

Confabulation: Implications for Criminal Justice, Forensic Mental Health, and Legal Professionals

**Jerrod Brown^{1,2,3*},
Deb Huntley¹, Erik W Asp⁴,
Cameron R Wiley⁵,
Janina Cich^{1,3} and
Stephen Morgan¹**

Abstract

Physical and psychological brain disruptions have the ability to impair vital memory functions and processes. For instance, a physical injury to the brain's frontal lobe can disrupt executive functions, which would include the capacity to plan or multitask, impulse control, and decision making. Similarly, the presence of a degenerative disease such as Alzheimer's disease can degrade the frontal lobe and lead to executive dysfunction (e.g., short-term memory loss and Broca's aphasia—a dysfunction of language production). A dangerous potential result of such frontal damage is a phenomenon known as confabulation, which is the unintentional production of memories and statements that are objectively false. In other words, confabulation is lying without the intention of doing so. This cognitive disturbance not only has an impact on daily life, but confabulation is particularly problematic for criminal justice-involved individuals. In general, confabulation makes it difficult for an individual to participate in and navigate through all aspects of the criminal justice system. Moreover, those who may work on behalf of the afflicted, may be negatively impacted by their inability to discern truth from fiction. Individuals suffering from confabulation may be prone to waiving important legal rights (e.g., Miranda rights) or false confessions during interrogations, incompetence to stand trial (i.e., unable to follow legal proceedings and assist defense counsel with their case), or providing false testimony during trials. Each possibility detracts from the integrity of various legal processes. Despite these diverse consequences, there is a dearth of empirical research on the consequences of confabulation in criminal justice settings. In an effort to raise awareness of confabulation in the criminal justice system and encourage further research, this article provides an overview of the symptoms and effects associated with confabulation for professionals working in criminal justice, forensic mental health, and legal settings.

Keywords: Confabulation; Criminal justice; Forensic mental health; Legal settings; Memory

- 1 Concordia University, St. Paul, MN, USA
- 2 Pathways Counseling Center, St. Paul, MN, USA
- 3 The American Institute for the Advancement of Forensic Studies, St. Paul, MN, USA
- 4 Hamline University, St. Paul, MN, USA
- 5 North Carolina Central University, Durham, NC USA

***Corresponding author:** Jerrod Brown

✉ jerrod01234brown@live.com

1919 University Ave. W. Suite 6 St. Paul MN, 55104. USA.

Tel: 651-734-5517

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Introduction

Confabulation can be defined as “problems in memory processing where people replace gaps in their memory with imaginary experiences that they believe to be true” [1]. In other words, confabulation is the complex process of an individual reporting a false memory that they believe occurred in reality but actually did not. This can happen during the encoding or retrieval of information. For example, a true memory of a different event could be mistaken to have occurred in the place of a missing

memory. Such events can take a wide range of forms from small alterations of an actual event to the grand creation of a detailed event that never happened [2-5]. It may be that the individual's preoccupations and underlying motivations determine, at least in part, the form of the confabulation [6]. Although confabulation is often used to describe a wide range of memory distortions, the common denominator in confabulation remains the lack of intent to deceive. Because this false information is something that the individual believes to be true, Moscovitch describes

confabulation as ‘honest lying’ or fabricating information without the intent of deception [7].

There are two different categories of confabulation: provoked and spontaneous. Provoked confabulations are elicited by environmental cues. This precipitating environmental cue often takes the form of a question, particularly leading questions paired with negative response feedback, which are common in high-pressure criminal justice and legal situations such as interrogations or cross examinations [8,9]. For example, confabulation may be more likely when the situation makes the individual feel compelled to say something. These provoked confabulations can even occur in relatively healthy individuals [10-13]. In contrast, spontaneous confabulations occur without provocation from other individuals or the situation [14]. These spontaneous confabulations are difficult to detect and often happen inconsistently over time within an individual [15-17]. Both types of confabulation have the potential to profoundly impact legal processes [18,19].

Regardless of type, it is difficult to discern when confabulation is occurring, as an individual may be recounting a false memory at certain times and presenting accurate memories other times [20]. A key step in this process is distinguishing confabulation from willful forms of fabrication and symptoms of mental illness. On the topic of willful deception, Kerns differentiates confabulation from other forms of deception using the following characteristics: level of consciousness, goals, memory, content, and sensorium [21]. In terms of mental illness, there may be similarities between the clinical signs of confabulation and delusions, which can be present in neuropsychiatric populations. Generally, confabulation tends to be associated with false memories while delusions tend to be associated with false beliefs. It has also been noted that delusions are firmly held beliefs lasting over longer periods of time, whereas confabulations are dismissed more rapidly and readily [22-24]. Nonetheless, several investigators argue that a common core deficit may exist in both conditions [25,26]. Together, these characteristics describe the psychological state and underlying motives of the individual along with the general nature of the falsified information.

Once the occurrence of confabulation is confirmed, discerning its multifaceted and complex causes is the next step to properly managing both the impacted individual and the phenomenon itself [27]. Although confabulation can occur in relatively healthy individuals, two key factors have been linked to confabulation: physical causes (e.g., traumatic brain injury) and psychological sources (e.g., disorders including amnesia [28]). In terms of physical causes, traumatic brain injuries involving damage to the frontal lobes may be the most consistent link. These can result from car crashes, sports collisions, and violent altercations, each of which lead to the stretching and tearing of tissue and blood vessels [29,30]. After experiencing a traumatic brain injury, individuals can go from consistent reporters of accurate information to inconsistent and unreliable reporters of information [22,31].

