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Subclinical negative symptoms and the anticipation, experience and recall of emotions related to social interactions: An experimental study

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ABSTRACT

Healthy individuals use anticipated and recalled emotions to guide their decisions to seek out social interactions. It is unknown whether individuals with negative symptoms of schizophrenia, who are commonly observed to socially withdraw, show a bias in anticipation and recall of emotions related to a social interaction. To close this knowledge gap, this study examines whether higher levels of subclinical negative symptoms are associated with less positive and more negative anticipated and recalled emotions related to a social interaction. In a mixed model design participants were instructed to either predict or to experience and then recall emotions related to a simulated social inclusion- or exclusion-interaction. Disregarding the type of situation, participants with higher levels of subclinical negative symptoms anticipated more intense fear than participants with lower levels of subclinical negative symptoms. Divided by type of situation, however, participants with higher levels of negative symptoms experienced and recalled more sadness related to being socially included and even recalled more positive emotions after being excluded. These specific associations are likely to reflect negative expectations about potentially rewarding social situations in people with negative symptoms. A replication in populations with clinically relevant negative symptoms and inclusion of measures to assess memory is warranted.

1. Introduction

Negative symptoms play a central role in the impairment of social functioning in individuals diagnosed with schizophrenia (Bellack et al., 1990). Individuals with schizophrenia have fewer social contacts than their healthy peers (Hamilton et al., 1989; Harley et al., 2012) and their social network decreases even further during the course of the disorder (Salokangas, 1997; Goldberg et al., 2003). Diminished social interactions have been described as asociality whereas the extent to which individuals with schizophrenia initiate or are motivated to seek out social activity has been described as avolition (Blanchard et al., 2011b). Both of these phenomena are conceptualized as negative symptomatology (Blanchard et al., 2011b). Studies exploring the nature of impaired social functioning in schizophrenia and negative symptoms have so far focused on social skills (Halford and Hayes, 1995), social cognition (Lincoln et al., 2011), neurocognitive deficits (Green et al., 2000) and defeatist beliefs (Grant and Beck, 2009; Couture et al., 2011). More recently, research has also highlighted that the way in which individuals with schizophrenia process and regulate their emotions has a substantial influence on their social functioning (e.g., Hooker and Park, 2002; Aghveli et al., 2003; Kimhy et al., 2012).

Emotions provide information about the significance of a social situation and guide the potential actions to be taken (Barrett et al., 2001; for a review see: DeWall et al., 2015). Wilson and Gilbert (2003) suggested that in healthy individuals many action-related decisions are based on anticipation ("How will I feel in the future?") or recall ("How did I feel in the past during similar acts or events?") of emotional experiences. In line with this assumption, they found anticipated and recalled emotions to be associated with the motivation to seek out a social interaction (Wilson and Gilbert, 2003). Thus, the decision to interact socially seems to require individuals to anticipate emotions they are likely to experience or to consider recalled emotions.

Whereas direct emotional experience seems to be intact in people diagnosed with schizophrenia (e.g., Gard and Kring, 2009; Oorschot et al., 2013), anticipation and recall of emotions seem to be impaired (for a review see: Kring and Elis, 2013). Several studies using a self-report measure, the Temporal Experience of Pleasure Scale (Gard et al., 2006) have indicated that patients with negative symptoms are less likely to anticipate positive emotions than healthy individuals (e.g., Gard et al., 2007; Favrod et al., 2009; Chan et al., 2010). Even healthy individuals who are prone to

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negative symptoms reported a diminished ability to anticipate pleasure (Engel et al., 2013). It also needs to be noted that one large study found no differences between patients with negative symptoms and healthy controls in self-reported anticipatory pleasure (Strauss et al., 2011) and that contradictory findings were also reported in studies that used the experience sampling method (Gard et al., 2014) or evocative tasks (Trémeau et al., 2014). Furthermore, the focus of existing studies has been on the anticipation of positive emotions and we are not aware of any study that has investigated situations likely to elicit anticipation of negative emotions.

With regard to recall of emotions, several studies found patients with schizophrenia to be more likely to forget positive than negative stimuli (Calev and Edelist, 1993; Herbener et al., 2007). Herbener et al. (2007) suggested that this might be due to impairments in memory consolidation processes for positive, but not for negative emotional stimuli that contribute to anhedonia or amotivation. However, only one study has examined how patients with schizophrenia recall their own emotional experience (Horan et al., 2006). This particular study found that patients with schizophrenia did not differ significantly from controls in recall of their pleasant emotional experience four hours after exposure to pleasant stimuli. Notably, the same patients recalled significantly higher levels of unpleasant emotions after their exposure to pleasant stimuli but this was not significantly associated with negative symptoms. So far, no study has examined the link between negative symptoms and recall of emotions in response to unpleasant evocative stimuli.

