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Confabulations in Schizophrenia

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Abstract

Introduction—Current theories of confabulation are based primarily on observation of neurological patients. The present paper evaluates these theories based on evidence from schizophrenia. Schizophrenia is unique in that it presents with a pathophysiology which differs from that of other neuropsychiatric conditions, and yet the candidate deficits various theories of confabulation implicate are often simultaneously present in schizophrenia.

Methods—A selective review of literature on schizophrenic and neurological confabulations was undertaken.

Results—Schizophrenic confabulation differs from neurological confabulation in terms of its characteristic features and association with symptoms, cognition and linguistic functions. Current evidence also suggests confabulation may be conceptualized as a special class of delusions pertaining to memory phenomena.

Conclusions—Schizophrenia presents with confabulations that cannot be fully accounted for by existing theories. It also presents with confabulations with unique features, which have different cognitive correlates and relation to other symptoms of the condition.

Introduction

> "He not only recalls facts, but also things said in his presence, possibly even his dreams, and all of this is now part of his consciousness…If he remembers something, he cannot decide whether it happened in reality or whether he dreamed it: the trace left by a real incident is only little different from the one left by…an idea."--Korsakoff (1889, p.514)

Confabulation can be defined as "statements or actions that reflect unintentional but obvious distortions of memory" (Gilboa et al., 2006). Two features characterize confabulations (Berlyne, 1972; Burgess and McNeil, 1999; Moscovitch and Melo, 1997). (1) They are false memories--either false in content, or false in the given context, and (2) the confabulator is unaware of the falsehood of these claims. Confabulation is a relatively rare form of memory disorder found in severe neuropsychiatric conditions like Korsakoff's syndrome, traumatic

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brain injury, anterior communication artery aneurysm, Alzheimer's disease, bipolar disorder, schizophrenia, and (in a milder form) among healthy people (La Corte et al., 2011; Salazar-Fraile et al., 2004; Zaragoza et al., 2001; review Lorente-Rovira et al., 2011). It is an intriguing phenomenon which has the potential to tell us more than we currently know about the mechanisms of memory, and how their breakdown can result in memory errors. Most of what we know about confabulation comes from studies of neurological conditions and it has not been examined whether the theories derived from these conditions can also account for confabulations in psychiatric conditions like schizophrenia.

Understanding confabulation as it occurs in schizophrenia is important because schizophrenia has a pathophysiology that differs from that of other neuropsychiatric conditions and any theory that claims to account for confabulation should be able to account for it wherever it is found, and not just in organic psychosis. More importantly, schizophrenia provides a unique opportunity for evaluating competing theories because the candidate deficits implicated by various theories—temporal context confusions, executive functioning, memory and monitoring deficits—are all present in schizophrenia, often simultaneously (Lorente-Rovira et al., 2007, 2010; Nathaniel-James et al., 1996). There are several theories that try to account for confabulation. The aim of the present review is to evaluate these theories and examine them based on evidence from schizophrenia. We also describe unique aspects of schizophrenic confabulation and how it relates to cognitive function and positive symptoms.

Methods

Few studies have investigated confabulations in schizophrenia. At the time of writing, a Pubmed search for "schizophrenia + confabulation" produced only 17 papers. A broader search for "confabulation" produced 295 papers (with 38 reviews). As the purpose of the current review was to compare what is known about confabulation in schizophrenia in terms of features, cognitive basis, and relation to symptoms with findings from other neuropsychiatric conditions and predictions from current theories, more attention was paid to studies which provided information to help answer these questions. The review was not limited to any specific period, but most of the papers (especially the ones relevant to schizophrenia) were published on or after 1996. Two books on confabulation were also referred to in preparing this review (Hirstein, 2005; Schnider, 2008).

Results and Discussion

Theories of Confabulation

The oldest theory of confabulation states that confabulations serve to fill in gaps in one's memory. Kraepelin (1919/1971) was an early proponent of this view which is still widely held (e.g., APA, 2000) despite the fact that there is little empirical evidence to support it (Schnider, 1996). The more recent theories include temporality, source-monitoring, and retrieval accounts.

