



LIQUID AND GRIT

Slots Design Report

Competitive research and data insights for slots designers

TABLE OF CONTENTS

NEW INNOVATIONS	4
Pre-Play Customization	
Memory Game Bonus	
Respins to Bonus	
Player Integrated Bonus	
MARKET TRENDS	9
Line Configuration	
Base Game	
Progression	
DEEP DIVES	13
Social Casino	
<i>Monster Treasure</i> – Caesars Slots	
<i>Prince of Sherwood</i> – House of Fun	
<i>Reel Wealthy</i> – Vegas Words	
<i>Mystical Sands</i> – Heart of Vegas	
Real Money	
<i>Beauty & the Beast</i> – Yggdrasil Gaming	
<i>Viking Runecraft</i> – Play'n Go	
APPENDIX	28
Slots Player Personas	
Data Collection Process	

DECEMBER

2017

INTRODUCTION



“Capitalism is all about somebody coming and trying to take the castle. Now what you need is you need a castle that has some durable competitive advantage—some castle that has a moat around it.” – Warren Buffett

Dear Slots Designer,

Aristocrat recently acquired Big Fish Games. They now have strong apps appealing to two of the four main slots player types.

Aristocrat’s content in Heart of Vegas and Cashman Casino caters primarily to *Plain Janes*...players who are looking for something to do, to kill time, and to reduce boredom. Conversely, Big Fish Game’s content in Big Fish Casino targets *Mr. and Mrs. Ricardos*...players who are looking to relax, socialize, and relieve daily stress.

These two player types do not often overlap. According to Facebook Insights, only 3% of Facebook users who have Big Fish Casino are also interested in Heart of Vegas. Contrast that with Slotomania, which has a 40% overlap with Heart of Vegas (this is only directional information and not actual player overlap).

The battle lines for players has become clear: teams targeting *Plain Janes* and *Mr. and Mrs. Ricardos* must be on the attack. Teams with *Night-Out Nancys* and *Entertain-Me Eddies* should build a moat. The extent of investment in either offense or defense depends on the age and size of your app: the older and larger the app, the more time should be spent on a moat.

Invest in your durable competitive advantage.

Brett Nowak
Editor-in-Chief

NEW INNOVATIONS

PRE-PLAY CUSTOMIZATION

Pharaoh's Way *Royal Choice* lets players choose between free spins or a dice bonus game, before starting play

- Players are given an immediate choice to play as *Black* with bonus games, or as *White* with free spins (1)
- The bonus game gives three dice rolls that select Chess pieces to award players (2)
- The free spins option triggers 10, 20, or 30 free spins (3)

Release: 11/17/17

KPI: Spins per session

Target player: All player types

[More images and videos](#)

Related machines:

- [Ride 'Em Wild - Caesars Slots](#) (4)
- [All Stars 3 - House of Fun](#) (5)
- [Panda Chi - Slotomania](#) (6)

KEY TAKEAWAYS

- Let players choose their preferences upon machine-entry to remove constant flow interruption before every bonus round. Before implementing the feature, pull data to determine the percentage of players that choose the same bonus over and over on machines with bonus options
- Test new preferences such as machine volatility, number of free spins, and level of animation. This will personalize the experience and increase spins per session



MEMORY GAME BONUS

Slotomania *Memories of Oz* contains a bonus game inspired by the classic Memory game

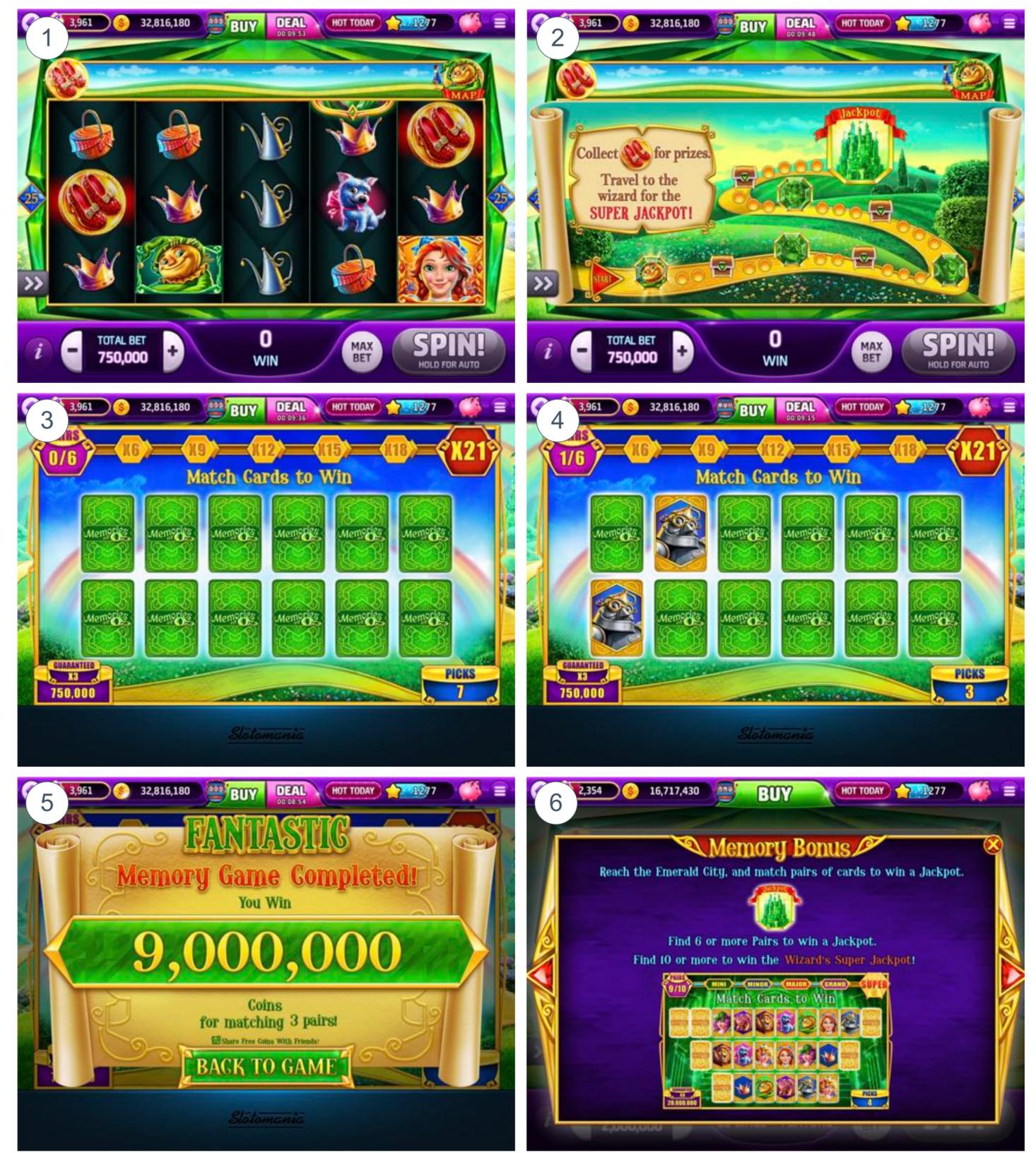
- Players collect *Slippers* to fill the meter and progress along a map (1 & 2)
- Filling the progress meter triggers the *Memory Bonus* game (3)
- Players have 7 picks to match cards (4)
- More matches lead to larger multipliers (5)
- Reaching the end of the map triggers a *Memory Bonus* with jackpot prizes (6)

Release: 11/16/17
 KPI: Engagement
 Target player: Night-Out Nancy
[More images and videos](#)

- Related machines:
- [Pink Panther - Caesars Slots](#)
 - [Candy Control Center - Wonka Slots](#)
 - [Zeus Myth & Match 'Em - Hot Shot Casino](#)

KEY TAKEAWAYS

- Release bonus games that are simplified versions of fun, popular card games like *Memory*, *Solitaire*, and *Bridge*
- Add a simple progression system for Whales with two forms of the same bonus game that: 1) awards coin payouts, and 2) awards *only* jackpots
- Include a simple progress meter that players must fill—such as triggering 10 bonus games—to unlock the jackpot-only bonus game (see [All Stars 2 - House of Fun](#) as an example)



RESPINS TO BONUS

GSN Casino *The Wild Chase*, originally an RMG machine, triggers a respin with every win that potentially leads to a bonus game

- Any win triggers a respin. Respins continue until a loss (1)
- During the respins, *Wild X* symbols increase the winnings by x2, x3, etc. These are tracked in the top left corner (2)
- Landing three *Vaults* during a set of respins triggers the free spins (3 & 4)

Release: 11/4/17 (4/12/16 RMG)

KPI: Engagement

Target players: Entertain-Me

Eddie, Night-Out Nancy

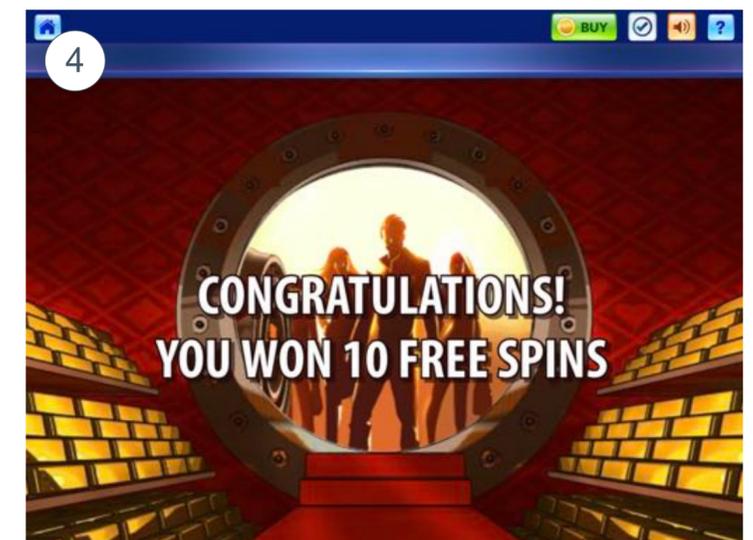
[More images and videos](#)

Related machines:

- [Overlords of Freezing - Scatter Slots](#)
- [Lady Femina - Scatter Slots](#)
- [Avalanche Classic - DoubleU Casino](#)

KEY TAKEAWAYS

- Respins are an up-and-coming mechanic to excite Entertain-Me Eddie and Night-Out Nancy players (see Market Trends for details on respins). These players want the higher hit frequency machines that respins provide
- Expand bonus mechanics from one mechanic (respins) to many (respins + bonus). This is a successful, ongoing trend in social and RMG (see [September 2017 Slots Design Report](#))



PLAYER INTEGRATED BONUS

POP! Slots *Diamond King* involves players in the bonus game and utilizes a wheel with a King-of-the-Game mechanic

- Players receive a bet-up mechanic with eligible jackpots upon machine-entry (1)
- Three or more stacks of *Diamonds* triggers the bonus game for all players on the joined machines (image is one symbol short of triggering a bonus) (2)
- During the free spins, players try to hit a *Wheel* to 'snatch' the *Diamond* (3)
- The player with the *Diamond* when the free spins ends receives an additional bonus (4)

Release: 10/31/17

KPI: Engagement

Target player: Mr. and Mrs. Ricardo

[More images and videos](#)

Related machines:

- [Quick Gold - POP! Slots](#)
- [Pirates' Gems - POP! Slots](#)

