Chapter 3
Dissociation and social cognition in schizophrenia spectrum disorder

3.1. Abstract

While there is emerging evidence that dissociation is linked with trauma history and possibly symptoms in schizophrenia, it remains unclear whether dissociation represents a symptom dimensions in its own right in schizophrenia and as such is uniquely related to other features of illness. To explore this issue the current study sought to find out whether dissociation was uniquely related to an index of social cognition closely linked to social functioning, namely affect recognition. We hypothesized that dissociation would be linked with affect recognition because symptoms of dissociation may uniquely disrupt processes which are expected to be needed for correctly recognizing emotions. The sample contained 49 participants diagnosed with a schizophrenia spectrum disorder who were in a non-acute phase of disorder. Participants were concurrently administered the Bell–Lysaker Emotion Recognition Task, the Dissociative Experiences Scale, the Post Traumatic Stress Disorder Checklist and the Positive and Negative Symptoms Scale. Stepwise linear regression analyses were performed in which dissociative symptoms were forced to enter after the other symptoms in order to predict deficits in affect recognition. These analyses revealed that greater levels of dissociative symptoms predicted poorer recognition of negative emotions over and above that of positive, negative, cognitive and PTSD symptoms. Results are consistent with the possibility that dissociation represents a unique dimension of psychopathology in schizophrenia which may be linked to function.
3.2 Introduction

Generally the symptoms most often considered in schizophrenia include positive, negative and disorganization (Green & Nuechterlein, 1999). However, schizophrenia as originally described by Bleuler (1911) also involved a range of other symptoms. He, for example, described elements of the self which are intact but dissociated from one another.

Single emotionally charged ideas or drives attain a certain degree of autonomy so that the personality falls into pieces. These fragments can then exist side by side and alternately dominate the main part of the personality, the conscious part of the patient. (Bleuler, 1911, p. 143)

Bleuler, thus, seems to find elements which are consistent with how the DSM-IV-TR (American Psychiatric Association, 2000) characterizes dissociation, that is, as involving problems with integrating emotions, memories and sensations into consciousness.

The study of dissociation gained momentum around the end of the 19th century, due largely to the work of Pierre Janet (1889). After much neglect, researchers again started examining dissociation, also as an element of schizophrenia, in the later part of the 20th century. Bernstein and Putnam (1986), for instance found that persons with schizophrenia report experiencing dissociation 19% more frequently than persons not suffering from schizophrenia. Others also noted high levels of dissociation among persons with schizophrenia and especially those with past experiences of trauma (Holowka et al., 2003; Lysaker et al., 2008; Ross & Keyes, 2004). Vogel et al. (2009) found a relationship between dissociation and level of concurrent schizophrenia symptoms, but not with trauma. Schäfer et al. (2012) found that during the acute phase of schizophrenia, positive symptoms were the strongest predictor of dissociation whilst in a post-acute phase it was childhood sexual abuse. Relatedly, Longden et al. (2012) argued that hearing voices is best understood as a form of dissociation, rather than a psychotic phenomenon.

While there is emerging evidence of a link between dissociation, trauma and possibly symptoms in schizophrenia, as well as symptoms of other disorders (van der Hart, Nijenhuis, & Steele, 2006), it remains unclear whether dissociation represents a symptom dimensions in its own right. One piece of evidence that could point to the importance of dissociation is a unique relationship with core aspects of functioning. The detection of such a relationship may be important as it may point to the need for more careful assessments of dissociation among schizophrenia patients as well as interventions focused on this form of psychopathology.

To explore this issue the current study sought to discover whether dissociation was uniquely related to an index of social cognition closely linked to social functioning, namely affect...
recognition. Social cognition is an umbrella term that includes abilities necessary for successfully understanding social exchanges and includes the concepts: affect recognition, theory of mind, social knowledge and social rules (Couture, Penn, & Roberts, 2006). Multiple studies demonstrated that people with schizophrenia show impairments in social cognition (Horan et al., 2009; Pijnenborg, Witbaar, van den Bosch, & Brouwer, 2007; Sparks, McDonald, Lino, O’Donnell, & Green, 2010; van ’t Wout et al., 2007). Deficits in social cognition are furthermore relatively stable over time in patients with schizophrenia (Lysaker, Olesek, et al., 2011) and linked with deficits in social functioning in daily life (Kee, Green, Mintz, & Brekke, 2003; Malone, Carroll, & Murphy, 2012; Pijnenborg et al., 2009).