Conversely, neurological and psychological factors ranging from neurodegenerative diseases to depleted cognitive functioning resulting from extreme stressors and environmental factors

can result in confabulation. Neurodevelopmental disorders and depleted cognitive functioning, which are disproportionately likely in criminal justice settings may include susceptibility to fantasy and confusion along with deficits in executive functioning, short- and long-term memory, autobiographical memory, and reality and source monitoring. Alternatively, demanding situations can also contribute to the likelihood of confabulation [2,32-34]. This could be caused in part by an effort to make sense of a situation or leading questions and repetitive negative feedback. In an experimental study with undergraduates serving as participants (n=79), Kassin and Kiehel elicited false confessions by manipulating the presence of pressure and false incriminating evidence [35]. When placed under greater pressure, and accused by an untruthful witness, participants confessed to the accusations and confabulated how they performed the accused activities. This study highlights the impact of the situation on confabulation.

This phenomenon can also happen in the real world. For example, Kassin and Kiechel discuss the case of a former deputy sheriff who was charged with satanic cult crimes and raping his two adult daughters [35,36]. Despite no physical evidence to support the accusations, and after months of extreme stress and prolonged interrogation by law enforcement, he eventually “recalled” details of the crimes. However, when he was accused of an equally disturbing crime by an expert who reviewed his case, he not only confessed but also added details to the story that he believed to be true. It was later determined that this individual suffered from a dissociative disorder, rendering him more vulnerable to stress and suggestive questioning [37]. In this example, the extended length of the interrogation and constant rehearsal of satanic cult information were key environmental factors that likely influenced this individual’s propensity to confabulate.

As the above example highlights, confabulation can have extraordinary consequences in criminal justice settings. Confabulation has been linked to everything from inaccurate witness accounts to false confessions and wrongful convictions. In these cases, individuals have incorporated information from a variety of sources into the creation of a false memory, including leading questions from the investigators and overheard conversations [38]. As such, the potential for confabulation threatens the reliability and validity of testimony provided by witnesses, victims, and defendants and limits the capacity of a defendant to assist her or his legal team in the development of a defense strategy [39]. In these instances, the confabulator provides inaccurate information without any outward indicators of lying [3]. Despite the dire consequences of confabulation in criminal justice settings, very few professionals working in these settings understand the intricacies of the topic and even hold many misconceptions about this memory phenomenon [4]. To begin addressing this need, this article provides an overview of the symptoms and effects associated with confabulation for criminal justice, forensic mental health, and legal professionals.

Criminal justice and forensic mental health implications

People suffering from confabulation often present a unique challenge in criminal justice settings. Throughout these processes, "...confabulation can turn rock-solid providers of information into people little more reliable than pathological liars" [40]. In the midst of criminal investigations, confabulation can have an adverse impact on an individual's capacity to waive Miranda rights or be interrogated by the police, which may result in false confessions for crimes [41]. After the completion of the criminal investigation, confabulation can hinder a defendant's capacity to enter a plea, understand legal proceedings, or help their attorney develop and execute a defense. Confabulation can also present problems for eye witnesses, where inaccurate information or testimony could contribute to the wrongful prosecution and/or conviction of a defendant [3,39,41]. The dangerousness of this possibility is emphasized by the fact that "...the confabulator believes that they are telling the truth and will show no outward sign of lying" [4]. Although neurological conditions like Fetal Alcohol Spectrum Disorder (FASD) and traumatic brain injury (TBI) can contribute to confabulation, psychological processes and environmental stressors are likely more influential in criminal justice settings [42-44]. The potential for confabulation is exacerbated by the use of closed ended (i.e., no/yes) and leading questions in intense legal situations [8,9,42]. In some instances, the suspect can incorporate secondhand details into the formulation of detailed confessions via confabulation [38].

Despite the devastating consequences of confabulation, there are relatively few scientific studies on the phenomenon [27]. In the limited existing research, an experimental study by Redlich and Goodman found that 4% of psychologically unimpaired participants exhibited confabulation in their memory of a computer task [45]. Similarly, in a laboratory study with a sample of 75 undergraduate students, Kassin and Kiechel found that nine percent of participants confabulated by stating that they committed a computer typing error when in fact, they had not [35]. In a replication of Kassin and Kiechel, Horselenberg, Merckelbach, and Josephs, explored whether these findings held up in a different sample of 34 undergraduate psychology students [35,46]. Indeed, they found that 58% of participants were shown to have confabulated. The difference in the percentage of confabulating participants may be ascribed to a slight variation in the experimental procedure introduced in the Horselenberg study [46]. In their procedure, every participant was informed by a putative witness that the participant was seen to have committed the computer task error. In the Kassin and Kiechel procedure, only half of the participants were confronted by an experimental confederate who claimed to see the participant commit the error [35]. The other half of the participants were not. Their (Kassin and Kiechel's) findings revealed that in the no-witness condition, there was zero confabulation, while in the witness condition there was 41 percent.

In a recent review article, Gudjonsson summarizes the existing literature on the role of confabulation in false confessions [47].