KEY TAKEAWAYS

- For Mr. and Mrs. Ricardo players, add bonus games triggered by any player, and include player profiles within the machine to strengthen the social connections within the app
- Consider incorporating single player option to play multiple machines. Plain Jane players will like this mechanic since they will have a greater chance of winning. Aristocrat's new RMG machine *Walking Dead 3* triggers the bonus game by either player and includes a love-seat (see [Walking Dead 3](#))



MARKET TRENDS

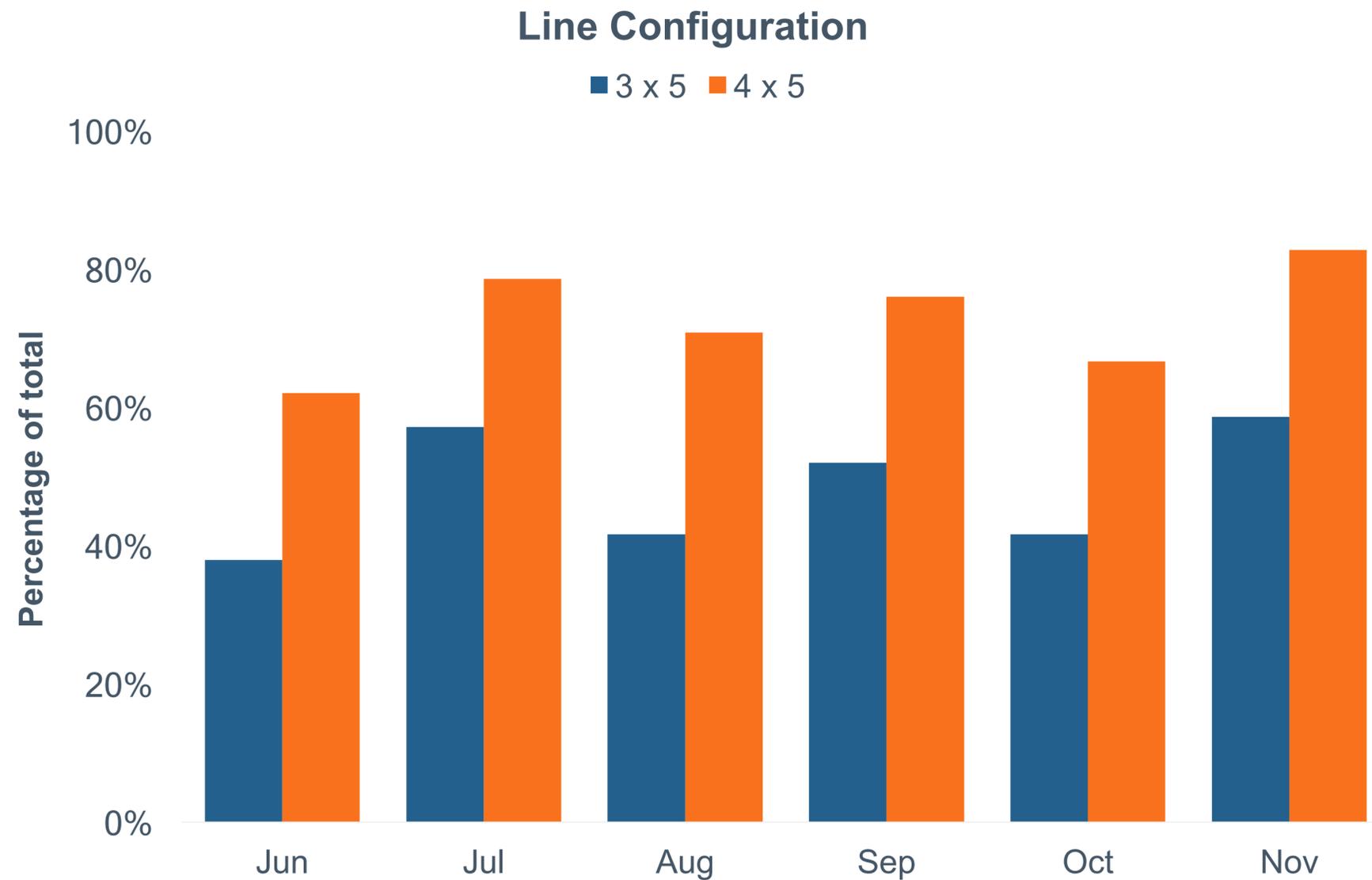
11/1/17 – 11/30/17

Apps included in the trend data:

DoubleDown Casino, Heart of Vegas, House of Fun, Goldfish Casino, Slotomania, Jackpot Party, Hit it Rich, Caesars Slots, Quick Hit Slots, and Hot Shot Casino

LINE CONFIGURATION

Line configuration continues to be dominated by 3 x 5 and 4 x 5 machines. Other than two n x n machines this month, line configuration remains fairly standard and unimpactful



Hit it Rich [Ghostbusters](#) (n x n)



House of Fun [Sherlock Clues of Fortune](#) (n x n)

BASE GAME

Respins continue to grow in popularity, driven by the evolutions of Lightning Link-style machines. Slot machine developers are trying to please the more social player types, Night-Out Nancys and Entertain-Me Eddies

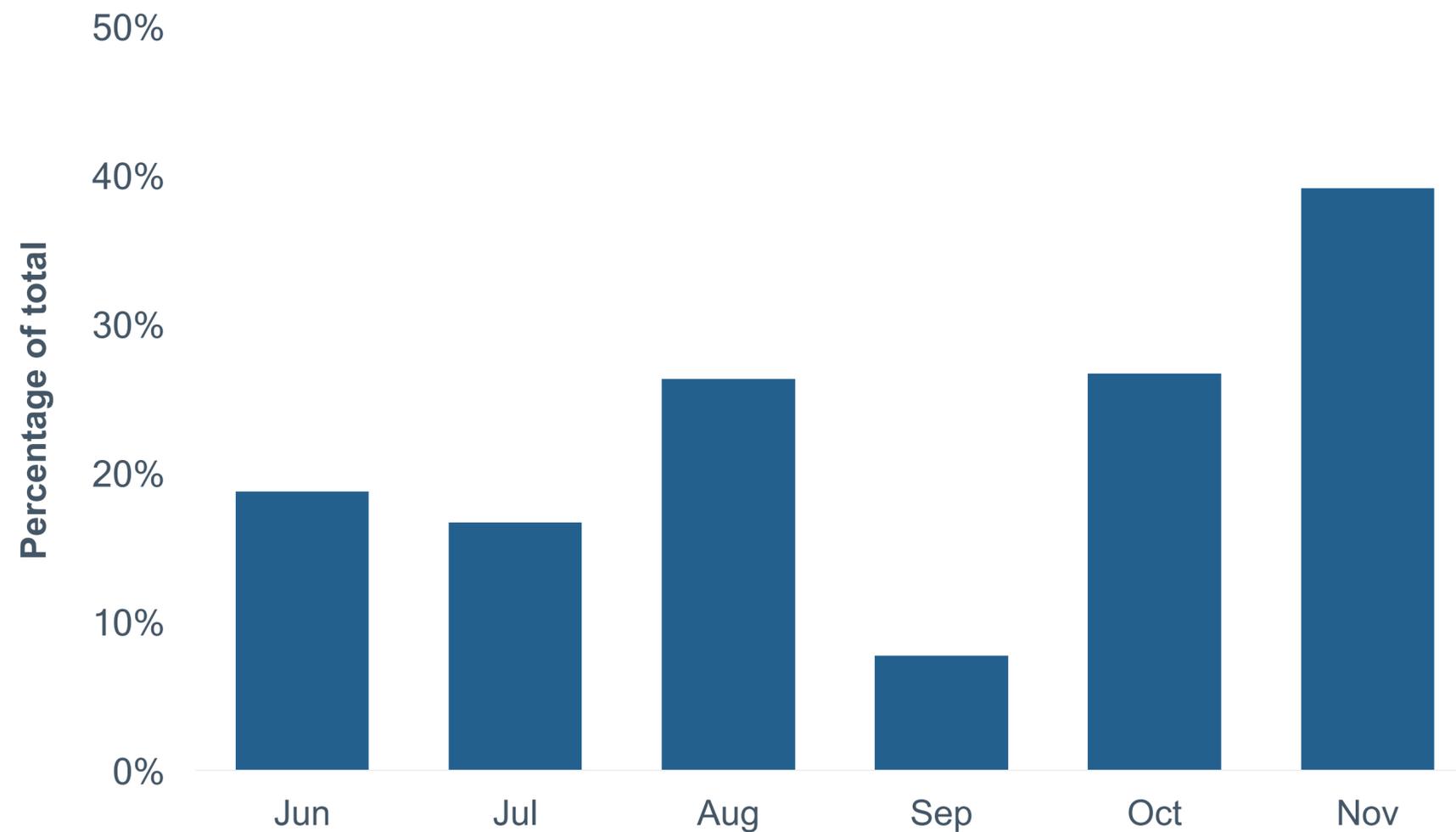


Gold Fish [Diamond Winners](#)



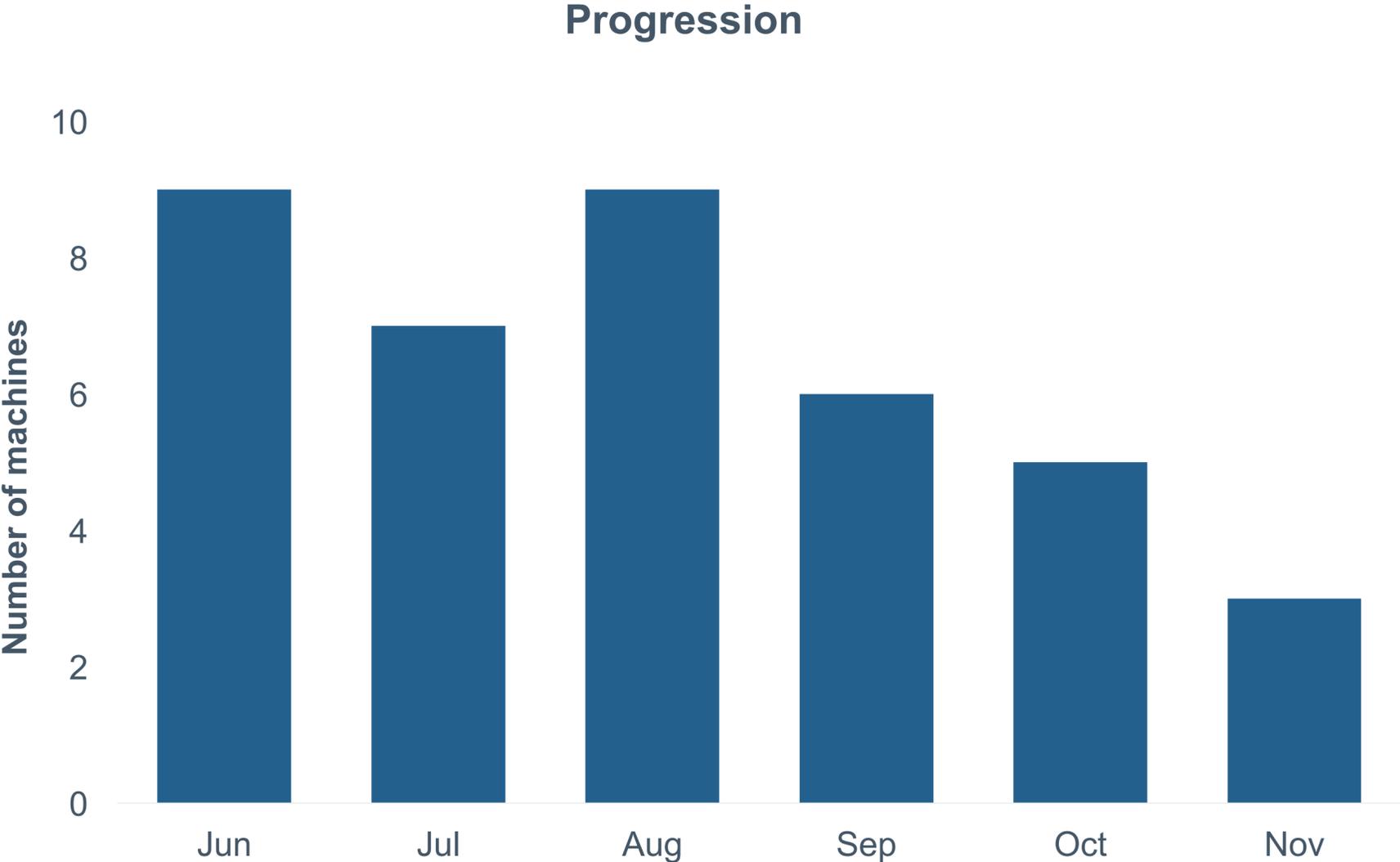
Quick Hit Slots [Playboy Sunset Sapphires](#)

