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Unique and Overlapping Symptoms in Schizophrenia Spectrum and Dissociative Disorders in Relation to Models of Psychopathology: A Systematic Review

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Schizophrenia spectrum disorders (SSDs) and dissociative disorders (DDs) are described in the fifth edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-5) and tenth edition of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) as 2 categorically distinct diagnostic categories. However, several studies indicate high levels of co-occurrence between these diagnostic groups, which might be explained by overlapping symptoms. The aim of this systematic review is to provide a comprehensive overview of the research concerning overlap and differences in symptoms between schizophrenia spectrum and DDs. For this purpose the PubMed, PsycINFO, and Web of Science databases were searched for relevant literature. The literature contained a large body of evidence showing the presence of symptoms of dissociation in SSDs. Although there are quantitative differences between diagnoses, overlapping symptoms are not limited to certain domains of dissociation, nor to nonpathological forms of dissociation. In addition, dissociation seems to be related to a history of trauma in SSDs, as is also seen in DDs. There is also evidence showing that positive and negative symptoms typically associated with schizophrenia may be present in DD. Implications of these results are discussed with regard to different models of psychopathology and clinical practice.

Key words: schizotypy/psychosis/trauma/phenomenology/differential diagnosis

Introduction

Schizophrenia spectrum disorders (SSDs) and dissociative disorders (DDs) are described as 2 distinct

diagnostic categories in the fifth edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-5¹) and the tenth edition of the International Statistical Classification of Diseases and Related Health Problems (ICD-10²). These distinct diagnoses are a reflection of categorical models of psychopathology.³ Both manuals characterize SSDs by positive symptoms (eg, hallucinations), negative symptoms (eg, alexithymia), catatonia, and disorganization. DDs are characterized by dissociation, which is described as a disruption in the usually integrated functions of consciousness, memory, identity, or perception.¹ Pathological dissociation is often seen as a reaction to trauma and has been described broadly to include depersonalization (feeling detached from oneself) and absorption (being absorbed in your own mental imagery) but also more narrowly as fragmentation of the identity.⁴

The distinction between SSDs and DDs was weaker in the past.⁵ Bleuler⁶ described schizophrenia originally as a disorder in which “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.”^(p143) This description is similar to contemporary descriptions of DDs.⁷ In addition, Bleuler’s rudimentary form of dissociation known as splitting of associations is theoretically close to the modern concept of synthetic metacognition (ie, the ability to synthesize intentions, thoughts, and feelings into complex representations of self), which is impaired in schizophrenia.⁸ The first 2 versions of the DSM still had a link between SSDs and dissociation. The DSM-I⁹ stated that schizophrenic reactions can lead to dissociative phenomena^(p27) and the DSM-II¹⁰ associated “dreamlike

dissociation” with acute schizophrenic episodes^(p34). Furthermore, up until the mid-20th century depersonalization was important in the diagnosis of schizophrenia,¹¹ but is now seen as a dissociative symptom.

A big change came with the DSM-III,¹² which was developed after diagnoses were found to be unreliable due to unclear diagnostic criteria.^{13,14} The goal of the DSM-III was to remedy this problem by emphasizing reliability.¹⁵ One of the changes was that the DSM-III contained a new diagnostic category: the DDs. At the same time the connection between SSDs and dissociation disappeared completely. No changes were made in the DSM-IV and DSM-5 in this regard.

Given the strong focus on classification of psychopathology into DSM categories, the possibility of an overlap between these diagnoses has mostly been neglected. Traditionally, research on SSDs has focused more on biological factors, whereas research on DDs has focused more on life experiences (eg, trauma¹⁶). These different perspectives date back to Pierre Janet¹⁷ and Emil Kraepelin¹⁸; while Janet emphasized the role of trauma in dissociation, Kraepelin emphasized the role of biological factors in dementia praecox (later coined schizophrenia⁶).

Despite the different theoretical underpinnings between DDs and SSDs, several studies have found surprisingly high co-occurrence of these diagnoses (not to be confused with true comorbidity^{19,20}). While some studies showed no co-occurrence of SSDs and DDs,²¹ others showed that between 9% and 50% of schizophrenia spectrum patients also meet diagnostic criteria for a DD.^{22–24} One study showed that in a sample of patients diagnosed with Dissociative Identity Disorder (DID) 74.3% also met diagnostic criteria of a SSD, 49.5% met diagnostic criteria for schizoaffective disorder, and 18.7% met diagnostic criteria for schizophrenia.²⁵ In addition, patients with a DD have often had a previous diagnosis of a SSD (between 27% and 41%).²⁶ This co-occurrence is surprisingly high considering the much lower occurrence of the individual diagnoses.²⁷

A question that arises from the shared history and high co-occurrence is whether the categorical distinction between SSDs and DDs is clinically and scientifically the most useful approach. This is an important question since many studies base their inclusion criteria on these classifications and the type of healthcare someone will receive is based on these classifications.¹⁵ Although co-occurrence is seen in many diagnoses, this issue is especially relevant for DDs and SSDs because of their shared history. Furthermore, their treatment of choice differs strongly, with a focus on psychotherapy for DDs and on pharmacotherapy for SSDs.^{28,29} Moreover, treating DDs with antipsychotic medication is usually ineffective²⁹ while psychotic symptoms in DDs decrease with DD treatment.³⁰

