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Research Article

Emotion Recognition Deficits: A Narrative Review

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Abstract

Much of the current literature on emotion recognition is focused on emotion recognition deficits. Typically, the emotion stimuli used to assess emotion recognition have been static or dynamic faces or the Ekman collection of 60 faces and the ability to label these correctly. Only a few studies have appeared on vocal emotion recognition. In this narrative review, research on emotion recognition that was published in 2024-2025 is briefly summarized. Typically, the basic emotions including happy and sad have been recognized by focusing on the lips and lower face as these are the salient features of those emotions and fear is often expressed by the eyes and upper face. Several clinical conditions have compromised emotion recognition ability including alexithymia (difficulty recognizing, expressing and describing emotions), cognitive impairment, callous – unemotional behavior traits, attention deficit hyperactivity disorder (ADHD), autism, internalizing behavior and depression, bipolar disorder, Parkinson's, multiple sclerosis, and post – stroke. Other risk factors/predictors of emotion recognition deficits include intergenerational transmission of the problem, low cognitive stimulation in early development and emotion dysregulation. Potential underlying biological mechanisms that have been studied include estrogen, neural correlates, involvement of the amygdala and genetic mechanisms. Interventions have included vagal stimulation, dopamine and oxytocin. This literature has been limited by the more frequent sampling of children and individuals with clinical conditions and by the most frequent presentation of static rather than dynamic facial expressions that are more representative of the emotions experienced in real life.

Keywords

Autism, ADHD, Depression, Parkinson's Disorder.

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Introduction

Emotion recognition Is critical for social interaction. Much of the literature on emotion recognition is focused on emotion recognition deficits. Typically, the emotion stimuli used to assess emotion recognition have been static or dynamic faces or the Ekman collection of faces and the ability to label these correctly. Only a few studies have appeared on vocal emotion recognition.

In this narrative review, research on emotion recognition that was published in 2024-2025 is briefly summarized. This research was found on PubMed, PsycINFO and Google Scholar by entering the terms emotion recognition and the years 2024-2025. Exclusion criteria included non-English papers, pilot studies and proposed protocols.

This current literature on emotion recognition can be divided into different sections including facial features, clinical conditions, risk factors/predictors, potential underlying biological mechanisms and interventions. These are followed by a discussion on the methodological limitations of this literature. Unlike the current literature on most psychological problems, the current literature on emotion recognition has not included prevalence data. The prevalence of emotion recognition difficulties is likely high given that it has been studied in many large clinical samples. This review briefly summarizes 28 papers including 3 papers on facial features, 16 papers on clinical conditions, 2 on risk factors/predictors, 4 on potential underlying mechanisms and 3 papers on interventions.

Salient Facial Features

Various experimental manipulations have been performed to determine the process of emotion recognition (see Table 1). For example, in a study that covered faces with masks, a strong impact

of masks was noted on the recognition of happiness, sadness and disgust [1]. These data suggested that the shape of the mouth is a salient feature of these expressions and necessarily observed for the recognition of these emotions. That there was less impact of the masks on anger and fear recognition suggested that the eyes and upper face are more salient for those emotions.

Table 1: Salient facial features for emotion recognition (and first authors).

Features	First Authors
Shape of the mouth	Thomas
Lower half of face	Kang
Dynamic facial expressions and intensity	Corluka

Further evidence of the importance of seeing the lower face was noted in a study on deaf individuals (N= 22 deaf signers, and 37 hearing adults) [2]. The deaf individuals had lower recognition accuracy of the top half of the face, suggesting that they were not only reading lips for understanding language, but also for recognizing emotions in the lower half of the face. Event related potential data revealed a decrease in the late positive potential that was associated with emotion recognition deficits. This was not surprising as the late positive potential is a brainwave pattern that reflects how the brain processes emotional stimuli.

Other salient features of emotional expressions are dynamism and intensity of the expression. In a study on individuals with autistic traits, less accuracy was noted for both static and dynamic facial expressions presented as photos and videos [3]. Not surprisingly, these individuals had greater recognition accuracy for dynamic than for static expressions, likely because they had more experience with the more frequently occurring dynamic expressions.