Respins



PROGRESSION

Progression mechanics in slot machines are on the decline as Featured Apps shift focus to Lightning Link-style machines in November



Caesars Slots [Monster Treasure](#)



House of Fun [Lady Havana](#)

DEEP DIVES

SOCIAL CASINO

- *Monster Treasure* – Caesars Slots
- *Prince of Sherwood* – House of Fun
- *Reel Wealthy* – Vegas Words
- *Mystical Sands* – Heart of Vegas

MONSTER TREASURE

Caesars Slots *Monster Treasure* includes a machine-specific secondary currency that players use to complete albums for a jackpot

- Any Key symbol that lands may open a chest (1)
- Opening a chest triggers a pick 'em bonus (2)
- The pick 'em awards coins and gems, the machine-specific currency (3)
- Players use gems to purchase cards that reveal monsters and one free spin round on each page of the album (4)
- Collecting all the cards triggers the *Monster Pick 'Em* bonus (5)
- There are multiple albums to unlock (6)

Release: 10/26/17

KPI: Retention

Target players: Night-Out Nancy,
Entertain-Me Eddie

[More images and videos](#)

Related machines:

- [Brave Red - House of Fun](#)
- [Once Upon a Time - Slomania](#)
- [Quests in Wonderland - House of Fun](#)

KEY TAKEAWAYS

- Add mechanics that accumulate player value over the lifetime of play. Then, build more complex RTPs that share the RTP over multiple play sessions
- If adding a secondary currency, like in *Monster Treasure*, consider applying it to multiple machines to spread the development cost
- Continue to award players jackpots that are guaranteed to hit after collecting or progressing a certain amount (see the live ops [Progressive Frenzy](#) on how to add this mechanic to existing machines)



MONSTER TREASURE STATS

Game play

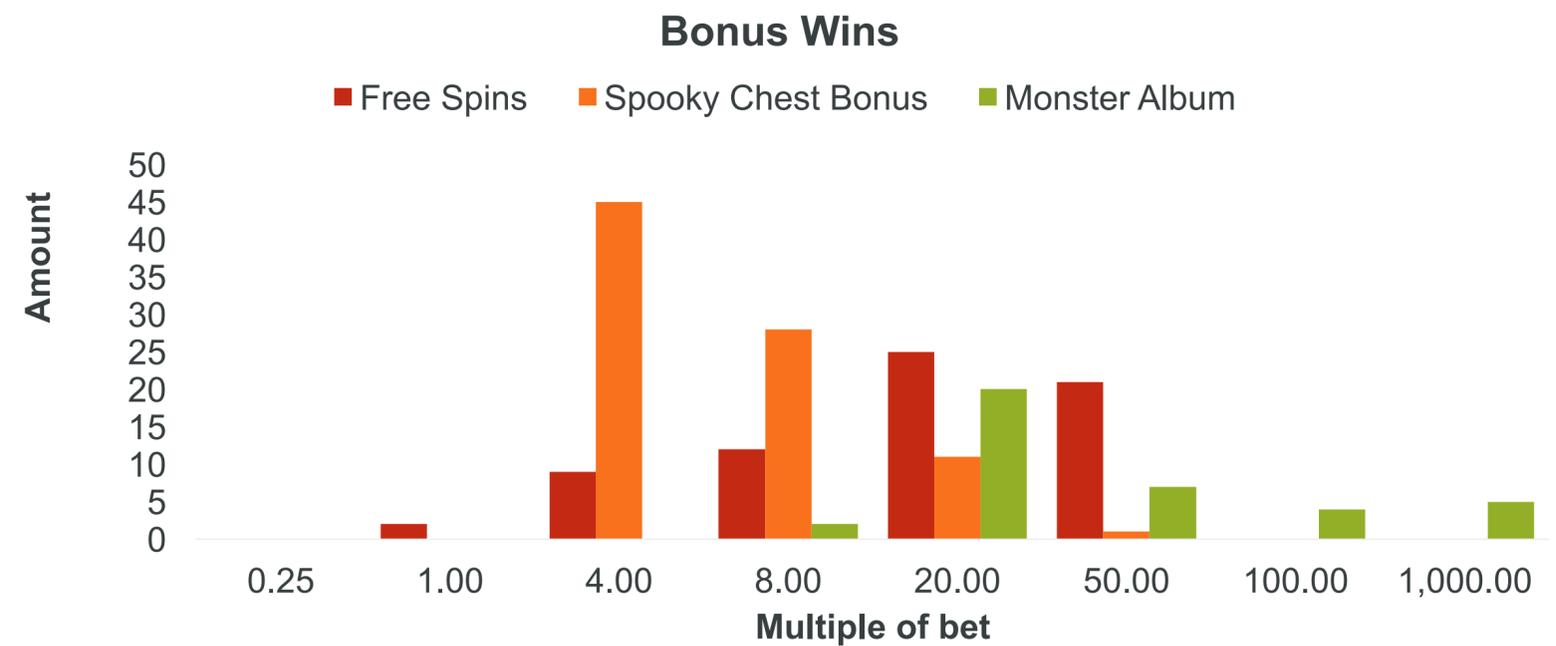
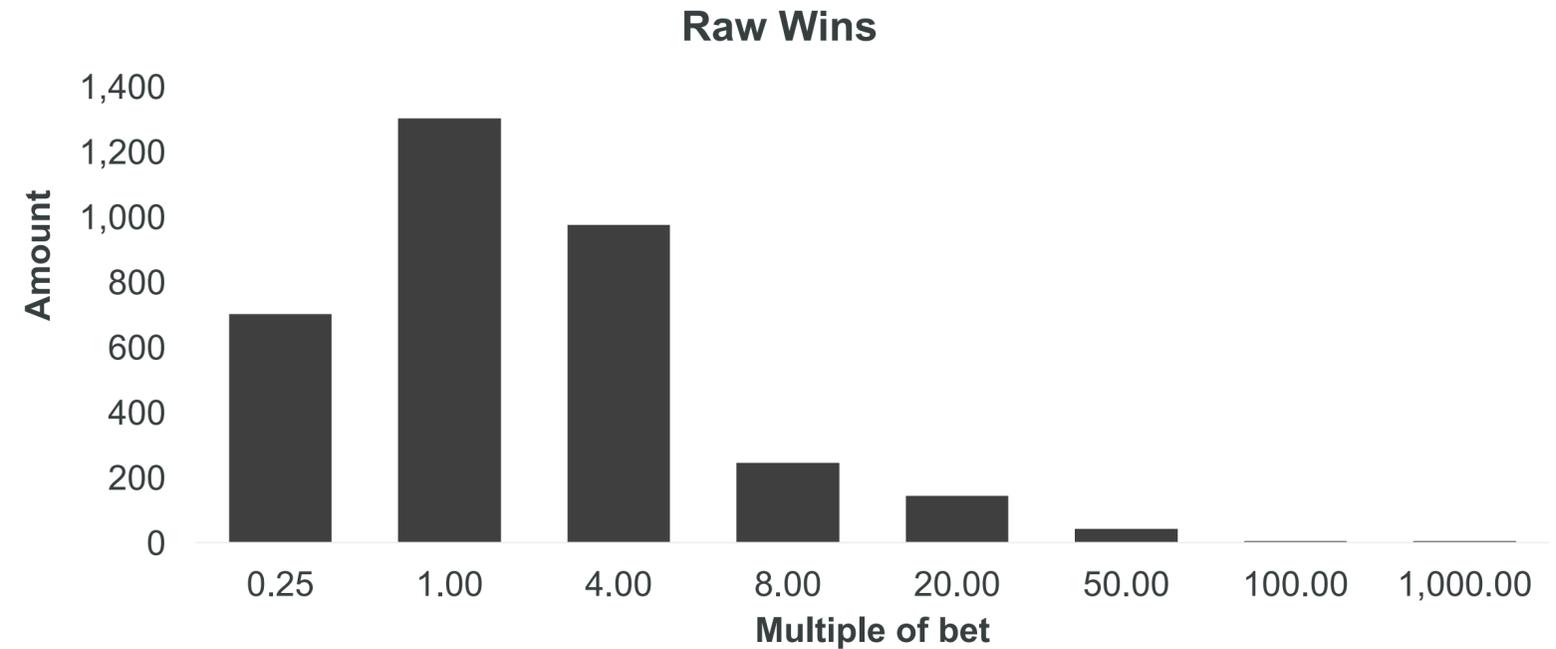
Hit frequency	34%
Volatility	14.8
Spins until a bonus	52

Distribution of RTP as % of total RTP

Base game	51%
Bonus game	49%
Free Spins	10%
Spooky Chest Bonus	5%
Monster Album	34%

RTP range

RTP observed after 10K spins	102%
Real RTP lands between (w/90% confidence)	77% - 126%



PRINCE OF SHERWOOD

House of Fun *Prince of Sherwood* (a near reskin of *Gorilla Grand*) includes a Lightning Link-like respin

- Six or more *Archers* trigger the respins (1)
- If an *Archer* hits during the respins, the respins resets to 3 (2)
- The symbols in the respins depends on the bet amount (3)
- The wheel triggers if a wheel symbol lands during the respins, or when a player fills up all the slots with *Archer* symbols (4)
- The number of unlocked wheel sleeves depends on player bet (5)
- There is a *Random Wilds* feature that triggers on random losses, adding 4 - 20 gold symbols to the reels (6)
 - See the *Prince of Sherwood* character animation [videos](#) in the Feature Database

