were set. The application process included musical activities such as singing and listening along to songs, movement and dance, musical storytelling and coloring and drawing. In addition, Eray was reinforced systematically with a small piece of potato chip for each appropriate response. As you can see in Table 1, the musical activities consisted of 6 stages with various types of activities.

Table 1. The stages, contents, phases, materials, prompting procedure and process of the musical activity programme

| Stage | Content | Phase | Material | Prompting | Process |
|---|---|---|---|---|---|
| 1 | Real life situation (Cause-and-effect) | First 4 weeks | Car | Physical | Eray was asked how he felt about his broken toy and the "I am sad, because…" song was sung in relation to the situations Eray finds himself in during the session. After a conversation was had in regards to why he became sad. |
| | | Second 4 weeks | Ferris wheel | Modeling | |
| | | Final 4 weeks | Monkey | Verbal | |
| 2 | Made-up Story (Cause-and-effect) | First 4 weeks | Winnie the Pooh Storybook | Physical | "Winnie the Pooh" storybook was read in a musical fashion and the "I am sad" song was sung in relation to the situations the character Winnie finds himself in during the tale. After a conversation was had in regards to why he became sad. |
| | | Second 4 weeks | | Modeling | |
| | | Final 4 weeks | | Verbal | |
| 3 | Photos | First 4 weeks | Sad | Physical | The "I am sad" song was sung while pointing at photos of sad faces that were placed in front of him. |
| | | Second 4 weeks | Sad and happy | Modeling | |
| | | Final 4 weeks | Sad, happy and angry | Verbal | |
| 4 | Illustrations | First 4 weeks | Sad | Physical | The "I am sad" song was sung while pointing at illustrations of sad faces that were placed in front of him. |
| | | Second 4 weeks | Sad and happy | Modeling | |
| | | Final 4 weeks | Sad, happy and angry | Verbal | |
| 5 | Drawing | First 4 weeks | An A4 sized piece of paper with an empty face shape and pencil | Physical | During this stage, after listening to the "I am sad" song Eray is asked to draw a sad facial expression on a drawing of a blank face. During each drawing, an example is given of different situations in which we become sad. |
| | | Second 4 weeks | | Modeling | |
| | | Final 4 weeks | | Verbal | |
| 6 | Mimicking | First 4 weeks | Mirror, emoji stickers, and a sticker chart | Modeling and Physical, then Verbal | While dancing to music the music suddenly stops, Eray is asked to put a sad facial expression on to his own while looking into the hand mirror found on the floor. Following this, he is told to stick one of his sad face emoji stickers on to the chart. |
| | | Second 4 weeks | | | |
| | | Final 4 weeks | | | |

In general, we can observe that Eray presents a profile as being a willing participant from the start to the end of the study. Eray did not feel the need from the start for a period to obtain any compatibility towards the work routine. He showed success in the areas of dancing appropriately to rhythm and in imitating/copying the music therapist during dance and movement related work. Playing rhythm sticks and tambourines especially became an activity, which made him very happy. He learned the session routine and activity order in a short amount of time and no difficulties were faced in doing the activities one after the other.

### 3.1 Findings Related to the 1st Research Question

The findings related to the 1st research question encompasses stages 1 and 2 of the conducted musical activity programme. Establishing an awareness for a cause-and-effect correlation was the main working area.

Findings Related to Stage 1

Within the first 4 weeks of the study, Eray was able to listen to the song lyrics and to make gestures and mimics according to these song lyrics with full and partial physical prompting. During the second 4 weeks, it was observed that Eray began to hum the song. When the desired behavior presented in this study with promptings was realized, a different mode and prompting were introduced. During the final 4 weeks, it was observed that with the aid of verbal promptings, Eray was able to make fitting gestures and mimics to the song lyrics. In addition, it was observed that, beyond being able to just hum the song lyrics, during this stage, Eray was able to sing them in a comprehensible manner.

Findings Related to Stage 2

During stage 2, it was observed that Eray succeeded in being able to establish a cause-and-effect correlation in relation to a situation in a story (Winnie the Pooh) being read to him. Eray showed that he was able to point out when asked a sad facial expression from a storybook character that was shown to him. He was able to do this successfully.

### 3.2 Findings Related to the 2nd Research Question

The findings related to the 2nd research question encompasses stages 3 and 4 of the conducted musical activity programme. Noticing and showing the characteristics of the facial expressions of sadness within musical activities was the main working area.

Findings Related to Stage 3

While being accompanied by the song "I am sad", it was wanted of Eray to look at the photo and show the photo of a sad face. Within the first 4 weeks, Eray was able to follow the directives with the aid of physical prompting. During the period of the second 4 weeks, it was observed that Eray began to hum the song and modeling was used to prompt him. He was able to differentiate and point out the sad facial expression between photos of sad and happy facial expressions. By adding a 3rd photo (sad, happy and now angry) for him to be able to differentiate facial expressions with verbal prompting while singing. In addition, it was observed that beyond being able to just hum the song's lyrics, during this stage Eray was able to sing them in a comprehensible manner.

Findings Related to Stage 4

While being accompanied by the song "I am sad", it was wanted of Eray to look at the card and show the illustration of a sad face. Just like during stage 3, within the first 4 weeks, Eray was able to follow the directives with the aid of physical prompting. During the period of the second 4 weeks, it was observed that Eray was able to differentiate and point out the sad facial expression between illustrations of sad and happy facial expressions and modeling was used to prompt him in this phase. By adding a 3rd illustration (sad, happy and now angry) for him to be able to differentiate illustrated facial expressions with verbal prompting while singing the song.

