

# Review of Researches on Autistic Children's Emotion Recognition Ability

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**Abstract:** The most prominent feature of autistic children is the deficiency of social cognition, of which emotion recognition is the weakest link in social cognition. On the basis of combing the literature on emotional recognition of autistic children at home and abroad, it is found that the research on emotional recognition of autistic children mainly focuses on facial expressions, verbal information and other emotional clues of autistic children. At the same time, it is also found that there are some problems in this field, such as relatively insufficient developmental research, weak consistency of research results and difficulty in implementing empirical research. Therefore, it is the trend of future research to further improve the research on the development of emotion recognition and to construct standardized intervention programs based on emotion recognition.

**Keywords:** Eye Movement; Index of Eye; Movement Process in Developmental Dyslexia; Eye Movement Model

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## 1. Introduction

Autism spectrum disorder (AutismSpectrumDisorders, ASD), short for autism, is a neurodevelopmental disorder that occurs in infancy and is closely related to abnormalities in neurochemical mechanisms of the brain[1]. Kanner(1943) was first reported and described in “Autistic disorder of emotional communication” and its main characteristics. At present, autism is generally believed to be a highly heterogeneous developmental state<sup>[2]</sup>, which is a group of behavioral syndromes characterized by social disorder, speech developmental disorder and stereotyped repetitive behavior patterns[3]. The U.S. Centers for Disease Control and Prevention (CDC) has released the latest report on the prevalence of autism in 2018. The report points out that the prevalence of autism has increased from 2014 in 1/68 to the current 1/59 and shows an increasing trend. This has gradually attracted the attention and attention of the society. Recent neuroscience research shows that most autistic children lack theory of mind (Theory FMIND, TOM )<sup>[5]</sup>, that is, it is difficult to infer the psychological state of oneself or others, and cannot integrate and process and interpret social communication and emotional information, thus affecting their communication and social communication ability. Bons points out that the core problem of autistic patients is the impairment of social function, among which social disorder represented by difficulty in explaining and predicting others' emotions is the main manifestation of autistic patients<sup>[4]</sup>.

Emotion recognition is not only an important psychological ability and social skills, but also a necessary prerequisite for individuals to participate in social communication and communication<sup>[6]</sup>, which plays an important role in social communication. For ordinary children, emotion recognition is a social skill developed at an early stage. 4 Infants at the age of 1 month can recognize joy in familiar environment, Sadness, Basic expressions of fear and surprise<sup>[7]</sup>; 7 Infants at the age of 1 month can make habitual and directional responses to familiar or unfamiliar emotional faces<sup>[8]</sup>; 12 Age of 1 month Babies can use nonverbal communication to express basic requirements and social interaction with others<sup>[9]</sup>. From the perspective of developmental psychology, with the growth of individual age, the accumulation of experience and the improvement of thinking quality, the ability of emotion recognition has been continuously improved, while autistic children have qualitative defects in this respect. Research shows that autistic children lack sensitivity to emotion recognition<sup>[10]</sup> and have defects in recognizing facial expressions of others [11-12]. However, at present, the explanation for the emotional recognition defects of autistic patients only stays in the three aspects of facial expression, speech

information and other emotional clues.

This research mainly carries on the document retrieval through the keyword retrieval method. It is specifically divided into the following steps: first, single keyword search and combination search. By “Autism Spectrum Disorder” “Emotion Recognition” “Facial Recognition of Autistic Children” “High-Functioning Adolescents With Asd” “fMRI Study on Autism” is the key word, and the condition is limited to the documents published in 2010-2018. The documents 102 are searched in EBSCO, Web Of Science and other databases. Secondly, 61 articles were obtained by browsing the titles of the articles, deleting the articles and repetitive articles whose research objects and contents are irrelevant to emotion recognition. Thirdly, the abstract of 61 articles is carefully read and screened, and the articles that conform to the research theme, published in authoritative journals are selected. Finally, a total of 45 articles are included in the research. Relevant documents retrieved at home and abroad are classified according to the research contents, which are mainly divided into facial expressions, verbal information, other emotional clues, emotion recognition and other three categories. Judging from the amount of literature, the total amount of research is not large, and there are great differences among the research results.

