

Emotion Word Use in Schizophrenia

How emotion words can inform our understanding of clinical symptoms

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ABSTRACT

Schizophrenia is a complex chronic mental disorder and is characterized by disturbances in thought, perception, and behavior. Patients suffer from severe symptoms which can be classified in positive symptoms and negative symptoms, ultimately leading to deficiencies in language and emotion perception, emotion processing and emotion expression. From previous studies, researchers were able to conclude that clinical symptoms in schizophrenia find their reflection in language. In this sense, the aim of this paper is to investigate symptoms, outcomes of previous research on the link between language, emotion, and schizophrenia to see what the link between clinical symptoms and emotion word use of patients looks like. After discussing previous literature on these topics, I present two examples of the untypical emotion word use in patients and combine these insights with the emotion processing model by Vingerhoets et al. (2000). Due to the model's focus on the role of neurological, psychosocial and situational factors, I will be able to illustrate the influence of clinical symptoms of schizophrenia on general emotion processing further. In the future, this line of research could improve our understanding of schizophrenia by gaining further insight into characteristic features of language of patients.

1. Introduction

Language itself can be defined as one of our primary means of communication which makes it possible for humans to express their emotions in a very unique way. While the vast complexity of human language offers many advantages, it also creates countless vulnerabilities for disturbances, such as hearing impediments, speech disorders or mental illnesses (Deutsch-Link, 2016). One particular mental illness, namely schizophrenia, has been shown to produce many different deficits in language. Patients with schizophrenia suffer from various language and emotion centered impairments, including a deficit in judging emotional states or expressing emotions themselves. However, previous studies have majorly focused on investigating emotion perception, expression, and processing within this patient group (Cramer et al, 1989; Hong et al. (2015); Kohler et al. (2000)). The use of emotion words has not been investigated much. Emotion words can generally be defined as words used by the speaker to describe emotional states, such as anger, disgust or joy. This is surprising since recent findings suggest that specific language factors,

such as complexity of speech, speech rate, and use of particular word categories, like emotion words, could potentially be indicators of clinical components of mental illnesses (Cohen et al., 2009).

Linking this information to the assumption that typical clinical symptoms in schizophrenia have a reflection in language, would indicate that there is a possibility that one could uncover the underlying basic symptoms through language impairments (Obrębska & Obrębski, 2007). However, language impairments have to be thoroughly investigated themselves and are often not easy to diagnose. Consequently, the aim of this paper is to provide insight into whether emotion word use can be utilized as a fast and reliable method of scanning speech to identify major symptoms in schizophrenia. This would combine the clinical and linguistic point of view, which are often described as entirely separate paradigms. In order to do so, I want to gather information on general clinical symptoms of schizophrenia, outcomes of previous research on the link between language impairment, emotion and schizophrenia, and emotion word use to answer the following research question:

What does the link between clinical symptoms of schizophrenia and the emotion word use of patients look like?

To answer this research question, I want to first discuss the necessary aspects for an official diagnosis of schizophrenia (2.1) before looking at existing literature on emotions in patients with schizophrenia (2.2). In section 3, these investigations will be combined to answer the research question of the paper by looking at some exemplary clinical symptoms and how they could be reflected in the emotion word use of patients. The examples will then be further analyzed and put into context using an adapted version of the emotion processing model by Vingerhoets et al. (2000). The last section concludes the paper and lists possible limitations of emotion word research in schizophrenia and gives outlook for further research.

2. Schizophrenia

2.1. Diagnosis

According to the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-V), schizophrenia is defined as a chronic mental disorder characterized by disturbances in thought, perception and behavior, which affects approximately 7 out of 1000 people (American Psychiatric Association, 2013). It is a syndrome, which means that there is a cluster of different symptoms associated with it and different patients might experience different symptoms. These symptoms are immensely diverse and are most often categorized in two different sets: positive symptoms and negative symptoms (Kay et al., 1987).