Clinical Conditions and Emotion Recognition Deficits

Most of the studies in the current literature on emotion recognition have involved individuals with various clinical conditions including physical and psychological problems (see Table 2). Several clinical conditions have compromised emotion recognition ability including alexithymia (difficulty recognizing, expressing and describing emotions), cognitive impairment, callous – unemotional behavior traits, attention deficit hyperactivity disorder (ADHD), autism, internalizing behavior and depression, bipolar disorder, Parkinson's, multiple sclerosis, and post – stroke.

Table 2: Groups' demographic data.

Clinical Conditions	First Authors
Mild cognitive impairment	Burgio, Ju
Callous-unemotional behaviors	Kemp, Powell, Muratori
Attention deficit hyperactivity disorder	Vosough, Bozkurt, Sells
Autistic traits	Wang
Internalizing behaviors & major depressive disorder	Schrader, Koob
Parkinson's Disease	Slomp, Rodriguez-Antiquedad, Voruz
Multiple sclerosis	Pumphrey
Bipolar disorder	Liu

Alexithymia

Alexithymia is considered a personality trait that involves difficulty recognizing, expressing and describing emotions. Several studies have appeared in a separate literature on alexithymia, although only a few were found on the current literature search for emotion recognition deficits.

In a study on alexithymia and personality pathology (N= 651), regression analyses suggested that alexithymia accounted for 15% of the variance in negative affect, 22% in detachment, 11% in antagonism, 18% in disinhibition and 25% in psychoticism [4]. In a paper entitled "Alexithymia profiles and depression, anxiety, and stress", (N= 1250 university students), regression analyses indicated that alexithymia accounted for 15 to 16% of the variance in depression, anxiety and stress [5]. Difficulties identifying negative feelings and identifying positive feelings were the strongest unique predictors.

Intimate partner violence including physical, psychological and sexual abuse has been associated with alexithymia in a systematic review and meta-analysis on 17 studies [6] . Comparable levels of alexithymia were noted in victims and perpetrators of intimate partner violence. Greater alexithymia was found in the victims and perpetrators of intimate partner violence versus controls.

In another systematic review on 20 studies a significant association was noted between alexithymia and personality disorders which were correlated with increased emotional dysregulation and interpersonal difficulties [7]. Alexithymia was also notably comorbid with psychosomatic disorders, eating disorders, depression, anxiety, suicidal behavior and substance use disorders.

In a paper entitled "Interactive relationship between alexithymia, psychological distress and post-traumatic stress disorder symptomatology across time", military personnel (N = 1871) were followed at pre-deployment post-deployment and three to four years after post- deployment [8]. Those with alexithymia were at longitudinal risk of developing more PTSD symptomatology and experiencing hyperarousal irrespective of the proximity to their traumatic exposure.

Mild Cognitive Impairment

In a study on facial emotion recognition in individuals with mild cognitive impairment, impaired recognition of emotions was noted (N=31 individuals with mild cognitive impairment and 30 healthy controls) [9]. Those with more cognitive impairment had less recognition of fear. MRIs revealed less volume in the right parietal cortex of those individuals with mild cognitive impairment, which was not surprising given the involvement of the right parietal cortex in attention and processing of visual stimuli.

In a paper entitled "Deficits of facial emotion recognition in elderly individuals with mild cognitive impairment" (N =181 with mild cognitive impairment and 119 without), the results are given in the title of the paper [10]. Just as in the previous study, these older individuals with mild cognitive impairment showed deficits in recognizing facial emotions.

Callous-Unemotional Behaviors

At least three papers in this current literature have focused on emotion recognition in individuals with callous–unemotional behaviors. Associations between callous and unemotional traits and emotion recognition abilities have been assessed in school children

(N =258 third, sixth and eighth grade students) [11]. A computer task on facial expression recognition was given to the children. The results suggested interactions between callous-unemotional traits and conduct problems as well as emotion recognition difficulties, especially for fear and sad expressions.

In very similar research on 7-to-10-year-old children (N= 45), not surprisingly, greater emotion recognition was noted for dynamic versus static faces [12] Those children with more callous – unemotional traits showed less emotion recognition of sad and neutral faces. This pattern of behaviors includes a lack of empathy for others' feelings which would include less attentiveness to their emotional expressions like sadness.