## **2. Research Status of Emotion Recognition Ability**

Many studies believe that autistic children are dealing with and explaining social situations.

Xu et al. and other aspects of defects, resulting in its expression of their emotions and identify other people's emotions are significantly behind ordinary children [13]. For autistic children, emotion recognition is not only challenging, but also an important factor in predicting their social adaptation. Because understanding the emotion and mental state of others depends on facial expressions, body language, and the integration of emotional cues from various channels in situations [14], paying attention to the identification of emotional cues of autistic children is the key to reveal their emotional development.

### **2.1 Facial Expression Recognition**

At present, researches on emotion recognition of autistic children mostly focus on facial expression recognition [15-16]. Existing related researches mainly focus on behavioral research of expression recognition, Visual scanning characteristics research and neurophysiological mechanism research.

#### **2.1.1 Behavior Research**

Behavioral research mainly studies the expression recognition ability and characteristics of autistic patients by setting various expression recognition tasks. Langdell was the first to point out that autistic children and ordinary people show different behavioral characteristics in facial expression recognition. After that, autistic children's facial expression recognition has attracted the attention of many scholars [17]. Thomas found that autistic children pay more attention to the lower part of the face when looking at the face, that is, recognize facial emotion through the information in the lower part of the face [18]. Humphreys and others also believe that autistic children have extremely significant difficulties in recognizing fear expressions [19]. Relevant analysis shows that autistic children who frequently avoid angry faces have more serious social difficulties, which may become one of the indicators for evaluating the severity of symptoms of autistic children. In the research of mixed expression paradigm, it is found that when happy, sadness and other two expressions are mixed, autistic children are more inclined to limit expression recognition to mouth information [20], that is, they have the characteristics of local processing in expression recognition. In a study that explored the effect of input on laughter through facial feedback sensitivity testing techniques, it was found that autistic children were less affected by experimental conditions, while further studies showed that there was a significant correlation between the limited range of influence and facial feedback sensitivity [21]. In another point test on happy, emotional face recognition such as sadness and anger, autistic children showed attention bias towards angry faces, while no difference between happy or sad faces was found among groups [22]. It can be seen that when faced with complex information such as social input and facial feedback in the real environment, different treatment methods of autistic children are the main causes of facial expression recognition disorder.

The research results on emotion recognition ability between autistic children and ordinary children are not

completely consistent, and there are some opposite conclusions. For example, Yongning Song and others used Bubbles paradigm research and found that autistic children and ordinary children have basically the same or similar results in recognizing happy and sad expressions [23]. In another point test task, they also found no emotional face attention bias in autistic children [24-25]. Karami-nis also believes that there is no significant difference in emotional recognition between autistic children and ordinary children[26]. It's just that people seriously underestimate the emotional recognition ability of autistic children. However, studies by Rhodes and others have found that compared with ordinary adults, adult Asperger's syndrome patients have significant anger dominance effect when recognizing facial expressions with moderate and high intensity[27]. The difference of research results may be related to the shortage of research quantity, The individual differences of research objects and the different research methods adopted.