Temporality Theory—The basic idea underlying temporality theory is that confabulations occur because true memories are misplaced in time, and become irrelevant in the given

context. They may correctly remember the content, but fail to recognize the chronological order of events (see Korsakoff, 1889). There are two versions of this account, by Dalla-Barba and Schnider. According to Dalla-Barba (1993) confabulations occur because patients confuse habitual, well-learned and generic information for specific events in time (habits confabulation) (Gilboa and Verfaellie, 2010; La Corte et al., 2011). In a case-study, La Corte et al. (2011) showed that a patient with ruptured right internal carotid siphon aneurysm confabulated on questions related to autobiographical information ("What did you do yesterday?", "I was at the Montpellier University to give a lecture"), orientation to time and place ("Where are we now?", "We are in the French Oil Department"), and personal future ("What are you going to do tonight?", "I will go back home and will have dinner with my wife") (p.311). For every question, the patient recalled a memory from his past which was generally true, though not true with respect to the time period specified in the question. However, the patient did not confabulate when questioned about semantic memory, impersonal future, etc. Schnider (2008), on the other hand, suggests that confabulators are unable to suppress previously activated, but currently irrelevant memory traces, which results in past memories intruding into the present (temporal context confusion). Schnider (2008) implicates a failure of the (dopamine mediated) reward system of the brain in the failure to suppress currently irrelevant information (see Gilboa and Verfaellie, 2010). Schnider's account is similar to Dalla-Barba's in its emphasis on the irrelevance of retrieved memories with respect to the current context, but it differs from Dalla-Barba in its emphasis on proactive interference as the primary source of confabulations.

Although studies have supported temporality theory (Schnider and Ptak, 1999; Schnider, 2003, but see Gilboa et al., 2006), temporal accounts are limited by their inability to account for complex/bizarre confabulations in terms of a reliance on the stable elements of memory or temporal displacement of true memories. An anterior communicating artery aneurysm patient who claims to have met a woman with a bee's head (Turner et al, 2010) or a schizophrenia patient who claims to have committed murder (McKenna, 2007) cannot be said to be confusing their past memories with the present.

Source Monitoring Theory—Source monitoring theory (SM) states that memories are attributed to specific sources using heuristic and systematic decision making processes, based on evaluation of cues such as contextual and sensory/perceptual information, cognitive operations and semantic detail (Johnson et al., 1993). Cognitive impairments can affect the evaluative processes involved in making these judgments (Shakeel and Docherty, 2012), and disruption in the more extended reasoning processes can result in confabulation (e.g., Johnson et al., 1993). SM theory can account for the findings of the temporality theory in terms of a metacognitive deficit in discriminating the origins of various retrieved information (see e.g., Turner et al, 2010), and it can account for more. For example, when a patient claims to have died because of a gunshot wound (Stuss et al., 1978), it is hard to argue they are confusing their personal past with the present, but SM can account for this in terms of a failure to distinguish between imagination and perception (Johnson et al., 1993).

Despite being theoretically plausible, there is a lack of adequate empirical evidence supporting a specific association of SM deficits with confabulation (see e.g., Johnson et al, 1997). Studies have documented SM errors in non-confabulating patients (Johnson et al.,

1997; Kopelman et al., 1997), and also have implicated different brain regions for the two phenomena (Gilboa et al., 2002; Johnson and Raye, 2000). In summary, SM deficits are neither necessary nor sufficient for confabulation to occur, but may be one of several factors that contribute to it (e.g., Gilboa and Verfaellie, 2010; Johnson et al, 2000; Schnider, 2008; Turner et al, 2010).

Retrieval Accounts—Retrieval theories view confabulation primarily as the result of failure in retrieval/reconstructive processes of memory due to a dysfunction in coordinated activity of areas including the hippocampus, dorsolateral and ventromedial prefrontal cortex, and the frontal pole. According to the strategic retrieval model, confabulations can result from a defective search component (resulting in failed search strategies and retrieval) interacting with monitoring deficits (resulting in an inability to reject/suppress inaccurate information); of these the latter appear to be more important (Gilboa and Moscovitch, 2002; Moscovitch and Melo, 1997). The emphasis on retrieval errors in confabulation is partially supported by the observation that patients confabulate on remote memories as well as memories acquired after the onset of illness or trauma (Fotopoulou, 2010; Gilboa et al., 2002).

Moscovitch and Melo (1997) compared confabulating amnesics with non-confabulating amnesics and healthy controls by asking them to describe personal experiences and historical events in response to specific cue words. Firstly, confabulating amnesics produced fewer memories than the other groups, which suggests poor search strategies. Secondly, confabulating amnesics produced significantly more false details than non-confabulating amnesics. Finally, compared to non-confabulating amnesics and healthy controls, confabulating patients produced significantly more secondary confabulations when prompted to generate details, which indicates a failure of the monitoring processes in confabulation. Retrieval accounts have made predictions which have been largely supported by empirical investigations. Remarkably, the model itself has evolved over time to acknowledge the importance of other factors like SM, perseveration, temporal context confusions, and motivational factors (see Gilboa, 2010).

