

## PROBLEMS IN SPECIFYING ALEXITHYMIA: A REVIEW OF THE EMPIRICAL LITERATURE

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**Abstract:** Alexithymia represents an interesting phenomenon, which ranks among border concepts of psychosomatic medicine. It can be understood as a border concept of psychosomatics, as there is no general consensus in its etiology. Objective: The review focuses on interpretation and specification of alexithymia. It classifies alexithymia into basic and more detailed groups derived from diagnostic questionnaire methods. From the view of etiology it concentrates on psychoanalytical, sociological, cognitive-neuropsychological and neurochemical interpretations. Methods: We used the mapping, analysis and review of the studies of alexithymia etiology from various perspectives. Results: In our opinion, the connection of the psychodynamic approach with the neuroscientific research is a crucial and bearing platform for further research in the area of alexithymia. Conclusions: We can pronounce that a complex platform where both important theories can meet has still not been found.

**Keywords:** alexithymia, etiology, psychoanalytical model, neuropsychological model, typology.

### 1 Alexithymia

The concept of alexithymia appears frequently in the psychosomatic literature. Many current studies examine alexithymia in relation to certain psychosomatic problems and mental disorders. Nonetheless, alexithymia remains debatable, disapproved by a few scientists, and fairly unclear. The concept of alexithymia is not clearly classified within psychosomatic theories. It may be understood as a borderline concept within psychosomatics, as there is no general consensus on its etiology. In research the term "alexithymia" is used as a so-called "heuristic construct", which is suitable for researching the role of personality and emotions in the pathogenesis of somatic illnesses (Taylor, 2000). Thus, the purposes of this paper are to specify the term "alexithymia," synthesize existing knowledge in this area, and identify issues for future research.

The term "alexithymia" might be translated as "no words for emotions". The term was coined by the psychiatrist Peter E. Sifneos of Beth Israel Hospital in Boston (Baštecká and Goldman, 2001). Alexithymia might be defined as a deficiency in the modulation of emotions, which results in maladaptive styles during final processing and expression of emotions. It is both a verbal and non-verbal disorder of understanding emotions and transferring them into words. Alexithymia might also be seen as a problem in the area of mentalization (symbolization) of emotions in the mind, such that emotional states are minimally differentiated and are experienced as somatic tension or physical unease. This process manifests itself in individuals' communications with their surroundings. These individuals fail to find words for their feelings. They describe their emotional states in connection with somatic tension. Such expression is associated with an insufficient ability to understand feelings and low introspection, which is compensated by turning away from the inner self to the outside world. Due to the clear cognitive and personality features of such individuals, early concepts of alexithymia were connected with the terms "infantile personality" (Ruesch, 1948) and "operational thinking" (Marty and de M'Uzan, 1963).

Recently, a co-occurrence has been demonstrated with several clinical disorders such as somatoform disorders, panic disorder, depression with dominant somatic symptoms, post-traumatic stress disorders, and eating disorders (Vanheule, 2008). Naturally, we cannot claim that each of these disorders is caused by alexithymia; however, there is evidence that these disorders are somehow related to alexithymia (Frewen, Pain, Dozois, and Lanius, 2006; Hund and Espelage, 2005; Mueller and Buehner, 2006; Speranza, Laos, Wallier, and Corcos, 2007; Taylor,

Bagby, and Parker, 1997; Vanheule, Desmet, Verhaeghe, and Bogaerts, 2007; Verhaeghe, Vanheule, and De Rick, 2007).

### 1.1 Clinical typology and manifestation of alexithymia

It is within the context of psychosomatic disorders that the term "alexithymia" gains particular importance. Emphasis is often put on alexithymic aspects in communication, in the form of a stereotypical description of somatic changes lacking expression of one's own emotional response, and further in the form of a poor fantasy life and thoughts connected with external events.