## 2. 1. 2 Research on Visual Scanning Features

In order to explore the mechanism of facial expression processing in autistic children, some researchers have used infrared eye tracking technology to study the visual scanning characteristics of facial expression in autistic children. Mosaic paradigm study found that autistic children's facial perception speed is significantly lower than that of ordinary children[28], while the study of masking paradigm further shows that the frequency of gaze points, gaze time and other facial expression recognition parameters of autistic children are significantly reduced[29]. under the condition of mouth masking. Obviously, autistic children's attention to face is related to the severity of their symptoms, and there may be other alexithymia subtypes. Lan Jijun et al. used eye movement technology to explore 3-6 factors affecting facial expression recognition of autistic children. By observing the fixation of unfamiliar facial expressions and familiar facial expression pictures in high-level and low-level speech groups, it was found that speech ability had little effect on facial expression recognition of autistic children, autistic children had better recognition ability to familiar faces, and showed overall attention bias to positive and negative expressions[30]. Lin Yunqiang also found that the average child's total fixation time on happy expression and angry expression was significantly higher than that of autistic children, and the fixation time on happy expression was significantly longer than that on angry expression for both types of children[31]. Perhaps angry expressions make autistic children have obvious perception of threat, which results in more avoidance and less fixation time. Among them, high-function autistic children have shorter fixed duration of angry faces than other facial expressions. In the assessment of visual search ability flicker tasks for autistic children and ordinary children, positive emotion and negative emotion pictures slowed down their reaction speed compared with neutral pictures. But when searching is particularly difficult and requires a strong continuous search strategy, autistic children have better visual search ability, with only slightly lower accuracy than ordinary children. Further research through classical fixed time method and network analysis based on transformation matrix, found that the fixed time in the right eye region of autistic children increased, and the fixed time in the left eye of ordinary children was more[32]. In addition, compared with ordinary children, autistic children's attention to emotional faces is generally focused on the mouth region[33-34].

Some researchers hold the opposite view on the length of fixation in the facial core region. For example, Sawyer and others have found that there is no difference in the fixation time between autistic children and children with Asperger's syndrome in the eye region and mouth region through the study of emotional recognition and scanning characteristics of autistic children[35]. Another study believes that although autistic children focus on the mouth area, their eye scanning pattern is no different from that of ordinary children when watching facial images[36]. Obviously, different facial scans cannot fully explain the difficulty of emotion recognition. Through ERP research, it is further found that emotional recognition defects of autistic children may start from irregular visual perception process. Compared with nerve specificity, autistic children are more prominent in local processing in visual space tasks such as embedded digital tasks and visual search tasks, and are more willing to use bottom-up attention strategy[37-38], and this tendency is related to their language acceptance ability and the severity of autism [39]. The study of eye tracking mode found that preschool autistic children pay more attention to the image area and neglect the social information of the image, which is mainly due to the adverse effect of bottom-up attention strategy on their language and social development.

## 2. 1. 3 Neurophysiological Mechanism Research

Emotion recognition involves fusiform gyrus, superior temporal lobe, amygdala, frontal lobe and other brain

regions, and their activities are under-activated or abnormal. Munson and others believe that attention specificity caused by amygdala abnormality is the reason why autistic children cannot pay attention to and recognize facial expressions according to conventional ways in real social interaction, and amygdala region has certain predictive effect on emotional understanding and social adaptation of autistic children in later stage[40]. When using fMRI and studying emotional pictures of autistic children, it was found that the difficulty was related to the decline of prefrontal cortex [41]. Alaerts found that autistic adults' performance in recognizing emotional state from point light source display was significantly lower than that of normal adults, and the neural functional connection of the right posterior superior temporal sulcus in their brain regions was significantly reduced[42]. fMRI Research has found that when autistic children recognize facial expressions, the activated brain regions are significantly different from those of ordinary children. The main manifestation is that the activation level of fusiform gyrus's facial region is lower, while the activation level of the infratemporal brain region is higher. The former region is directly related to emotional cognition, while the activation of the latter region is mainly related to object cognition, which indicates that the shortening of the time for autistic children to gaze at the eye region of faces is related to the abnormal development of fusiform gyrus and amygdala, making it difficult for them to accurately process unfamiliar faces.