### 3.3 Findings Related to the 3rd Research Question

The findings related to the 3rd research question encompasses stages 5 and 6 of the conducted musical activity programme. Expressing sadness within musical activities were the main working area.

Findings Related to Stage 5

During stage 5, Eray was able to fill in 8 empty face shaped drawings on an A4 sized piece of paper with a sad facial expression by using two eyes and a downwards pointing mouth. Prompting procedure was followed as it was planned. It was reported that during the continuation period of this stage, Eray started to draw "tear drops from eyes" in addition to "two eyes and a mouth" without any directive or prompting. With the result of Eray

being able to this on his own, to create a connection with the photos and illustrations being used in stage 3 and 4, teardrops were drawn on the photos and illustrations with him.

Findings Related to Stage 6

The ability to express emotions using mimics is fundamentally found to be spread across all the stages of this process however stage 6 specifically targets this ability. During this stage, Eray was shown sad gestures and mimics by being modeled in front of him and just after helped him to make the same gestures and mimics with physical prompting. IN a short while only verbal promptings were presented and asked of him to do it for himself. It was noted that Eray found it difficult to concentrate while looking at his face in the mirror. Eventually, he was able to use the sad mimics and gestures to show when he is sad.

*3.4 Findings of Social Validity*

Social validity is a term coined by behavior analysts to refer to the social importance and acceptability of treatment goals, procedures, and outcomes (Foster & Mash, 1999). Social validity data of this study was obtained from the semi-structured interview with the mother.

Eray's mother is a 29-year-old university graduate. She lives with her husband and does not have any other children. She does not work so as to pay full attention to Eray. During the research the researcher only interacted with the mother, she was not able to meet with the father. Eray's mother expressed that she was extremely happy that her son was going to be a part of a music related study.

She expressed that she thought the musical activities being used within this study were suitable for natural interaction and that from now on she would prefer similar methods and activities to be used for the continuation of his perceiving and ability teachings/education that will follow. The mother expressed that the outcome of Eray learning the "sad" facial expression is that besides using them in the musical activities, he also showed them during daily life and since participating in this study that Eray started to be able to express his emotions, that he could understand what people within his environment were feeling from their facial expressions, and able to react to them. The mother said that *"the ability of Eray to be able to express his emotions to me has made it easier for me to understand him. Our communication has developed."* From this comment, we can regard this as a sign that the social validity of the study has increased. Lastly, the mother commented that she was impressed by the musical activities. "*To be able to be entertained and to learn must be a lot of fun. I am sure that Eray feels the same, he still sings the "I am sad" song. Furthermore, his learning this emotional expression has increased his sensitivity towards other emotions",* she revealed her opinion and continued "*there are activities within the study such as music, dance, drawing, storytelling in that a child will enjoy, I can not find any point in which to criticise."*

## 4. Discussion and Conclusion

The purpose of this study was to teach the skill of reading facial expressions to a child with autism using musical activities. At the end of the study,

- Eray was able to establish the cause-and-effect correlation when faced with a real-life situation of his own, related to being sad.

- Eray was able to establish the cause-and-effect correlation in relation to a situation to which the character of a story he was being told was sad.

- When being presented with photos of faces belonging to real people, that had among them a "sad" facial expression, he was able to perceive this facial expression and distinguish it from amongst the other shown facial expressions of emotions.

- He could perceive the "sad" facial expression from amongst the cards of illustrated faces that were presented to him, he could distinguish it from amongst the facial expressions showing other emotions.

- Eray succeeded in drawing a "sad" face using 2 eyes, a mouth and teardrops on a blank face shape.

- It was reported that Eray could; express the sound made during a "sad" emotion situation, make a gesture of rubbing his eyes like he was crying and make mimics showing that he is sad.

During the process of the study, in places that were needed, the prompting procedure was withdrawn gradually (most-to-least) and Eray became more independent in his responses. In addition to the prompting procedure, Eray was given a food reinforcement (a small piece of potato chips), when he gave the correct response and showed active participation. It was concluded that this systematic approach affected the musical activities and its effectiveness in a positive manner.

From the result of the semi-structured interview that was conducted with Eray's mother, it was concluded that the study was valid from a social aspect, and reported that the skills gained by Eray during the study were generalized with other emotional situations at home and with other people in his life.

The results cannot be generalized because of the limitations of the study. Therefore, it is recommended to plan further research (i) for other emotional facial expressions (ii) with different target groups (iii) within a single subject design for more generalizable results.

As supported by the research mentioned in the introduction of the study, the development of the skills of the autistic individuals in perceiving emotions and facial reading will make them more positive in social interaction and communication. At this point, it is suggested to plan alternative future applications on this subject.

Because of their neurological and biological differences, it is not easy for individuals with autism to empathize with others and feel their emotions at first. Whereas social acceptance and teaching them how to make empathy theoretically to establish effective communication with others may give them acceptance in social life.

Since music and affectivity are two related phenomena, the use of music and musical activities can be utilized in the studies which focus on the terms and the concepts of the perception of the emotions, recognition of the emotions, feeling the emotions, naming the emotions.

It is important to design scientifically stronger and multi-faceted research to generalize the results of this case study.

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