In the predominantly categorical approach of the DSM-5, a diagnosis is considered to reflect an underlying disease entity.³¹ As an alternative, the dimensional model states that symptoms are best conceptualized on a spectrum ranging

from healthy to pathological,^{3,32} and are thus, to a certain extent, also found in healthy controls and patients with other diagnoses. Within this model, co-occurrence is less surprising as diagnoses do not necessarily reflect underlying disease entities but simply combinations of pathological experiences occurring together. Co-occurrence would then reflect 2 (or more) combinations of pathological experiences occurring together instead of 2 or more disease entities occurring together (ie, comorbidity).

The high co-occurrence between SSDs and DDs might be further explained by the network structure model of psychopathology.³³ The network structure model states that psychopathological symptoms can cause other symptoms. For example, anxiety can cause sleep problems, which can lead to fatigue, which in turn can increase anxiety and cause feelings of depression.³⁴ In this view a diagnosis does not necessarily reflect a disease entity but rather a network of interacting symptoms. Other factors, such as personality traits and the environment also influence these networks. These networks might be different for different individuals with the same symptoms. Combining the dimensional model with the network structure of psychopathology leads to the prediction that having problems in 1 domain (eg, dissociation) can cause problems in another domain (eg, psychotic symptoms). For example, it has been suggested that dissociative detachment can lead to impaired reality testing, which in turn can cause psychotic symptoms.³⁵

If symptoms can cause other symptoms, the co-occurrence between SSDs and DDs might be best examined on a symptom level. Accordingly, several studies have examined the symptoms of these diagnoses (eg, Renard et al³⁶, O’Driscoll et al³⁷). The aim of the current review is to combine the results of these studies, and give an overview of the extent to which the diagnostic symptoms are unique to one of the 2 diagnoses. Although the diagnoses might differ in other ways, this review focusses on the DSM-5 symptoms because the diagnoses are based on the prevalence of these symptoms. In addition, although there is still some debate on the magnitude,^{38,39} trauma is generally considered to play a role in the etiology of both DDs⁴⁰ and SSDs.⁴¹ Therefore, we will explore the role of trauma in relation to symptoms. In the discussion the results we will be related to the different models of psychopathology.

Methods

The criteria for systematic reviews as described in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement⁴² were followed for this study. The PubMed, PsycINFO, and Web of Science databases were searched for literature published between 1980 and March 8, 2016. We limited our search to literature published after 1980, as this was when the DSM-III was published describing SSDs and DDs as 2 distinct diagnostic categories. The search was limited to records in English.

The following Boolean search term was used: “(“dissociative disorder” AND (psychosis OR psychotic OR schizotyp* OR hallucinations OR delusions OR “negative symptoms” OR alexithymia OR catatoni* or disorganiz*)) OR (schizophrenia AND (dissocia* OR depersonalization OR derealization)) OR (psychosis AND (dissocia* OR depersonalization OR derealization)) OR (psychotic AND (dissocia* OR depersonalization OR derealization))”.

Figure 1 shows the inclusion process through a flow chart. To be included in this review, records had to meet the following criteria: (1) describe a unique empirical study in (2) a sample of adult patients with a DSM or ICD confirmed diagnosis of SSD or DD on (3) symptoms the DSM-5 associates with DDs or SSDs, respectively. Most of the records that were excluded based on topic were found because “dissociation” was used to describe things not being connected instead of as a symptom. Records excluded based on type were, eg, review articles, case reports, and book chapters. Records excluded based on sample did not examine a DD or SSD sample. Other reasons were, eg, using the same dataset as another study or not reporting descriptive statistics. The references of identified articles were examined in order to identify studies that were not found in the original database search.

Results

Symptoms of Dissociation in SSDs

Several studies examined symptoms of dissociation in schizophrenia spectrum patients through the Dissociative Experiences Scale (DES⁴³), which is the most commonly used instrument for measuring dissociation. The questionnaire contains 28 items describing dissociative experiences. The respondent is asked to state how often they had each

experience ranging from 0% to 100% of the time, resulting in mean scores ranging from 0 to 100. Mean scores for healthy controls ranged between 4.38⁴³ and 14.86⁴⁴, whereas mean scores of patients with a DD ranged between 24.9 for depersonalization disorder⁴⁵ and 57.06 for multiple personality disorder (the term used for DID in DSM-III).⁴³