Central to this presentation is the development of a heuristic model or hypothetical example of how someone might falsely confess to murder as a result of confabulation. This model focuses on "contextual risk factors" (e.g., interrogation setting), "enduring vulnerability" (e.g., short- and long-term memory deficits), and "acute state" variables (e.g., suggestibility). These factors contribute to a susceptibility of doubt in the individual's memory and leads to the consideration that the individual may have committed the act in question. Ultimately, the individual partially or fully accepts responsibility for the event and wrongly confesses to a crime not committed by that person.

In light of this possibility, it is important for criminal justice professionals to anticipate and recognize the symptoms and risk factors associated with confabulation. Further, criminal justice practitioners, legal professionals, and forensic mental health specialists should consider a variety of issues regarding confabulation, particularly as it relates to accurate witness accounts, testimonies, and court-ordered forensic evaluations. If confabulation is suspected, professionals should consider the possible presence of mental, neurological, and other medical conditions. The following are key points about confabulation that criminal justice, legal, and forensic mental health professionals should take into consideration.

Adaptive functioning

Adaptive functioning is a person's capacity to take care of one's self, perform essential daily activities, and fulfill their social responsibilities [48]. Influenced by intelligence, socialization, temperament, and culture (American Psychiatric Association, 2013) this concept is composed of three components. First, the conceptual component relates to equal and simultaneous competence in different academic skills (i.e., math, reading, writing and problem-solving ability). Second, the social component primarily involves verbal and non-verbal communication, the capacity to establish and maintain relationships, and empathy. Third, the practical component refers to the individual's ability to learn new skills and from past mistakes across a broad range of settings, including home, school, and work environments. Together, deficits in these components of adaptive functioning compromise an individual's ability to meet personal, academic, and occupational obligations [49].

Limitations in adaptive functioning are common in both individuals involved in the criminal justice system and those affected by confabulation [42,50-52]. Those suffering from frontal lobe impairment, which has been linked to confabulation, have difficulty with self-monitoring and emotional processing, leading to inappropriate social behavior [53,54]. For example, Beer, John, Scabini, and Knight note that patients with orbitofrontal damage exhibited unusual behaviors such as reacting to strangers in an inappropriately intimate manner, disclosing too much personal information, and teasing others in an unsuitable way [55]. In addition to these deficits in social behavior, individuals with orbitofrontal damage are at an increased risk for confabulation. In turn, negative social consequences may be associated with an increase the likelihood of confabulation, particularly in response

to negative in feedback [27]. Finally, the risk of confabulation increases with age and in the presence of uncertain social settings and expectations such as during interrogations in criminal justice settings [27].

To protect against the consequences of adaptive functioning deficits in criminal justice settings, a reliable and valid assessment of adaptive functioning is essential. Although commonly difficult to assess in criminal justice settings, such an evaluation should examine the client's behavior across the lifespan using a combination of different sources of information such as official medical records and collateral informants (e.g., family members and friends). It may also be suggested that validated psychological inventories be used to assess the state of the client's adaptive behavior. Among them is the Adaptive Behavior Assessment System-Second Edition (ABAS-II; Harrison & Oakland), which is constructed to capture the above-mentioned domains of adaptive behavior: conceptual, social and practical [56]. Once completed, the assessment should be used to inform important legal decisions like competency to stand trial or make other legal decisions (e.g., waive Miranda rights or enter a plea) and the allocation of government resources (e.g., Medicaid and social security benefits).

Executive functioning

Executive functioning refers to the higher-order cognitive processes including information processing, attention, impulse control, and memory that are necessary for complex thoughts [57,58]. The brain's capacity for executive functioning is essential for an individual's ability to plan, achieve goals, anticipate consequences, make decisions, and solve problems [59,60]. Deficits in executive functioning can negatively impact an individual's ability to perform basic activities including interacting with others at a basic level, scheduling and attending appointments, and maintaining health. As a result, individuals with executive functioning issues are prone to feeling overwhelmed, affective dysregulation (e.g., outbursts of anger), fatigue, and humiliation. As regards to the current concern, compromised executive functioning has been linked to memory impairments including confabulation [61-63].

The relationship is less than straightforward, but the frontal lobe, executive function, and confabulation have been consistently linked in the scientific literature [64,65]. Specifically, damage or disorders impacting the frontal lobe often co-occur with executive functioning deficits [64]. In a meta-analysis of 27 lesion and neuroimaging studies and 1,992 participants, Alvarez and Emory found mixed evidence on the relationships between frontal lobe activity and executive functioning. Although these findings do not reveal a simple causal relationship, there may be a more nuanced relationship between frontal lobe impairments and executive function than originally posited.

Similarly, the research on the relationship between executive function and confabulation is just as strife with inconsistencies. Some research has found a relationship between executive function and spontaneous confabulation, whereas other research has failed to replicate these findings [66,13]. For example, an MRI

case study of an individual recovering from a stroke reported that the level of executive function impairment in the paramedian arteries of the thalami was related to confabulation [67]. Further, as the patient's executive functioning improved during the recovery, their incidents of spontaneous confabulation decreased [67]. In contrast, another study failed to establish an association between the Provoked Confabulation Test and the Stroop Color-Word Test. Despite these inconsistencies, mental health professionals should be familiar with the symptoms of executive dysfunction and its possible relationship with confabulation until research clarifies the nature of the relationship between these constructs [65].