However, event-related potentials and MEG studies have proved that when recognizing angry facial expressions, autistic children's right insular task dependence  $\beta$  connection strength, clustering and feature vector centrality (all  $p < 0.001$ ) Significantly Decreased[43]. Bal thinks that the difficulty in emotion recognition of autistic children is caused by the atypical features of sympathetic nervous system, that is, when watching expression pictures, their pupils dilate, heart rate acceleration, a series of physiological signals such as the increase of skin electrical level and respiratory frequency have changed[44]. In-depth study found that autistic children have excessive brain local association, insufficient long-distance association is the cause of the disorder in coordination of expression recognition tasks[45]. This also makes autistic children more sensitive to the danger signals conveyed by direct contact eyes than avoidance of fear eyes. However, studies using fMRI and concurrent skin conductance response (SCR) have also found that autistic children are more sensitive to the upcoming aversion stimulus[46].

Due to different research perspectives and heterogeneity of autistic children, some research results of facial expression recognition are different or even contradictory, which also shows the complexity of the etiology of autistic children. With the development of research methods and the wide application of new technologies, the research on facial expression recognition for autistic children is getting deeper and deeper. Especially eye tracking technology, ERP, fMRI and others are widely used in autism research, showing a trend to study facial expression recognition of autistic children from the perspective of neurophysiology, which will definitely help reveal the intrinsic mechanism of facial expression recognition of autistic children.

## **2.2 Speech Information Recognition**

Like facial expressions, verbal information provides rich and subtle information for people to recognize other people's emotions. Speech, on the one hand, can semantically convey relevant information about individual emotional states and background events, and on the other hand, the intonation of speech itself carries individual emotional clues. Because of the complexity of emotional cues in speech, psychologists have studied emotional cues recognition in speech from semantic and intonation aspects.

### **2.2.1 Semantic Information**

Research on pure emotional semantic recognition in speech of autistic children has achieved some results, but there are inconsistencies among the results. Some studies believe that autistic children have no obvious difference in the meaning recognition of neutral adjectives in the noun, compared with ordinary children of similar physiological age, but their understanding of emotional adjectives is obviously behind that of ordinary children, and it is difficult to extract the complex psychological state of others according to the situation information in the dialogue[47]. However, some researchers believe that autistic children do not have obvious defects in using semantic lexical cues. For example, Rosen found that autistic children's ability to recognize emotional semantic words is equivalent to that of normal children with age matching. Even when semantic clues are added to other emotional clues, the correct rate of emotional recognition

is improved to be close to that of normal children[48]. Even if children with autistic tendencies undergo equivalent stimulus training, It can also make good use of the contextual clues given in the verbal information to identify five emotions such as happiness, pleasure, sadness, anger, fear ,and has achieved good generalization effect.

The research results on the influence of semantic cues on the recognition of other emotional cues are also inconsistent. Grossman and others pointed out that when semantic clues do not match facial expressions, the error rate of autistic children's judgment on facial expressions is obviously increased, and there is obvious difference compared with ordinary children[49]. Some studies have also pointed out that high-functioning autistic children pay more attention to the semantic components of speech information than the information conveyed by intonation[50]. Relevant researches on brain function also confirm that autistic children activate more fusiform gyrus on emotional words than ordinary children, and their activation on expression recognition is not as good as ordinary children, which shows that autistic children do pay more attention to the processing of emotional words. The reason is that autistic children suffer from memory impairment of retrieval semantic features. When faced with novel standard tasks, they need more emotional and sensory information to promote situational memory retrieval[51]. But there are also some researches that lonely children cannot effectively use semantic information to accurately judge the emotional state of others. If we study autistic children's facial expression recognition using the paradigm of combining pictures with a single audio track, we find that it is difficult for them to extract emotional events in speech, thus affecting their emotional recognition in real social situations[52]. Based on the above findings, the influence of semantic information cues on emotional recognition of autistic children needs further verification.