The strategic retrieval account suggests confabulations do not have a temporal gradient (i.e., they occur equally for remote as well as recent memories), which is not supported by current evidence (Schnider et al., 1996, Dalla-Barba et al., 1998; Box et al., 1999). It also suggests that confabulations can occur for semantic as well as episodic memories (see Moscovitch and Melo, 1997) but studies have observed confabulators who produce few, if any, semantic confabulations (Dalla-Barba 1993). The emphasis on executive functions may be misplaced as studies have shown patients can confabulate despite having intact executive functions (Dalla-Barba, 1993; Nedjam et al., 2000). Finally, if confabulations are caused by specifiable lesions, the theory fails to account for why these lesions so infrequently cause permanent confabulation or even, at times, any confabulation at all (see Alexander, 2011).

Schizophrenic Confabulations

Although current descriptions often focus on their occurrence in neurological conditions (e.g., Berlyne, 1972), even as early as 1919, Kraepelin (1971) described *paraphrenia*

confabulans in patients with schizophrenia who "bring forward with the most profound conviction an enormous number of extraordinary stories absolutely in the form of personal experiences" (p. 311). Confabulations in schizophrenia differ from those of other neuropsychiatric conditions in terms of their features and cognitive correlates, and are unique in their association with symptoms like formal thought disorder (FTD) and delusions.

Features—Nathaniel-James and Frith (1996) asked schizophrenia patients and healthy controls to recall Aesop fables which were read out to them. One of the fables was the following:

> A rich man took a valuable cargo on a voyage across dangerous seas. A storm soon blew up and the ship went down throwing the passengers into the sea. They all began to swim for their lives except the rich man who raised his arms to heaven and promised his God all kinds of riches if he was saved. The other passengers shouted to the praying man, 'Don't leave it to God to save you, swim for yourself'.

They found that every schizophrenia patient (but only one control participant) added some information not present in the story during retrieval. E.g., one patient's recollection was:

> A rich man went on a swimming expedition and he stopped swimming in the middle of the ocean. In the middle of the ocean he decided that he would pray to our Lord God…he would pray to God, our Lord…Jesus who would…um…Jesus our Lord, who would accept his prayer…answered prayer. But he carried on praying as was his word and he was hailed by people on a passing boat who said, 'God won't help you, swim for yourself'.

Although schizophrenia patients do invent entirely new information, they differ from neurological patients (e.g., Kopelman, 1987) in also having a tendency to reorganize and restructure the original information (Nathaniel-James and Frith, 1996; Lorente-Rovira et al, 2007, 2010; but see Kopelman, 1999). In the above fable, the idea of a *swimming expedition* and *passing boat* in the patient's recall probably comes from the reference to passengers swimming and mention of the boat in the original story (Nathaniel-James and Frith, 1996). A later study by a different group (Lorente-Rovira et al., 2007) replicated these findings and found both re-organized and new material in the confabulations produced by schizophrenia patients. However, the new information generated by the schizophrenia patients differed from the gross inventions described in patients with amnesia and dementia (e.g., Kopelman, 1987) in that they were generally constrained by the context of the story. For example (from Lorente-Rovira et al., 2007), 'A laborer was trying to chop a tree down with his axe. He broke the axe' [Original story: 'A laborer worked along a stream. His axe fell (into the water)…']. In a neurological study, on the other hand, one amnesia patient recalled the Wechsler memory story about a woman ('Anna Thompson') being robbed by stating that the woman worked in a pub to make the money and that her husband had left her, neither of which are stated in, nor can be reconstructed from elements in the original story (Kopelman, 1987).

While this pattern of findings partially supports the temporality theory, temporality theory cannot account for the fact that the patients do not just displace the sequence of events but also tend to restructure/reorganize it to mean something new. Furthermore, temporality