Substance abuse or misuse

Not only does substance abuse increase risk of criminal justice involvement, but it has a negative influence on executive functioning [68]. In fact, alcohol, cannabis, and heroin are substances that have been shown to influence cognitive impairments and increase the likelihood of confabulation [69,70]. The deleterious influences of cannabis on working and declarative memory have been well established for decades [69]. In their recent literature review, Barcelo and colleagues explore new research to gain a clearer understanding of the relationship between cannabis and confabulation [69]. The authors summarize that cannabis use renders a susceptibility to confabulation in both current and former users. This susceptibility may be linked to alterations in the cognitive functioning abilities of the lateral and temporal lobes of the frontal cortex.

In light of long-term impact of heroin abuse on cerebral structures, Mitrovic and colleagues explored the impact of long-term heroin use on neurophysiological functioning and memory in a sample of 90 participants with a history of heroin addiction [70]. Here, the 90 participants were split into three groups of 30 participants: participants who abused heroin up to one year, between one and five years, and longer than five years. Findings indicate that heroin abuse for a period of longer than one year was associated with impairments in short-term and delayed verbal memory. In other words, the length of heroin abuse is positively correlated with the number of memory impairments. As such, long-term heroin abuse could increase the risk of confabulation. Given that substance abuse has exceedingly high prevalence rates in the criminal justice system, practitioners should be prepared to identify the co-occurrence of confabulation and substance abuse.

Suggestibility

Individuals with frontal lobe injuries and subsequent executive function deficiencies are not only at risk for confabulation but are also more susceptible to suggestibility and manipulation [9,58]. For example, in a study of 32 psychiatric patients, Smith and Gudjonsson found that confabulation was correlated with suggestibility and anxiety. Because these relationships were not strong in magnitude, there is a possibility that other social and situational factors may influence the likelihood of confabulation [58]. Interestingly, Smith and Gudjonsson found that confabulation was not associated with compliance or self-esteem, suggesting that the tendency to simply go along with

requests or obey instructions has little impact on this behavior [58]. Similar findings were reported by Clare and Gudjonsson in a sample of people with mild learning disabilities (mean IQ = 65) [71,72]. Specifically, these participants were more prone to suggestibility and confabulation relative to a comparison group with average intellectual abilities. The findings reported above provide evidence that executive function, or in general, I.Q., is negatively related to the probability of the production of confabulation, whereas personality factors, such as susceptibility to suggestion, are positively associated. These relationships have been empirically investigated and have been shown to be statistically valid [19]. Generally, consistent findings were also summarized in Schacter, Kagan, and Leichtman's comparison of preschool children and adults with frontal lobe damage [32]. Here, both groups exhibited suggestibility and confabulation, both deficits being consistent with the frontal lobe impairment's contribution to reality monitoring.

Nonetheless, other research by Gudjonsson and Young found that confabulation was not correlated with suggestibility or acquiescence [73]. However, this work was conducted in a diverse sample of 66 adults with learning disabilities, 58 unemployed adults, and 21 mental health services staff members. As such, it is unclear to what degree that these findings are a function of the sample. Regardless, Gudjonsson and Young report that factors like uncertainty and expectation are likely to contribute to confabulation, and these factors also contribute to suggestibility under social pressure [73]. In light of these potential influences, repeated questioning and severe negative feedback should be avoided during interrogations to decrease the likelihood of confabulation.

Hanba and Zaragoza directly investigated the impact of the role of interviewer feedback in confabulation in a sample of 66 undergraduate students [74]. Participants were randomly assigned to confabulation (n = 36) and no confabulation (n=30) groups. All participants were interviewed immediately after watching an 8-minute excerpt of a Disney movie and two days later. During the first interview, participants in the confabulation group received inaccurate information from the interviewer about things that did not happen in the video. When re-interviewed, participants in the confabulation group reported this false information as part of their memories of the video. Using a similar design in a sample of 98 undergraduate students, Zaragoza, Payment, Ackil, Drivdahl, and Beck found that participants reported false memories and confabulation one to two months after seeing the video [34]. These findings generalize beyond video excerpts of Disney movies as well. Pezdek, Lam, and Sperry also found similar results when using a 5-minute crime video in a sample of 144 undergraduate students. Together, these studies highlight how feedback from interviewers can result in false memories and confabulation. The weight of this potential relationship is emphasized by the fact that both confabulation and suggestibility have been concerns in real life cases of false confession and wrongful conviction [1]. As a result, law enforcement officers should be careful about administering coercive interrogation techniques and eliciting false confessions [1,75]. Additionally, one should treat with caution confessions

that have been extracted over a series of sequential interviews, as the data indicate that repeated exposure to suggested false information is associated with a stronger confidence in the information, even if it is the belief that the listener/suspect/believer was the perpetrator of the misdeed [34].

What to do when you expect confabulation?