Release: 11/20/17

KPI: Engagement

Target player: Night-Out Nancy

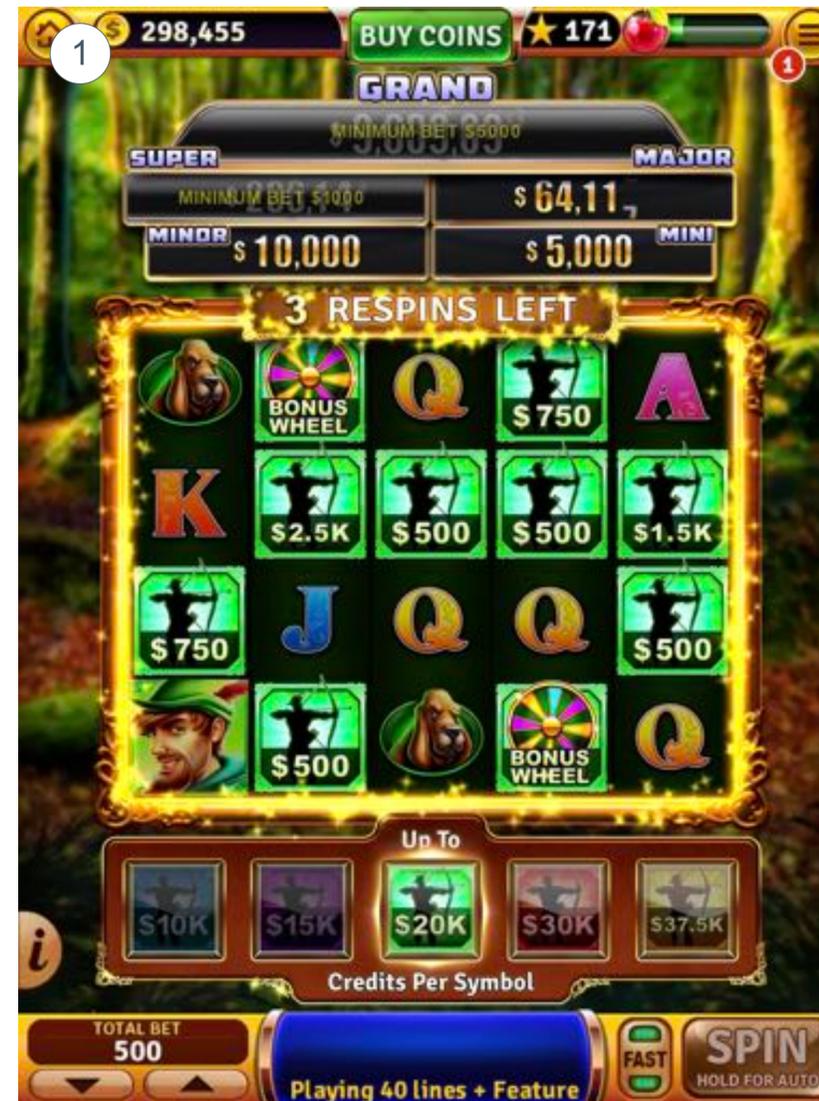
[More images and videos](#)

Related machines:

- [Gorilla Grand - House of Fun](#)
- [October Grand - Caesars Slots](#)
- [Happy Panda - House of Fun](#)

KEY TAKEAWAYS

- Experiment with full screen animations during the base game
- Depending on your target audience, simplify or add-on to a successful RMG feature like Lightning Link. For Plain Janes and Mr. and Mrs. Ricardos, simplify the mechanic. For Night-Out Nancys and Entertain-Me Eddies, add to the mechanic



PRINCE OF SHERWOOD STATS

Game play

Hit frequency	32%
Volatility	5.1
Spins until a bonus	16

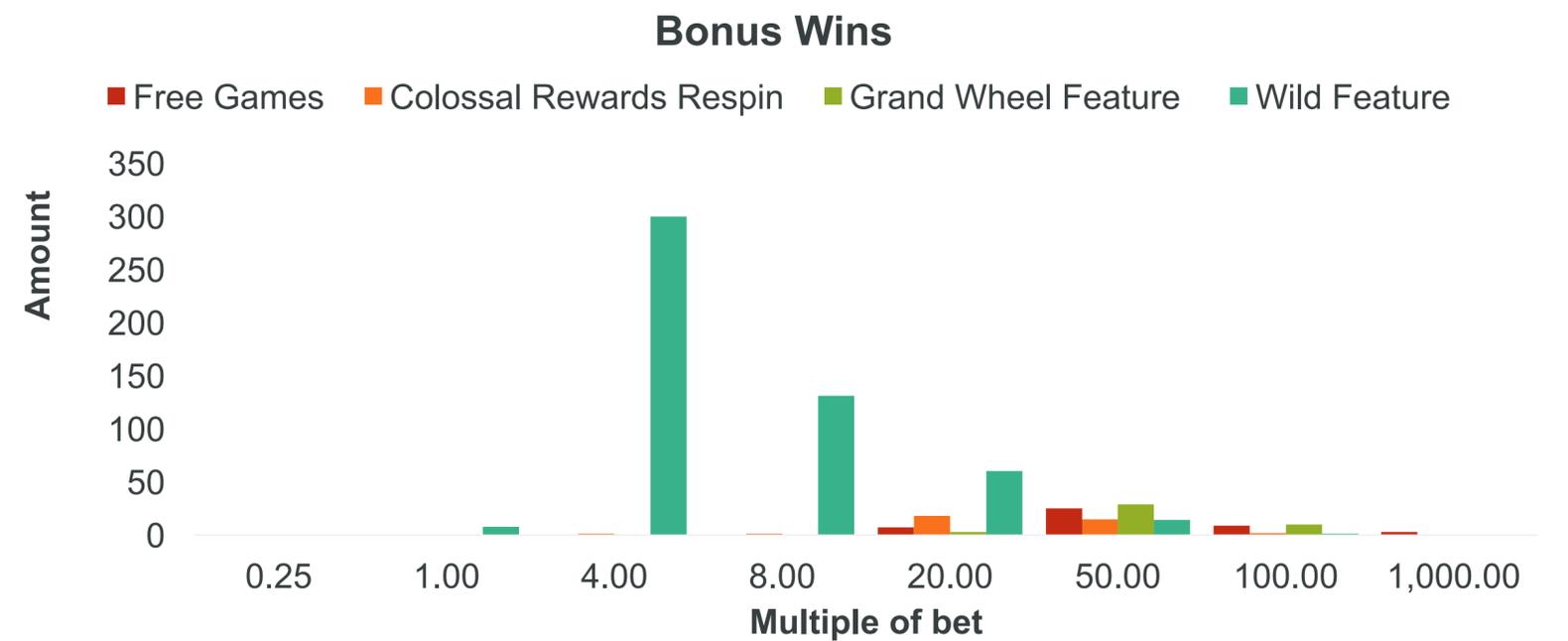
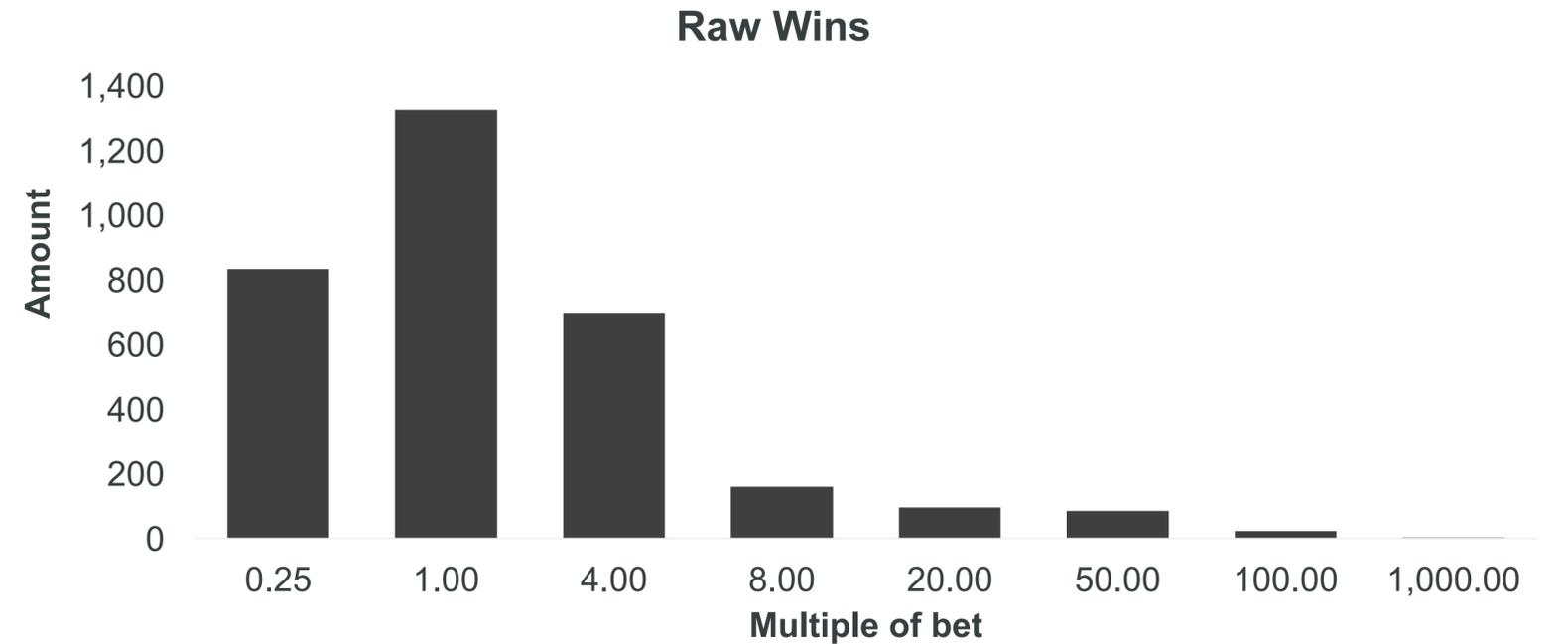
Distribution of RTP as % of total RTP

Base game	24%
Bonus game	76%

Free Games	23%
Colossal Rewards Respin	12%
Grand Wheel Feature	13%
Wild Feature	28%

RTP range

RTP observed after 10K spins	88%
Real RTP lands between (w/90% confidence)	80% - 97%



REEL WEALTHY

Vegas Words *Reel Wealthy* combines scatter pay with a spinning stepper machine

- Each symbol that lands pays (1)
- Symbol value is then multiplied by the bet multiplier, which is based on a 5 credit bet (2)
- Hitting single special symbols—*Coins*, *Cash*, or *Gold*—triggers the progressive jackpots (3)

Release: 11/10/17

KPIs: Revenue, Early retention

Target players: Plain Jane, New Players

[More images and videos](#)

Related machines:

- [All That Cash: Easy Money - High 5 Casino](#)
- [Devil's Choice - Caesars Slots](#)
- [Money Rain Deluxe - Big Fish Casino](#)

KEY TAKEAWAYS

- Continue to overlap mechanics from stepper and video to create new, exciting machines
- This machine appeals to both Plain Janes, who are motivated to play and win, and New Players, who are trying to understand how machines play (see [October 2017 Slots Design Report](#) for details on *Devil's Choice*, another simplification slots innovation)
- Single symbol jackpot triggers are another easy way to entertain both Plain Janes and New Players...making every spin a mini-anticipation mode