As noted by Obrębska & Obrębski (2007), positive symptoms typically add a feature to a patient which is normally not experienced by healthy individuals. In addition, positive symptoms respond well to medication. In this sense, they add something to normal behavior. Examples for positive symptoms in schizophrenia are psychotic

symptoms like delusions, which are defined as false beliefs that a person might feel very strongly about, or hallucinations, which refer to things that a person senses but are not real. In contrast, negative symptoms are deficits or lack of normal behavior. As such, negative symptoms include, for instance, poverty of speech, low emotional expressiveness, or anhedonia, which is the inability to experience pleasure or avolition, which is defined as a decrease in emotion.

In general, the DSM-V notes that people with schizophrenia seem to go through three phases, typically in order. During the first phase, which is called the prodromal phase, people seem to be withdrawn which is often compared to depression disorder (American Psychiatric Association, 2013). During the second phase, the active phase, patients experience more severe symptoms. Finally, they enter the third phase, which is called residual phase, which involves cognitive symptoms, like not being able to concentrate. Afterwards, they enter the prodromal phase once again and the cycle starts over.

Taking all of this into account, for an official diagnosis of schizophrenia, patients have to have at least one positive symptom out of delusions, hallucinations or disorganized speech and at least either disorganized behavior or negative symptoms (American Psychiatric Association, 2013). So, they could not just experience disorganized behavior and negative symptoms but need an additional positive symptom. Although some people suffer from cognitive symptoms as well, they are not specifically needed for a diagnosis. In addition, signs of these disturbances have to be ongoing for at least 6 months, so they will be in one of the three phases for a minimum of that time. However, there has to be at least one month of the active phase, in which symptoms are the most apparent. Finally, those symptoms cannot be attributed to other conditions, such as substance abuse.

When looking at language impairment in schizophrenia, the paper by Deutsch-Link (2016) summarizes crucial information on linguistic perspectives in language production in schizophrenia. While phonology, morphology, and syntax seem to remain intact, the lexicon, semantics and pragmatics show signs of impairment. Looking at the vocabulary of patients with schizophrenia, she reports that poverty of speech and a reduction in content of speech are noticeable. This shows, for instance, in a tendency to replace words they might have difficulties with by creating new words, such as *handshoe* as a literal replacement for the word *glove*. Moreover, the semantic disruption becomes visible through a loss of meaning of utterances or dysfunctional use of words, where words seem to be stuck together without meaning or relation to one another. Lastly, an impairment in pragmatics manifests itself in an overall tendency of speech to take a long and complicated path to get to a point instead of taking the more obvious and direct route, as well as by a tendency to deviate from the topic of discussion completely.

2.2. Emotions in Schizophrenia

The processing of emotion is a crucial part of successful social interactions throughout life. Researchers argue that emotions develop over time and serve a variety of inter- and intrapersonal functions, such as helping us recognize and assess critical situations, strengthening relationships or making important decisions (Kring & Elis, 2013). However, schizophrenia often interferes with and disrupts these emotion-centered functions, which ultimately influences many different areas of life. Considering this major effect of emotion deficits in schizophrenia, it is not surprising that deficiencies in emotion areas have been observed since the earliest descriptions of the illness (Bleuler, 1911). Since then, many studies provide evidence for patients suffering from an array of language and emotion-centered impairments.

One field of emotion deficits in schizophrenia is emotion perception, which refers to the ability to correctly identify emotions in other individuals or stimuli in general. Cramer et al. (1989) found that patients inaccurately judge emotions conveyed in a particular scene compared to the interpretations of healthy individuals. These findings are confirmed by the research of Yildirim et al. (2018), who studied the relationship between perception and thought disturbances in schizophrenia. They found that patients with schizophrenia display deficits in recognizing happy, sad, fear, anger, and neutral facial emotions compared to a healthy control group.