In still another study on deficits in emotion recognition and processing in children with callous-unemotional traits (N =97 males 8-12-years-old), less recognition was noted for sad and angry faces [13]. Fewer fixations and shorter duration looking were noted for sad and fear faces, again suggesting less attentiveness and experience with those faces which would contribute to their inferior recognition of the faces. In addition, the authors noted that MAOA – activity alleles were also related as genetic biomarkers. This association was not surprising given that monoamine oxidase plays a key role in regulating the production of serotonin (anti-depressant neurotransmitter) and dopamine (activating neurotransmitter) that are, in turn, associated with emotions.

Attention Deficit Hyperactivity Disorder

Attention deficit hyperactivity disorder (ADHD) has been the focus of a few papers in this current literature on emotion recognition. In an event-related potential study on children with ADHD (N=117 ADHD and 183 healthy controls), moderate to large effect sizes were noted for emotion recognition behaviors including errors and reaction time for recognition of facial expressions [14]. Surprisingly, smaller (small to moderate) effects were noted for the neurophysiology data, as those data are typically less biased than behavioral data.

In another study on children with ADHD, dynamic facial expressions were presented (N =47 8-to-13-year-old children) [15]. Less accuracy in recognition was noted for disgust and anger expressions. Less recognition for these expressions may relate to less experience seeing these expressions. Fixations on the eye region were shorter for happy, angry, sad, disgust and neutral emotional expressions. These results were not surprising as the salient features for these expressions occur in the lower face and lips, not the eye region.

In a meta-analysis of the less frequent form of emotion recognition involving vocal expressions, 21 studies were reviewed on samples with ADHD [16]. Moderate effects sizes were noted for vocal emotion recognition deficits in individuals with ADHD. Surprisingly, the deficits did not differ across the different emotions.

Autistic Traits

Neurotypical adults with autistic traits have been assessed for emotion recognition (N= 32) [17]. Their accuracy was greater for happiness and then surprise, sadness, anger, fear, and disgust. They showed greater imitation of surprise and happiness, and then disgust but much less for sadness, anger, and fear. Again, these data my reflect the lesser experience seeing expressions of sadness, anger and fear. As might be expected, significant linkage was noted between emotion recognition and the level of autistic traits.

Internalizing Problems, Major Depression Disorder and Post-Stroke Depression

Individuals with internalizing problems have been noted to have inferior emotion recognition. In a systematic review of 42 studies (N=7579), those with internalizing problems consistently had inferior emotion recognition. Internalizing problems often lead to depression which has also been associated with emotion recognition deficits.

In a paper entitled "Neurophysiological pathways of unconscious emotion processing in depression" (N=126 including 60 with major depression disorder, and 66 healthy controls). Those with depression had greater reaction time to happy expressions and in general more emotion recognition and processing difficulties [18]. The amplitude of their event-related potentials was correlated with activation of the right amygdala. This association was not surprising given that the right amygdala plays a critical role in the rapid processing of emotional stimuli, especially negative emotions that would be associated with depression, and the amplitude of event-related potentials reflects the strength of the neural activity during the processing of the stimuli.

In a study entitled "Behavioral and neuroanatomical correlates of facial emotion processing in post-stroke depression" (N=26), less recognition of happy, sad and fearful faces was reported [19]. Those more depressed patients had greater processing of negative faces and faster processing of angry and sad faces, likely because of their experience with sadness and anger. The authors attributed these findings to brain lesions in emotion-related processing circuits including the insula, basal ganglia, inferior and middle frontal regions which likely not only contributed to their emotion recognition deficits but also to their post-stroke depression.

Bipolar Disorder

Impaired facial emotion recognition has also been reported for individuals with bipolar disorder, previously known as manic depression (mood swings from depressive lows to manic highs) (N= 69) [20]. Those individuals with bipolar disorder had less accurate emotion recognition than the healthy control participants. The individuals with manic episodes had less accurate recognition of neutral, joy and fear emotions, likely because they have difficulty concentrating and are easily distracted by irrelevant stimuli. Interestingly, their inaccurate recognition of extreme emotions like joy and fear match their extreme mood swings.