We anticipated that dissociation would be related to impaired affect recognition, for several reasons. Affect recognition is the ability to interpret what emotion another person is experiencing on the basis of verbal and non-verbal cues. It requires numerous processes, of which, at least two might be disrupted in the face of dissociation. First, recognizing emotions in other people often requires the use of knowledge of one’s own emotional states. Specifically persons often use their own emotional experiences for understanding those of others (Giancarlo Dimaggio, Lysaker, Carcione, Nicolò, & Semerari, 2008; Ridout, Thom, & Wallis, 2010). As a lack of integration of one’s own emotional states is a central element of dissociation (American Psychiatric Association, 2000) persons with dissociation may lack the needed access to their own emotions in order to perceive those of others. Consistent with this is a recent study which found that poor affect recognition in schizophrenia was linked with an inability to distinguish one’s own emotions and a history of sexual trauma (Lysaker, Gumley, et al., 2011). A second process which helps persons recognize the emotions is metacognitive awareness of one’s own bodily response to the other (Damasio, Everitt, Bishop, & Damasio, 1996). For instance, knowing that one feels afraid versus relaxed in the presence of another may be a cue regarding the emotional state of that other person. Again, a key feature of dissociation is having feelings of being out of touch with bodily experience, and as such it may be linked with poor affect recognition. Furthermore, if dissociation is indeed a result of interpersonal trauma, negative emotional expressions might naturally trigger trauma-memories leading to disruptions in swift and accurate mindreading (Bateman & Fonagy, 2012; Liotti & Prunetti, 2010).

To test the hypothesis that dissociation is linked with poorer affect recognition we administered assessments of dissociative experiences and affect recognition to adults in a non-acute phase of schizophrenia. To ensure that findings were not an artifact of other core symptoms of schizophrenia, PTSD or socially desirable responding, we also assessed positive, negative and
cognitive symptoms of schizophrenia, PTSD symptoms, trauma history and the tendency to report what is viewed as socially desirable. Of note, given a range of work suggesting dissociation is a means of protecting oneself from disturbing emotions (Bowins, 2004; Oathes & Ray, 2008), we also hypothesized that dissociation would be a stronger predictor of deficits in the recognition of negative emotions as opposed to positive emotions.

3.3 Methods

3.3.1 Participants

Forty-nine participants with a confirmed DSM-IV diagnosis of schizophrenia or schizoaffective disorder as diagnosed with the Structured Clinical Interview for DSM-IV Disorders (SCID) were enrolled in the study. The participants were recruited from an outpatient psychiatry service at a Veterans Affairs Medical Center. All participants were in a post-acute phase of illness as defined by having no hospitalizations or changes in medication or housing in the month before entering this study. Patients with mental retardation or active substance dependence were excluded from the study. There were 45 male and 4 female participants in the sample, their average age was 51.82 years old ($SD = 9.75$) and on average they had 13 years of education ($SD = 2.05$). The mean amount of lifetime psychiatric hospitalizations was 4.57 ($SD = 4.38$) and the average age at the first hospitalization was 31.53 years old ($SD = 13.05$).

3.3.2 Instruments

3.3.2.1 The Bell–Lysaker Emotion Recognition Test

The Bell Lysaker Emotional Recognition Test (BLERT; Bell, Bryson, & Lysaker, 1997) uses voice and facial cues to measure emotion recognition. During the BLERT the participant watches 21 video-clips, each 10 seconds long. The participant is asked what emotion is expressed in each of these video-clips. The task measures the percentage of positive and negative emotions the participant recognizes correctly. The negative emotions are sadness, anger, fear and disgust while the positive emotions are happiness and surprise. Furthermore the task differentiates between “easy” and “hard” video-clips. This distinction is based upon the performance of a control group without schizophrenia who had more or less difficulty recognizing.
3.3.2.2 Dissociative Experiences Scale
The Dissociative Experiences Scale (DES, Carlson & Putnam, 1993) is a self-report tool for measuring the frequency of dissociative experiences. The DES was developed as a screening tool and contains 28 dissociative experiences that respondents may or may not have had in daily life. The respondent is asked to state how often they had each ranging from 0% to 100% of the time. The DES has three subscales: amnestic dissociation (e.g. finding new things among your belongings which you don't remember buying), experiences of depersonalization (e.g. feeling that your body doesn't belong to you) and derealization, and absorption and imaginative involvement (e.g. being in a familiar place but finding it strange and unfamiliar).