The prevalence of dissociation in patients with a SSD as measured through the DES is shown in table 1. Most studies found that schizophrenia spectrum patients score significantly higher on dissociation than healthy controls, with mean scores of patients ranging from 11.9 to 44.24.^{46,47} The pooled mean dissociation scores were calculated from the studies that provided means, SD, and sample sizes (see table 1). Schizophrenia spectrum patients had a pooled mean score of 19.66 and healthy controls of 7.63. The difference between these groups showed a large effect size (Cohen's $d = 1.04$; pooled SD = 11.48). No significant differences were found between schizophrenia spectrum patients and healthy adolescents^{43,48,49} which is explained by healthy adolescents having more dissociative experiences than healthy controls in general.^{43,48,50} Moreover, schizophrenia spectrum patients scored significantly lower than DD patients.^{43,48} Elevated dissociation scores were also found in schizophrenia spectrum patients using the State Scale of Dissociation,⁵¹ the Questionnaire of Experiences of Dissociation,⁵² the Dissociation Tension Scale,⁵³ and the Cambridge Depersonalization Scale.⁵⁴⁻⁵⁷

The DES is often divided in the following 3 subscales (for a discussion, see Giesbrecht et al⁸⁵): amnesia (eg, finding things among your belongings you don't remember buying), depersonalization and derealization (eg, looking in the mirror and not recognizing yourself), and absorption and imaginative involvement (eg, being so involved

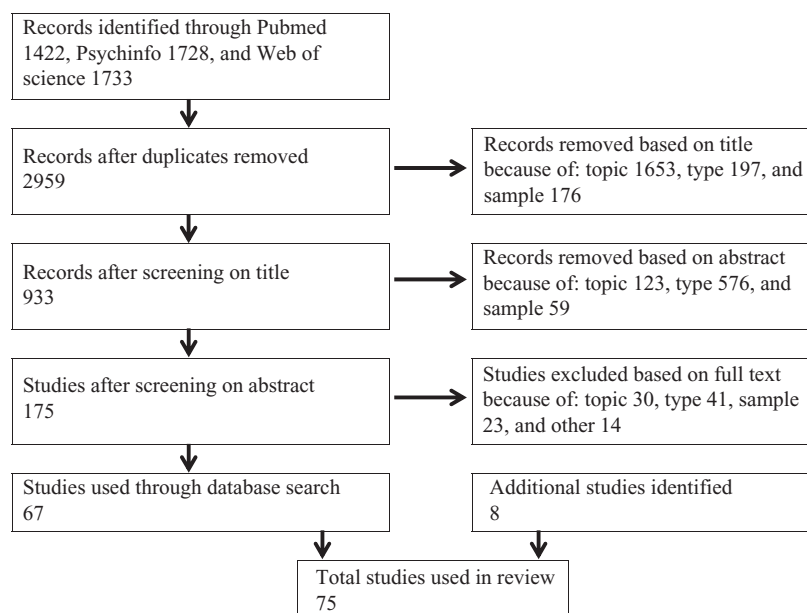


Fig. 1. Flow diagram of systematic search.

Table 1. Dissociative Symptoms in Schizophrenia Spectrum Disorders as Measured With the DES

Study	Sample	<i>n</i>	DES Mean (SD)
Bernstein and Putnam ⁴³	Schizophrenia ^b	20	20.63 ^c (NA)
Ross et al ^{58a}	Schizophrenia ^b	20	17.1 (15.3)
Fink and Golinkoff ⁵⁹	Schizophrenia ^b	11	12.6 (NA)
Goff et al ^{47a}	Psychotic outpatients ^b	61	44.24 (30.53)
Goff et al ^{60a}	Psychotic outpatients ^b	61	15.82 (14.16)
Horen et al ^{61a}	Schizophrenia ^c	19	20.4 (19.6)
Yargic et al ⁶²	Schizophrenia ^b	23	11.61 ^c (NA)
Putnam et al ^{48a}	Schizophrenia ^b	65	17.6 (16.0)
Moise and Lechner ²³	Schizophrenia ^c	53	18.7 (NA)
Spitzer et al ^{63a}	Schizophrenia ^d	27	15.8 (10.5)
Yargic et al ^{64a}	Schizophrenia ^c	20	15.6 (2.7)
Offen et al ^{65a}	Schizophrenia spectrum ^c	36	25.2 (14.6)
Offen et al ^{66a}	Schizophrenia spectrum ^c	26	23.1 (16.6)
Welburn et al ⁶⁷	Schizophrenia ^c	9	17.98 (NA)
Brunner et al ^{49a}	Schizophrenia spectrum ^d	26	14 (10.6)
Ross and Keyes ²⁴	Schizophrenia ^c	60	18.94 (NA)
Dorahy et al ^{68a}	Schizophrenia spectrum ^c	9	22.7 (13.8)
Merckelbach et al ^{69a}	Schizophrenia ^c	22	21.5 (16.5)
Hlastala and McClellan ^{70a}	Schizophrenia ^c	27	26.9 (21.5)
Bob et al ^{71a}	Schizophrenia ^c	82	15.7 (8.5)
Schäfer et al ^{46a}	Schizophrenia spectrum ^c	30	
	Admission		21.0 (17.7)
	Stabilized		11.9 (9.9)
Vogel et al ^{72a}	Schizophrenia ^c	87	14.73 (12.87)
Modestin et al ^{73a}	Schizophrenia spectrum ^d	43	9.9 (6.8)
Perona-Garcelán et al ⁷⁴	Schizophrenia ^c	51	17.01 (NA)
Dorahy et al ^{75a}	Schizophrenia ^c	34	21.54 (16.11) ^f
Vogel et al ^{76a}	Schizophrenia spectrum ^c	80	16.76 (12.44)
Sar et al ^{77a}	Schizophrenia ^c	70	18.1 (16.6)
Bob et al ^{78a}	Schizophrenia ^c	58	14.21 (11.17)
Perona-Garcelan et al ^{79a}	Schizophrenia spectrum ^c	37	19.00 (13.38)
Schäfer et al ^{80a}	Schizophrenia spectrum ^d	145	
	Admission		19.2 (15.0)
	Stabilized		14.1 (12.0)
Varese et al ^{44a}	Schizophrenia spectrum ^c	45	30.81 (12.52)
Renard et al ^{36a}	Schizophrenia spectrum ^c	49	28.83 (19.71)
Perona-Garcelán et al ^{56a}	Schizophrenia spectrum ^c	71	18.7 (13.42)
Pec et al ⁸¹	Schizophrenia ^c	31	13.7 (NA)
Laferriere-Simard et al ^{82a}	Schizophrenia spectrum ^c	50	18.12 (12.68)
Bozkurt Zincir et al ^{83a}	Schizophrenia spectrum ^c	54	23.35 (23.7)
Tschoeke et al ^{21a}	Schizophrenia ^c	21	19.9 (17.8)
Oh et al ⁸⁴	Schizophrenia ^c	68	17.0 (NA) ^f

