



# Dissociative Experiences in Gambling Disorder

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## Abstract

**Purpose of Review** This review provides a summary of the literature (2012–2018) regarding dissociative experiences in Gambling Disorder (GD). We provide an overview of conceptualizations of dissociation, its relationship to GD, dissociation within specific types of gambling, and harm reduction strategies targeting gambling-related dissociative experiences.

**Recent Findings** The gambling literature lacks a unified conceptualization of dissociative experiences, and measures different aspects of dissociation across studies. The propensity of some individuals toward general and in-game dissociation appears to be involved in the development and/or maintenance of GD. Several features of gambling may facilitate in-game dissociation, particularly among individuals with GD. As such, tools that disrupt in-game dissociation may be crucial for harm reduction.

**Summary** Future research should be aimed at developing a single, operational definition of dissociation in gambling, and this should be systematically examined across gambling modalities. Additionally, ongoing refinement of interventions that effectively interrupt in-game dissociation holds promise for reducing gambling-associated harms.

**Keywords** Gambling disorder · Dissociative experiences · Harm reduction · Altered state of awareness · Escape motivation

## Introduction

Gambling shares many characteristics with substance use, including the ability to alter mood and to induce an altered state of awareness or perception. Individuals with gambling disorder (GD) are more likely than those without to report experiencing a sense of unreality while gambling, that someone else is controlling their actions, and an extreme narrowing of attention such that they lose track of time and do not attend to external events [1]. In this review, we summarize recent literature on dissociative experiences in GD. We begin with a brief discussion on conceptualizations of dissociative experiences within the gambling literature, followed by a review of dissociation's relationship to GD severity and psychological vulnerabilities for GD. These results are placed within the context

of earlier theories of GD. Next, we summarize the literature within specific types of gambling, and finish with a discussion of the application of dissociation theories to harm reduction strategies.

## Definitions of Dissociation in GD

Within the gambling literature retrieved, several conceptualizations of dissociation exist and there is no generally accepted definition. In the fifth edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-5), dissociation refers to a disruption in the integration of mental activities including “consciousness, memory, identity, emotion, perception, body representation, motor control, and behavior” [2]. Dissociation exists on a continuum, with pathological alterations in personality or identity at the extreme [3], and it is unclear where normal dissociative experiences become abnormal along this spectrum, or where the experiences exhibited by some individuals with GD fall. Some researchers are critical of the use of the term “dissociation” altogether in reference to gambling, and refer to processes such as an “altered state of awareness” [4], “immersion” [5, 6], “dark flow” [7•], and “the zone” [5]. Regardless, each concept includes changes in one or more mental activities that are reminiscent of those included in the DSM-5's description of dissociation. For example, altered

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state of awareness refers to a “subjective feeling of an unusual state of consciousness relative to one’s ordinary waking state” [4], and “the zone” refers to an immersion in gambling, characterized by an extreme narrowing of attention at the expense of external events [5].

A variety of measures are used in the recent literature, and although there is some overlap in their definitions, each assesses somewhat different elements of dissociative experiences. For example, the Dissociative Experiences Scale (DES) [8] was developed as a clinical measure of dissociation and includes disruptions in memory, perception, and depersonalization/derealization across a variety of everyday experiences. In contrast, the Jacobs’ Dissociative Experiences Questions (DEQ) [9] measures trance-like and depersonalization experiences, and disruptions in identity and memory that occur specifically within a gambling context. The DES also measures trance-like states that have been described in the dissociative disorder literature, which are similar to the description of altered states of awareness described above. Murch and colleagues [5, 6] have also attempted to identify physiological correlates of the immersive experience during electronic gaming machine (EGM) play to provide a real-time measure of dissociation. In a sample of university students and community gamblers, Murch and colleagues [5] collected respiratory sinus arrhythmia (RSA) data while participants played on an EGM. RSA is a marker of vagal tone that has been linked to immersion experiences [5, 10, 11]. However, in that study, RSA was not associated with dissociative experiences as measured by the Dissociation Questionnaire (DQ), a measure that used the four items in Jacob’s DEQ [9], plus an added time-distortion item [12, 13]. Although decreased RSA was associated with affect score in a Game Experience Questionnaire (GEQ; a measure of gaming experiences), this subscale measures positive and negative affect during play (e.g. “I felt content”), which does not expressly relate to disintegration of any mental activities that are characteristic of dissociation.