theory cannot account for the more bizarre kind of schizophrenic confabulations which do not draw from one's personal past, or involve confusing the past for the present (e.g., McKenna, 2007). Interestingly, the findings in schizophrenia cannot be accounted for fully by the strategic retrieval account either, because the patients are not randomly retrieving erroneous information and failing to reject it. They are, instead, reorganizing and reconstructing the information and are often constrained by elements in the original story. In addition, retrieval accounts primarily implicate retrieval deficits in the formation of confabulations, but evidence from schizophrenia suggests the involvement of encoding as well as retrieval deficits in schizophrenia. For instance, when schizophrenia patients are presented with their own confabulated recall, they fail to correct their stories and often claim their recollections are accurate (Nathaniel-James et al., 1996). This suggests the stories are represented abnormally at the encoding phase and are disorganized even before they are retrieved. This deficit is further compounded by a faulty editing process at output (see Morais et al., 2004). Schizophrenia patients' tendency to confabulate even in the absence of a memory component further supports the role of faulty encoding processes. Kramer et al., (1998) presented schizophrenia patients with a sequence of pictures they had to combine into a story in a narrative discourse task. Despite the fact that the pictures remained in front of the participants throughout the task, the patients produced stories which were very different from those of healthy participants. The authors attribute this to patients interpreting the stories differently (for examples, see Kramer et al., 1998). Nathaniel-James et al. (1996) suggest that this differs from retrieval theories which implicate strategic retrieval processes based primarily on observations of neurological patients with impaired free recall but preserved recognition. The evidence, therefore, suggests that prospective monitoring is not sufficient to avoid confabulations in schizophrenia (also see Morais et al., 2004; Lorente-Rovira et al., 2010). Monitoring may be crucial for neurological confabulations (see Gilboa et al., 2006), but schizophrenic confabulations also implicate encoding processes (Kramer et al., 1998; Lorente-Rovira et al., 2010). Current theories therefore fail to account for confabulations as they appear in schizophrenia.

Cognitive Correlates—Despite some overlap, the cognitive correlates of schizophrenic confabulations differ from those seen in other conditions (e.g., Nathaniel-James et al., 1996; Lorente-Rovira et al., 2007, 2010). Studies have examined the role of executive functions, memory and verbal comprehension.

Executive function: Studies on the role of executive functions in schizophrenic confabulations have produced inconsistent results. While some studies have found an association with executive function, response monitoring and response suppression, others have not (Lorente-Rovira et al., 2007; 2010; Nathaniel-James and Frith, 1996; Nathaniel-James et al., 1996). Studies have also failed to find an association of schizophrenic confabulations with planning or IQ (Lorente-Rovira et al., 2007; Nathaniel-James and Frith, 1996; Nathaniel-James et al., 1996; but see Morais et al., 2004; Salazar-Fraile et al., 2004). Taken together, these findings suggest that the association of executive functions with confabulations is not as well established in schizophrenia as in neurological conditions (e.g, Moscovitch and Melo, 1997). Even in non-psychotic populations, confabulators have been described who lack clear executive deficits (Dab et al., 1999). The findings from

schizophrenia do not support the retrieval theory view that memory and executive deficits alone combine to cause confabulations (for review, see DeLuca, 2000). The retrieval account seems to apply better, though not invariably, to neurological conditions (Lorente-Rovira et al., 2007). On the other hand, schizophrenic confabulations are associated with semantic memory and verbal comprehension.

Memory: Though memory deficits have been observed often in neurological patients with confabulations, findings from several studies suggest that memory deficits are neither necessary nor sufficient for the occurrence of schizophrenic confabulations (Morais et al., 2004; Lorente-Rovira et al., 2007, 2010; Morais et al., 2004; Nathaniel-James and Frith, 1996; Nathaniel-James et al., 1996; Salazar-Fraile et al., 2004). However, some studies have suggested a more specific role for semantic memory deficits in schizophrenia. Lorente-Rovira et al. (2007; also see Lorente-Rovira et al., 2010) found a clear difference between confabulators and non-confabulators on semantic memory tasks like the semantic verification test [which requires true/false responses to sentences, e.g, 'Buses are driven', 'Geese have 4 legs' (Laws et al., 1995)], and the Camel and cactus test [which involves matching a target word (camel) to a related word from a set (tree, sunflower, cactus, rose) (Bozeat et al., 2000)].

Verbal comprehension: Schizophrenia patients tend to produce more memory errors on stories than on word lists (see Nathaniel-James and Frith, 1996), unlike brain damaged patients (Dab et al., 1999). More specifically, Morais et al. (2004) showed that confabulation in schizophrenia patients was higher for fables than stories, and higher for stories than word lists, but was unrelated to memory monitoring failure. Schizophrenic confabulations are also found to be associated with conceptual disorganization (Salazar-Fraile et al., 2004), and they exhibit difficulty in distinguishing plausible from implausible information in fables (Nathaniel-James et al., 1996). Taken together, these findings suggest that confabulations in schizophrenia may in part be the result of verbal comprehension deficits and organizational ability which may affect the encoding process, and manifest as errors at retrieval.