Note: DES, Dissociative Experiences Scale; NA, not reported in paper.

^aUsed to calculate pooled mean: $M_p = 19.66$, $SD_p = 14.12$, total $n = 1375$.

^bDiagnosis according to the Diagnostic and Statistical Manual of Mental Disorders, third edition.

^cDiagnosis according to the Diagnostic and Statistical Manual of Mental Disorders, fourth edition.

^dDiagnosis according to the International Statistical Classification of Diseases and Related Health Problems, tenth edition.

^eMedian score.

^fScore according to DES-T.

in a fantasy or daydream that it feels as though it were really happening).⁸⁶ In addition, 8 items of the DES are thought to assess pathological dissociation; these items form the dissociative taxon (DES-T) and are thought to better predict DDs than the traditional DES.⁸⁶ Table 2 shows the results of studies examining the different symptom clusters of dissociation. While symptoms of dissociation in schizophrenia are not limited to 1 aspect of dissociation, absorption, and imaginative involvement

are more prevalent than amnesia, and depersonalization/derealization.^{23,46,74,80} In addition, schizophrenia spectrum patients scored significantly lower than DID patients on the DES-T,⁷⁵ but still higher than healthy controls.^{69,75,80} Pathological levels of dissociation have also been found in schizophrenia spectrum patients through using the Structured Clinical Interview for DSM-IV Dissociative Disorders (SCID-D⁸⁷). Patients diagnosed with a SSD showed pathological levels of dissociative amnesia (34%),

Table 2. Mean (SD) Scores on Symptom Clusters of Dissociation in Schizophrenia Spectrum Disorder

Study	<i>n</i>	Symptom Cluster	Mean (SD)		
Moise and Leichner ²³	53	DES			
		Amnesia	5.7 (NA)		
		Absorption	15.7 (NA)		
Schäfer et al ⁴⁶	30	DES	Admission	Stabilized	
		Amnesia	13.2 (15.0)	5.8 (7.9)	
		Absorption	25.6 (21.5)	15.3 (10.6)	
		Depersonalization	24.7 (25.3)	13.3 (15.2)	
Schäfer et al ⁸⁰	145	DES	Admission	Stabilized	
		Amnesia	13.3 (14.5)	8.9 (11.0)	
		Absorption	25.2 (16.6)	19.2 (14.2)	
		Depersonalization	18.1 (18.3)	13.3 (14.6)	
Perona-Garcelán et al ⁷⁴	68	DES	With Hallucinations	Former Hallucinations	No Hallucinations
		Amnesia	17.13 (NA)	9.93 (NA)	5.97 (NA)
		Absorption	35.87 (NA)	24.86 (NA)	14.98 (NA)
		Depersonalization	36.24 (NA)	6.45 (NA)	1.75 (NA)
Haugen and Castillo ²²	50	SCID-D	Pathological levels in:		
		Amnesia	34%		
		Depersonalization	48%		
		Derealization	22%		
		Identity confusion	46%		
		Identity alteration	56%		

Note: DES, Dissociative Experiences Scale⁴³; NA, not reported in paper; SCID-D, Structured Clinical interview for DSM-IV Dissociative Disorders.⁸⁸

depersonalization (48%), derealization (22%), identity confusion (46%), and identity alteration (56%).²²

Two studies compared dissociative symptoms of patients with a SSD at admission with patients in the stable phase (see table 2).^{46,80} Dissociation scores at admission were similar to other studies in schizophrenia spectrum patients. However, total scores, subscale scores, and DES-T scores were significantly lower after patients were considered stable, suggesting that dissociation was associated with acute psychotic symptoms.⁸⁰ In addition, no significant difference was found on DES scores between healthy controls and individuals diagnosed with a SSD in remission.⁷³