Moreover, it has remained unclear from existing studies whether the difficulties to anticipate and recall emotions in patients with negative symptoms also apply to emotions related to social interactions. This is a relevant question because a decreased likelihood to anticipate and recall positive emotions related to social interactions, combined with an increased likelihood to anticipate and recall negative emotions is likely to reduce a patients' motivation to seek out social interactions in the future.

This study thus examines the link between overall negative symptoms and the anticipation and recall of positive and negative emotions in a sample of healthy individuals with subclinical negative symptoms. Research in individuals with subclinical negative symptoms is necessary to enhance our understanding of the psychological processes involved in negative symptoms in schizophrenia. This approach is justified by the fact that lower negative symptoms have been used as low-level criterion in high-risk studies (Yung et al., 2003; Lencz et al., 2004; Piskulic et al., 2012) and by the evidence for a continuity of negative symptoms (for a review see: Kaiser et al., 2011). Furthermore, in individuals at increased risk of psychosis, progressive decrease in social interactions has been found to be related to negative symptoms (Corcoran et al., 2011).

We hypothesized that subclinical negative symptoms will be related to the anticipation and recall of emotions that arise in a situation of social inclusion and exclusion, but will not be related to the direct experience of emotions. Specifically, we hypothesized that participants with higher levels of subclinical negative symptoms will show:

- less intense positive emotions in anticipation of a social interaction,
- more intense negative emotions in anticipation of a social interaction,
- similar intense positive and negative emotions in direct experience of a social interaction,
- less intense positive emotions related to recalling a social interaction, and
- more intense negative emotions related to recalling a social interaction

than participants with lower levels of negative symptoms.

Social experiences can be positive (i.e. receiving positive attention, being included in a group) or negative (i.e. being criticized, being excluded). In order to elicit positive and negative emotional experience, we used the well-established Cyberball paradigm (Williams and Zadro, 2005) that enabled us to simulate two controlled social interactions (social inclusion and social exclusion). This allowed us to explore the differential effect of the social interaction type on anticipation, experience and recall, although we did not have specific hypotheses on that.

2. Method

2.1. Participants

The sample consisted of 74 healthy psychology students from the University of Hamburg who volunteered to take part in the experiment in return for partial fulfillment of a curriculum requirement. All participants were 18 years or older. Exclusion criteria were a present or past mental disorder and a family history of schizophrenia as assessed with four questions (i.e. "Do you currently have or have had a mental health problem?", "If yes, what kind of mental health problem?", "Is there anybody in your family who currently has or has had a mental health problem?", "If yes, what kind of mental health problem?") before the assessment started.

2.2. Procedure and design

The experimental procedure is depicted in Fig. 1. Participants were informed that the study aimed to investigate the effects of mental visualization during an online game on performances in various tasks. After written informed consent and the assessment of subclinical symptoms with the Community Assessment of Psychic Experiences (CAPE; Stefanis et al., 2002), participants were

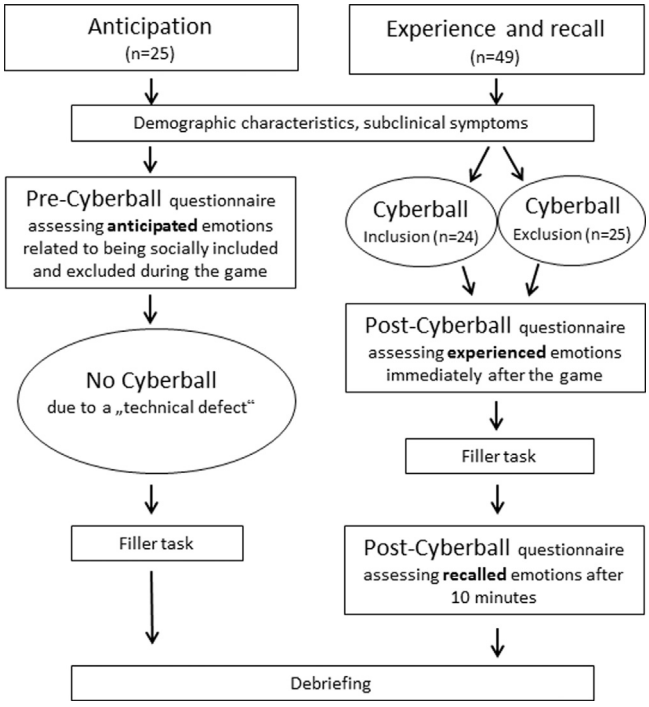

Fig. 1. Experimental procedure. Cyberball paradigm by Williams and Zadro (2005).