REAL WEALTHY STATS

Game play

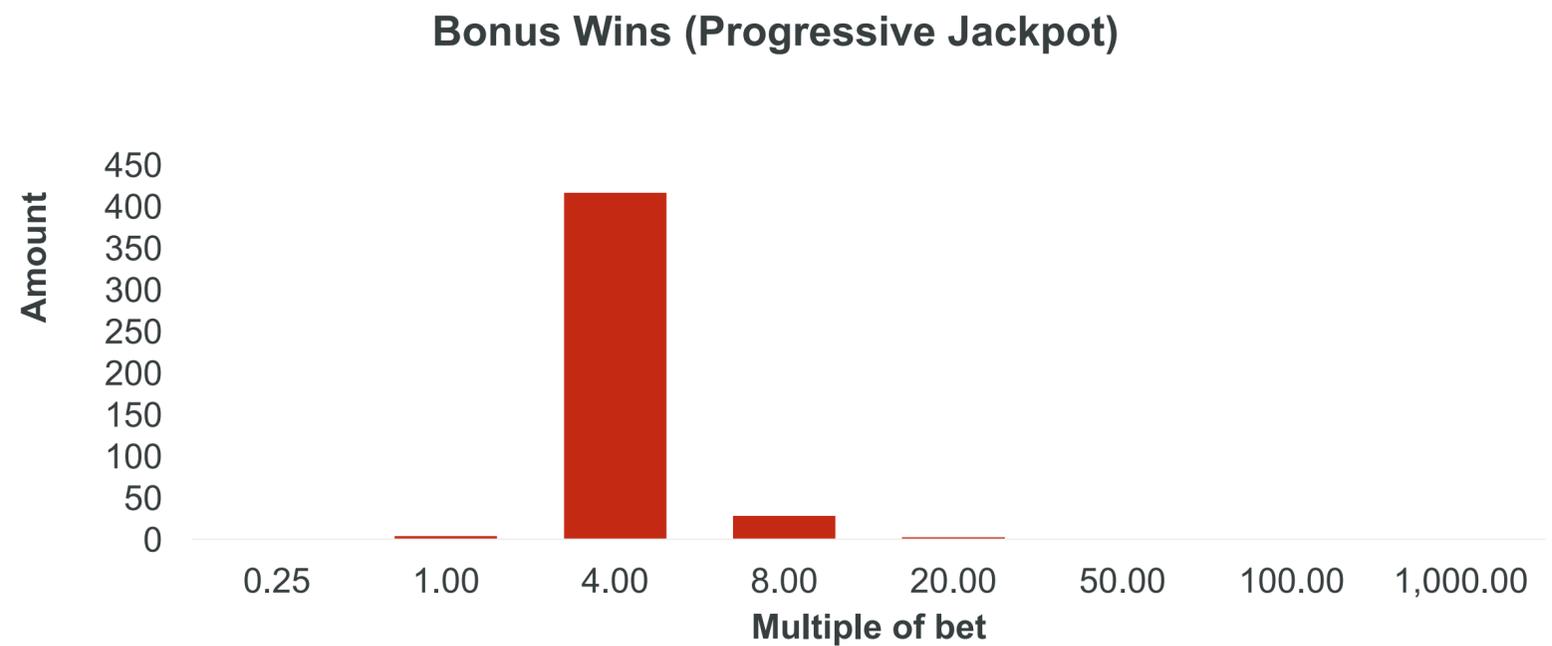
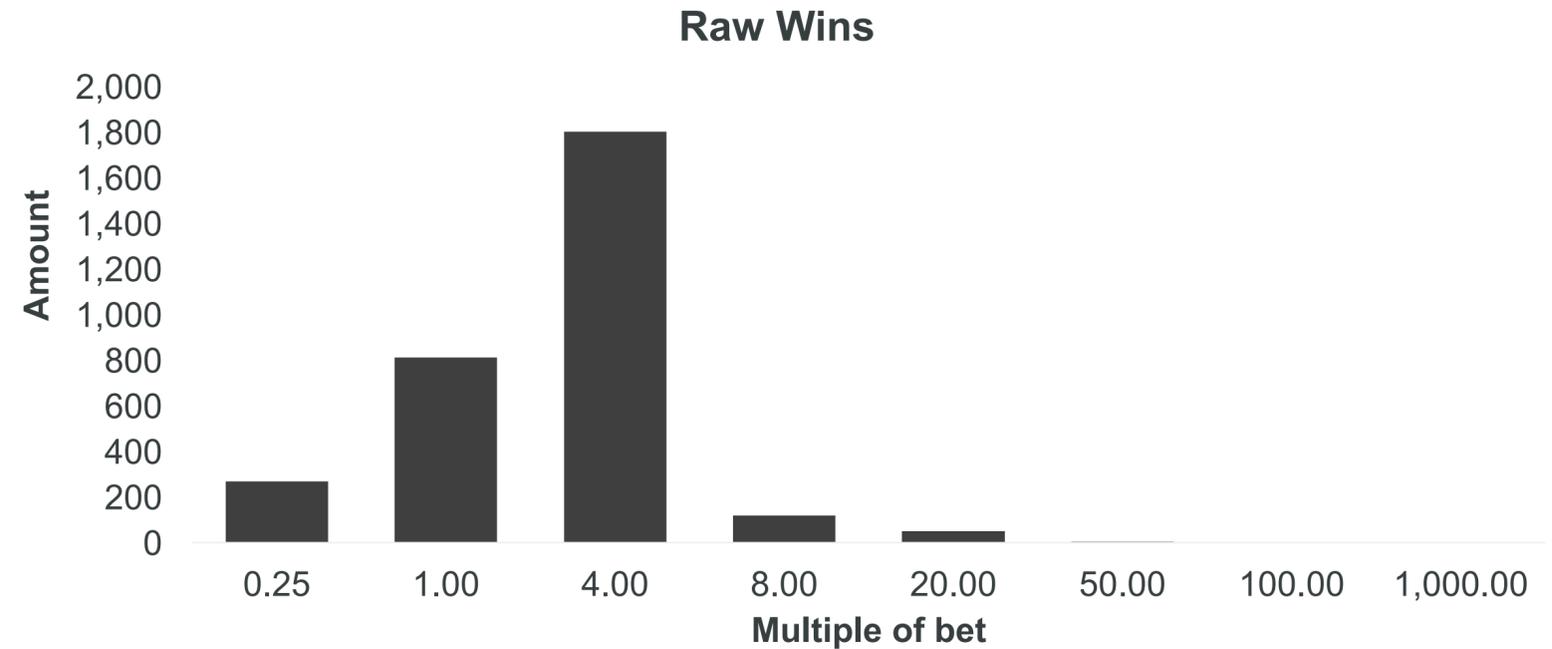
Hit frequency	31%
Volatility	1.4
Spins until a bonus	22

Distribution of RTP as % of total RTP

Base game	89%
Bonus game	11%
Progressive Jackpot	11%

RTP range

RTP observed after 10K spins	56%
Real RTP lands between (w/90% confidence)	54% - 59%



MYSTICAL SANDS

Heart of Vegas *Mystical Sands* randomly triggers *Cash Zones*, in both the base game and free spins. This upgrades symbols to gold

- Players have the choice between two small bet amounts without progressives, or two large bets with progressives (1)
- The *Gold Symbol Feature* is randomly triggered during the base game and free spins (2)
- The *Gold Symbol Feature* awards 1, 2, or 3 *Cash Zones*—called *Gold Windows* in this machine—on reel 1 (3)
- Any symbol that lands in the *Cash Zone* will convert to gold, as well as any other instance of the same symbol (4)

Release: 11/4/17

KPI: Revenue

Target player: Entertain-Me Eddie

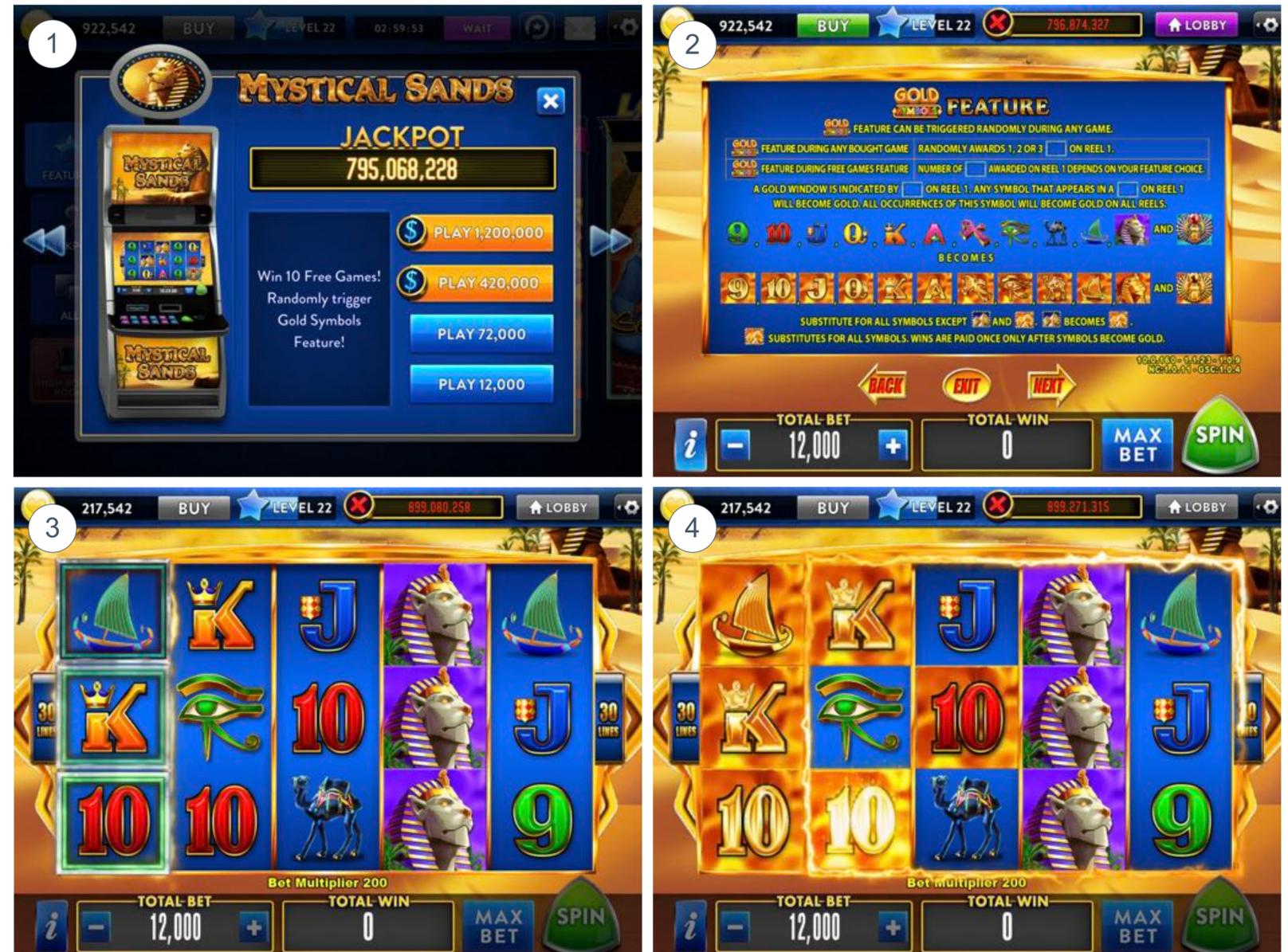
[More images and videos](#)

Related machines:

- [Medusa Magic - Slotomania](#)
- [Bestial Twins - Scatter Slots](#)
- [Bounty Bonanza - myVEGAS Slots](#)