#### 2. 2. 2 Intonation Information

Some studies have found that autistic children are not sensitive to speech, especially to emotional intonation recognition, i.e. there is an obvious gap with ordinary children in the recognition and use of intonation information, and it seriously affects their social interaction. Although some adult patients with Asperger's syndrome can recognize emotional information in intonation, the correct rate of re-recognition under medium and high intensity emotional intonation information is lower than that of the control group, and the reaction time is longer[53]. It can be seen that adult Asperger's syndrome patients are worse in facial expression recognition and intonation emotion recognition.

At the same time, some researches believe that autistic children do not have defects in recognizing some intonation clues. If meaningless sentences are used as carriers, it is found that high-function autistic children are happy to recognize, angry sad neutral mood and other intonation abilities are similar to those of ordinary children [54] ,which can accurately recognize the emotion in music[55] just like them. Autistic adults and ordinary adults have no difference in recognizing sad intonation[56].

Although there have been some researches on emotional semantics and intonation recognition of autistic children, researches in various fields have not yet reached a relatively consistent conclusion, and the comparability of research results is relatively small. Therefore, further research is needed to clarify the role of semantic and intonation information in emotional recognition of autistic children.

### **2. 3 Recognition of Other Emotional Clues**

In addition to the above-mentioned facial expression cues, semantic cues and intonation cues, there are also some studies that focus on the identification of other emotional cues such as physical action cues, situational cues by autistic patients.

In the research of limb clue recognition, it is found that autistic children have defects in their ability to infer others' emotions based on physical actions. If autistic children observe social situations with scattered eye movements and pay more attention to the background in the situation, ignoring the body posture and key movements of the characters[57], their ability to recognize body movements of happiness and fear is obviously lower than that of ordinary children[58]. But there are also studies that suggest that autistic children do not lag behind in emotional recognition of body posture, but differ from ordinary children in the recognition of individual emotions. For example, children with Asperger's syndrome can recognize that body movements represent certain emotions, but they cannot be correctly classified[59].

When studying emotional cues in situations, it is found that autistic children can use cues in external situations to

infer the emotional state of others under the cues of structural problems. The study found that concerts affect the emotional recognition of autistic children, especially the recognition of sad expressions is more susceptible to music situations consistent with emotions, but it only takes a long time to recognize[60]. Due to the limitations of daily living conditions, autistic children cannot immediately and actively use these clues, thus showing a decline in emotional recognition. But even if they can understand the positive and negative emotions of others, they can hardly understand the cognitive emotions based on false beliefs[61], which further shows the difficulty of autistic children in social interaction. It can be seen that autistic children still have obvious defects in their ability to choose emotions according to situations.

It is difficult to make an accurate judgment on the emotions of others according to the clues provided by the situation. In addition to the above emotional cue recognition, other studies have found that autistic children will partially rely on wishes, emotional cues such as beliefs[62].

Thus, the research on emotional recognition of autistic children has not yet reached a completely consistent conclusion. The difference of research results is closely related to the difference of experimental materials, experimental design. In addition, the type of disorder and age range of autistic children may be the main causes of population heterogeneity, and the different matching criteria used when comparing with ordinary children may also affect the research conclusion. The discussion on this issue still needs the support of subsequent research.

### **3 Existing Problems in Relevant Research at Present**

Although scholars have done a lot of research on emotion recognition from multiple perspectives at this stage, and have achieved valuable research results. But so far, there are still some difficulties and deficiencies in the research on emotional recognition of autistic children. Breakthrough and solution of these difficulties are expected to provide ideas and suggestions for research and educational intervention on emotional recognition of autistic children.

#### **3.1 Lack of Developmental Research**

Whether it is behavioral research or physiological research, looking at the experimental design and research conclusions, there is a big problem, that is, the lack of developmental research. At present, most researches are mainly focused on the cross-sectional study of emotional recognition of autistic children, and lack of longitudinal tracking research, which makes it impossible to know the change track of emotional recognition characteristics of autistic children as they grow older, and whether the recognition of the same facial expression shows different development trends and other related issues. Therefore, it is still necessary for developmental research of autistic patients at all ages. For example, Martino et al. found based on task-based and resting fMRI research, there is still a lack of empirical fMRI research on task-based of autistic patients at each stage of development [63]. The new sharing plan[64] based on brain imaging data of autistic patients aged 6 to 60 can promote research in this field, which will help to discover abnormal features of brain structure of autistic patients. Despite this, there are still few reports of brain structural abnormalities and dysfunction in autistic children.