As such, in reviewing the literature, it is essential to understand that the dissociative experiences under investigation do not fall under one operational definition. Moreover, dissociation occurring generally must be distinguished from that reported while gambling. In this review, we attempt to summarize the recent available research on dissociative experiences in gambling and individuals with GD. We use the term “in-game dissociation” to refer to a pattern of highly selective attention and attenuation of gambling-irrelevant processing that may be accompanied by additional disruptions in mental processes identified in the DSM-5 description of dissociation, and “general dissociation” to refer to the DSM-5-related disruptions that are not measured as specifically relating to gambling contexts.

## Methods

To identify studies for inclusion, we conducted Scopus, PsychInfo, and Google Scholar searches using the following terms: gambling AND one of the following: dissociation, absorption, immersion, the zone, or dark flow. The year of publication was restricted to from 2012 and 2018 and included one in-press (available online) article. The abstracts of identified articles were reviewed for their relevance and included as appropriate (see Table 1). Of the 106 articles initially retrieved, 17 articles were included in this review. Articles were excluded if they were not reporting original research, did not include a measure of dissociation, or did not measure gambling behavior.

## The Dissociation-Gambling Relationship

One extended line of research has explored associations between dissociation and GD severity, and between dissociation and other psychological factors in individuals with GD. Gori and colleagues [18] examined the role of general dissociation among individuals with GD across several treatment settings: an outpatient treatment program, an outpatient self-help group, and an inpatient program. Individuals in the inpatient program showed the highest severity of GD symptoms, as well as higher general dissociation scores compared to the other groups. In this study, group membership accounted for 20% of the variance in general dissociation ( $\eta^2 = 0.20$ ), a large effect according to Cohen [30]. Similarly, Imperatori and colleagues [19•] reported a large positive association ( $r = 0.48$ ) between GD severity and pathological general dissociation among casino gamblers, and in-gambling dissociation also shows a large positive association with GD severity among university and community EGM players ( $r$ s 0.45 to 0.65) [1, 5]. Taken together, these studies highlight the large, positive association between the severity of GD symptoms and dissociative experiences in general, and while engaging in gambling behavior.

A growing body of literature also supports the theory that dissociative experiences are implicated in the development, and/or perpetuation of disordered gambling behavior [16]. Not only are dissociation and GD severity consistently associated, dissociation has generally been shown to predict GD symptom severity [1, 19•]. Additionally, in a study by Carlbring and colleagues [15], in-game dissociation predicted post-treatment status, such that individuals with higher dissociative gambling scores were less likely to report no gambling in the 30 days immediately following treatment.

One prominent theory proposes that problematic gambling behavior is used by many individuals to escape aversive states such as depression or anxiety [1, 9, 14•], and that the effect of in-game dissociation may be instrumental in the appeal of this escape-style gambling [9, 16, 31, 32]. For example, in a

**Table 1** List of articles reviewed, with information regarding the sample, country, sample size of each study, and the terminology used, context in which dissociation was examined, and measures of dissociation