KEY TAKEAWAYS

- Consider releasing a *Cash Zone* mechanic, like Scientific Games [Playboy Hot Zone](#), in a portrait-mode machine. Portrait machines are a new trend in Featured Apps largely because they allow for new mechanics, such as this one
- Place *Cash Zones* on the rightmost reel to make every spin an anticipation mode



MYSTICAL SANDS STATS

Game play

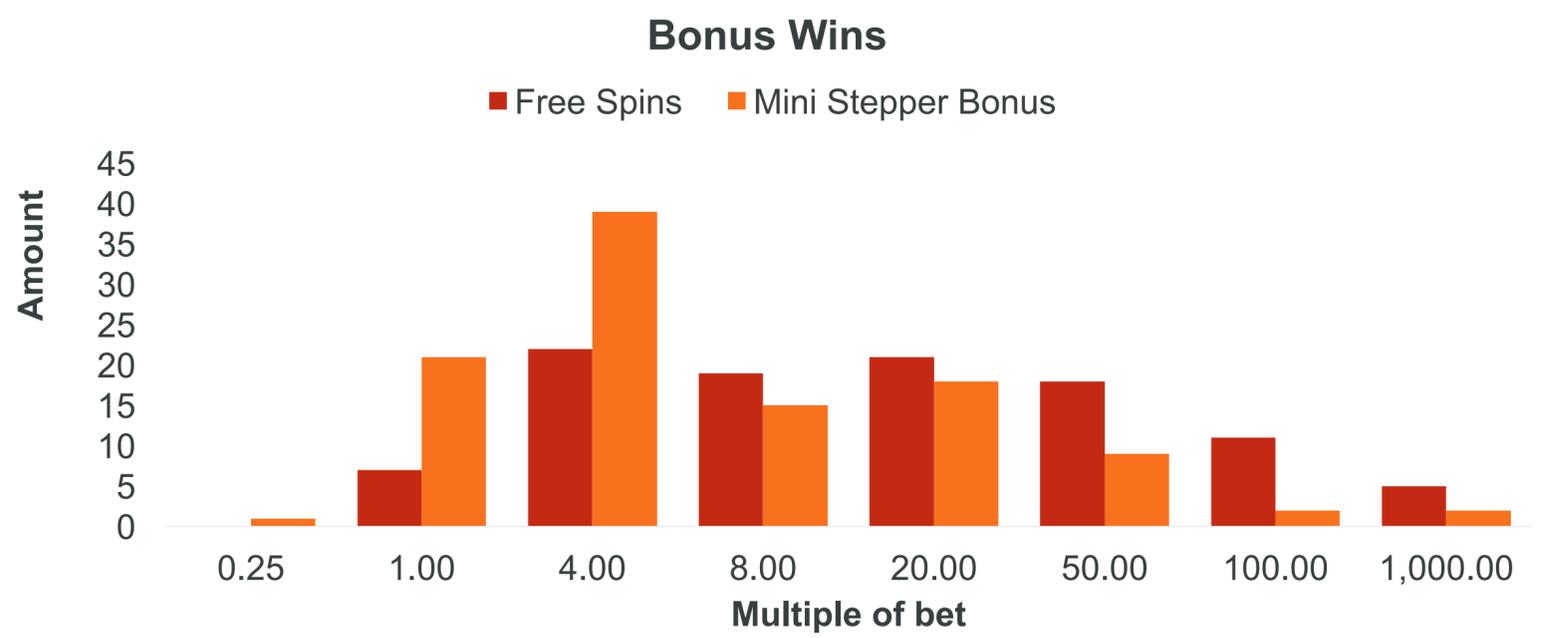
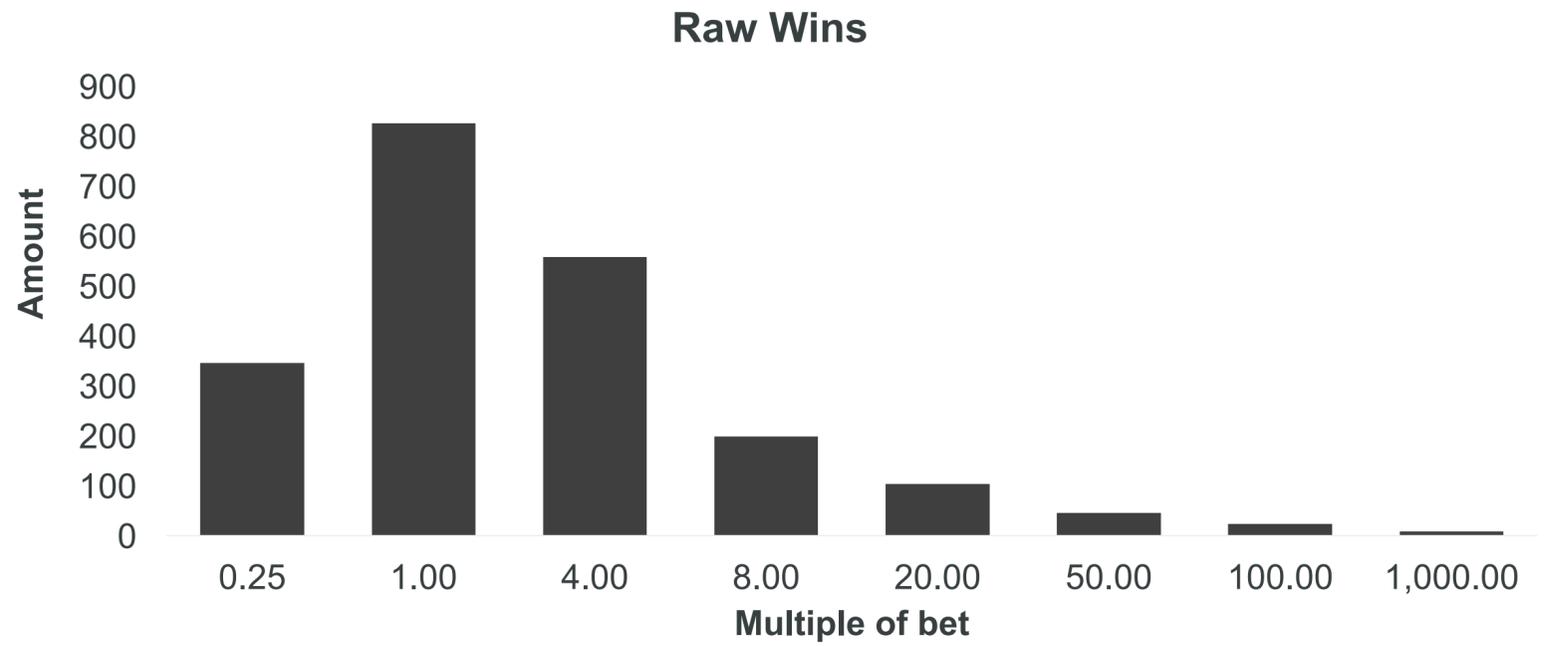
Hit frequency	21%
Volatility	6.9
Spins until a bonus	42

Distribution of RTP as % of total RTP

Base game	56%
Bonus game	44%
Free Spins	31%
Mini Stepper Bonus	13%

RTP range

RTP observed after 10K spins	89%
Real RTP lands between (w/90% confidence)	78% - 101%



REAL MONEY

- *Beauty & the Beast* – Yggdrasil Gaming
- *Viking Runecraft* – Play'n Go

BEAUTY & THE BEAST

Yggdrasil Gaming *Beauty & the Beast* added a bet-up mechanic and continues to experiment with characters that trigger bonus mechanics

- On regular bet mode, players receive 1 pick of a *Servant* before the free spin round. *Servants* each triggering a different mechanic—nudges, synchronizing the middle three reels, or playing 2-4 wilds in random places (1 & 2)
- On *Golden Bet* mode, players may purchase additional boosts that increase their bet amount (3, 4, & 5)
 - Boost: free spins start with 2 features (cost: +5 coins)
 - Nudge: activate nudge in the base game to trigger free spins (cost: +15 coins)
 - Boost & Nudge: combination of the two above (cost: +30 coins)

Release: 2/24/17

KPI: Spend per spin

Target players: Night-Out Nancy

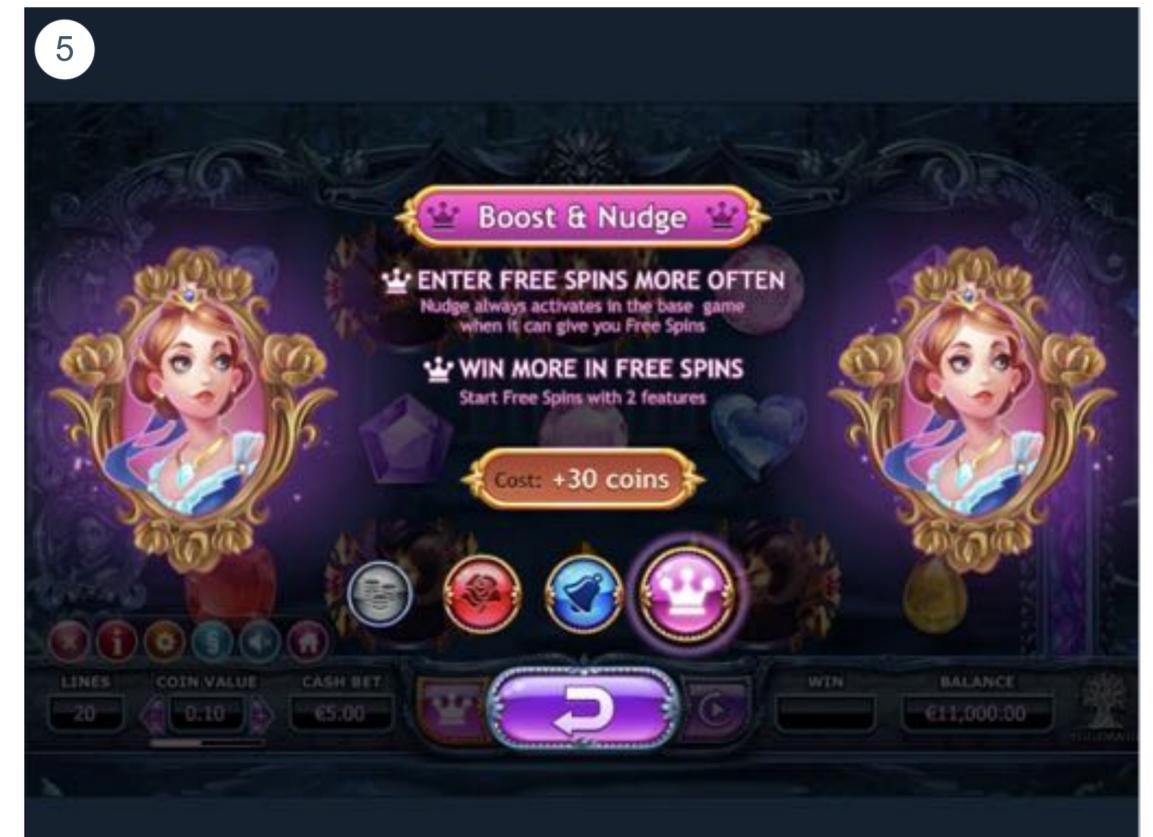
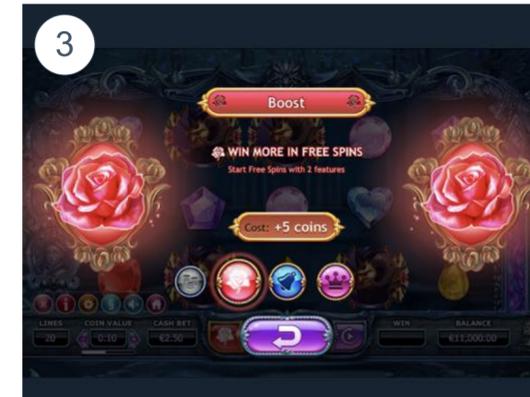
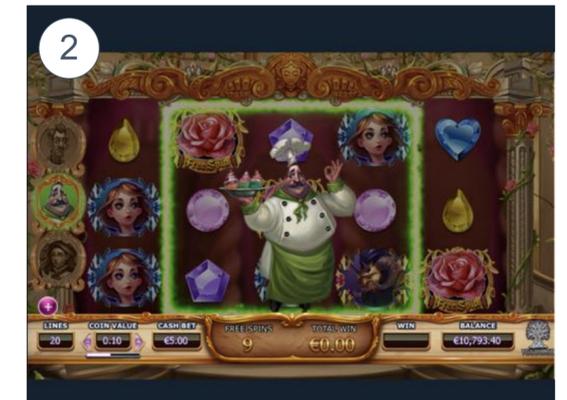
[Play the machine](#)