In addition to being familiar with the potential contributors to confabulation, there are several steps that criminal justice, forensic mental health, and legal professionals can take to prevent miscarriages of justice. Foremost, screening and assessment should be an immediate priority when confabulation is considered a possibility as misinformation and misdiagnosis can lead to inaccurate diagnoses and decrease the success of treatment. In such instances, the expansion of typical screening and assessment protocols to include additional neurological and psychological tests is essential to better evaluate the risk for confabulation. This includes using assessments designed specifically to identify confabulation like the Nijmegen-Venray Confabulation List (NVCL-20), a relatively recent measure with strong psychometric properties [45]. During this assessment process, mental health professionals also need to account for the possibility of several co-occurring conditions including neurocognitive (e.g., Fetal Alcohol Spectrum Disorder (FASD), Traumatic Brain Injury (TBI), and Wernicke-Korsakoff syndrome (WKS)), learning, and communication disorders along with deficits in adaptive and executive functioning. Consideration of proneness to suggestibility and other memory impairments including amnesia, source monitoring, and strategic retrieval is necessary [76,77]. Concerning the topic of "strategic retrieval", recall that confabulation is a phenomenon occurring in episodic or autobiographical memory, and not of semantic memory – memory for widely-known facts. In the normal population, strategic retrieval strategies help to guide and organize episodic memory retrieval. Damage to this system, often associated with damage to the ventro-medial prefrontal cortex has been shown to be associated with confabulation [78]. Special consideration should also be extended to the individual's historical habits and propensity for imagination and fantastical thoughts, which can contribute to confabulation and false memories [15,33,79,80].

Such a protocol must account for the possibility that individuals who confabulate may unreliably self-report information and contribute to diagnostic inaccuracies. To combat this problem, professionals can develop and enhance communication skills that improve interactions with clients who present with warning signs for confabulation to help increase the accuracy of information. Further, professionals should incorporate fact-checking protocols to investigate any apparent inconsistencies, verify the accuracy of any self-report information provided by these clients, and rule out malingering [2,3]. This can be done through a systematic fact-checking procedure that incorporates information from different data sources including official records (e.g., medical history and criminal history) and collateral informants (e.g., family members and friends) [42]. Initiating relationships with other professionals and care providers may be beneficial in this process, particularly if these collaborators have expertise in confabulation [2,3,81,82].

If concern for confabulation is raised during this process, criminal justice, forensic mental health, and legal professionals must clearly make a note of this in the individual's case file and ensure proper referral for care.

The quality of information obtained during the screening and assessment process can be maximized in several ways. For example, criminal justice and forensic mental health professionals should allow extra time for processing information and remain comfortable with silence and long pauses [42,82]. Remaining calm and patient and not rushing the client can limit the likelihood that they will be stressed or overwhelmed. Keeping language and questions simple and often verifying comprehension is of paramount importance. It is also beneficial to use encouraging approaches and avoid non-confrontational methods [42]. Above all else, make sure that the client understands that it is quite acceptable for them not to know the answer to a question. Throughout the assessment process, mental health professionals must remind themselves that confabulation is unintentional and to avoid personal frustration with the transactional process [2,3,81].

After the assessment and screening process is completed, mental health professionals should incorporate the following information in the treatment plan and routine [82]. Early intervention offers the best chance for short- and long-term client outcomes. That said, symptom management should be the primary goal. In cases where strokes or traumatic brain injuries are present, rehabilitation should be an emphasized component of the treatment plan. Relaxation, rest, and sleep-improvement strategies could be integral in this process. The use of a memory diary and self-monitoring training could be beneficial for memory monitoring [83,84]. Because caregivers and other support system members can make a world of difference, mental health professionals should consider providing education on the topic of confabulation to these individuals [85-89].

Conclusion

People who suffer from brain injuries and neurocognitive

impairments frequently experience a host of lifelong cognitive disabilities. In some instances, these disabilities may contribute to the manifestation of confabulation. This unintentional production of false memories can have many negative consequences, particularly on the integrity of the criminal justice and legal systems. To protect against these deleterious possibilities, increased awareness and recognition of confabulation and how to deal with its consequences in the criminal justice system remains imperative. Unfortunately, there is a lack of education and training options on the topic of confabulation in the criminal justice system. Professionals are encouraged to not only seek out such rare opportunities but also to create and publicize educational and training opportunities related to confabulation and its consequences in the criminal justice system.

That said, there is still a need for advanced and innovative research on confabulation in the criminal justice and legal systems in several areas. First, research that explores the causes and mechanisms of confabulation, particularly in criminal justice and forensic mental health settings, is essential. Second, systematic reviews that help contextualize the influences of confabulation in legal settings can provide an important contribution. In particular, there is strong need to better understand the nuanced impacts of confabulation on competency to stand trial, confessions, testimony, and forensic evaluations. Third, on the topic of forensic evaluations, there is a strong need for the development and validation of screening and assessment tools for use with individuals who may be confabulating in criminal justice settings. Fourth, surveys would be beneficial in understanding the experiences and attitudes of professionals in forensic mental health and legal settings in relation to confabulation. Finally, there is a great need for research focused on developing techniques and recommendations for handling and addressing confabulation in the criminal justice system. Together, such a multi-faceted approach to research has the potential to minimize the consequences of confabulation in the criminal justice system.

