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# The Phenomenon of False Memory and Its Correlation to Mental Health

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## **Abstract**

Memory has always been important for humans. Whether it is remembering the location of one's car in a crowded parking lot or giving an eye-witness testimony, memory is instrumental in every part of society. False memory is a situation where one incorrectly believes or recalls an event. This review is about false memory and how mental disorders may or may not increase the capacity for false memory. Previous studies have found correlations between false memory and specific mental health disorders. Additional research is needed in patients with post-traumatic stress disorder (PTSD), substance abuse, and schizophrenia. The benefits of future research in this field include the impact and potential improvement of the patients affected by these disorders. This research could also change how eye-witness accounts are perceived. This review outlines how different mental disorders contribute to the production of false memories.

**Keywords:** pseudo memory, mental health, trauma, false memory, eye-witness accounts

## Introduction

False memory, or pseudo – memory, is a phenomenon where the brain inaccurately recalls specific details or events. Despite the falsity of the memory or thought, the person honestly believes this falsity to be true.<sup>1,2</sup> Research has shown memory can be influenced by various factors both externally and internally.<sup>2</sup> Trauma is both an internal and external component that contributes to the formation of false memories.<sup>2</sup> A trauma can be an event in which a person experiences intense emotional distress or faces an imminent threat which may contribute to one’s mental well-being.<sup>2</sup> However, because multiple types of traumas can be caused, there has not been enough extensive research to show a correlation between false memory and mental health.<sup>2,3</sup> In addition, psychiatric disorders are constituted by any disorder in which there is a disturbance or deviation in emotional regulation, thought pattern, or behavior.<sup>2</sup> Because of this definition, substance abuse disorders are listed in the DSM as potential diagnoses for mental health patients.<sup>2</sup> Besides the lack of research in this field, an accurate memory is relied on in certain aspects of society, such as the legal system, and can lead to serious consequences if the perceived memory is inaccurate.<sup>4</sup> In this review, I will discuss the correlations between trauma disorders, psychiatric disorders, and substance abuse along with the prevalence of false memories in these disorders.

## Trauma – Related Disorders

Trauma-related disorders are disorders where a patient’s mental status is altered and include but are not limited to depression, post-traumatic stress disorder (PTSD), and borderline personality disorder (BPD).<sup>2,3</sup> These disorders can also be characterized as psychiatric disorders, but not all psychiatric illnesses are trauma-related.<sup>2</sup> According to the current *Diagnostic Statistical Manual of Mental Disorders* (DSM-5), PTSD is characterized as a trauma-disorder where a patient experiences a disturbance in their mental health after an acute or chronic exposure to a traumatic event.<sup>2</sup> BPD is a disorder characterized by poor coping skills, mood instability, and insecure identity.<sup>2</sup> Because both

PTSD and BPD are often seen together in the same patient along with other mental disorders, studies used exclusion criteria for experimental groups to isolate PTSD and BPD so any previous comorbidities would be irrelevant.<sup>3,5</sup> To determine if those with PTSD and BPD have more or less false memories, data was taken through surveys and word recognition tests asking about different emotional experiences.<sup>3,5,6</sup> One study found those with PTSD and BPD were not able to recognize more false memories.<sup>3</sup> However, this study did find those afflicted with a disorder were more likely to create a false memory based on the relatedness of the event to the disorder.<sup>3</sup> On the other hand, one study utilizing the Deese-Roediger McDermott (DRM) paradigm in BPD patients observed participants had no difference in regular memory but a decrease in false memory compared to their ‘healthy’ counterparts.<sup>7</sup> The DRM method is observed when patients study word lists that are all related to a particular ‘buzzword’ and later tested on their memory of these lists.<sup>7</sup> Another found Iranian war veterans with trauma-related PTSD were less likely to recognize real events but more likely to identify false memories.<sup>6</sup> Additionally, trauma-related words from one study elicited a larger number of responses.<sup>8</sup> These studies indicate a need for further research in those with PTSD, both with and without comorbidities. The studies involving veterans should also include those who haven’t been exposed to combat but have PTSD.