Several studies examined to what extent dissociation is seen in different subgroups of SSD patients (see table 3). For example, chronic schizophrenia spectrum patients scored higher on dissociation than first episode patients.⁸⁹ Furthermore, individuals with a diagnosis of psychosis not otherwise specified experienced more dissociation than individuals diagnosed with schizophrenia or schizoaffective disorder.⁹⁰ In addition, as confirmed by a recent meta-analysis,⁹¹ there seems to be a robust relationship between auditory verbal hallucinations and dissociation.^{24,44,63,80,92-94} Although weaker than the relationship with hallucinations, there also seems to be a relationship between dissociation and delusions.^{47,63,79,95,96} Only 1 study found that patients scoring high on dissociation also scored higher on negative symptoms and general symptoms of psychopathology as assessed with the positive and negative syndrome scale (PANSS⁹⁷).⁷⁶

Dissociation in Relation to Trauma

Schizophrenia spectrum patients with a self-reported history of trauma experience more dissociation than those without a self-reported history of trauma ($M_p = 19.75$ and $M_p = 13.29$, respectively, Cohen's $d = 0.49$, see table 4).^{60,75} These findings were confirmed with objective assessments of trauma history by examining patients who had been exposed to "The Troubles" in Ireland.⁹⁹ Patients with more than 1 trauma experience more dissociation than those with only 1 trauma, indicating a cumulative effect.¹⁰⁰ In addition, schizophrenia patients scoring high on dissociation report significantly more trauma than those scoring low on dissociation.^{24,77,92} Both schizophrenia patients with and without trauma scored significantly higher on dissociation than healthy controls.⁷²

Dissociation seems to be related to childhood trauma and not adult trauma in SSDs.⁷⁹ However, the results are mixed with regard to different types of childhood trauma. One study found that dissociation is only related to childhood physical neglect,⁷⁶ while others have also found relations with emotional abuse,^{46,102} physical abuse,¹⁰² and sexual abuse.⁸⁰ Finally, 2 studies were found which did not find a relationship between trauma and dissociation in SSDs.^{93,95}

Symptoms of Schizophrenia in DDs

There has been relatively little research on symptoms of schizophrenia in DDs compared to the research done on dissociation in SSDs. Furthermore, interpreting the

Table 3. Dissociation in Different Subgroups of Patients Diagnosed With a Schizophrenia Spectrum Disorder

Study	Sample	<i>n</i>	DES Mean (SD)
Goff et al ⁴⁷	Psychotic outpatients ^a		
	With delusions of possession	25	58.4 (47.2)
McClellan and McCurry ⁹⁰	Without delusions of possession	36	34.4 (32.7)
	Schizophrenia ^b	18	26.4 (21.0)
	Schizoaffective ^b	7	18.4 (18.4)
	Psychosis NOS ^b	11	41.2 (12.6)
Glaslova et al ⁹⁸	Schizophrenia ^a		
	Without atypical psychotic symptoms		26.9 (21.5)
Perona-Garcelán et al ⁷⁴	With atypical psychotic symptoms		34.9 (19.4)
	Schizophrenia ^b		
	With hallucinations	17	27.5 (NA)
	Past hallucinations	16	14.65 (NA)
Perona-Garcelan et al ⁷⁹	No hallucinations	18	9.19 (NA)
	Schizophrenia spectrum ^a	37	
	With delusions		22.28 (15.94)
Varese et al ⁴⁴	Without delusions		11.22 (9.88)
	Schizophrenia spectrum ^b		
	With hallucinations	15	42.59 (11.03)
	Past hallucinations	14	26.06 (10.90)
Braehler et al ⁸⁹	No hallucinations	16	23.93 (14.93)
	Schizophrenia spectrum ^b		
	First episode	62	13.01 (13.27)
	Chronic	43	21.56 (18.98)

Note: NA, not reported in paper.

^aDiagnosis according to the Diagnostic and Statistical Manual of Mental Disorders, fourth edition.

^bDiagnosis according to the Diagnostic and Statistical Manual of Mental Disorders, third edition.

Table 4. Dissociation in Relation to Trauma in Patients Diagnosed With a Schizophrenia Spectrum Disorder

Study	Sample	<i>n</i>	Score Mean (SD)
Goff et al ⁶⁰	Psychotic outpatients ^a		
	With child abuse	27	20.0 (16.1)
Ross et al ¹⁰¹	Without child abuse	34	12.5 (12.4)
	Schizophrenia ^a		
	With child abuse	37	21.6 (NA)
Vogel et al ⁷²	Without child abuse	46	8.5 (NA)
	Schizophrenia ^b		
	With trauma and self-rated PTSD	14	21.0 (15.8)
	With trauma, no self-rated PTSD	43	15.0 (12.9)
Perona-Garcelan et al ⁷⁹	Without trauma and self-rated PTSD	30	11.4 (11.2)
	Schizophrenia spectrum ^b		
	With childhood trauma	15	28.01 (17.99)
Dorahy et al ⁷⁵	Without childhood trauma	22	12.85 (8.98)
	Schizophrenia ^b		
	With maltreatment	16	32.5 (21.0) ^c
Vogel et al ⁷⁶	Without maltreatment	18	11.8 (9.9) ^c
	Schizophrenia spectrum ^b		
	No CPA	60	15.3 (12.2)
	Low CPA	7	16.5 (11.6)
	Moderate CPA	6	21.9 (14.9)
	High CPA	7	25.1 (13.0)

Note: CPA, childhood physical abuse; DES-T, dissociative taxon; NA, not reported in paper; PTSD, posttraumatic stress disorder.