References

- Gudjonsson GH (2003) The psychology of interrogations and confessions: A handbook. John Wiley & Sons, Ltd. London, UK.
- Brown JM, Haun J, Zapf PA, Brown NN (2017) Fetal Alcohol Spectrum Disorders (FASD) and competency to stand trial (CST): Suggestions for a 'best practices' approach to forensic evaluation. *Int J Law Psychiatry* 52: 19-27.
- Brown J, Hesse M, Rosenbloom M, Harris B, Weaver J, et al. (2015) Confabulation in correctional settings: An exploratory review. *The Journal of Law Enforcement* 4: 1-8.
- Brown J, Long-McGie J, Oberoi P, Wartnik AJ, Weinkauff E, et al. (2015) Confabulation: Connections between brain damage, memory, and testimony. *Journal of Law Enforcement* 3: 1-11.
- Huntley D, Brown J, Wiley CR (2016) Confabulation and mental health: A beginner's guide. *Behavioral Health* 4: 1-9.
- Conway MA, Tacchi PC (1996) Motivated confabulation. *Neurocase* 2: 325-339.
- Moscovitch M, Melo B (1997) Strategic retrieval and the frontal lobes: evidence from confabulation and amnesia. *Neuropsychologia* 35: 1017-1034.
- Ackil JK, Zaragoza MS (1998) Memorial consequences of forced confabulation: Age differences in susceptibility to false memories. *Develop Psychol* 34: 1358.
- Gudjonsson GH, Clare IC (1995) The relationship between confabulation and intellectual ability, memory, interrogative suggestibility and acquiescence. *Pers Individ Dif* 19: 333-338.
- Bartlett FC (1932) *Remembering: A study in experimental and social psychology*. Cambridge: Cambridge University Press, UK.
- Burgess PV, Shallice T (1996) Confabulation and the control of recollection. *Memory* 4: 359-411.
- Kopelman MD (1987) Two types of confabulation. *J Neurol Neurosurg Psychiatr* 50: 1482-1487.
- Skranes J (2017) Executive function deficits in preterm subjects are

- a combination of social risk factors and brain maldevelopment. *Acta Paediatrica* 106: 1380-1382.
- 14 Coltheart M, Turner M (2009) Confabulation and Delusion. In W. Hirstein (Ed.), *Confabulation: Views from neuroscience, psychiatry, psychology, and philosophy*. Oxford University Press, London. pp: 173-187.
 - 15 Nash RA, Wade KA (2009) Innocent but proven guilty: Eliciting internalized false confessions using doctored-video evidence. *Appl Cognit Psychol* 23: 624-637.
 - 16 Schnider A (2001) Spontaneous confabulation, reality monitoring, and the limbic system—A review. *Brain Res Rev* 36: 150-160.
 - 17 Schnider A, Von Daniken C, Gutbrod K (1996) The mechanisms of spontaneous and provoked confabulations. *Brain* 119: 1365-1375.
 - 18 Clare NN, Gudjonsson G, Connor P (2011) Suggestibility and Fetal Alcohol Spectrum Disorders: I'll tell you anything you want to hear. *J Psychiatry Law* 39: 39-71.
 - 19 Clare ICH, Gudjonsson GH (2010) The vulnerability of suspects with intellectual disabilities during police interviews: A review and experimental study of decision-making. *Mental Handicap* 8: 110-128.
 - 20 Moscovitch M (1989) Confabulation and the frontal systems: Strategic versus associative retrieval in neuropsychological theories of memory. *Varieties of memory and consciousness: Essays in honour of Endel Tulving* 133-160.
 - 21 Kerns L (1986) Falsifications in the psychiatric history: A differential diagnosis. *Psychiatry* 49: 13-17.
 - 22 Hirstein W (2005) *Brain Fiction: Self-deception and the riddle of confabulation*. MIT Press, Massachusetts, USA.
 - 23 Langdon R, Turner M (2010) Delusion and confabulation: Overlapping or distinct distortions of reality?. *Cognit Neuropsychia* 15: 1-13.
 - 24 Usher AM, Stewart LA, Wilton G (2013) Attention-deficit hyperactivity disorder in a Canadian prison population. *Int J Law Psychiatry* 36: 311-315.
 - 25 Asp EW, Tranel D (2013) False tagging theory: Toward a unitary account of prefrontal cortex function. In: Stuss, D.T., Knight, R.T. (Eds.) *Principles of Frontal Lobe Function* (2nd Ed., pp. 383-416). Oxford University Press, New York, NY, USA.
 - 26 Stuss D, Levine B (2002) Adult clinical neuropsychology: Lessons from studies of the frontal lobes. *Annu Rev Clin* 53: 401-433.