Author	Sample	Country	<i>N</i>	Dissociation terminology	Context	Measure
Blaszczynski et al. (2016) [14•]	University students	Australia	141	Dissociation	In-game	DES
Carlbring et al. (2012) [15]	Treatment-seeking gamblers	Sweden	284	Dissociative gambling	In-game	Item from DEQ
Cartmill et al. (2015) [16]	Past 12-month gamblers	Australia	142	Dissociation	In-game	DQ
Dixon et al. (2014) [17]	Casino gamblers	Canada	102	Flow	In-game	GEQ
Dixon et al. (2018) [7•]	Adult casino gamblers	Canada	136	Dark flow	In-game	DEQ
Gori et al. (2016) [18]	Treatment-seeking gamblers	Italy	204	Dissociation	General	DES-II
Imperatori et al. (2015) [19•]	Italian casino gamblers	Italy	171	Dissociation	General	DES-T
McCormick et al. (2012) [1]	Electronic gaming machine gamblers	Australia	190	Dissociation	In-game	DEQ
McKeith et al. (2017) [4]	Poker-machine gamblers	Australia, USA	38	Altered state of awareness	In-game	PCI-ASA items
Murch et al. (2017) [5]	Male undergraduate students	Canada	40	Immersion, dissociation	In-game	DQ, GEQ, RSA
Murch & Clark. (2019) [6]	Male undergraduate students and community electronic gaming machine players	Canada	76	Immersion	In-game	GEQ-Flow subscale, modified DEQ
Oakes et al. (2012) [20]	Gamblers, family members, and mental health professionals	Australia	30	Altered state of awareness	In-game	Content analysis
Pattinson & Parke (2016) [21]	Older adults	Great Britain	17	Escapism	In-game	Content analysis
Remond & Romo (2018) [22]	General community	France	432	Immersion, dissociative state	General	QPI
Stewart & Wohl (2013) [23]	University students	Canada	59	Dissociation	In-game	DEQ
Tricker et al. (2016) [24•]	Poker-machine players	Australia	37	Altered state of consciousness	In-game	PCI-ASA items
Wohl et al. (2014) [25]	Study 1: university students, study 2: undergraduate electronic gaming machine gamblers	Canada	17, 56	Dissociation	In-game	DEQ

DEQ Dissociative Experiences Questions [9], DES Dissociative Experiences Questionnaire [8], DES-II Dissociative Experiences Scale–Revised [26], DES-T Dissociative Experiences Scale Taxon [27], DQ Dissociation Questionnaire [13], GEQ The Game Experience Questionnaire, PCI-ASA Phenomenology of Consciousness Inventory–Altered State of Awareness [28], QPI Questionnaire on the Propensity to Immersion [29], RSA respiratory sinus arrhythmia

qualitative study examining motivations for gambling among older adults, Pattinson [21] noted that one common theme reported was gambling as a distraction from chronic conditions. One participant, she reported that “sort of everything around me doesn’t exist, you know?” [21], suggesting an altered state of awareness with a narrowing of attention at the expense of gambling-irrelevant cues. Lending further support to this hypothesis, Oakes and colleagues [20] reported that experiencing a dissociative state of consciousness during gambling may be an important factor in predicting relapse among EGM players. The authors conducted focus groups with four groups of people with knowledge of the relapse process: (1) individuals with problem gambling who had undergone urge exposure and response prevention, (2) their significant others, (3) individuals who had participated in self-help programs, and (4) therapists and counselors. These individuals provided information on their experience with relapse. One theme that emerged was an altered state of awareness

(ASA; a trance-like or dissociative state) while gambling that may impede re-engaging with treatment goals once gambling begins. For example, one participant described that “you become almost robot like and you just sit there and it’s almost as though the money loses its real sense of value” (p. 459). Therefore, in-game dissociation may be involved in maintaining problem gambling behavior for some individuals and decrease the risk of achieving or maintaining long-term abstinence and/or controlled involvement.

In-game dissociation has been linked to this escape motivation across several studies in this review [16, 17, 33]. Dixon and colleagues [17] sought to explain the relationships between in-game dissociation, depression symptoms, gambling expectancies, and gambling severity among a sample of casino gamblers. Using a gambling simulator, they found a significant relationship between in-game dissociation, depression, and GD severity, as well as with depression and the expectation that gambling would elevate their mood.