3.3.2.3 Marlowe–Crowne Social Desirability Scale
The Marlowe–Crowne Social Desirability Scale (MCSDS; Crowne & Marlowe, 1960) is a self-report measure which assesses the tendency of persons to report experiences in order to appear in a culturally desirable way. The MCSDS has 33 statements on which the participants have to say if it applies to themselves.

3.3.2.4 Post-Traumatic Stress Disorder Checklist
The Post Traumatic Stress Disorder Checklist (PCL-S; Weathers, Litz, Herman, Huska, & Keane, 1993) is a self-report of PTSD symptoms. The PCL-S contains seventeen items asking to what extent the participant experiences symptoms of PTSD. For the purposes of this study we utilized the sum of these seventeen items. This questionnaire included a list of traumatic experiences and the participants are asked whether they have ever experienced each of them. This gave a second variable, namely the sum of the traumatic experiences.

3.3.2.5 Positive and Negative Syndrome Scale
The Positive and Negative Syndrome Scale (PANSS; Kay, Fiszbein, & Opfer, 1987) was used to measure positive, negative and cognitive symptoms. The PANSS is a 30 item rating scale based on chart review and a semi-structured interview. It is widely used for assessing the wide range of symptoms in schizophrenia. The PANSS has several subscales, in this study only the positive, negative and cognitive symptoms subscales are used (Lindenmayer, Grochowski, & Hyman, 1995). The inter-rater reliability on the PANSS subscales was between 0.90 and 0.93.
3.3.3 Procedure
All procedures were approved by the Roudebush Veterans Affairs Medical Center review committee and informed consents were signed by all participants. First the diagnosis of schizophrenia or schizoaffective disorder was confirmed through the SCID-1. The data was collected as part of a larger longitudinal study on work rehabilitation. The PANSS interview was taken by clinically trained research assistants who were also available for questions participants had about the questionnaires.

3.3.4 Analyses
The data was analyzed with Predictive analytics software (PASW, formerly known as SPSS) version 18. First the relationship between dissociation and social cognition was analyzed through a stepwise linear regression analysis. To make sure that the possible effects of dissociation were not the result of schizophrenia's core symptoms, trauma history, PTSD symptoms or social desirability, these control variables were forced into the analyses before dissociation. The second step was to examine whether there were significant differences in performance between the positive and negative and easy and hard emotion recognition subscales by two paired samples' t-tests. Lastly the underlying relationships between the different dissociation subscales and the emotion recognition subscales were analyzed in four separate stepwise linear regression analyses. In these analyses the dissociation subscales were forced to enter the equation after the control variables.

3.4 Results
Table 3.1 shows the means and standard deviations of the different variables that were measured. On average the sample reported experiencing feelings of dissociation 29% of the time ($SD = 19.71$), which is similar to the original report of (Bernstein & Putnam, 1986). The table also shows that on average the emotions were recognized correctly in 62% of the video-clips ($SD = 18.72$).

The first step of the data analysis was a stepwise linear regression analysis to see if dissociation predicted affect recognition as measured by the BLERT total score over and above the core symptoms of schizophrenia as measured by the PANSS, trauma history, PTSD symptoms and social desirability. For this purpose the PANSS subscales, trauma history PTSD symptoms and social desirability were forced first into the model and the DES total was
Table 3.1
Means and standard deviations of the different variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissociation (DES)</td>
<td>28.83</td>
<td>19.71</td>
</tr>
<tr>
<td>Emotion recognition (BLERT)</td>
<td>61.52</td>
<td>18.72</td>
</tr>
<tr>
<td>Positive symptoms (PANSS)</td>
<td>17.90</td>
<td>5.09</td>
</tr>
<tr>
<td>Negative symptoms (PANSS)</td>
<td>19.39</td>
<td>4.75</td>
</tr>
<tr>
<td>Cognitive Symptoms (PANSS)</td>
<td>16.71</td>
<td>3.90</td>
</tr>
<tr>
<td>PTSD (PCL-S)</td>
<td>43.00</td>
<td>12.78</td>
</tr>
<tr>
<td>Trauma (PCL-S)</td>
<td>6.59</td>
<td>3.31</td>
</tr>
<tr>
<td>Social desirability (MCSDS)</td>
<td>18.39</td>
<td>5.91</td>
</tr>
</tbody>
</table>

entered last. This revealed that trauma history, PTSD symptoms and social desirability were not significantly related to emotion recognition. The only PANSS subscale that was significantly related was the cognitive symptoms subscale ($t = -3.39; p = 0.001$). After controlling for all these variables the DES total score still predicted a significant amount of variance in emotion recognition ($t = -3.32; p = 0.002$).