Provided that the concept of alexithymia is defined (operationalized) by these behavioral manifestations, it may be divided into primary and secondary types. Primary alexithymia represents a disposition which causes and/or maintains a somatic illness. Alexithymia is thought to be secondary if it is a consequence of a certain somatic illness. From this point of view, alexithymia might be understood as a coping strategy that the individual has developed in relation to his/her illness.

Baštecký, Šimek, Šavlík and Svoboda (1993) state that alexithymic patients are characterized by the following features:

1. They chronically describe physical symptoms that are not related to the fundamental illness.
2. They complain of tension, irritation, frustration, aches and pains, boredom, emptiness, unease, agitation, nervousness, etc.
3. They significantly lack a fantasy life; however, they carefully describe unimportant details of their environment.
4. They have great difficulties in finding the proper words to express their emotions.
5. Either they cry very little, or a lot – however, in the latter case the tears do not seem to be related to the corresponding feelings, such as grief or anger.
6. They rarely remember their dreams.
7. Their emotions are often excessive.
8. Their interpersonal relations are often poor, showing significant dependence or preference for seclusion and rejection of people.
9. Personalities are frequently narcissistic, submissive, passive-aggressive, passively dependent, or psychopathic.
10. Physicians and/or therapists are usually bored with such patients. They seem to be very dull.

The development of scales for measuring alexithymia has brought progress in understanding of the concept. For example, the Toronto Alexithymia Scale (TAS) distinguishes three factors in the concept of alexithymia. The first factor represents failure to express one's own emotions; the person experiences undifferentiated emotional excitement. The second factor represents inability to describe one's emotions. The third factor emerges out of externally-oriented thinking, represented by a restricted fantasy life.

In the area of projective assessment of alexithymia, Porcelli's (2007) Rorschach Alexithymia Index bears mention. With this index it is possible to identify phenomena connected with alexithymic characteristics by the Rorschach method. The index consists of variables that are associated with the lack of mentalization (M=0-1), insufficient emotional expression (WSumC=1-2), concrete thinking (F%>0.73), high social conformity (P>7), interpersonal problems (CDI positive), and problems in developing close relationships (T=0). According to Porcelli, a reliable alexithymia predictor is achieved if at least three of the above-stated criteria are fulfilled.

The Bermond-Vorst Alexithymia Questionnaire (BVAQ) (2001) is another approach of interest. It divides the concept of alexithymia into subtypes. These authors describe alexithymia as a reduced ability to distinguish among emotional feelings, a reduced ability to fantasize, a reduced ability to verbalize emotional experience, and a reduced tendency to think about

and/or be concerned with examination of one's own emotions. The subtypes that emerged based on this method are Type I alexithymia; Type II alexithymia; Type III alexithymia; lexithymia; and the modal type. Each of these is described below.

### 1.2 Type I Alexithymia

This is understood as a reduced ability to experience emotions and identify feelings, a weakened ability to fantasize, and insufficient understanding of emotional processes. This type is characterized mainly by distant social relations and limited extent of emotional expression in interpersonal relations, which is caused by a deficit of empathy and sociability. These individuals are socially and emotionally impoverished. They respond to stressful situations with the mechanism of projection. They tend to rationalize everything without any emotional accompaniment. While this might be convenient in certain professions, they may encounter problems in private life, friendships, and other relations due to their emotionally cold behaviour. This characteristic description is similar to schizoid personality descriptions.

### 1.3 Type II Alexithymia

This type is characterized by a good ability to experience emotions and an identification of feelings and fantasy life, with a low understanding of emotional processes. These individuals suffer from insufficient emotional stability. They may complain about somatic problems and/or insomnia. They may suffer from anxiety, panic attacks, and/or depression. Occasionally, paranoid ideation may appear (Vingerhoets, Nyklíček, and Denolet, 2008). They respond to stressful situations by developing symptoms of anxiety and depression. They also react to strain by dissociation (Moormann, Bermond, and Albach 2004, in Nyklíček, Vingerhoets, and Temoshok, 2004). Patients with Type II alexithymia are less resistant to stress. Their self-respect is reduced and they feel ineffective. This type of alexithymia is found predominantly among women, and frequently with children who have been sexually abused (Albach, Moormann, and Bermond, 1996). Compared with the previous type, the characteristic description is more varied, more likely approaching a disorganization of psychic functions and a propensity to decompensate under the influence of strain, which is found with asthenic, emotionally unstable, avoidant, and histrionic personality types.