Therefore, the dissociative experience while gambling may help the individual to escape from negative affect. Similarly, Cartmill and colleagues [16] found that anxiety and in-game dissociation interacted to predict problem gambling behavior among a sample of young gamblers (mean age of approximately 24). As well, using structural equation modeling, McCormick and colleagues [1] found paths between stressors such as anxiety and in-game dissociative experiences, and that 46% of variance in gambling problem severity was predicted by the escape motivation among regular EGM gamblers. Moreover, a history of childhood trauma was found to predict psychological vulnerabilities (depression, anxiety, and life stress) and GD severity. However, the inclusion of the trauma variable only increased the variance explained in severity to 50%. Conceivably, childhood trauma could increase emotional vulnerability, which is in turn linked to GD through dissociation as a mechanism of escape. In support of this, among a sample of casino gamblers, Imperatori and colleagues [19] found general dissociation to mediate the relationship between the severity of childhood trauma and greater GD severity. It is possible that individuals with a propensity toward general dissociative experiences may be more prone to experience dissociation while gambling, and that this serves an escapist function in response to broad emotional vulnerability, resulting in part from childhood trauma. The dissociative escape mechanism may in turn promote the development of GD from an initial maladaptive coping behavior.

## Features of Gambling Types

Although the overall frequency of dissociative experiences appears similar across gambling and substance-related addictions [34], gambling also features several unique characteristics that may foster dissociative experiences. Much of this research has focused on EGMs because such factors as ambient sound, colored lights, and the flow of the games may be most likely to induce dissociative states [1, 16]. As Schüll [35] contends, EGMs are designed to produce a “state of suspended animation” (p. 13) that some researchers have called “the zone.” As previously noted, the “zone” refers to a dissociative-like state characterized by narrowed attention, “losing track of time and all else around them” [17].

However, EGMs themselves have structural characteristics that make it challenging to isolate the individual component that fosters the dissociative experience. One such feature is that many machines have multiple possible payout lines, and many players opt for the maximum number of lines [36]. This can contribute to a “smoother” gambling experience [35] which may foster greater dissociation than single payout line games. To test this possibility, Dixon and colleagues [17] had gamblers recruited from a casino play a simulated EGM and complete measures of GD severity and in-game dissociative

experiences. Participants played two games: one in which they bet one cent on a single line and one in which they bet one cent on each of 20 lines per spin. Consistent with their hypothesis, dissociative experiences were significantly greater in the multi-line game, but this effect was only significant among “high-risk” gamblers. Additionally, 94% of participants preferred the multi-line over the single-line game.

Dixon and colleagues [7] modified the design of their earlier study to balance the bet size in the single and multi-line games, to rule out the possibility that preference for the multi-line game was due to the overall greater bet size per spin. Like the previous study, GD severity was significantly and positively correlated with dissociative experiences, and this association was stronger in the multi-line game. Similarly, Murch and Clark [6] found that increasing the number of payout lines, but not the amount bet per line, significantly increased dissociative experiences. Taken together, these studies suggest that multi-line games available on EGMs preferentially induce dissociative experiences during gambling, and that this is more pronounced among individuals with problem and disordered gambling.

Two studies also attempted to induce ASA through game-specific gambling cues among poker-machine players (akin to EGMs). Tricker [24] found that the relationship between GD severity and a cue-reactive urge to gamble was mediated by ASA, which accounted for a large proportion of the total effect ( $\kappa^2 = 0.40$ ). He proposed that exposure to gambling cues may lead an individual to re-experience the dissociative state associated with previous gambling, increasing the urge to gamble. However, McKeith and colleagues [4] employed an identical design and failed to replicate this effect. Of note, participants in the second study showed very low ASA scores, suggesting that the gambling cue did not induce an ASA, and therefore, any ability of gambling severity to predict cue-reactive ASA may have been mitigated.

Recent research has also suggested that dissociation may not occur only within the context of EGM gambling. In examining predictors of “escape style” gambling, Cartmill and colleagues [16] compared EGM and non-EGM players. Both groups reported similar levels of anxiety and dissociative experiences during gambling behavior, and these variables uniquely predicted GD severity across gambling modalities. Controlling for anxiety, in-game dissociation accounted for 33% of the variance in GD severity, and together both variables accounted for 50% of the variance. Remond and Romo [22] examined the relationship between dissociative experiences and gambling severity across EGMs within casinos, consoles and mobile screens, and on computers. Across all modalities of electronic gambling, dissociation scores were significantly higher among individuals with GD. Therefore, it is possible that the electronic format of EGMs, not only the ability to play multiple lines simultaneously, facilitate dissociative experiences reported by individuals with GD.