Furthermore, a study comparing older patients versus older patients with depressive disorder (DD), found those with DD recognized more false memories but had no difference in working memory.<sup>5</sup> Another study researching the mood-congruent memory (MCM) effect suggested that those with depression may score as well as the control group for working memory when using structured memory tests.<sup>9</sup> The MCM effect is a supposed bias where a person remembers information related to their mood.<sup>9</sup> However, patients with depression will show a decrease in working memory in studies that utilize free recall methods.<sup>9</sup> Moreover, a study using the (DRM) model observed participants with depression would have higher levels of both false and working memory based on the emotional impact

or reliability of the specific test.<sup>10</sup> Based on the above studies, there is evidence to suggest those with depressive disorders have an increase in false memories.

## **Psychiatric Disorders**

One reason why studies about psychiatric disorders, such as schizophrenia and psychopathy, and false memory are needed is due to the prospect that the correlation plays a role in the development of the conditions' symptoms.<sup>11,12</sup> While the development of memory is influenced by states of emotional excitability, those with psychopathic personality traits have a degree of emotional impairment.<sup>11</sup> This means those with psychopathic traits comprehend emotions differently which leads to traits like manipulateness and apathy.<sup>11</sup> This emotional impairment causes a higher level of “fearless dominance”, or lack of fear against potential threats, in people with these characteristics which decreases their chance of developing negative false memories.<sup>11</sup>

Similarly, people with schizophrenia do not have a greater capacity for false memory than those without schizophrenia.<sup>12</sup> However, those with schizophrenia have a harder time remembering true memories than the control group which could be attributed to the physiological differences shown in the brains of schizophrenic patients.<sup>12</sup> Schizophrenic patients suffering from delusions have a higher capacity for false memory and recall less true memory than those without delusions.<sup>13</sup> More research is needed to confirm whether the inability to properly use certain neural pathways could be the reason for this lack of true memory. As shown with the previous research studies, the influence of psychiatric disorders on the capacity for false memory is specific to the individual disorder.

## **Substance Use**

When it comes to the use of drugs, like 3,4-methylenedioxy-methamphetamine, or better known as MDMA or Molly, false memory can be affected in multiple ways, such as verbal and recognition impairment in the brain.<sup>14</sup> MDMA causes a decrease in false memory after intoxication

due to the drug altering the encoding mechanism in the brain.<sup>14</sup> Alternatively, a meta-analysis determined there is an increase in the capacity for the retrieval of false memories when using alcohol and cannabis; however, there is a decrease in the encoding effects of memory when these drugs are ingested.<sup>15</sup> Another study analyzed the use of different substances with relation to false memory to show how testimonies given under the influence of these substances can have serious legal consequences.<sup>4</sup> This study found an increase in false memory in those under the influence of antipsychotics, alcohol, stimulants, and some hallucinogens.<sup>4</sup> False memory production can either decrease, increase or be unaffected depending on which substance is abused.

## **Conclusion**

While various relationships can be seen between multiple disorders, research exemplifies a connection between false memory and mental illness. There is evidence to show an increase of false memory in trauma-related disorders like PTSD, BPD, and DD.<sup>3,5,7,10</sup> While there is a correlation between individual psychiatric disorders and false memory production, the cause is still unknown and the effect on false memory is dependent on the individual disorder.<sup>11,12,13</sup> Similar to most psychiatric disorders, the effect a substance will have on false memory is also dependent on the specific substance and whether it was the only substance taken.<sup>4,14,15</sup> Table 1 shows how each disorder reviewed contributes to both working and false memory. However, more research on the specificity of how and why this happens in certain disorders needs to be done. The research should have large sample sizes and a focus on trauma-material. More research should be done in areas of schizophrenia, substance abuse, and PTSD without comorbidities. These analyses could benefit patients affected by these disorders and advise the judicial system for remediation of the law where memory is relied on.

**Table 1. Mental Disorders and Their Influences on False and Working Memory**

<b>Disorder</b>	<b>Influence on False Memory</b>	<b>Influence on Working Memory</b>	<b>Sources</b>
Depression	Increase in false memory	Potential decrease in working memory (depends on task)	5, 9, 10
PTSD	Increase in false memory	Decrease in working memory	3, 6, 8
Borderline Personality Disorder	Decrease in false memory	No influence found	3, 7
Schizophrenia	No influence found	Decrease in working memory	12, 13
Psychopathy	Decrease in negative false memory	Decrease in working memory	11
Substance Abuse (Cannabis, MDMA, alcohol, etc.)	Increase/Decrease in false memory (depends on substance)	Decrease/Increase in working memory (depends on substance)	4, 14, 15

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