Symptom correlates—While confabulations in other neuropsychiatric conditions are often studied in isolation, schizophrenic confabulations have been studied in relation to other symptoms, esp. FTD and delusions. The evidence at present suggests that delusions and other positive symptoms are associated with (but do not cause) schizophrenic confabulation (Nathaniel-James and Frith, 1996; Salazar-Fraile et al., 2004; Simpson and Done, 2002).

Formal thought disorder: Nathaniel-James and Frith (1996) found that FTD was associated with the severity (though not presence) of confabulation in schizophrenia (also see Nathaniel-James et al., 1996; Lorente-Rovira et al., 2007, 2010). Schizophrenia patients with FTD sometimes generate idiosyncratic/bizarre statements that are indistinguishable from fantastic confabulations of neurological patients in terms of their content, and in the fact that they are often unprovoked (e.g, Kopelman et al., 1997; Lorente-Rovira et al., 2007; Nathaniel-James and Frith, 1996). For instance, Chaika (1974) describes a patient (also see McKenna and Oh, 2005) who produced the following speech (extract):

> My mother's name was Bill…and coo? St. Valentine's Day is the official startin' of the breedin' season of the birds. All buzzards can coo. I like to see it pronounced buzzards rightly. They work hard. So do parakeets." (p. 260).

Lorente-Rovira et al. (2007) have argued that reorganizing and reconstructing ideas within a story to produce new information may not be very different from derailment in FTD. Also, the tendency of confabulating schizophrenia patients to commit errors like referring to a voyage as a swimming expedition (Nathaniel-James and Frith, 1996) is similar to the use of word approximations seen in thought disorder (Lorente-Rovira et al., 2007). Given the fact that the evidence for a central role of executive deficits in schizophrenic confabulations is weak, they suggest that schizophrenic confabulations may, instead, involve a defective strategic retrieval system interacting with defective semantic memory (Lorente-Rovira et al., 2010). However, the importance of semantic memory in schizophrenia may only be relative. Semantic memory impairments also contribute to neurological confabulations, though more to their characteristics (e.g, bizarreness) than their presence (Dalla-Barba, 1993).

Thought disorder is primarily associated with the disorganization (form) of speech and can be distinguished from confabulation, which pertains to the veracity of its content (e.g., Baddeley and Wilson, 1988; Kopelman, 1987). Abnormalities in word use, disorganized syntax and failure to integrate sentences—which characterize thought disorder—are not found in confabulations (for discussion see Lorente-Rovira et al., 2007). That said, it can often be difficult to determine in clinical settings whether the patient is demonstrating a disorder of speech or content, or both.

Delusions: A delusion is a *false belief* firmly sustained despite evidence to the contrary, not culturally explicable, and usually preoccupying (APA, 1994; Kopelman, 2010). A confabulation, on the other hand, is a *false memory* where the person is not aware of its falsehood. Schizophrenic confabulations are closely related to the delusions. Simpson and Done (2002) found that delusional schizophrenia patients confabulate significantly more than non-delusional patients and non-psychiatric controls. Furthermore, they found that the occurrence of confabulations is affected by the presence of a relation between encoded information and the content of delusions, whereas delusion related schemas affect the way information is incorporated into memory (Simpson and Done, 2002).

There are remarkable similarities between confabulations and delusions. Like delusions, confabulations can be consistent over time (e.g., Burgess and McNeil, 1999), and when they are not, it is usually attributable to the presence of memory deficits (Turner and Coltheart, 2010). Confabulating patients have been shown to defend their claims, generate additional false memories to support them (e.g., McKenna, 2007; also see Turner and Coltheart, 2010), and act on their beliefs (Burgess and McNeil, 1999; Schnider, 2008). Like delusions, confabulations can also vary in content from the commonplace to the bizarre (Burgess and McNeil, 1999; Turner et al., 2010). However, it must be noted that there are also important differences between the two phenomena. While confabulations are consistently associated with lesions to the orbitofrontal cortex and medial prefrontal cortex (Gilboa, 2006; Schnider, 2003), there is no clear overlap with the regions implicated in delusions (Spence, 1997; Menon, 2011; Zwanzger et al., 2002). Also, confabulation (at least in neurological patients)

has often been associated with amnesia and almost invariably with executive dysfunction (see Kopelman, 2010) and is best viewed as primarily a disorder of retrieval (Gilboa and Verfaellie, 2010). On the other hand, the relation between delusion and cognitive deficits has been equivocal (e.g, Selva et al., 2007; see Kopelman, 2010). While memory deficits, context confusion, and monitoring deficits, are associated with confabulations, they are not associated with delusions (Gilboa, 2010). When memory deficits are present in delusion, they are related to biased encoding of novel information (Gilboa, 2010). Finally, delusions are often more elaborate, systematic and pervasive than confabulations (Kopelman, 1999).