#### **3.2 Heterogeneity of Selected Subjects and Experimental Materials**

First of all, autistic children are a group with huge heterogeneity in reality. The current autism diagnosis technology is difficult to accurately diagnose the prevalence of autistic children. Different autistic children also show great differences in their typical symptoms. This difference is difficult for researchers to overcome in research practice. Secondly, some researchers did not select standard expression pictures with good reliability and validity after strict sampling. As experimental materials, but chose self-made experimental materials. However, it is often difficult to grasp the standardization, reliability and validity of self-made experimental materials, which to some extent affects the authenticity and scientificity of experimental results and brings great confusion to the research in this field. Thirdly, the researchers' selection of basic or complex facial expression images will also affect the experimental results. Four basic facial expressions such as Happiness, Anger, Sadness, Fear are easier to identify, while complex facial expressions such as, Shame caused by beliefs and wishes are more difficult to identify and will inevitably interfere with the experimental results. Finally, the facial expressions in the experimental materials are difficult to truly induce the emotions of the subjects,

thus affecting the scientificity and accuracy of the experimental results. It is because of various factors that the external validity of the research is low, which reduces the reference between different research results and leads to great controversy on the facial expression recognition ability of autistic children. For example, some researches on expression recognition indicate that autistic children have no difficulty in simple emotion recognition, but have difficulty in complex emotion recognition. At the same time, some researches also show that autistic children have no difference with ordinary children in scanning mode, and they pay the same attention to the eye area and mouth area of expression. Other studies believe that autistic children have difficulty in recognizing happy expressions, and their visual scanning mode only focuses on the mouth region of expressions.

### **3.3 Operational Difficulties in Empirical Research**

From the research content, previous studies were mainly limited to the influencing factors of autistic children's emotional understanding, and stayed at the description stage of the phenomenon. Few studies explored the internal mechanism of emotional recognition. The influence of development mode on other psychological characteristics and embodied emotional understanding of autistic children. Most studies have selected high-functioning autistic children as subjects, and due to the influence of experimental difficulty and differences between subjects, the number of subjects meeting the experimental requirements is relatively small. At the same time, the universality of the research results has been questioned due to the high wastage rate of subjects in the longitudinal follow-up study. Of course, the social difficulties of low-functioning autistic children with intellectual disabilities increase the difficulty of the experiment, which is also an inevitable problem.

## **4. Prospect of Research on Emotion Recognition Ability of Autistic Children**

Analysis of related researches on autistic emotion recognition at home and abroad shows that there is no unified conclusion on facial expression recognition of autistic children. Due to the heterogeneity of subjects. The difficulty of experimental materials and the influence of factors such as research field of vision, researchers at home and abroad have reached different conclusions. Relatively speaking, researches on autistic children abroad are more focused on behavioral response, neural mechanism, while domestic researches are mainly conducted through unstructured questionnaires, observation and theoretical speculation. In addition, basic research should serve the practice of educational intervention, and the problems encountered in the practice of educational intervention should also become one of the important sources of empirical research topics. Therefore, the research on emotional recognition of autistic children needs to be further deepened.