### 1.4 Type III Alexithymia

This type is characterized by a low level of emotion and fantasy life, but a high level of understanding of one's emotional processes. In this respect, the question arises: how can these individuals have well-developed cognition while having low emotion and a poor fantasy life? Cognitive neuropsychologists have tried to deal with this problem and have concluded that these individuals, in spite of the identified deficiencies, still have an ability to respond to other people's emotions in a socially acceptable way (Moormann, Bermond, and Albach 2004, in Nyklíček, Vingerhoets, and Temoshok, 2004). A possible explanation may also be found in the way they complete the BVAQ self-assessment questionnaire, wherein they may understand acceptance of their own emotionality as weakness. These individuals can easily get along with others in their social environment and are socially skilled. They have high self-esteem and try to keep problems and tasks under control. In reaction to illness or a stressful situation, individuals with Type III alexithymia might be called repressors. Also, research has shown that individuals with Type III alexithymia tend to manipulate others (Niessen, 2001). In conclusion, Type III alexithymia shows similarities with a narcissistic personality structure.

### 1.5 Lexithymia

Lexithymia is characterized by high emotion, a high level of fantasy life and a well-developed understanding of emotional processes. Lexithymic individuals are used to experiencing an affectionate relationship with a mother, which supports the idea

that early childhood experiences shape personality later in life (Moormann, Bermond, and Albach, 2004, in Nyklíček, Vingerhoets, and Temoshok, 2004). Both Freud and Erikson assumed that an emotionally warm child-caregiver relationship based on trust contributes to optimal personality development (Carver and Scheier, 2000). The importance of a high-quality early relationship with a mother (caregiver) to cultivating emotional life was emphasized by many of Freud's followers and supporters of psychoanalytic and dynamic approaches, e.g., Winnicott, Mahler, Sullivan, Klein, Horney, and many others. This perspective is further highlighted mainly in works by Bowlby (2010) within attachment theory, and in studies on mental deprivation by Czech authors, mainly Matějček (1969).

Generally, lexithymic individuals are emotionally intelligent and have the ability to overcome difficult life situations. They also have high self-esteem and self-assessment, which is considered to be a solid base for realization of their creative and expressive potential. Oldham and Morris (1990) point out that a dramatic or theatrical style strongly emphasizes emotions, and such people can express themselves easily and openly. This dramatic or rather theatrical type might be understood as a subtype of lexithymia. This interpretation is also supported by the finding that lexithymic individuals, in comparison with the modal type, had significantly different scores on emotional perception, emotional expression, and social intelligence (Niessen, 2001). This means that individuals with a dramatic style are intuitive and have a sense of empathy.

A second lexithymia subtype is marked as an outgoing type. Lexithymic individuals of this subtype focus more on sociability than theatrics (Millon, Weiss, Millon, and Davis, 1994). They greatly believe in their own charm and effect on others and they may have a tendency to manipulate others.

Generally, we may suppose that lexithymic individuals, due to their theatricality and/or belief in their influence and charm, are popular guests of TV talk-shows. The behavior arising from the theatricality and dramatic style of one's own expression predisposes an individual to succeed in shows and programs of different types, which to a certain extent clearly is a hallmark of modern western culture based on exhibitionism.

### 1.6 Modal type

The modal type can be translated as a "typical" type. It is characterized by an average emotionality and fantasy life, and average accompanying cognition. People of this kind are not too conspicuous. They may have a pessimistic view of the future.

## 2 Theories of alexithymia development

Having briefly specified alexithymia and its manifestations, the discussion will now focus on interpretations of the etiology of alexithymia. Psychoanalytic, psychodynamic, sociological, neuroanatomical (cognitive-neuropsychological), and neurochemical models will be examined.