Related machines:

- [Jungle Books - Yggdrasil Gaming](#)
- [Hercules High & Mighty - Barcrest](#)
- [American Glamor 2 - Caesars Slots](#)

KEY TAKEAWAYS

- Test adding boosts as bet-up mechanics to machines, drawing inspiration from Bingo games for additional boost functionality. Choices like this are uncommon in RMG because regulation makes it difficult in many jurisdictions (and obviously acceptable in social)
- Consider allowing players to collect characters that have an impact over multiple machines



BEAUTY & THE BEAST STATS

Game play

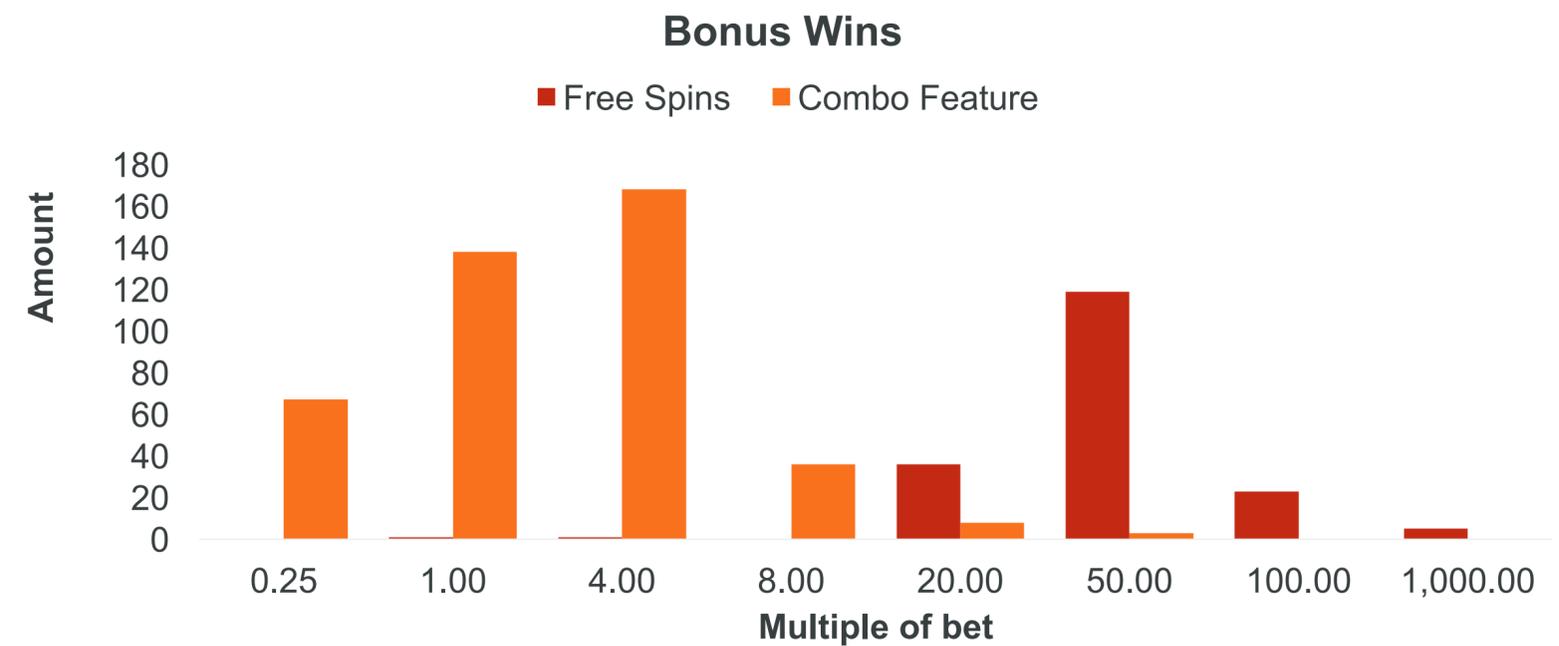
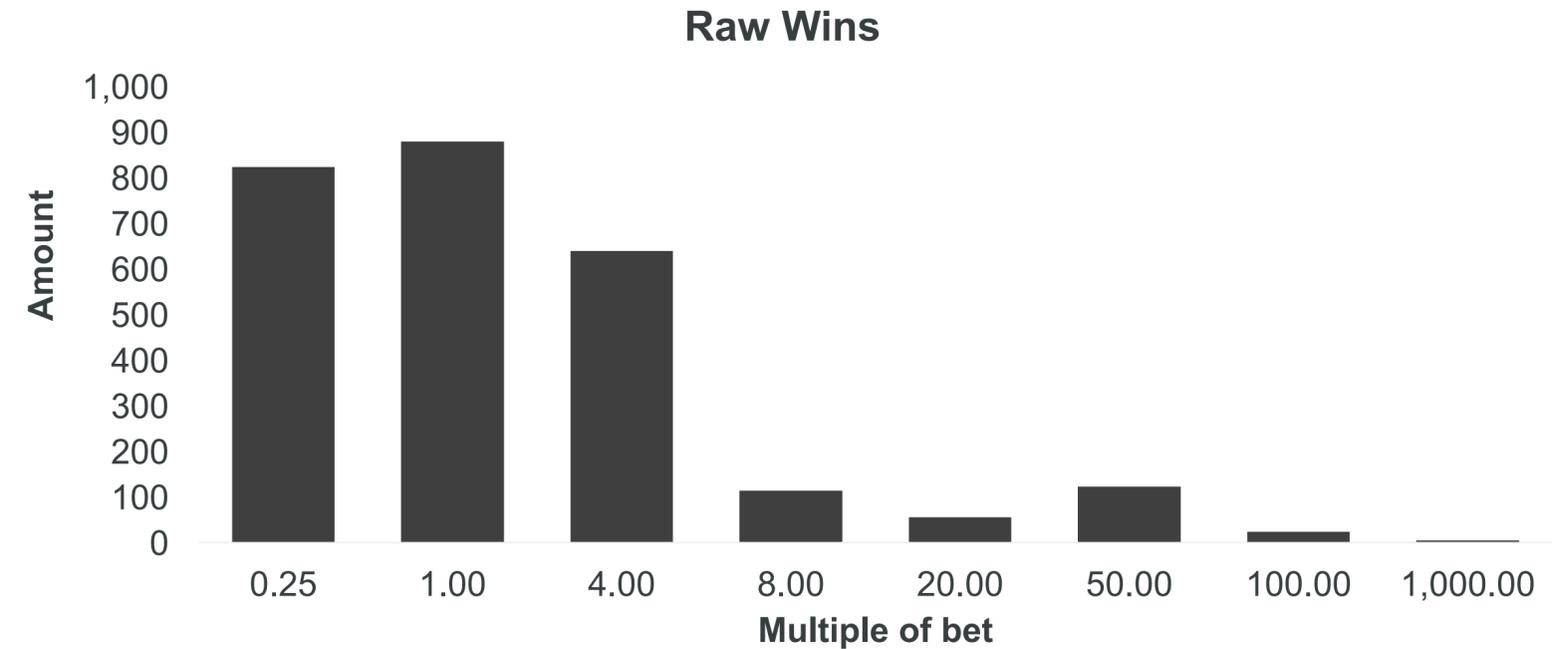
Hit frequency	27%
Volatility	5.8
Spins until a bonus	14

Distribution of RTP as % of total RTP

Base game	18%
Bonus game	82%
Free Spins	74%
Combo Feature	8%

RTP range

RTP observed after 10K spins	93%
Real RTP lands between (w/90% confidence)	83% - 103%



VIKING RUNECRAFT

Play'n Go *Viking Runecraft* incorporates mechanics from mid-core Puzzle games to produce a cascading reel set with levels, collections, and a wheel

- The base game is a cascading reel with *Cluster Pays*, similar to a Puzzle app (1)
- Players clear levels with winning combinations of a certain pattern, often needing multiple wins to complete the pattern (2)
- On each level, there are four Gods that may appear, each with a special mechanic (3)
- Players must collect 5 different *Rune Stones* and clear the level to trigger the bonus game (4)
- Collecting the 5 *Rune Stones* triggers a wheel bonus (5 & 6)
- Hitting 20 symbols during a set of cascading respins triggers the *Charge of Destruction*, awarding one of four features. Hitting 40 symbols triggers the *Ragnarok* feature (7)
- The *Ragnarok* awards all four features with multipliers for each hit during this bonus (8)