Parkinson's Disease

Impaired facial emotion recognition has been related to abnormal social behaviors in patients with new Parkinson's Disease (N=142 individuals with Parkinson's disease and 142 healthy controls) [21]. These results were based on the Ekman 60 Faces Test and the Apathy Evaluation Scale. Less facial emotion recognition was related to apathy and social behavior problems. The greatest recognition difficulties were noted for disgust, sadness and anger expressions.

Facial emotion recognition deficits are also associated with hypomania

and related brain correlates in individuals with Parkinson's disease (N= 94) [17]. In this sample, deficits were again noted for disgust and anger on the Ekman 60 Faces Test, consistent with the deficits noted in the sample just described [22]. These deficits were correlated with decreased cortical thickness in the fronto–temporo–parietal regions typically associated with the processing of emotions.

Vocal emotion recognition has also been limited in those with asymmetric Parkinson's disease (N =15 newly diagnosed, 15 advanced and 15 healthy controls) [23]. Reduced vocal emotion recognition was associated with left side motor symptoms. Differential effects were noted for disease duration and for dopaminergic replacement therapy. In early-stage Parkinson's patients, the dopaminergic replacement therapy had deleterious effects on those with left side motor symptoms but the same therapy had positive effects on those with right side motor symptoms. Left-side symptoms (right hemisphere pathology) are linked to more psychiatric issues like depression and anxiety. Research on dopaminergic therapy for depression and anxiety has shown mixed effects. The exacerbation of anxiety and depression by dopamine has been attributed to dopamine's interaction with other neurotransmitters including serotonin which would typically reduce anxiety and depression.

Multiple Sclerosis

Multiple sclerosis is another motor disorder that has been related to emotion recognition deficits (N= 31 with multiple sclerosis and 21 healthy controls) [24]. In this sample, the emotion recognition deficits were related to deficient cognitive processes including information processing speed.

Risk Factors/Predictors of Emotion Recognition Deficits

Only a couple papers on risk factors/predictors of emotion recognition deficits were found in this literature (see Table 3). They include *intergenerational transmission of maltreatment* and low cognitive stimulation early in development.

Table 3: Risk factors/predictors of emotion recognition deficits (and first authors).

Risk factors/Predictors	First Authors
Intergenerational transmission of maltreatment	Buisman
Low cognitive stimulation in early development	Murguietio

In a study entitled "Intergenerational transmission of maltreatment", parents who had been abused (N= 250) were shown photos of anger, fear, happiness, and sadness facial expressions [25]. Parents with more neglectful behavior showed more errors in identifying the fear expressions and abusive parents showed more errors identifying anger expressions. Because abusive behavior is often preceded by anger, the abusive parents have likely experienced anger but might experience denial when observing photos of anger expressions.

In a paper entitled "Developmental impacts of deprivation and threat on emotion recognition", mother – child dyads were seen at 6-to-36-months and emotion recognition was assessed in early and middle childhood (N=92 mother – child dyads) [26]. Low cognitive stimulation in early development was related to emotion recognition deficits in middle childhood. Exposure to intimate partner violence also led to difficulty recognizing anger expressions.

Potential Underlying Biological Mechanisms for Emotion Recognition Deficits

Some potential underlying biological mechanisms have been identified in this recent literature on emotion recognition (see Table 4). These include estrogen, neural correlates, activation of the amygdala and genetics.

Mechanisms	First Authors
Estrogen	Jang
Neural correlates	Morningstar
Amygdala	Labuschagne Schrader
Brain lesions insula, basal ganglia, frontal regions	Koob
Genetic biomarkers	Muratori

In a paper, entitled "Estrogen predicts multimodal emotion recognition accuracy across the menstrual cycle", the results are given in the title (N= 63) [27]. These results were based on emotion recognition of stimuli presented in a video recording that included visual, auditory, and multi-modal stimulation as well as non-linguistic vocalizations (e.g. laughter, sobs and sighs). Low estrogen levels were associated with emotion recognition deficits possibly via the association between low estrogen levels and negative moods. The multi-modal stimulation of this study was uniquely more representative of emotions as they are typically experienced.