 - 27 Lorente-Rovira E, Santos-Gomez J, Moro M, Villagran J, McKenna P (2010) Confabulation in schizophrenia: A neuropsychological study. *Journal of the International Neuropsychological Society* 16: 1018-1026.
 - 28 Faul M, Xu L, Wald MM, Coronado VG (2010) *Traumatic brain injury in the United States*. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Atlanta, GA, USA.
 - 29 Finnie JW, Blumbergs PC (2002) Traumatic brain injury. *Vet Pathol* 39: 679-689.
 - 30 Hirstein W (2000) Self-deception and confabulation. *Philosophy of Science* S418-S429.
 - 31 Schacter DL, Kagan J, Leichtman MD (1995) True and false memories in children and adults: A cognitive neuroscience perspective. *Psychol Public Policy Law* 1: 411-428.
 - 32 Wade KA, Garry M, Read JD, Lindsay DS (2002) A picture is worth a thousand lies: Using false photographs to create false childhood memories. *Psychon Bull Rev* 9: 597-603.
 - 33 Zaragoza MS, Payment KE, Ackil JK, Drivdahl SB, Beck M (2001) Interviewing witnesses: Forced confabulation and confirmatory feedback increase false memories. *Psychol Sci* 12: 473-477.
 - 34 Kassin S, Kiechel K (1996) The social psychology of false confessions: Compliance, internalization, and confabulation. *Psychol Sci* 7: 125-128.
 - 35 Ofshe RJ (1992) Inadvertent hypnosis during interrogation: False confession due to dissociative state; mis-identified multiple personality and the satanic cult hypothesis. *Int J Clin Exp Hypn* 40: 125-156.
 - 36 Pezdek K, Lam ST, Sperry K (2009) Forced confabulation more strongly influences event memory if suggestions are other-generated than self-generated. *Legal Criminol Psychol* 14: 241-252.
 - 37 Kassin SM (2007) Internalized false confessions. *The handbook of eyewitness psychology* 1: 175-192.
 - 38 Hirstein W (2009) Introduction: What is confabulation?. Retrieved from <https://philpapers.org/archive/HIRIWI.pdf>
 - 39 Brown J (2017) Fetal alcohol spectrum disorder and confabulation: A clinical, forensic and judicial dilemma. *The Journal of Special Populations* 1: 1-11.
 - 40 Douglas H (2015) Foetal alcohol spectrum disorders: A consideration of sentencing and unreliable confessions. *J Psychiatry Law* 23: 427-442.
 - 41 Gudjonsson GH, Sigurdsson JF, Sigurdardottir AS, Steinthorsson H, Sigurdardottir VM (2014) The role of memory distrust in cases of internalised false confession. *Applied Cognitive Psychology* 28: 336-348.
 - 42 Rensen YC, Oosterman JM, Van Damme JE, Griekspoor SI, Wester AJ, et al. (2015) Assessment of confabulation in patients with alcohol-related cognitive disorders: The Nijmegen-Venray Confabulation List (NVCL-20). *Clin Neuropsychol* 29: 804-823.
 - 43 Horselenberg R, Merckelbach H, Josephs S (2003) Individual differences and false confessions: A conceptual replication of Kassin and Kiechel (1996). *Psychol Crime Law* 9: 1-8.
 - 44 Gudjonsson G (2017) Memory distrust syndrome, confabulation and false confession. *Cortex* 87: 156-165.
 - 45 Harrison PL, Oakland T (2002) *Adaptive behavior assessment system*, (2nd edn). The Psychological Corporation, San Antonio, TX, USA.
 - 46 American Psychiatric Association (2013) *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Publishing, Arlington, VA, USA.
 - 47 Borson S, Raskind MA (1997) Clinical features and pharmacologic treatment of behavioral symptoms of Alzheimer's disease. *Neurol* 48: 175-245.
 - 48 Edwards WJ, Greenspan S (2010) Adaptive behavior alcohol spectrum and fetal disorders. *J Psychiatry Law* 38: 419-447.
 - 49 Fast D, Conry J (2004) The challenge of fetal alcohol syndrome in the criminal legal system. *Addic Biol* 9: 161-166.
 - 50 Greenspan S (2008) Foolish action in adults with intellectual disabilities: The forgotten problem of risk-unawareness. *Int Rev Res Ment Retard* 36: 147-194.
 - 51 Nahum L, Bouzerda WA, Guggisberg A, Radek P, Schnider A (2012) Forms of confabulation: Dissociations and associations. *Neuropsychologia* 50: 2524-2534.
 - 52 Turner M, Coltheart M (2010) Confabulation and delusion: A common monitoring framework. *Cognitive Neuropsychiatry* 15: 346-376.
 - 53 Beer J, John O, Scabini D, Knight R (2006) Orbitofrontal cortex and