## Harm Reduction

Given the support for the role of dissociation as an escape mechanism in the development or maintenance of GD, and that dissociative gambling may influence treatment success [15], dissociation has been identified as an important intervention target for reducing the harms associated with gambling. Harm reduction strategies aim to minimize gambling-associated risks and facilitate responsible gambling behavior, while not greatly disturbing individuals who gamble non-problematically [37]. Breaks in play, which are game features that temporarily interrupts or suspends gambling [14•], have frequently been proposed as one harm reduction strategy. Theoretically, by disrupting attention to the gambling experience, the dissociative process can also be disrupted which provides gamblers an opportunity to re-appraise their behavior. Recently, several studies have evaluated this possibility.

Stewart and Wohl [23] investigated whether pop-up messages had utility in increasing adherence to monetary limits set by gamblers while gambling on an EGM. In a sample of university students, greater severity of GD symptoms decreased the likelihood that participants would adhere to monetary limits, which was mediated by dissociative experiences. Importantly, this mediating effect disappeared when an in-session EGM pop-up reminded participants when they had reached their limit. This pop-up reminder ostensibly disrupted the relationship, whereby GD severity reduced adherence to monetary limits via dissociation. However, another study by Blaszczynski and colleagues [14•] found that breaks in play did not reduce in-game dissociation and increased cravings to continue gambling. Thus, breaks in play alone may exacerbate the desire to escape, rather than reduce in-game dissociation.

In a related vein, Wohl and colleagues [25] proposed that responsible gambling tools that are esthetically pleasing, engaging, and give the user a sense of control over its functioning may enhance adherence to monetary limits to a greater extent than traditional pop-up messages. The authors recruited a group of university student EGM players to aid in the development of such a tool, and then compared it to a traditional pop-up message like that used in Stewart and Wohl [23]. As hypothesized, individuals who were presented with the enhanced responsible gambling tool were more likely to adhere to their limit, compared to participants who received the standard pop-up tool. Both groups reported low symptoms of dissociation that did not differ significantly from each other. It is possible that the pop-up message in both conditions effectively disrupted any dissociative process. However, the sample consisted of individuals without disordered gambling behaviors, who are less likely to experience dissociation during gambling [15]. Whether the new pop-up tool would be more effective at disrupting dissociative experiences is unclear. Overall, some evidence supports the use of pop-up messages as a harm reduction mechanism that may function via disrupting in-game dissociative experiences.

## Conclusions and Future Directions

Individuals with GD report experiences akin to the DSM-5 conceptualization of dissociation during both gambling sessions and in general day-to-day life such as a sense of unreality, losing track of time, and an extreme narrowing of attention. The propensity toward general and in-game dissociation also appears to be involved in the development and/or maintenance of GD, and the recent literature supports its role in maintaining problem gambling behavior. Several features of gambling, such as multi-line betting on EGMs, may facilitate in-game dissociation, and this effect may be particularly impactful among individuals with GD or who are motivated to escape aversive states. As such, pop-up messages during gambling may be vital in reducing gambling-related harms by disrupting in-game dissociation.

In reviewing the literature, we also noted several ongoing issues on which future research would be informative. First, the field continues to lack a clear conceptualization of dissociation, and to what extent in-game dissociation parallels general dissociation. Second, it is unclear whether general dissociation increases the risk of in-game dissociation and escape-style gambling. Third, the association between dissociation and GD has not been systematically examined across gambling modalities, with most research focusing on EGM and related forms of gambling. Finally, continuing to refine interventions that effectively interrupt in-game dissociation and increase adherence to pre-defined limits among individuals with problem and disordered gambling holds promise for reducing gambling-associated harms.

## Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no competing interests.

**Human and Animal Rights and Informed Consent** This article does not contain any studies with human or animal subjects performed by any of the authors.

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