There have been different views on the relation between confabulations and delusions. Some theorists have suggested that they are both the result of a failure of the same underlying processes (Turner and Coltheart, 2010). Others have argued that delusions and confabulations are separate due to their differing characteristics (Hirstein, 2005) and have different etiologies (Kopelman 1999). Some of the earliest thinkers such as Korsakoff conceptualized delusion sufficiently broadly to incorporate within it the idea of false memories (Korsakoff, 1891; see Berrios, 2000). Two arguments support this latter view. First, drawing from studies on the relation between *normal* beliefs and memories (e.g., Mazzoni and Kirsh, 2002), confabulations can be conceptualized as a special class of delusions the same way memories can be considered a special class of beliefs. Delusion can refer to any kind of false belief (e.g., persecutory, referential, grandiose, etc.) with false beliefs about past events (memories) being one of them. The second argument comes from the presence of two phenomena observed in schizophrenia in which the criteria for delusions and confabulations are met simultaneously—delusional memory and delusional confabulation. Delusional memory is commonly defined as a delusion that arises from a (usually episodic) memory (for alternate definitions, see Kopelman, 2010). These delusional interpretations may have their origin in a true, or false, memory. A delusion resulting from a false memory is indistinguishable from confabulation. For example, a patient may falsely remember undergoing an operation as a child and become convinced he has been implanted with a microchip which transmits/controls his thoughts. Delusional confabulations are a rare phenomenon in which fantastic delusions and delusional memories are made up on the spot and shift, change and become more elaborate as the patient is questioned about them (McKenna, 2007). One of our patients A.P., a 48 year old African-American male with schizophrenia, showed evidence of delusional confabulation during a routine interview. In response to questioning, he generated secondary confabulations. At the time of interview he did not meet criteria for delusions, and showed poor memory and some confabulation on a semantic memory task [Wechsler Logical memory-IV (Wechsler, 1945)]. Due to significant thought disorder (tangentiality, loosening of association) the patient had to be asked specific questions to keep him on the topic. However, the following day, he repeated the confabulations with very little change (excerpts):

E: How many children do you have?

P: I may have over a 100 children.

E: How many children do you know by name?

P: My son, he is pretty big, he is 8 feet tall and 650 lbs and he killed a man called… [Name of a famous pro-wrestler]

E: How did he kill him?

P: He probably crushed his skull.

E: Why did he kill him?

P: Because [the wrestler]…tried to rape my mom.

E: What happened after…that?

P: Yeah, I don't know what happened though. I don't know if he did time for that. He probably had a hell of a lawyer.

E: Where did this happen?

P: I don't know. Probably in Ohio somewhere.

E: How often do you meet (your son)?

P: I never met him. I have seen him on magazine…seen him on T.V. I've seen him on T.V. as the Predator.

E: You said you had a 150 children, how do you know…

P: They told me, when I had pneumonia I was taken to the hospital, before I got discharged they said we took your blood a 100 times. 'A hundred times!' I said, 'why?' I don't know.

E: And what did they do with that blood?

P: I don't know, I guess maybe they want to try to know how many kids I have got. And they tried to take more blood. But I won't let them.

E: And why are they interested in taking your blood and finding out how many children you have?

P: (Because) my children want to know who their father is.

Conclusions and Future Directions

Schizophrenic confabulation differs from that in other neuropsychiatric conditions in three important aspects. Firstly, schizophrenia patients tend to restructure/reorganize the original information and are constrained by the context of the original information. This pattern cannot be fully accounted for by existing theories. Secondly, schizophrenic confabulations do not show a strong association with executive function deficit, but are associated with semantic memory and verbal comprehension deficits. Finally, schizophrenic confabulations are associated with positive symptoms like formal thought disorder and delusions. Studies of confabulation support the idea that memory is largely a constructive process involving temporal, metacognitive, and executive functions, and that breakdown in these cognitive functions can result in false memories. Studying confabulations in schizophrenia may tell us

more about the role of language processes in confabulation and also whether confabulations can be better conceptualized as a special case of delusions.

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