

Games of Chance: Common Beliefs & Misconceptions

Authored by
mohammed loot

December 4, 2025

RECOMMENDED CITATION

mohammed loot (2025). *Games of Chance: Common Beliefs & Misconceptions*.
Psychepedia. Retrieved from <https://psychepedia.arabpsychology.com/?p=29028>

Introduction to Cognitive Biases in Gambling

Games of chance, by definition, operate on principles of mathematical probability, where outcomes are statistically independent and predictable only in the long run. However, human engagement with these systems is overwhelmingly governed not by objective statistics but by a complex interplay of subjective beliefs, cognitive heuristics, and emotional responses. These beliefs fundamentally distort the objective assessment of risk and reward, leading to systematic errors in judgment that often sustain persistent, and sometimes pathological, gambling behavior. The core conflict arises between the statistical rigor of randomness and the innate human tendency to perceive patterns, causality, and personal influence where none objectively exist.

The study of beliefs about games of chance is a critical area within psychological research, focusing on the cognitive distortions that allow individuals to maintain engagement despite consistently negative expected returns. These distortions serve protective functions, managing the anxiety associated with pure randomness and providing the individual with a necessary sense of agency within an unpredictable environment. Key psychological phenomena, such as the illusion of control, the gambler's fallacy, and interpretive biases, move the focus away from rational assessment toward heuristic thinking, which relies on mental shortcuts that often fail dramatically in probabilistic settings.

Understanding the architecture of these erroneous beliefs is essential not only for comprehending the dynamics of recreational gambling but also for developing effective interventions for problem gambling. Persistent engagement in negative expected value games is frequently maintained by these deeply ingrained, yet demonstrably false, cognitive frameworks. These beliefs dictate how losses are interpreted, how wins are attributed, and how future decisions regarding staking and persistence are made, demonstrating their profound influence over the behavioral outcomes in environments designed to exploit these very psychological vulnerabilities.

The Illusion of Control

One of the most powerful and pervasive cognitive biases shaping beliefs in games of chance is the **Illusion of Control**, a phenomenon where individuals exhibit an expectancy of personal success probability inappropriately higher than the objective probability justifies. This bias manifests specifically when individuals believe that their personal involvement, specific behaviors, or subjective skill can influence outcomes that are determined entirely by random processes. The illusion provides a psychological buffer against the discomfort of acknowledging total lack of agency in a random environment.

Manifestations of the Illusion of Control are numerous and varied across different gambling modalities. Classic behavioral examples include practices such as selecting specific lottery numbers rather than accepting randomly generated quick picks, believing that forceful or gentle

throws of dice will influence the numerical outcome, or believing that a specific slot machine is "due" because they have personally invested time and effort into it. These actions, objectively meaningless in a system governed by statistical mechanics, provide the participant with a crucial sense of active involvement and agency, transforming the random process into a perceived test of skill or personal favor.

The illusion is significantly strengthened by factors such as choice, familiarity, and perceived involvement. Studies have consistently demonstrated that individuals are generally less willing to trade a lottery ticket they personally selected for one that was randomly assigned, even when the monetary value and objective odds remain identical, indicating a personal investment in the outcome that transcends rational statistical assessment. This psychological ownership over the process helps sustain engagement by framing the activity not as passive submission to chance, but as an active attempt to exert influence over fate.

The Gambler's Fallacy

The **Gambler's Fallacy**, also historically known as the doctrine of the maturity of chances or negative recency bias, represents a fundamental and widespread cognitive distortion concerning the independence of probabilistic trials. It is defined as the erroneous belief that if a particular outcome has occurred frequently in the recent past, it is statistically less likely to occur in the immediate future, despite the objective fact that each trial is independent and has no memory of previous results. This fallacy is a cornerstone belief system for many persistent gamblers, particularly those engaging in sequence-based games like roulette or coin flips.

This cognitive error stems from a deep-seated misunderstanding of the Law of Large Numbers. Individuals intuitively expect short sequences of random events to exhibit the same properties of balance and uniformity that characterize infinitely long sequences. Consequently, if a roulette wheel yields "Red" five times consecutively, the sequence is psychologically perceived as being unbalanced or atypical, leading the gambler to conclude that "Black" is now "due" to restore the expected equilibrium of the overall distribution, thereby justifying a larger bet on the less recent outcome.

Crucially, this belief ignores the statistical reality that the probability of the next spin or trial is determined solely by the physical mechanics of the game, entirely independent of its history. In a standard US roulette game, the probability of Black remains 47.37% (assuming zero and double zero are green) regardless of whether the previous hundred results were Red. The reliance on this perceived, self-correcting statistical system is a powerful driver of continued betting, particularly following a sequence of losses, as the individual believes they are closing in on the inevitable corrective win.

The Hot Hand Fallacy and Clustering Illusion

In contrast to the negative recency inherent in the Gambler's Fallacy, the **Hot Hand Fallacy** (or positive recency bias) postulates the opposite: the belief that success breeds success, meaning that a sequence of successful outcomes indicates an increased probability of continued success. This phenomenon is often studied in contexts involving perceived skill, such as basketball shooting, but its application extends robustly to pure games of chance, such as believing a slot machine or a card dealer is "hot" after a string of wins.

The Hot Hand Fallacy is closely allied with the **Clustering Illusion**, which describes the human tendency to perceive non-existent patterns or clusters in data that is, in fact, randomly distributed. When a series of wins occurs purely by chance, the gambler often attributes this cluster not to statistical variance but to an underlying, temporary, and often exploitable causal factor--such as momentum, personal luck, or affinity with the machine. This attribution error transforms random success into perceived evidence of a temporary advantage.