### **4.1 Further Improvement of Research on the Development of Emotion Recognition**

Through research, it is found that abnormal emotion recognition is regarded as one of the diagnostic criteria for autism, so it is extremely necessary to further explore the relationship between abnormal emotion recognition and social disorder in autistic children. Is the social disorder of autistic children caused by specific emotional cognition or insufficient facial expression processing? Can abnormal emotion recognition provide useful reference for early diagnosis and subsequent intervention of autistic patients? This has caused researchers to attach great importance to. But there are still several issues worth further discussion: first, the effectiveness of experimental materials. There are many factors that affect autistic children's emotion recognition, but most emotion recognition studies select standardized pictures, photos and videos. Can these experimental materials induce real social emotions? Is the brain area activated the same as that in the real situation? Can its research results accurately predict the performance of autistic children in real situations? In order to avoid being influenced by experimental materials, we should focus on exploring the characteristics of emotional recognition of autistic children in real social situations in the future. Secondly, the lack of longitudinal tracking research. From the research design point of view, there is no long-term longitudinal tracking research design. With the growing age of autistic children, social experience factors may also affect the emotional recognition ability of autistic children, causing changes in brain regions. Therefore, emotional recognition of autistic children should be studied from the perspective of development. Again, subjects lack representativeness. Due to the uncertainty of the etiology of autism groups.

The limitations of the experimental process and operational difficulties, as well as the small number of subjects in most studies, make the research conclusion lack of universality. Therefore, expanding the age range of subjects, increasing the number of subjects, strengthening the research on low-functioning autistic children is the key problem to be solved urgently in the future. Finally, the integration of research technologies. Interdisciplinary research is an inevitable trend in the development of emotion recognition research, especially the combination of behavioral science and cognitive neuroscience. The former focuses on the description of emotional recognition symptoms and functional intervention for autistic children, while the latter focuses on cranial nerve research and focuses on the neurophysiological mechanism of emotional recognition for autistic children. Only the combination of multiple disciplines, the integration of multiple technologies can fully explore the characteristics and abnormal causes of emotional recognition of autistic children.

## **4.2 Construction of Standardized Intervention Scheme Based on Emotion Recognition**

Although a lot of basic research results have been achieved on emotional recognition of autistic children, effective educational interventions are lacking. The educational intervention of rehabilitation educators on emotional recognition of autistic children should be based on their own experience as well as the research results of psychology and neuroscience. Research shows that autistic children pay more attention to the mouth when recognizing facial expressions. Therefore, in educational intervention, rehabilitation technicians should pay more attention to the transmission of mouth information, slow down the speech speed as much as possible and exaggerate the movements of mouth muscles, so that autistic children can accurately understand and master the information transmitted by rehabilitation educators. With the deepening of the intervention, rehabilitation educators can gradually show a natural relaxation state of their mouth to be closer to daily life. Therefore, intervention training combined with the existing research results can not only verify the theoretical assumptions, but also put forward new ideas for future research. In addition, the main purpose of the intervention is to improve the social skills and skills of autistic children, and to cultivate their enthusiasm and autonomy on this basis. The traditional intervention training for autistic children is usually carried out in a specific rehabilitation place. In this closed environment, autistic children can only contact with the same obstacle groups and rehabilitation specialists as him, and the range of interpersonal communication is narrow and the stimulation conditions available are limited. Because they are often isolated from the ordinary environment, high-functioning autistic children who can adapt to the ordinary environment through educational intervention may be more derailed from real life and even suffer from secondary disorders such as depression. Therefore, autistic children can take part in outdoor group activities after establishing a trust relationship with a rehabilitation teacher. Observation and imitation of peer behavior can not only effectively promote their interest in spontaneous friendship, communication, but also help them to generalize social skills in daily life, thus developing their social adaptability. In our country, the intervention research on emotion recognition of autistic children is still in its initial stage, and most of the researches are copying mature research paradigms and intervention programs from abroad. In view of the far-reaching impact of emotion recognition on children's socialization, in future research, it is necessary to focus on building a standardized program for emotion recognition of autistic children in China based on China's cultural background and social status quo, especially for the intervention program of emotion recognition in early childhood, select appropriate evaluation tools and educational contents to further improve intervention strategies, and combine qualitative analysis and quantitative research to form a complete intervention system to promote the early intervention and teaching practice progress of autistic children.

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