^aDiagnosis according to the Diagnostic and Statistical Manual of Mental Disorders, third edition.

^bDiagnosis according to the Diagnostic and Statistical Manual of Mental Disorders, fourth edition.

^cScore according to DES-T.

results can be complicated as some authors argue there is a difference between, eg, true hallucinations and pseudo-hallucinations,¹⁰³ while others argue there is no clear distinction between these 2 concepts.¹⁰⁴ No studies were found that explicitly compared symptoms of patients with healthy controls. A substantial number of studies focused on Schneider's first-rank symptoms of schizophrenia in DDs. Schneider¹⁰⁵ described the following 11 symptoms as characteristic of schizophrenia: auditory hallucinations (audible thoughts, voices arguing, voices commenting); somatic passivity; thought withdrawal, insertion, and broadcasting; delusional perception; and delusions of control (made feelings, drives, and behavior). In the past Schneider's first-rank symptoms were considered pathognomonic for schizophrenia.^{2,12,106} Some of these symptoms (ie, voices arguing, voices commenting, and bizarre delusions) were still considered to be pathognomonic in the DSM-IV. However, this has been changed in the DSM-5.

Substantiating the reduced emphasis on Schneider's first-rank symptoms in schizophrenia, these symptoms have been found to be highly prevalent in dissociative disorders,¹⁰⁷ especially in those with a former diagnosis of schizophrenia.¹⁰⁸ First-rank auditory hallucinations have been found in 47% to 90% of the patients with a DD.^{26,109,110} Forty-five percent of the patients with a DD experienced delusions²⁶ although bizarre delusions were uncommon.¹⁰⁹ However, delusions of thought withdrawal/insertion and delusions of control were found to be even more common in DID than in schizophrenia.⁹⁵ Patients with DID on average show between 3.6 and 6.4 first-rank symptoms^{26,109,111} whereas the general population reported 0.5¹¹² and schizophrenia patients reported 0.9 first-rank symptoms.¹¹³ These results show that first-rank symptoms of schizophrenia are more common in DDs.

DID patients have on average more positive symptoms than schizophrenia patients, as assessed with the PANSS.¹¹⁴ Between 16% and 20% of the patients with a DD experience visual hallucinations and more than 70% experience auditory hallucinations.^{115,116} In addition, DD patients showed elevated scores on the schizophrenia scale of the Minnesota Multiphasic Personality Inventory.¹¹⁷

While Honig et al.¹¹⁸ found that auditory hallucinations in samples diagnosed with a DD or a SSD were similar, Dorahy et al.⁷⁵ found that some characteristics differed. For example, patients with a DD had a younger age of onset, more voices, more often child voices, more often voices commenting to each other, and more often reported the voices would be missed.⁷⁵ However, the small samples and large amount of variables precluded the use of inferential statistics.

Although there is a paucity of research in this regard, clinical impressions suggest that the diagnoses may be distinguishable on negative and disorganized symptoms. Patients with DID have shown negative symptoms, albeit

not as many as schizophrenia patients (17.06¹¹⁴ and 21.01⁹⁷, respectively). However, it is important to note that, similar to the other diagnostic symptoms, not all patients diagnosed with schizophrenia experience negative symptoms. They are experienced by approximately 58% of the patients.¹¹⁹ DID patients scored higher than schizophrenia patients on the PANSS general psychopathology scale ($M = 50.09$ and $M = 37.74$, respectively). Symptoms of alexithymia are seen in schizophrenia¹²⁰ as well as DDs.^{121,122} In addition, children diagnosed with a DD reported symptoms of withdrawal and disorganized thinking.¹¹⁶ No additional research on disorganization was found. A case report described 3 patients diagnosed with a DD with severe catatonic symptoms.¹²³ In addition, in a mixed trauma patient sample, of which approximately half had a DD, 67% showed catatonic symptoms.¹²⁴ In this study catatonia was unrelated to dissociation and psychosis. These findings are in line with the DSM 5 de-emphasizing catatonia as an indicator of schizophrenia, removing it as a subtype and introducing the diagnosis catatonia associated with another mental disorder,¹ and studies advocating that catatonia should be considered an independent syndrome.¹²⁵

Discussion

The results of this review show similarities but also differences in symptoms between SSDs and DDs. Patients diagnosed with a DD, on average, experience more dissociative and positive symptoms, whereas patients diagnosed with a SSD, on average, experienced more negative symptoms. Despite these quantitative differences, the literature indicates that DDs and SSDs overlap on many of their diagnostic symptoms. Elevated levels of dissociation have been found in SSDs and several symptoms used to diagnose SSDs are also present in DDs. Furthermore, the variances in scores suggest that there are, eg, individuals diagnosed with a SSD experiencing more dissociation than the average patient with a DD.