### 2.1 Psychoanalytic and psychodynamic interpretations of alexithymia

Psychoanalytic theories propose that developmental stages are important in the formation of alexithymia. McDougal (1982) suggests that instinctive impulses are not mentally processed by alexithymic patients, but they directly affect the body. This is caused by disruption in the mother-child interaction in the earliest stage of their relationship, and the child's failure to create inner representations for instinctive impulses. Due to this inability, instinctive impulses are expressed by being directly released instead of being filtered and connected to fantasies and semantic symbols. McDougal (1982) posits this inability to name, distinguish and work out affective states as a defense structure that protects alexithymic patients from psychotic anxiety (due to mental or physical fragmentation, or loss of the feeling of danger in uncontrolled explorative action).

Another researcher, M'Uzan (1976), suggests a similar approach. He emphasizes that it is essential for the development of alexithymia that a child fails to be able to use fantasy (hallucinatory phenomena) as a means of gaining protection and delight. Later on, this results in an inability to use mental activities that serve the same function. M'Uzan is a representative of the French school, which views psychosomatic symptoms mainly as products of mental conflict dynamics and/or consequences of specific ego deficits.

This interpretation is very close to the concepts of ego psychology. Ego psychology has largely expanded our understanding of Ego and its functions (i.e. self preservation, postponing instinctive wishes, and employing defense mechanisms) since Freud's original assumptions about setting goals, intentions, and self-fulfilment. Some researchers assume that the so-called "non-conflict part of Ego" is not affected by basic instinctive conflicts and supports other important parts of the mind, e.g. perceptive, motor, cognitive functions, etc.

Ego psychology supporters presuppose that internalization processes are key mechanisms in the shaping of personality. Introjection is one form of internalization. Introjections are understood as mental representations of significant people, mainly parents. The introjections formed in childhood affect interpersonal relations. They help the individual to guess the thoughts, emotions and motives of other people and to presuppose their reactions. Healthy inner dialogue with parent introjections reduces anxiety and enables decision-making in accordance with the values and attitudes formed in childhood. Poor introjections lead to feelings of dependence, uncertainty, helplessness, and emptiness. Demanding and cruel introjections cause feelings of guilt, failure, and uselessness (Millon, Lerner, and Weiner, 2003).

Ego psychological models work with a three-type concept of intrapsychic dysfunction: lower Ego power, maladaptive Ego defense mechanisms, and dysfunctional introjections. The insufficiently powerful Ego cannot test reality in an adaptive way; it has a distorted perception of inner and outer psychic contents. Maladaptive defense mechanisms cannot satisfactorily control stress and anxiety. Dysfunctional introjections cause improper perception of self and others. The key idea for the concept of alexithymia is that of dysfunctional introjections, which form the basis for misinterpretation of mental processes and lead to improper perceptive contact with one's own experience and that of others. The worsened perceptive contact with inner and outer reality may induce other important features connected with alexithymic individuals, that is, increased effort at social adaptation, adherence to social roles, poor fantasy life and sticking to conservative arrangements. Considering how important the quality of perception is when confronting changeable conditions, these manifestations help alexithymic individuals to cope with life's demands.

Stephanos (1975) was concerned with an ego deficit structure of mind, emphasizing that with alexithymic patients, this is understood as a defense mechanism from an early mother-child relationship, therefore it is meant as a defect in early identification process. What Stephanos proposed was that absolute dependence on an object (mother) is developed in the first year of life, while the father is pushed into the background in the parent-child relationship and therefore he becomes featureless, unclear, and without Oedipal potency. In this period a phenomenon of reduplication is developed as well. Reduplication means that patients see other people stereotypically, unclearly delineated, and without distinguishable individuality (Mohapl, 1988). Psychosomatic patients have problems distinguishing other people's characteristic features and they close in on themselves. In other words, they tend to perceive an object according to their own self-image model, which is unstructured.