Another field of emotion-centered deficits in schizophrenia is emotion processing and emotion expression, which relates to an impaired displaying of emotions across different areas of the individual, like in their faces, voices or bodies. The study by Kohler et al. (2000) examined the emotion processing deficit in schizophrenia and confirms that there is a relation between neurocognitive performance and the severity of symptoms of patients with schizophrenia. In particular, the researchers found a significant correlation between an emotion processing deficit and the negative symptom of alogia, or poverty of speech, and the positive symptoms of hallucinations and thought disorder. Another study focusing on the differences in speech in schizophrenia and healthy controls was conducted by Hong et al. (2015). The researchers analyzed narratives in which participants had to describe past experiences, which evoked one of the five basic emotions out of happiness, sadness, anger, fear and disgust. Their results showed that narratives of happy, sad, and anger emotions depict the most differences between the two groups. However, the study only included a very small sample size.

Although, as mentioned in the introduction, research has illustrated that different language factors, including emotion words, can indeed be used to analyze clinical symptoms, only a very limited number of studies on schizophrenia has focused on word use of patients so far. In the study by Obrębska & Obrębski (2007), the researchers examined patients with positive and negative types of schizophrenia. In the experiment itself, patients were asked to describe different pictures which illustrated different emotional scenarios. The lexical analysis of the answers reveals that patients with positive symptoms produced longer sentences than patients with

negative symptoms or healthy controls. Furthermore, there is a difference in use of different word classes, such as pronouns, showing that patients with positive symptoms use the personal pronoun *I* in speech more often. The utterances by patients with negative symptoms are further less lexically abstract and shorter overall in length.

Linking the relation between emotions and word categories and how they are used in schizophrenia, the study by Minor et al. (2015) provides some insight. The researchers conducted a lexical analysis of semi-structured interviews with schizophrenic patients on their lives and illness. The analysis indeed confirmed the hypothesis that clinical variables can be predicted by different word categories.

One of the only studies actually investigating emotion word use of patients was performed by St-Hilaire et al. (2008). The study aimed to verify whether there is a relation between the use of emotion words during free speech and the actual emotional experience of patients. However, they could not find a difference in the number of emotion words used between patients with schizophrenia and a healthy control group. Nevertheless, it should be highlighted that the tasks in their experiments did not elicit emotional responses or memories, so only a very limited number of emotion words were used by the participants. This can be regarded as a significant limitation of this study and its results.

3. Emotion Words in Schizophrenia

After looking at clinical diagnostics of schizophrenia and establishing an understanding of what emotion and language related deficits generally look like in this chronic mental illness, it becomes evident that so far there are no studies directly investigating whether there is a clear link between emotion word use and typical symptoms in schizophrenia. Nevertheless, since there appears to be a clear link between emotion and schizophrenia, I want to use these insights to answer the research question of what the association between emotion word use and symptoms in schizophrenia could look like. In order to do so, I want to briefly describe emotion word use and how it is already used in a clinical context before combining the information in this paper to discuss some examples and how they can be linked to an emotion processing model.

Generally speaking, the expression and use of emotion words can convey information about the emotional and physical state of the speaker but also provide information about the relation between the speaker and the listener (Cohen et al., 2009). Therefore, it can be said that analyzing the use of emotion words can lead to interesting findings and information on a wide range of topics including psychopathological problems. In fact, the use of emotion words is already used in clinical environments, for instance, in researching the benefits of trauma resolution by writing or talking about upsetting experiences which ultimately leads to improvement in theoretical and practical therapy setting (Pennebaker, 1992). In order to analyze the speech of patients, researchers have opted to use lexical analysis. This method

appears to be very suitable for disorders which involve language impairments, such as schizophrenia (Cohen et al., 2009). The lexical analysis of utterances of patients with schizophrenia can be regarded as a convenient and immediate method of scanning the patient's speech to identify major symptoms of schizophrenia which might otherwise go undetected during assessment or would take longer to be recognized (Minor et al., 2015). Since emotion words are already being used in other clinical conditions, I want to provide some examples on what the emotion word use could look like in two exemplary symptoms.