If diagnoses reflect distinct disease entities one would expect clear boundaries between diagnoses.^{126,127} With regard to symptoms, the literature does not reveal such clear boundaries between SSDs and DDs. In an effort to explain the symptom overlap, some authors proposed a new diagnosis or diagnostic subtype having characteristics of both SSDs and DDs.^{82,128,129} However, the dimensional model³ of psychopathology may provide a more parsimonious explanation for the unclear boundaries. In this model patients can present with symptoms associated with different diagnoses as the symptoms do not necessarily reflect underlying disease entities.

The results are also in line with the network structure of psychopathology,³³ which specifically predicts that boundaries between diagnoses will be fuzzy. Symptoms function as a small world network in which symptoms can cause other symptoms.³⁴ For example, it has been

suggested that dissociation increases the vulnerability to psychotic experiences,¹³⁰ whereas paranoid ideation¹³¹ and perceptual abnormalities¹³² increases the vulnerability to dissociation. In addition, dissociation might cause weakened cognitive inhibition, in turn leading to hallucinations and delusions.⁴⁴ Furthermore, the relationship between varieties of inner speech and hallucination proneness seems to be mediated by dissociation.¹³³ Similarly, the relationship between self-focused attention and hallucinations is mediated by depersonalization.⁵⁴ Other individual differences such as deficits in reality discrimination and self-focused attention might also play a role in such symptom networks. However, as research using the network model is still in its infancy, the actual presence and appearance of such symptom networks is mostly limited to speculation.

Although the results of this study fit well with a combination of the dimensional model and network structure of psychopathology, they do not disprove the categorical approach. An alternative explanation for the symptom overlap is that patients who should be diagnosed with a DD are often misdiagnosed with a SSD.¹³⁴ These misdiagnosed patients would obscure the actual differences between the diagnoses. This explanation is, eg, supported by many DID patients having a former diagnosis of SSD.²⁶ Especially in the past, when Schneider's first rank symptoms were thought to be pathognomonic for schizophrenia, the high occurrence of these symptoms in DDs could have led to misdiagnosis. Limitations in the diagnostic process might still play a role in the symptom overlap. However, when assessed for both diagnoses many patients with a DD concurrently meet the diagnostic criteria for a SSD^{22–24} and vice versa.²⁵ If there are categorically distinct disease entities at present our diagnostic systems are insufficiently sensitive to detect them.

It could thus be argued that the overlap in symptoms is an artifact of the instruments we use,¹³⁵ eg, due to item overlap.³⁷ The current instruments could simply be limited in their ability to distinguish symptoms of SSDs and DDs from each other.⁹⁵ This limitation is seen in the following item of the DES: "Some people sometimes find that they hear voices inside their head that tell them to do things or comment on things that they are doing."¹³⁶ This item should measure a dissociative symptom but it could be argued that it measures a schizophrenia-related symptom instead. However, it is unlikely that the instruments completely explain the symptom overlap as similar results were found while excluding overlapping items⁵⁶ and when using different instruments (eg, Wolfradt and Engelmann⁵², Stiglmayr⁵³). In addition, because our conceptualization of symptoms is closely tied to the way we measure them, limitations in the instruments are directly related to limitations in the symptom concepts we have.

It has actually been questioned whether the concepts of psychosis and dissociation are distinguishable.^{137,138} It has, eg, been suggested that auditory hallucinations should

be conceptualized as dissociative instead of psychotic experiences.¹³⁹ Not all patients with a psychotic disorder experience auditory hallucinations.¹⁴⁰ Furthermore, in addition to being found in nonpsychotic clinical samples, auditory hallucinations are also found in nonclinical samples.¹⁴¹ Thus, auditory hallucinations alone are not necessarily pathological psychotic experiences. Instead, auditory hallucinations can be seen as experiences coming from an individual him/herself but not recognized as such, and might thus better be explained as dissociative experiences.¹³⁹ On the other hand, dissociation may not be able to account for the distinctive sensory characteristics of all hallucinations.¹⁴²

It might prove useful to conceptualize symptoms more narrowly than is commonly done. The discussion around dissociation is a good example of this. Should dissociation be defined as broadly as is done with the DES, including absorption and imaginative involvement, or should we conceptualize it more narrowly by emphasizing compartmentalization?⁴ Although there is overlap between DDs and SSDs on dissociation as measured by the DES, there might be clear differences when focusing on identity fragmentation. In the same vein, it might prove useful to distinguish hallucinations from pseudohallucinations and imagery,^{103,143,144} and delusions from overvalued ideas.¹⁴⁵ Or even more narrowly, eg, by dividing auditory hallucinations into different types of auditory hallucinations¹⁴⁶ or based on the characteristics of the hallucinations.⁷⁵ However, some authors argue that instead of making these subcategories (eg, hallucinations vs pseudohallucinations), conceptualizing symptoms on a continuum is more parsimonious.^{104,147} For these narrower symptom concepts to be useful there need to be reliable and valid instruments to distinguish them from each other.