Because previous research has shown that people with schizophrenia are particularly bad at recognizing negative emotions and that certain emotions were more easily recognized by controls without psychosis (Bell et al., 1997), we checked if these differences were also seen in this sample. We found that the difference between the percentages of correctly recognized negative emotions (53%) and correctly recognized positive emotions (77%) was significant (95% CI of the difference = 18.76; 30.22). We also found that compared with the easy video clips (58.97%), the hard video-clips (65.05%) were recognized significantly better (95% CI of the difference = 1.18; 11.18).

Finally four separate stepwise linear regression analyses were computed with the BLERT subscales as dependent variables. In the first step of every analysis the social desirability measurement, the trauma history, PTSD symptoms and PANSS subscales were entered. In the second step the DES subscales were entered. As revealed in Table 3.2, recognition of video-clips defined as “hard” was predicted by the PANSS cognitive scale (95% CI = −3.72; −1.41), amnestic dissociation (95% CI = −1.85; −0.61) and absorption and imaginative involvement (95% CI = 0.08; 1.17). Calculation of $R^2$ shows that these three variables together predicted 50% of the variance in this subscale of emotion recognition. The PANSS cognitive subscale alone predicted 17% of the variance; the DES subscales added the other 33%. Contrasting this finding is the result that none of the entered variables significantly predicted emotion recognition in the “easy” video-clips. As is also revealed in Table 3.2, recognition of negative
emotions was predicted by the MCSDS (95% CI = −2.06; −0.29), the PANSS cognitive symptoms scale (95% CI = −3.08; −0.42) and amnestic dissociation (95% CI = −0.66; −0.12). Together these three variables predict 30% of the variance, where 13% of the variance is explained by amnestic dissociation. A forward linear regression model showed that amnestic dissociation was the strongest predictor of difficulties recognizing negative emotions. The computed model revealed that an increase of 10% in amnestic dissociation predicted a decrease of 4% in recognition of negative emotions. Finally, as shown in Table 3.2, positive emotion recognition was only significantly predicted by PTSD symptom total score (95% CI = −17.95; −2.81). PTSD symptoms predicted 14% of the variance in positive emotion recognition.

### 3.5 Discussion

This study sought to examine whether dissociation is uniquely linked with affect recognition, an element of social cognition. As was hypothesized, dissociation was related to affect recognition even after controlling for positive, negative and cognitive symptoms, PTSD and social desirability. Dissociation uniquely contributed to predicting the recognition of negative emotions.印刷品に適した形式で示すため、下記の表を示す。

**Table 3.2**
Regression analyses.

<table>
<thead>
<tr>
<th>Dependent</th>
<th>Predictor</th>
<th>B</th>
<th>t</th>
<th>p</th>
<th>95% CI Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLERT</td>
<td>Constant</td>
<td>104.01</td>
<td>10.53</td>
<td>&lt;0.001</td>
<td>84.13</td>
<td>123.89</td>
</tr>
<tr>
<td>Positive</td>
<td>PTSD symptoms</td>
<td>−0.62</td>
<td>−2.83</td>
<td>0.007</td>
<td>−1.07</td>
<td>−0.18</td>
</tr>
<tr>
<td>BLERT</td>
<td>Constant</td>
<td>113.44</td>
<td>7.74</td>
<td>&lt;0.001</td>
<td>83.93</td>
<td>142.95</td>
</tr>
<tr>
<td>Negative</td>
<td>Cognitive symptoms</td>
<td>−1.75</td>
<td>−2.64</td>
<td>0.011</td>
<td>−3.08</td>
<td>−0.42</td>
</tr>
<tr>
<td></td>
<td>Social desirability</td>
<td>−1.18</td>
<td>−2.68</td>
<td>0.010</td>
<td>−2.06</td>
<td>−0.29</td>
</tr>
<tr>
<td></td>
<td>Amnestic symptoms</td>
<td>−0.39</td>
<td>−2.89</td>
<td>0.006</td>
<td>−0.66</td>
<td>−0.12</td>
</tr>
<tr>
<td>BLERT</td>
<td>Constant</td>
<td>118.09</td>
<td>10.88</td>
<td>&lt;0.001</td>
<td>96.23</td>
<td>139.94</td>
</tr>
<tr>
<td>Easy</td>
<td>Cognitive symptoms</td>
<td>−2.57</td>
<td>−4.47</td>
<td>&lt;0.001</td>
<td>−3.72</td>
<td>−1.41</td>
</tr>
<tr>
<td></td>
<td>Amnestic symptoms</td>
<td>−1.23</td>
<td>−4.00</td>
<td>&lt;0.001</td>
<td>−1.85</td>
<td>−0.61</td>
</tr>
<tr>
<td></td>
<td>Absorption</td>
<td>0.63</td>
<td>2.29</td>
<td>0.027</td>
<td>0.08</td>
<td>1.17</td>
</tr>
</tbody>
</table>
emotions. In fact, dissociation was the strongest predictor of emotion recognition when a forward linear regression was performed instead of the stepwise method. It was also revealed that dissociation had a strong relationship with emotion recognition in the video-clips that were harder to recognize for the controls without psychosis in the Bell et al. (1997) study.