Firstly, a common positive symptom in schizophrenia is experiencing delusions. Delusions are, among other things, defined as an "overrepresentation of abstract and metaphysical termini or verbal abuse of death, power and hostility themes" (Obrębska & Obrębski, 2007, p. 65). When considering the five basic emotions of joy, fear, anger, disgust, and sadness, the aforementioned themes can easily be put into relation to the category of anger emotion words. This would mean that the speech of a patient suffering from this positive symptom and the language and emotion deficits associated with it, will likely be represented by an overuse of emotion words belonging to the anger category when, for instance, asked to talk about an emotional experience. This observation would likely be increased even more when the emotional experience is based on or evokes anger emotions.

As for negative symptoms, an example is anhedonia, which is defined as the inability to experience pleasure, and has been a prominent personality trait in individuals with negative schizophrenia (Cohen et al., 2009). In this example, it can be expected that patients with anhedonia will show an increase in using emotion words which describe negative feelings, such as sadness or fear, while discussing or recalling pleasurable memories, since their ability to recall happy memories or experience positive emotions is impaired.

To illustrate further what the emotion processing deficit in schizophrenia looks like, I want to introduce the model by Vingerhoets et al. (2000), which has been adapted to represent general emotion processing. It focuses on the role of neurological, psychosocial and situational factors in emotion processing.

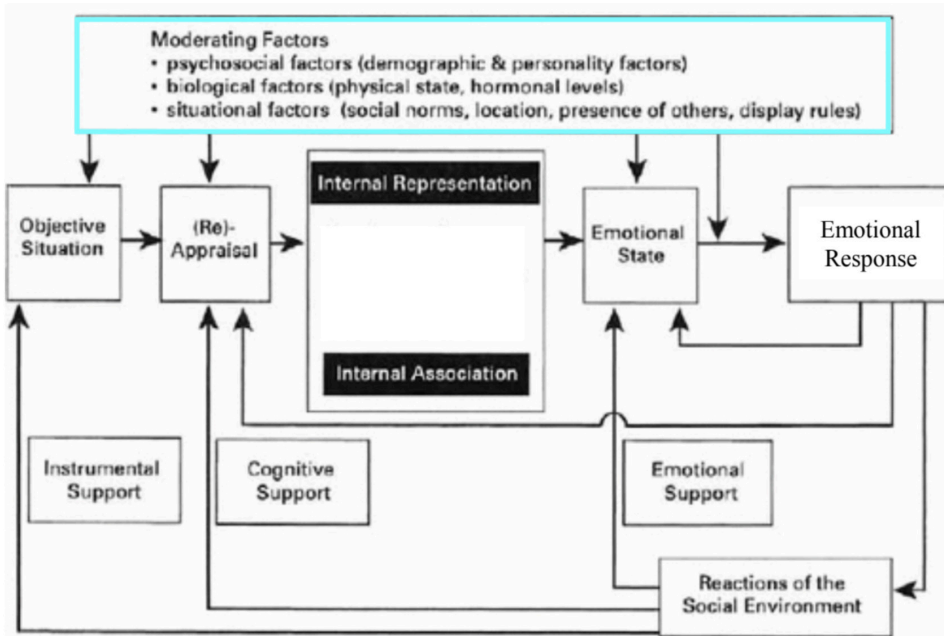


Figure 1. The adapted Model of Adult Crying by Vingerhoets et al. (2000).

In this model, emotion processing commences with an objective situation which is being appraised. Appraisal in this sense refers to the judgement of the experiencer on whether the given situation is personally relevant (Vingerhoets et al., 2000). The model also highlights the connection between appraisal and moderating factors, namely psychological, biological, and situational factors. If the situation is deemed relevant, appraisal sets emotion programs into motion which are being evaluated within the context of internal associations. Different emotions are generally differentiated by the various types of appraisal. For instance, a dangerous situation might induce fear while losing a loved one evokes feelings of sadness. However, the same emotions can be initiated by different appraisals. Moreover, these emotion programs are collections of responses based on previous experiences and they can be altered by biological or social factors, as well as physiological aspects. In this sense, emotional responses can be modified by being exaggerated, diminished or even inhibited before they are even expressed.