Release: 4/27/17

KPI: Revenue

Target player: Entertain-Me Eddie

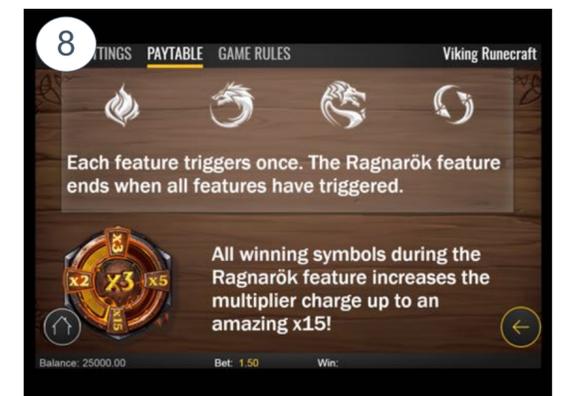
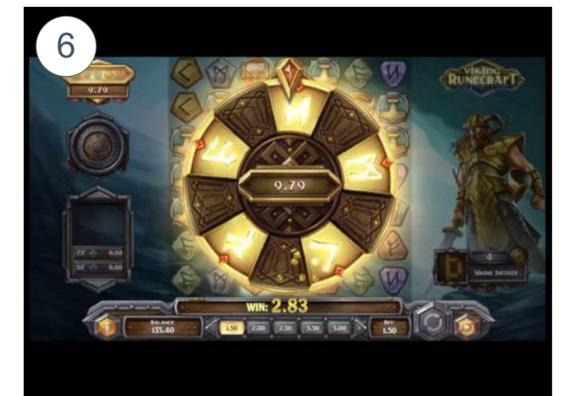
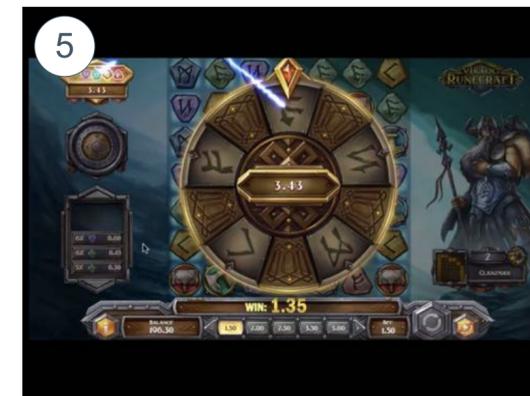
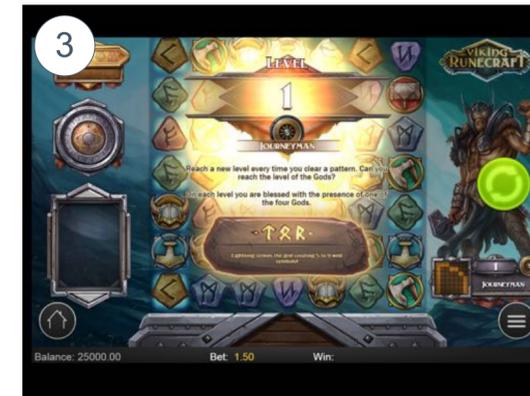
[Play the machine](#)

Related machines:

- [Secrets of the Forest - High 5 Casino](#)
- [Giovanni's Gems - Betsoft](#)
- [Chain Reactors - Cozy Games](#)

KEY TAKEAWAYS

- For Entertain-Me Eddie targets, push the complexity of featured slot machines (featured slot machines often take longer to develop and are often the money-drivers)
- As social casino players mature, they desire more complicated and involved meta-features (like clubs). Therefore, they crave more complex slot machines. This desire will speed up as RMG machines continue to trend towards more complex machines



VIKING RUNECRAFT STATS

Game play

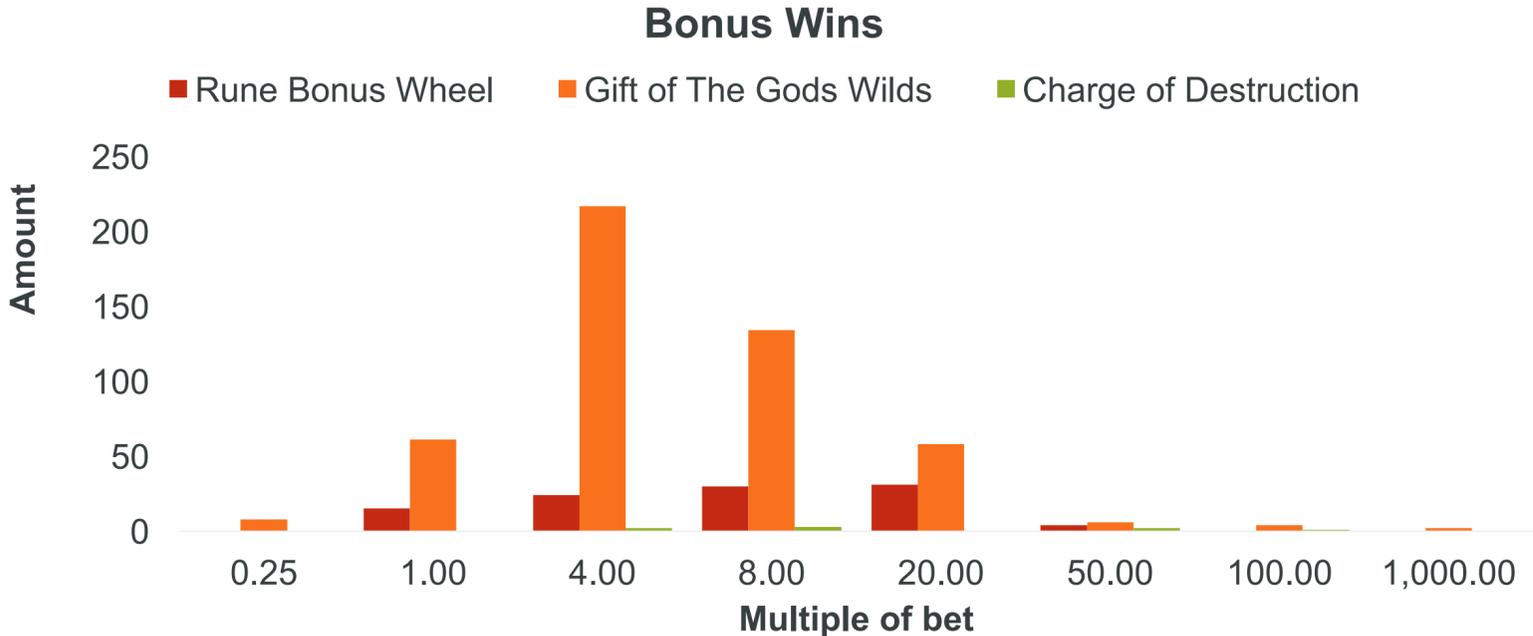
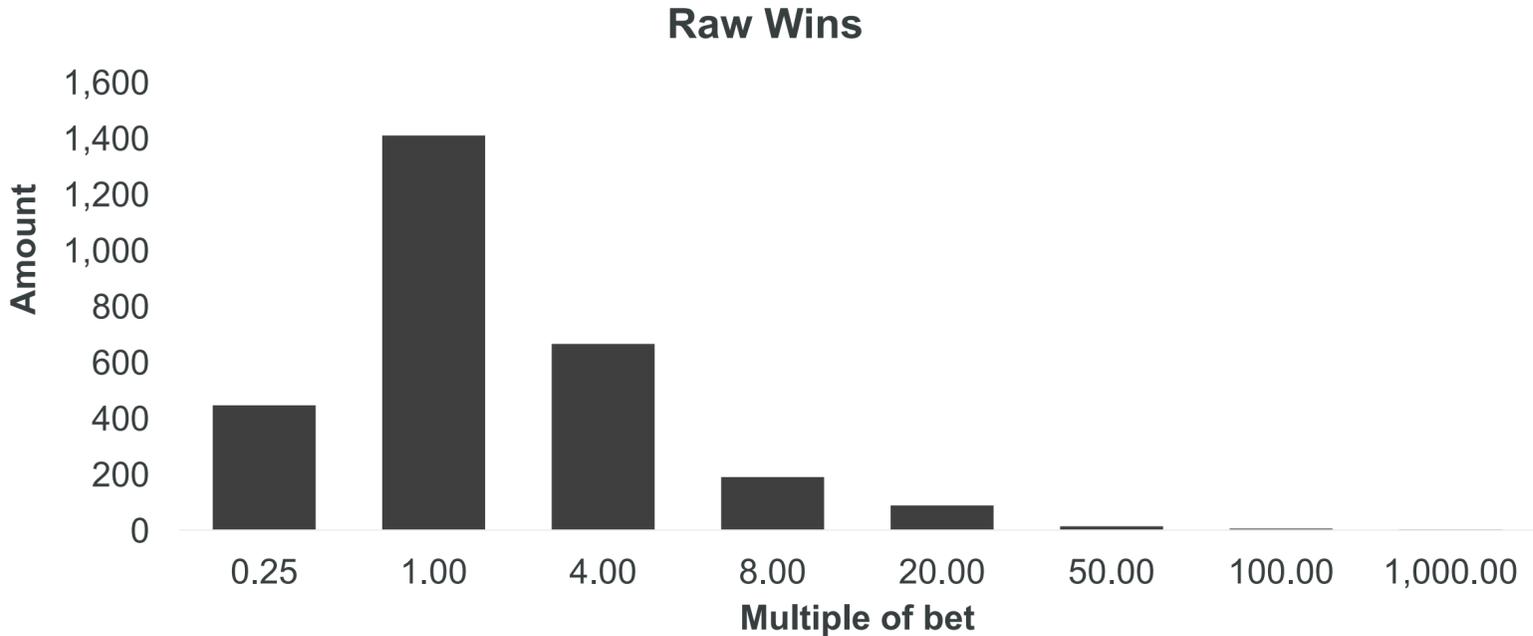
Hit frequency	28%
Volatility	3.1
Spins until a bonus	16

Distribution of RTP as % of total RTP

Base game	35%
Bonus game	65%
Rune Bonus Wheel	13%
Gift of The Gods Wilds	49%
Charge of Destruction	3%

RTP range

RTP observed after 10K spins	54%
Real RTP lands between (w/90% confidence)	49% - 59%



APPENDIX

SLOTS PLAYER PERSONAS

	PLAIN JANE	NIGHT-OUT NANCY	ENTERTAIN-ME EDDIE	MR. AND MRS. RICARDO
Desire	Utility	Excitement	Multi-Purpose	Relaxation
Motivation	Looking for something to do: kill time and reduce boredom	Wants a buzz: thrill of winning a jackpot, relaxing, and having a good time	Considers machines “lucky” or fun to play	Socialization, have fun, and relieve day-to-day stress
Features for choosing one game over another	Denomination that I want to play	Bet within budget, fun game to play	Fun game to play, good chance of winning	Fun game to play, denomination want to play
% of machines played with progressives	29%	40%	37%	25%
Player Income	Medium-high	High	Low	Medium-low
% female	54%	59%	45%	48%
Size of group	20%	28%	27%	26%

DATA COLLECTION PROCESS

Machine observations are from 10,000 spins. The process used to determine the data is outlined below. Recommendations, information, and data comes from market research, app intelligence tools, industry consultants, and deep analysis of the games

Machine information

- The RTP range is found using a sample of 10,000 spins, which is approximately 20 hours of play.
- To find the RTP range with 90% confidence, the median payout of the 10K spin +/- (standard error) x (z-score for 90% confidence) is calculated.
- The standard error is $(\text{standard deviation}) / \sqrt{\text{sample size}}$ and the z-score for 90% confidence is 1.65.
- For example, the median payout for *Zombie Prom* after 10K spins was 103% with a standard deviation of 3.3.
- The standard error is $3.3 / (\sqrt{10,000})$, which equals 3.3%
- The RTP range for *Zombie Prom* is then 103% +/- (1.65 x 3.3%).
- Based on this sample, the result is a 90% confidence that the real RTP of *Zombie Prom* falls between 97% and 109%.
- The volatility is the standard deviation, expressed in Excel as =STDEV(A1:A10001), of the 10K payouts. Payouts are in the form of multiples of bet.

Market research

- Each game is reviewed daily for updates, regardless of whether the game has been updated through the App Store.
- Transaction information comes from the iOS App Store's In-App Purchases tab. These transactions are ranked based on the number of transactions.
- Las Vegas player insights come from online sources, such as the Las Vegas Convention and Visitors Authority and the UNLV Center for Gaming Research.
- Progressive jackpot information comes from online research, specifically from wizardofodds.
- Trending revenue, downloads and package-rank data come from Priori Data, a Liquid and Grit partner.

Immature poets imitate; mature poets steal; bad poets deface what they take, and good poets make it into something better, or at least something different

– T.S. Elliot

LiquidandGrit.com



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