Functional connectivity was noted during facial and vocal emotion recognition in another study that recorded fMRIs (N= 28 individuals 8 to 19-years-old). Facial emotion recognition accuracy was greater than vocal emotion recognition accuracy and it increased with age. Not surprisingly, distinguishable neural correlates were noted for the different facial expressions, as they would activate different brain regions, for example, the amygdala which is the brain's "fear center".

In a paper entitled "Specialization of amygdala subregions in emotion processing", fMRI data were collected during face matching tasks (N= 86 participants 18–49-years-old) [28]. Functional connectivity was noted between the amygdala and the occipitotemporal and inferior frontal regions, which was labeled a face processing network. As already reported, the right amygdala was involved in emotion processing in depressed individuals [18].

As was described earlier in this paper, brain lesions have been noted during emotion recognition assessments [19]. Data from fMRIs showed lesions in an emotion – related processing circuit in several regions of the brain including the insula, basal ganglia, inferior and middle frontal regions.

As already noted, genetic biomarkers have been identified in young males with high callous-unemotional traits during emotion recognition tasks [13]. These authors suggested that MAOA-low activity alleles were the genetic biomarkers associated with emotion recognition deficits. MAOA (monoamine oxidase) regulates serotonin which is elevated during positive emotions and depleted during negative emotions.

Interventions for Emotion Recognition Deficits

A few intervention studies have appeared in this current literature

on emotion recognition deficits (see Table 5). They include vagal stimulation, dopamine, and oxytocin.

Table 5: Interventions for emotion recognition deficits (and first authors).

Interventions	First Authors
Transcutaneous vagal nerve stimulation	Zhao
Dopaminergic replacement therapy	Voruz
Oxytocin	Krug

In a study entitled "Transcutaneous vagus nerve stimulation improves emotion processing", the title reflects the results [29]. In this sample (N =52 individuals with major depressive disorder and 44 healthy controls), transcutaneous vagal nerve stimulation was given and that group was compared to a sham control group. Greater detection accuracy was noted for positive versus negative facial expressions. Fewer negative states were reported during the stimulation. The positive effects of vagal stimulation were not surprising as it has reduced depression in many studies, likely due to the increase in the antidepressant neurotransmitter serotonin.

As already noted, dopaminergic replacement therapy has been used with patients who have Parkinson's Disease [18]. The replacement therapy had positive effects on emotion recognition at least for those with right-side motor involvement. This activating neurotransmitter has been noted for its positive effects on mood and attention.

Oxytocin has also enhanced emotion recognition [30]. In this sample (N=149 university females), oxytocin was compared to a placebo in an intranasal spray. More emotional recognition was noted following oxytocin, especially for positive emotions. This hormone often referred to as the "love hormone' has been associated with calm, well-being and attentive behaviors which may have contributed to the greater recognition for positive emotions in this research.

Methodological Limitations of the Current Literature on Emotion Recognition

This current literature on emotion recognition has several methodological limitations. They include sampling, methods and data analysis problems.

Many of the samples were groups of individuals with cognitive, emotional and physical conditions which limits the generalizability of the data for healthy individuals. Several samples were children at different stages of their emotion recognition development which also limits the generalizability of the data.

The emotion recognition studies have been limited to facial expression recognition. Only a couple studies assessed vocal expression recognition, and no studies were found on recognition of emotions by touch, although that recognition was documented almost a decade ago. The emotions presented were limited to the 6 basic emotions even though some have suggested the existence of as many as 29 different emotions and the Ekman 60 faces used in several studies suggests as many as 60 facial expressions. The epistemic emotions like frustration and boredom were also not included in the facial expression studies.

The data suggest that emotions like happy and sad are expressed on the lips and the lower face and most readily recognized by focusing on the lips and the lower face and other emotions like anger are expressed by the eyes and the upper face. The mask study clearly demonstrated this difference across expressions. Other research documented the facilitating effects of intensity of expression as well as dynamic versus static expressions. Despite the data suggesting that dynamic versus static expressions are more readily recognized, most of the studies used static, low intensity photos as stimuli. Both facial and vocal expressions are typically experienced and recognized in a dynamic versus static state, suggesting that the dynamic presentation would be more reality oriented and more readily recognized.