A final example of a psychoanalytic interpretation of alexithymia is the Pinocchio syndrome, which has been applied to indicate alexithymic characteristics (von Rad and Rüppel, 1975). Pinocchio is a fairy-tale puppet hero who was

manipulated by his master, Lorenzini. In this conceptualization, alexithymia is formed when a mother projects her narcissist conflicts upon a child, manipulates with the child's physical manifestations, and responds to the child in a rejecting or hyper-protective way. In this respect, the individual's fixation on impulses is considered a defense system, or rather a specific response to mental strain. Inasmuch as the mother-child relationship plays a crucial role in the psychoanalytic approach, provided that this relationship is lost, somatic symptoms may develop in the child. Narcissistic behavior and/or response to the loss of a key person might also be understood as psychosomatic symptoms in this respect.

## 2.2 The sociological model of alexithymia

The sociological model of alexithymia development indicates that the patient's psychosomatic behavior is a consequence of functional adaptation to social standards and conventional pressure (Ahrens, Gyldenfeldt, and Runde, 1979). Alexithymic patients, due to their way of thinking and speech, seem to be dysfunctional in a psychiatrist's office, but not in daily life (Mohapl, 1988). Tabooing of emotions and an alexithymic way of communicating belong to the world of work and professional career. In this realm, it is not often socially acceptable to express emotions. Listening to someone's account of emotions is unpleasant and emotional expression is undesirable. The sociological perspective implies that alongside economic and social standard growth, people should show less of their emotions to achieve success.

Alexithymia in a sociological context might be understood as the internalization of social standards that are derived from the progress achieved by society. From this point of view, alexithymia is thought to be instrumental, i.e., an indicator of socially conditioned adaptation. Within the perspective of the instrumental orientation, emotional experience and expression seem to be non-functional manifestations of personality. However, human beings have needs associated with affects that are suppressed due to the instrumentalization. Thus, an alexithymic patient shows conformity with society and gives up his/her individuality, i.e. the reduplication process that has been mentioned.

## 2.3 Cognitive neuropsychological concepts of alexithymia

Cognitive neuropsychological research aims to explain the etiology of alexithymia in relation to the brain and brain structures. In this regard, the following discussion will first focus on general knowledge, followed by detailed analysis.

Initial neuroscientific findings indicated that the nature of emotional problems is anchored in the limbic system and its connection to the neocortex. The limbic system takes part in emotions, feelings, and experience, whereas the neocortex is responsible for intelligence, perception, and motor skills. From this point of view, the etiology of alexithymia is understood as suppression of impulses in the limbic system leading to the neocortex, which results in disorders in emotion and fantasy life. Nebycilin (1971) mentions alexithymia in relation to EEG patterns and factor analysis. He proposes that emotions result from activity in front of the limbic system, where the limbic system acts as a generator of emotional impulses, whereas the medial-basal and orbital cortex is their modulator. The following discussion will now concentrate on findings in regard to individual brain parts.

## 2.4 Corpus callosum and alexithymia

Various studies of humans have demonstrated that verbal expression, consciousness and serial information processing are located in the left hemisphere, whereas unconsciousness, non-verbality and parallel holistic information processing occur in the right hemisphere (Gazzaniga, 1989). As a result of this finding, emotional processes were attached to the right hemisphere. This conclusion suggests that agenesis or interruption of the corpus callosum structure leads to alexithymia. Several researchers have supported this hypothesis

(TenHouten, Walter, Hoppe, and Bogen, 1988). Based on this knowledge we may speculate that dysfunction of the corpus callosum results in a specific type of alexithymia, in which an individual experiences emotions, but also experiences undistinguishable excitement that is unconsciously related to the experienced emotional feelings.