- social behavior: Integrating self-monitoring and emotion-cognition interactions. *J Cogn Neurosci* 18: 871-879.
- 54 Harrison PL, Oakland T (2003) Adaptive behavior assessment system (2nd edn): Manual. Harcourt Assessment, San Antonio, TX, USA..
- 55 Domínguez-Salas S, Díaz-Batanero C, Lozano-Rojas OM, Verdejo-García A (2016) Impact of general cognition and executive function deficits on addiction treatment outcomes: Systematic review and discussion of neurocognitive pathways. *Neurosci Biobehav Rev* 71: 772-801.
- 56 Smith P, Gudjonsson GH (1995) Confabulation among forensic inpatients and its relationship with memory, suggestibility, compliance, anxiety, and self-esteem. *Pers Individ Dif* 19: 517-523.
- 57 Dinn WM, Harris CL (2000) Neurocognitive function in antisocial personality disorder. *Psychia Res* 97: 173-190.
- 58 Hughes C, Ensor R (2011) Individual differences in growth in executive function across the transition to school predict externalizing and internalizing behaviors and self-perceived academic success at 6 years of age. *J Exp Child Psychol* 108: 663-676.
- 59 Baddeley A, Wilson B (1988) Frontal amnesia and the dysexecutive syndrome. *Brain and Cognition* 7: 212-230.
- 60 Cunningham JM, Pliskin NH, Cassisi JE, Tsang B, Rao SM (1997) Relationship between confabulation and measures of memory and executive function. *J Clin Exp Neuropsychol* 19: 867-877.
- 61 Kessels RP, Korktrijk HE, Wester AJ, Nys G (2008) Confabulation behavior and false memories in Korsakoff's syndrome: Role of source memory and executive functioning. *Psychiatry Clin Neurosci* 62: 220-225.
- 62 Alvarez J, Emory E (2006) Executive function and the frontal lobes: A meta-analytic review. *Neuropsychol Rev* 16: 17-42.
- 63 Cooper JM, Shanks MF, Venneri A (2006) Provoked confabulations in Alzheimer's disease. *Neuropsychologia* 44: 1697-1707.
- 64 Fischer RS, Alexander MP, D'esposito M, Otto R (1995) Neuropsychological and neuroanatomical correlates of confabulation. *J Clin Exp Neuropsychol* 17: 20-28.
- 65 Olio KA, Cornell WF (2017) The façade of scientific documentation: A case study of Richard Ofshe's analysis of the Paul Ingram case. *Psychol Public Policy Law* 4: 1182-1197.
- 66 Lundqvist T (2005) Cognitive consequences of cannabis use: Comparison with abuse of stimulants and heroin with regard to attention, memory and executive functions. *Pharmacol Biochem Behav* 81: 319-330.
- 67 Barcelos A, Lopes A, Bernardo M, Adriana C (2017) Cannabis and confabulation: An intrusive relationship. *European Psychiatry* 41: S630-S631.
- 68 Martinovic MS, Dickov A, Vuckovic N, Mitrovic D, Budisa D (2011) The effect of heroin on verbal memory. *Psychiatria Danubina* 23: 53-59.
- 69 Zinn S, Stein R, Swartzwelder HS (2004) Executive functioning early in abstinence from alcohol. *Alcohol Clin Exp Res* 28: 1338-1346.
- 70 Clare ICH, Gudjonsson GH (1993) Interrogative suggestibility, confabulation, and acquiescence in people with mild learning disabilities (mental handicap): Implications for reliability during police interrogations. *British Journal of Clinical Psychology* 32: 295-301.
- 71 Schacter GH, Young S (2010) Does confabulation in memory predict suggestibility beyond IQ and memory? *Pers Individ Dif* 49: 65-67.
- 72 Hanba JM, Zaragoza MS (2007) Interviewer feedback in repeated interviews involving forced confabulation. *Appl Cognit Psychol* 21: 433-455.
- 73 Meissner CA, Russano MB (2003) The psychology of interrogations and false confessions: Research and recommendations. *Canad J Pol Secur Ser* 1: 53-64.
- 74 Fotopoulou A (2008) False selves in neuropsychological rehabilitation: The challenge of confabulation. *Neuropsychol Rehabil* 18: 541-565.
- 75 Fotopoulou A, Conway MA, Solms M (2007) Confabulation: Motivated reality monitoring. *Neuropsychologia* 45: 2180-2190.
- 76 Gilboa A, Alain C, Stuss DT, Melo B, Miller S, et al. (2006). Mechanisms of spontaneous confabulations: a strategic retrieval account. *Brain* 129: 1399-1414.
- 77 Henkel LA (2011) Photograph-induced memory errors: When photographs make people claim they have done things they have not. *Applied Cognitive Psychology* 25: 78-86.
- 78 Henkel LA, Franklin N, Johnson MK (2000) Cross-modal source monitoring confusions between perceived and imagined events: : Learning, Memory, and Cognition. *J Exp Psychol* 26: 321-335.
- 79 Huntley D, Brown J (2016) Understanding confabulation: An introduction for criminal justice and mental health professionals. *Forensic Scholars Today* 1: 1-4.
- 80 Mertz C, Brown J (2015) Confabulation: An Introduction for Psychologists. *Forensic Scholars Today* 1: 1-2.
- 81 Alderman N, Fry RK, Youngson HA (1995) Improvement of self-monitoring skills, reduction of behaviour disturbance and the dysexecutive syndrome: Comparison of response cost and a new programme of self-monitoring training. *Neuropsychol Rehabil* 5: 193-221.
- 82 Dayus B, Van den Broek MD (2000) Treatment of stable delusional confabulations using self-monitoring training. *Neuropsychol Rehabil* 10: 415-427.
- 83 Gilboa A, Verfaellie M (2010) Telling it like it isn't: The cognitive neuroscience of confabulation. *J Int Neuropsychol Soc* 16: 961-966.
- 84 Moscovitch M (1995) Confabulation. In D.L. Schacter (Ed.), *Memory distortions: How minds, brains, and societies reconstruct the past*. Harvard University Press, Cambridge, MA, USA. pp: 226-251.
- 85 Nys GM, Van Zandvoort MJ, Roks G, Kappelle LJ, De Kort PL, et al. (2004) The role of executive functioning in spontaneous confabulation. *Cognitive and behavioral neurology* 17: 213-218.
- 86 Redlich AD, Goodman G (2003) Taking responsibility for an act not committed: The influence of age and suggestibility. *Law and Human Behavior* 27: 141-156.
- 87 Salekin KL, Olley JG, Hedge KA (2010) Offenders with intellectual disability: Characteristics, prevalence, and issues in forensic assessment. *J Ment Health Res Intellect Disabil* 3: 97-116.
- 88 Schnider A (2008) *The confabulating mind: How the brain creates reality*. Oxford University Press, New York, NY, USA.
- 89 Young S, Moss D, Sedgwick O, Fridman M, Hodgkins P (2014) A meta-analysis of the prevalence of attention deficit hyperactivity disorder in incarcerated populations. *Psychol Med* 45: 247-258