Only a few studies focused on risk factors for emotion recognition difficulties including early in life risk factors like intergenerational transmission and low cognitive stimulation which highlight the need for further risk factor/predictor variable research that would inform intervention research. Surprisingly, while emotion recognition has been considered essential for face-to-face interactions, no interaction studies appeared in this literature. And the relationship between emotion recognition difficulties and emotion dysregulation was also not a topic of research.

Both the mechanism and intervention studies were limited to the assessment of one mechanism or one intervention rather than comparing multiple mechanisms/interventions for their effects or entering them into regression analysis or structural equation modeling to determine their relative importance/significance. Further, the data analyses were compromised by very unequal sample sizes in most of the studies.

Despite these methodological limitations, this literature has been informative. The relative absence of studies on risks/predictors of emotion recognition difficulties, underlying mechanisms and interventions highlights the importance of continuing research on emotion recognition both in healthy and clinical samples.

References

1. Thomas PJN, Caharel S. Do masks cover more than just a face? A study on how facemasks affect the perception of emotional expressions according to their degree of intensity. Perception. 2024; 53: 3-16.
2. Kang SM, Apar LS, Hurtado R. Emotion recognition in deaf individuals: evidence from event-related potentials. J Deaf Stud Deaf Educ. 2025; 30: 324-331.
3. Corluka N, Laycock R. The influence of dynamism and expression intensity on face emotion recognition in individuals with autistic traits. Cogn Emot. 2024; 38: 635-644.
4. Winterstein S, Mazzucchelli TG, Gross JJ, Krueger RF, Preece DA. Alexithymia and Personality Pathology. J Pers Disord. 2024 Oct;38(5):435-454. doi: 10.1521/pedi.2024.38.5.435. PMID: 39432262.
5. Preece DA, Mehta A, Petrova K, Sikka P, Pemberton E, Gross JJ. Alexithymia profiles and depression, anxiety, and stress. J Affect Disord. 2024 Jul 15;357:116-125. doi: 10.1016/j.jad.2024.02.071. Epub 2024 Feb 20. PMID: 38387670.
6. Veggi S, Benfante A, Di Tella M, Roveta F, Castelli L, Zara G. Intimate Partner Violence and Alexithymia: Do Emotions Matter? A Systematic Review and Meta-Analysis.

Trauma Violence Abuse. 2024 Jul;25(3):2521-2534. doi: 10.1177/15248380231217045. Epub 2023 Dec 22. PMID: 38131327.