While the study design precludes the drawing of causal conclusions, results may suggest hypotheses for future study. In particular, one interpretation of these findings is that greater levels of dissociation interfere directly with the capacity for affect recognition. It is possible that difficulties with integrating one’s own emotions and being in touch with one’s bodily experiences render the emotional experience of others more opaque. Again, these interpretations are speculative at best and rival hypothesis that difficulties in emotion recognition might lead to dissociation, or the possibility that these results were caused by other variables not assessed here, cannot be ruled out.

Interestingly, our findings replicate Bell et al. (1997) that people with schizophrenia perform significantly worse on the video-clips on which the people without psychosis performed significantly better. A possible explanation of this finding is that there are factors that make the emotions in these video-clips easier to recognize for the normal population, but people with schizophrenia do not benefit from these cues. This study also replicated the result that people diagnosed with schizophrenia are worse at recognizing negative emotions than positive ones. Another possibility is that negative emotions are experienced as especially adverse to survivors of trauma and as such are more difficult to recognize when they arise.

It was unexpected that no significant relationship was found between dissociation and emotion recognition in the video-clips that the non-psychosis group in Bell et al. (1997) performed better on. If the previously mentioned cues in these video-clips are unrelated to dissociation this could explain these findings. The result might however also be the result of having a limited sample size. The significant effect of social desirability was unexpected but indicates that people who tend to give socially desirable answers misrecognize more negative emotions. One possibility is that people with greater needs for social desirability have the feeling that seeing negative emotions in uncertainty is undesirable, leading to biased answers.

There are some limitations to this study. In the regression analysis of “hard” video clips the regression weights of dissociative symptoms could not be interpreted separately because these subscales are strongly related with each other. Furthermore, generalizability is limited by the sample composition which included mostly males who were entering rehabilitation and who had experienced schizophrenia for many years. Further work is needed to determine if the
same relationships among the variables will be found among other populations. We additionally included only a single assessment of emotion recognition and no other elements of social cognition or metacognition were measured. More work is planned in the future looking at the links of dissociation with other forms of social cognition including theory of mind and elements of metacognition including self-reflectivity. Because dissociation is by definition a disruption in conscious awareness, and the DES as a self-report is limited by requiring a certain amount of conscious awareness, it would be interesting to use lab tasks to measure dissociation in future research. Finally PTSD symptoms and trauma were assessed with self-reports and more work is needed which includes interview assessments of these phenomenon.

Future longitudinal studies are needed to examine whether the relationships found here extend over time and whether dissociation indeed plays a causal role in impaired affect recognition. Future research is also needed to explore what information people with and without schizophrenia spectrum disorder use to decide what emotion is shown. This might also explain why there was no relation between dissociation and emotion recognition for the video-clips nonpsychotic controls found easier to recognize. To test whether these finding are specific to schizophrenia or are a trans-diagnostic process it will be important to look at samples with other forms of mental disorders. With replication there may be clinical implications. In particular it may be that if treatments including psychotherapy may assist persons with schizophrenia who are experiencing dissociation to become more aware of their own emotions and bodily experiences (e.g. Lysaker, Buck, & Hammoud, 2007; Stanghellini & Lysaker, 2007) then they may be better able to regain lost or atrophied capacities for social cognition.