The model exemplifies that emotional responses strongly interact with the environment and the individual, which can lead to an unexpected or untypical emotional response. This becomes especially important when looking at individuals with schizophrenia. The various symptoms which are associated with schizophrenia alter the emotional responses of patients in different ways. Considering the examples introduced in this section, delusions could, for instance, exaggerate the feelings of hostility towards a certain stimulus which would alter the emotional response and lead to the increased use of anger-centered words. Similarly, anhe-

donia will act as an altering factor by modifying the emotional responses in a way that positive emotions as a reaction towards positive situations or memories are being inhibited or even diminished completely or altered in a way that only negative responses are being considered by the patient. The alteration of memories has been investigated by results in cognitive neuroscience by Kring & Elis (2013). Their study revealed that healthy individuals typically anticipate the future and how to emotionally react towards certain situations by relying on information from past experiences. However, research suggests that patients with schizophrenia have difficulties holding on to emotional experiences from the past and, therefore, have a hard time when developing emotional reactions. This would further serve as an added level of explanation for the modification of emotional responses in schizophrenia.

4. Conclusion

Many studies show that positive and negative symptoms as opposite ends of the continuum of clinical symptoms in schizophrenia are related to language impairment but, so far, no uniform way to easily identify these issues has been found. This paper showed that emotion word use can add another layer to existing methods by using lexical analysis to deepen our understanding of how language differences between patients and healthy individuals reflect the experiences of people with schizophrenia. Consequently, the very complex diagnosis of schizophrenia could be made more accessible. While emotion word use might not be a suitable lexical category to identify every possible symptom, it can surely be used for some manifestations in schizophrenia which have a heavy relation to language and emotion expression, as illustrated in the examples of delusions and anhedonia in the previous section. Emotion words could also be combined with other word categories, such as pronouns, for a lexical analysis which is fitting for more complex symptoms or to further distinguish between negative and positive symptoms. In the future, emotion word use could further be helpful in finding an answer to the question when exactly emotion deficits emerge. Research has not yet been able to show whether emotion impairment in schizophrenia is a consequence of the mental illness itself or whether it was priory already present. A couple of studies, like the research by Kring & Elis (2023), have looked into people with early signs of schizophrenia before the emergence, which is typically between ages 18 to 25. The early signs often include milder forms of the typical symptoms, such as hallucination or delusions. Emotion word use would be an easy way to analyze speech of people who show signs of schizophrenia to establish a kind of 'early-warning system'.

Although emotion words could inform our understanding of schizophrenia, there also appear to be limitations and difficulties to the use of emotion words, some of which I quickly want to mention. Firstly, many symptoms appear to have no clear relation to emotion word use. One example would be disorganized speech which is a typical positive symptom of schizophrenia and signals that an individual has trouble following a logical train of thought which manifests in the way they speak.

Although this symptom will clearly be visible in the language of a patient, it does not have an obvious relation to emotion word use. As a second confounding factor, the line between the different emotion categories is not always clear-cut. Some emotion words might belong to multiple categories or the interpretation depends on the speech context which makes the speech analysis more complex. Thirdly, the nature of schizophrenia itself poses problems to conducting consistent and reliable research outcomes. Depending on which phase the patient is in during the conduction of the study, the severity of symptoms can vary greatly. Also, different medications, which are primarily used to treat positive symptoms, can influence the responses of patients. Overall, this means that future research has to find solutions to some crucial limitations in emotion centered studies, such as establishing a standardized measure of emotion and consistent stimuli or even relying on the same diagnostic criteria. If researchers succeed in describing the features of language of patients with schizophrenia by focusing on emotion word use in the future, clinical personnel would gain a new and useful diagnostic tool and patients would get the chance of rapid and professional help. ■

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