### 2.5 Anterior commissure and alexithymia

The anterior commissure serves to connect olfactory parts of the brain (paleocortex). Gazzaniga's theory (1989) proposes that people with a disrupted function of the anterior commissure are unable to experience emotion, whereas they may have access to an accompanying cognition in the course of time. This conclusion was based on an experience with a female patient whose corpus callosum and anterior commissure were disrupted. This patient responded to emotional stimuli which were presented to the left visual field by giggling. When researchers asked her why she was giggling she answered: "That is a funny machine". She meant the machine that was monitoring her at the moment. It is important to note that such an answer appears only with people whose corpus callosum is disrupted. This finding posed a problem in relation to prior research on emotional experience. Even though the finding was based on objective indicators, researchers concluded that this patient's performance should be interpreted as behavior resulting from an unknown cause, instead of a disruption of transfer between hemispheres. The reason for this lies in experiments in which individuals with a disrupted corpus callosum did not have any difficulties in processing emotional stimuli that were presented to their left visual field, i.e. processed by the right hemisphere. This phenomenon was explained as follows: cognitive components are realized in the left hemisphere directly through the corpus callosum, whereas emotional components go first to the limbic system and later on they reach the left hemisphere through the anterior commissure. These results show that people are able to experience emotions even if their anterior commissure is disrupted.

### 2.6 Right hemisphere and alexithymia

The relationship between alexithymia and the right hemisphere was examined by Ross and Rusch (1981). This research was concerned with patients with a unilateral lesion directly in the right hemisphere cortex. These patients showed symptoms of depression, such as lack of appetite, insomnia, irritability, social avoidance, etc. According to the Dexamethasone Suppression Test, their plasma cortisol level was not suppressive, which often appears with depressive disorders. Nonetheless, these patients claimed they were well and felt all right. All of the symptoms mentioned above, excluding lack of emotional interest, disappeared after antidepressants had been administered. The authors suggested that these patients were unable to describe their own emotional reactions; however, they could describe emotional responses of other people. Their existing emotional reactions before their lesions occurred showed that alexithymic features were not caused by motor or cognitive inabilities.

Research on absence of emotions in cases of a right hemisphere injury concluded that 30% of such patients showed emotional numbness (Gainotti, 1972). Thus right hemisphere injury may result in the development of alexithymia. Wechsler (1973) states that patients with a unilateral lesion of the right hemisphere have problems with emotion-based memory information; however, they do not have any problems with neutral information. Wechsler (1973) explains that physical sensations, like electric discharges, pain, swelling, abnormal tingling or numbness, might be induced upon patients with a lesion of the right hemisphere cortex. Due to these sensations, such patients may be diagnosed as suffering from a hypochondriac disorder. This is the reason why alexithymic patients are supposed to suffer from hypochondriac disorders. In this respect to the alexithymia issue, it was finally concluded that these patients sometimes respond by means of emotional expression without the presence of affect (Krystal, 1988).

### 2.7 Anterior cingulum and alexithymia

As early as in 1937 Papez stated that the anterior cingulate cortex (ACC) takes part in the regulation of emotions, i.e., emotions are related to this structure. The cingulate cortex also helps to process attention, pain, maternal behavior, skeletal motor functions, etc. It can be divided into dorsal and rostral parts, the former being cognitive and the latter being affective. The rostral affective part of the cingulum is emotional, whereas the dorsal cognitive part is not primarily intended for emotional processing, even though it is influenced by the rostral part. From this point of view, alexithymia might be understood as a deficit in intentional emotional experience connected with a concomitant autonomous activation, which can be mediated by a functional disruption of afferent interceptive emotional information in the ACC. In connection with this, alexithymia may also be seen as an emotional equivalent to blindsight. Blindsight is a phenomenon that is connected with a lesion of the primary visual area V1 (such patients claim that they do not see, even though it is proven that they visually perceive; thus, they are not able to realize that they can see). Gündel et al. (2004) claim that alexithymia correlates with the extent of the right anterior cingulum.