Psychologically, the belief in the Hot Hand provides powerful positive reinforcement, justifying the escalation of betting stakes. Unlike the Gambler's Fallacy, which often motivates attempts to recover deficits, the Hot Hand fuels the belief that the individual possesses a temporary, superior predictive power or is currently favored by luck. This conviction reduces risk aversion and leads to increased engagement, as the gambler believes they must capitalize on this transient window of opportunity before their "luck runs out," sustaining the cycle of play based on erroneous pattern recognition.

Near Misses and Their Psychological Impact

The experience of a **near miss**--an outcome that is objectively a loss but subjectively feels extremely close to a win--is a potent mechanism for maintaining gambling persistence, particularly in machine-based games like slot machines or video poker. A near miss occurs when the outcome falls just short of the jackpot or desired payoff (e.g., matching two out of three symbols on a slot reel). Although the monetary result is zero, the psychological impact is far from neutral.

Neuroscientific investigations have provided compelling evidence regarding the motivational power of the near miss. Studies using functional magnetic resonance imaging (fMRI) indicate that near misses activate the same subcortical brain regions (specifically the ventral striatum) associated with genuine reward processing, albeit typically to a slightly lesser degree than an actual win. This partial activation mimics the reinforcing effects of success, effectively preventing the natural extinction of the gambling behavior that would normally occur following repeated, unambiguous losses.

From a cognitive perspective, near misses are often misinterpreted by the gambler as evidence

that they are "learning the system," "getting closer," or that the machine is "about to pay out," thereby reinforcing the Illusion of Control. The cognitive system processes the near miss as a motivational signal, suggesting proximity to success, rather than an accurate reflection of random, negative probability. This misinterpretation is crucial because it transforms what should be a loss signal into a powerful drive for continued action, maximizing time-on-device for operators.

Interpretive Biases and Personal Luck

To maintain a coherent self-narrative and justify continued play, gamblers frequently employ sophisticated **interpretive biases**, where outcomes are selectively recalled, interpreted, and attributed to factors that minimize personal responsibility for losses and maximize credit for wins. This process involves the asymmetrical attribution of results, which is essential for protecting the belief system against contradictory evidence. Wins are attributed internally to skill, intuition, superior judgment, or personal luck, while losses are externalized and attributed to uncontrollable forces such as bad luck, machine malfunction, or external interference.

This mechanism is a specific application of the **Self-Serving Bias** within the context of chance environments. By externalizing losses, the individual avoids the cognitive dissonance that would arise from acknowledging that persistent losses are simply the predictable outcome of engaging in negative-sum games. This psychological defense mechanism ensures that the gambler's sense of efficacy and optimism remains intact, thereby sustaining the motivation to return and attempt to "reverse" the externally caused string of bad luck.

Furthermore, the belief in "personal luck" is a central interpretive construct. Many individuals develop intricate, personalized theories regarding luck, viewing it as a finite, fluctuating resource that can be influenced by internal states, external rituals, or even alignment with cosmic forces. This belief system allows the individual to rationalize engagement even when objective statistical data overwhelmingly contradicts their personal experience. They may believe they are currently "unlucky" but that this phase will inevitably pass, ensuring continued investment in the hope of the inevitable reversal of fortune.

Superstition and Ritualistic Behavior

The inherent uncertainty and lack of control in games of chance lead many participants to rely heavily on **superstition and ritualistic behavior**. These actions, which range from wearing specific items of clothing or jewelry to performing intricate physical routines before placing a bet, are behavioral manifestations of the attempt to impose causality and structure onto a fundamentally random and unpredictable environment. These rituals provide a crucial psychological function: managing anxiety related to uncertainty.

Functionally, these rituals serve as behavioral proxies for the Illusion of Control. They create a

perceived, non-statistical link between the action (the ritual) and the desired outcome (the win). While objectively inert, the performance of the ritual grants the gambler a sense of having maximized their potential chances, thereby reducing the high level of anxiety associated with pure chance. The ritual is an attempt to create a personal, non-random element within the game's mechanics.

Examples of such rituals are widespread and include carrying specific lucky charms, insisting on sitting in a designated or "lucky" seat, or adhering to strict rules about handling money or tokens during play. Critically, the failure of the ritual to produce a win is rarely interpreted as evidence against the ritual itself. Instead, the ritual is often subtly modified, or the failure is attributed to a minor execution error or overwhelming external bad luck, ensuring the integrity of the superstitious belief system remains intact and the behavior persists.

Psychological Mechanisms of Persistence

The transition from recreational play to persistent or problematic gambling is often facilitated by powerful psychological mechanisms that compel continued engagement despite mounting losses. The **Sunk Cost Fallacy** is highly relevant here: having invested significant time, emotional energy, or, most importantly, money, individuals feel compelled to continue playing to justify the previous investment. The belief is that quitting now would render the prior losses meaningless, whereas continuing offers the possibility of validating the entire investment retrospectively through a future win.

A direct and highly destructive consequence of the Sunk Cost Fallacy and the Gambler's Fallacy is the powerful motivation to **chase losses**. The gambler believes that a win is statistically imminent and necessary to restore financial and psychological equilibrium, leading to increasingly large and risky bets intended to recover all previous deficits in a single trial. This escalating pattern of risk-taking is a defining feature of problematic gambling and is maintained by the distorted belief that the past losses are predictive of future, compensating wins.

Furthermore, the reinforcement schedule inherent in most games of chance is the most powerful operant conditioning mechanism for maintaining behavior. Most games utilize a **variable ratio reinforcement schedule**, where rewards are unpredictable in their timing but consistent on average. This unpredictability maintains a high rate of response because the hope of reward is constantly salient, and the uncertainty minimizes the likelihood of the behavior extinguishing. This schedule is far more resistant to extinction than fixed or continuous reinforcement schedules, ensuring high levels of behavioral persistence even under conditions of net loss.