7. Chaim CH, Almeida TM, de Vries Albertin P, Santana GL, Siu ER, Andrade LH. The implication of alexithymia in personality disorders: a systematic review. BMC Psychiatry. 2024 Oct 1;24(1):647. doi: 10.1186/s12888-024-06083-6. PMID: 39354408; PMCID: PMC11443833.
8. Putica A, Van Dam NT, Felmingham K, Lawrence-Wood E, McFarlane A, O'Donnell M. Interactive relationship between alexithymia, psychological distress and posttraumatic stress disorder symptomology across time. Cogn Emot. 2024 Mar;38(2):232-244. doi: 10.1080/02699931.2023.2283934. Epub 2024 Feb 6. PMID: 37987839.
9. Burgio F, Menardi A, Benavides-Varela S, Danesin L, Giustiniani A, et al. Facial emotion recognition in individuals with mild cognitive impairment: An exploratory study. Cogn Affect Behav Neurosci. 2024; 24: 599-614.
10. Ju EY, Kim CY, Choi BY, Ryoo SW, Min JY, et al. Deficits of Facial Emotion Recognition in Elderly Individuals with Mild Cognitive Impairment. Dement Geriatr Cogn Disord. 2024; 53: 321-328.
11. Kemp EC, Clark JE, Matlasz TM, Frick PJ. Associations Between Callous-Unemotional (CU) Traits and Emotion Recognition Abilities in School Children: The Influence of Conduct Problems and Age. Prev Sci. 2025; 26: 506-518.
12. Powell T, Plate RC, Miron CD, Wagner NJ, Waller R. Callous-unemotional Traits and Emotion Recognition Difficulties: Do Stimulus Characteristics Play a role. Child Psychiatry Hum Dev. 2024; 55: 1453-1462.
13. Muratori P, Palumbo S, Vellucci S, Mariotti V, Billeci L, et al. Deficits in emotion recognition and processing in children with high callous-unemotional traits: the role of the MAOA gene. Eur Child Adolesc Psychiatry. 2024; 33: 3529-3540.
14. Vosough S, Candrian G, Kasper J, Abdel Rehim H, Eich D, et al. Facial Affect Recognition and Executive Function Abnormalities in ADHD Subjects: An ERP Study. Clin EEG Neurosci. 2025; 56: 327-341.
15. Bozkurt A, Yıldırım Demirdöğen E, Kolak Çelik M, Akıncı MA. An assessment of dynamic facial emotion recognition and theory of mind in children with ADHD: An eye-tracking study. PLoS One. 2024; 8: 19.
16. Sells RC, Liversedge SP, Chronaki G. Vocal emotion recognition in attention-deficit hyperactivity disorder: a meta-analysis. Cogn Emot. 2024; 38: 23-43.
17. Wang HT, Lyu JL, Chien SH. Dynamic Emotion Recognition and Expression Imitation in Neurotypical Adults and Their Associations with Autistic Traits. Sensors. 2024; 24.
18. Schräder J, Herzberg L, Jo HG, Hernandez-Pena L, Koch J, et al. Neurophysiological Pathways of Unconscious Emotion Processing in Depression: Insights From a Simultaneous Electroencephalography-Functional Magnetic Resonance Imaging Measurement. Biol Psychiatry Cogn Neurosci Neuroimaging. 2024; 9: 1121-1131.
19. Koob JL, Gorski M, Krick S, Mustin M, Fink GR, et al. Behavioral and neuroanatomical correlates of facial emotion processing in post-stroke depression. Neuroimage Clin. 2024; 41.
20. Liu Y, Song Y, Li H, Leng Z, Li M, et al. Impaired facial emotion recognition in individuals with bipolar disorder. Asian J Psychiatr. 2024; 102.
21. Slomp AC, van der Zee S, Boertien JM, Gerritsen MJJ, van Laar T, et al. Impaired facial emotion recognition in relation to social behaviours in de novo Parkinson's disease. J Neuropsychol. 2024; 18: 205-216.
22. Rodríguez-Antigüedad J, Martínez-Horta S, Horta-Barba A, Puig-Davi A, Campolongo A, et al. Facial emotion recognition deficits are associated with hypomimia and related brain correlates in Parkinson's disease. J Neural Transm. 2024; 131: 1463-1469.
23. Voruz P, Grandjean D, Drapier S, Drapier D, Vérin M, et al. Differential Effects of Disease Duration and Dopaminergic Replacement Therapy on Vocal Emotion Recognition in Asymmetric Parkinson's Disease. Neurodegener Dis. 2024; 24: 129-140.
24. Pumphrey JD, Ramani S, Islam T, Berard JA, Seegobin M, et al. Assessing multimodal emotion recognition in multiple sclerosis with a clinically accessible measure. Mult Scler Relat Disord. 2024; 86.
25. Buisman RSM, Compier-de Block LHCG, Bakermans-Kranenburg MJ, Pittner K, van den Berg LJM, et al. The role of emotion recognition in the intergenerational transmission of child maltreatment: A multigenerational family study. Child Abuse Negl. 2024; 149.
26. Murgueitio N, Sheridan MA, Shipkova M, Halberstadt AG, Garrett-Peters PT, et al. Developmental impacts of deprivation and threat on emotion recognition. Neurotoxicol Teratol. 2025; 109.
27. Jang D, Lybeck M, Cortes DS, Elfenbein HA, Laukka P. Estrogen predicts multimodal emotion recognition accuracy across the menstrual cycle. PLoS One. 2024; 19.
28. Labuschagne I, Dominguez JF, Grace S, Mizzi S, Henry JD, et al. Specialization of amygdala subregions in emotion processing. Hum Brain Mapp. 2024; 45.
29. Zhao T, Schiweck C, Jamalambadi H, Meyer K, Brandt E, et al. Transcutaneous vagus nerve stimulation improves emotional processing. J Affect Disord. 2025; 372: 96-105.
30. Krug I, Fung S, Liu S, Treasure J, Huang C, et al. The impact of oxytocin on emotion recognition and trust: Does disordered eating moderate these relationships. PLoS One. 2024; 19.