As an alternative explanation, the distinct diagnostic categories with overlapping symptoms might be explained by having a different etiology. DDs are generally thought to be caused by childhood trauma,¹⁴⁸ whereas SSDs were originally thought to be more biological in nature.¹⁴⁹ However, the biopsychosocial model of schizophrenia is nowadays widely accepted and emphasizes both biological and environmental factors in its etiology. In line with this, much evidence shows that trauma also plays an important role in the etiology SSDs.^{150,151} In addition, biological factors have been suggested to play a role in the etiology of DDs.¹⁵² For example, twin studies show that genetic factors explain approximately 50% of the variance in pathological and nonpathological dissociation.¹⁵³ Moreover, abnormalities in frontal and occipital regions were found in DID patients.¹⁵⁴ Similar to SSDs,^{155–157} abnormalities have also been found in hippocampal and amygdalar volume.¹⁵⁸ However, there has been disagreement on the interpretation of these results,¹⁵⁹ and they have not been replicated.¹⁶⁰ No research was found that directly compared patients diagnosed with a DD with

those diagnosed with a SSD on brain functioning. While these studies indicate that, to a certain extent, there is overlap in terms of etiology between SSDs and DDs, additional research that directly compares the etiology of these 2 diagnostic groups is important.

There are factors, other than diagnostic symptoms and etiology, that might play a role in the differentiation between DDs and SSDs, eg, gender and cognitive functioning. Patients with a SSD are more often male,¹⁶¹ whereas patients with a DD are more often female.^{107,162,163} The decision to diagnose someone with a SSD or DD might be biased by gender.¹⁶⁴ This bias could be especially relevant for patients who have symptoms of both diagnoses. Similarly, patients with a SSD often show impairments in cognitive¹⁶⁵ and metacognitive functioning.¹⁶⁶ Although differences have been reported, eg, in processing speed,^{85,167} patients with a DD function cognitively on approximately the same level as healthy controls.^{160,168} Impaired cognitive functioning could simply be a symptom of SSDs that is not seen as a diagnostic symptom. However, the diagnosis someone gets could also be biased by that person's cognitive functioning. If the 2 diagnostic categories indeed differ in the characteristics of the symptoms (such as the content of hallucinations^{88,169}), cognitive functioning might even influence these characteristics.

A limitation of this literature review is that symptoms that are not described in the DSM-5 were not included. Thus, differences between SSDs and DDs might be found in factors that were not considered in the literature search such as fantasy proneness and suggestibility. With regard to these 2 specific factors, there is some debate on their exact role but both factors have been linked to DDs and SSDs and are thus also nonspecific.^{38,170–172} However, further research on symptoms that are not described in the DSM-5 as diagnostically relevant might prove useful for better differentiation. A second limitation of this study is that many, if not all, of the factors described in this review are not specific to 1 single diagnosis (eg, alexithymia,¹⁷³ catatonia¹⁷⁴). As a result, both SSDs and DDs show overlap with other diagnoses, eg, with anxiety disorders and depression. However, the shared history between SSDs and DDs makes the similarities between these disorders especially noteworthy. Furthermore, the fact that symptoms are generally nonspecific and that overlap in symptoms is common among many disorders only emphasizes the importance of taking a holistic approach and look at symptom networks separate from the diagnostic classifications we use.

To conclude, a large body of literature indicates the presence of symptoms of dissociation in SSDs. In addition, several studies show that symptoms typically associated with schizophrenia are also found in DDs. These results seem to be more consistent with a combination of the dimensional model and network structure model of psychopathology than with categorical models of psychopathology. However, other factors, such as misdiagnosis,

item overlap, and construct overlap might also play a role. Whether or not the diagnoses reflect disease entities, it is important for clinicians to be aware of the similarities between these 2 diagnostic classifications. Patients showing symptoms of both diagnoses might benefit from a combination of treatments. In addition, when a patient does not improve from the treatment of the initial diagnosis it is important to reconsider that diagnosis.

Future research should aim to use network analysis to further clarify this issue. A first step would be to examine which symptoms correlate with each other at a single time point for patients with a SSD or DD to see whether their symptom networks differ from each other. These networks might be different in the characteristics of the symptoms (eg, content of hallucinations^{75,88,169}) or in the exact structure of the symptom network (eg, which symptoms have the strongest connections with other symptoms). Such a study could also test the idea that the diagnoses may be distinguishable on negative, cognitive, and disorganized symptoms. The second step would be to see how these networks change over time on an individual level to examine if the same symptoms predict the emergence other symptoms. A last step would be to experimentally test whether the correlations are indeed a reflection of a causal relationships. As most of the research presented is phenomenological in nature the use of neuroimaging should be considered to investigate which neural correlates of dissociative and psychotic symptoms either converge or involve distinct circuitry. If there are distinct disease entities, differences might, eg, be found in resting state neural complexity,¹⁷⁵ and neural activity during working memory¹⁷⁶ and social cognition tasks.³⁶ The lack of studies on genetic factors that may be linked to dissociative disorders further emphasizes the need of more research in this area.

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