### 2.8 Frontal cortex and alexithymia

A theory of emotions developed by Damasio (1994) divides emotions into primary and secondary ones. In this conceptualization, the primary emotions cover manifestations of the basic emotions, such as fear, happiness, disgust, anger, etc. The primary emotions are ensured by the limbic system and gyrus cinguli. The secondary emotions develop as mental representations of the primary ones, i.e. pre-frontal systems play an important role during their development.

Difficulties in emotions might be observed both on 1) the primary emotion level, when the limbic system is obviously damaged, leading to emotional numbness, and 2) the secondary emotion level, i.e. in the pre-frontal system, when patients have difficulties in expressing and processing their feelings. This conceptualization suggests that alexithymia is a deficit in the secondary emotions, i.e. the ability to realize representations of the primary emotions. Various research studies have been carried out on the frontal cortex, some of which will be mentioned here. Hornak et al. (1996) gave an account of patients with lesions in the pre-frontal cortex who described difficulties in experiencing emotions compared to their premorbid state. Aftanas, Varlamov, Reva, and Pavlov (2003) studied the pre-frontal cortex in connection with alexithymia by means of ERP (Event Related Potential). The results of measurements showed a dysregulation in the assessment of emotional stimuli among alexithymic patients. Similarly, Kano et al. (2003), by means of PET, emphasized that alexithymic patients showed lower activation in the right pre-frontal cortex when responding to emotional stimuli in comparison with a control group. Much has been achieved in regard to the alexithymia – pre-frontal cortex relation; nevertheless, the results are still disputable and do not bring a clear answer about the etiology of alexithymia.

### 2.9 Neurochemical interpretations of alexithymia: Dopamine theory and alexithymia

Neurochemical interpretations prevailingly concentrate on dopamine as it is related to psychic difficulties. As a result, it is assumed that alexithymia is connected to functional limitations of dopamine. This assumption is supported by various evidence. For instance, most nerve structures that mediate and strengthen instrumental brain activity are innervated by dopaminergic fibers. Dopaminergic fibers are also very important to the medial frontal brain, which has a crucial emotional regulatory function. Further, treatment by means of 6-OHDA (6-hydroxydopamine, which results in dopamine cell damage) or dopamine receptor inhibitors (alfaflupentixole) lead to genital response decrease in both men and women.

The nucleus accumbens provides yet another point of view. It is thought to play an important role in the reward system. During

presentation of sexual stimuli, dopamine increases in this part of the mesolimbic system, so dopamine also plays an important role in sexual motivation regulation. De Bruin (1990) argues that dopamine projects into the pre-frontal and orbitofrontal cortex and is slightly represented in the dorsal lateral cortex. In the case of a lesion in the orbitofrontal cortex area, emotional expression changes, provided that 6-OHDA is applied and dopamine cells in the ventral tegment are damaged. In conclusion, the dopamine cells in the ventral tegment and the dopamine receptors in the orbitofrontal cortex participate in emotion regulation.

### 3 Conclusion

This literature review has aimed to describe various approaches to understanding the borderline psychosomatic concept of alexithymia. Due to lack of space, we realize that a number of interesting psychological concepts could not be mentioned. The etiology of alexithymia remains unclear, and research results have still not provided a complex explanation for this phenomenon. In our opinion, traditional psychodynamic theories suggest a variety of possible connections between early parent-child relations and the potential development of alexithymia. However, they do not contain a theoretical description of neuropsychological mechanisms causing the development of alexithymia. Contemporary neuropsychological approaches focus on possible alternatives to the development of alexithymia, from the view of structural and functional aspects of the human brain. However, there is no connection with human development of relationships. In our opinion, the connection of the traditional psychodynamic approach with the contemporary neuroscientific research is crucial and provides a platform for further research in the area of alexithymia.

Research on stress and its effects on personality formation in various stages of human development may provide an important link. From the neuroscientific point of view, there is great potential in research on the pre-frontal cortex and its connection to an individual's social experience. A complex platform where both important theories can meet has still not been found. This is an important direction for further research in this area.

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**Primary Paper Section: A**

**Secondary Paper Section: AN, FL**