



LIQUID AND GRIT

Slots Design Report

Competitive research and data insights for slots designers

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INTRODUCTION



“In art, the hand can never execute anything higher than the heart can imagine.”

- Ralph Waldo Emerson

Dear Slots Designer,

Social casino continues to establish itself as one, if not the *most*, innovative platforms for slots design.

This month, Old Vegas Slots released a *Lock & Respin* mechanic to consider for your next jackpot machine. DoubleU Casino *Halloween Heroes* delivered to players a multi-step bonus worth analyzing. Finally, House of Fun evolved their *Premium* bet-up mechanic.

The combination of progressive jackpots *and* jackpots is keeping players entertained. Mega/Colossal symbols spiked in October—a mechanic released by a number of different apps and companies. IP continues to rise, driven by strong output by Hit it Rich. See Market Trends for more details.

In the Deep Dives, you will find an analysis of House of Fun *Brave Red*, which has one of the most dynamic in-machine progression systems (highlighted in New Innovations in the [October 2017 Slots Design Report](#)), Big Fish Casino *Money Rain Deluxe*, which is their second Incredible Technologies machine, and Games Warehouse *Cash Commander*, which integrates war game mechanics into a real money machine.

Start with your imagination.

Brett Nowak
Editor-in-Chief

NEW INNOVATIONS

PREMIUM BET TIERS


Double the symbols on a reel with a *Premium* bet tier. Slotomania *Fortunes of Gold* converts to a *China Shores*-like machine with a bet up mechanic

Details:

- Bet up dialogue upon machine-entry (1).
- *Fortune Mode* doubles the symbols on reel 3 (2).
- Upon winning free spins, players are given a choice to win an instant coin prize, or play the free spins (3).
- Players always see an information FORTUNE MODE button on the bottom left of the reel sets (4).

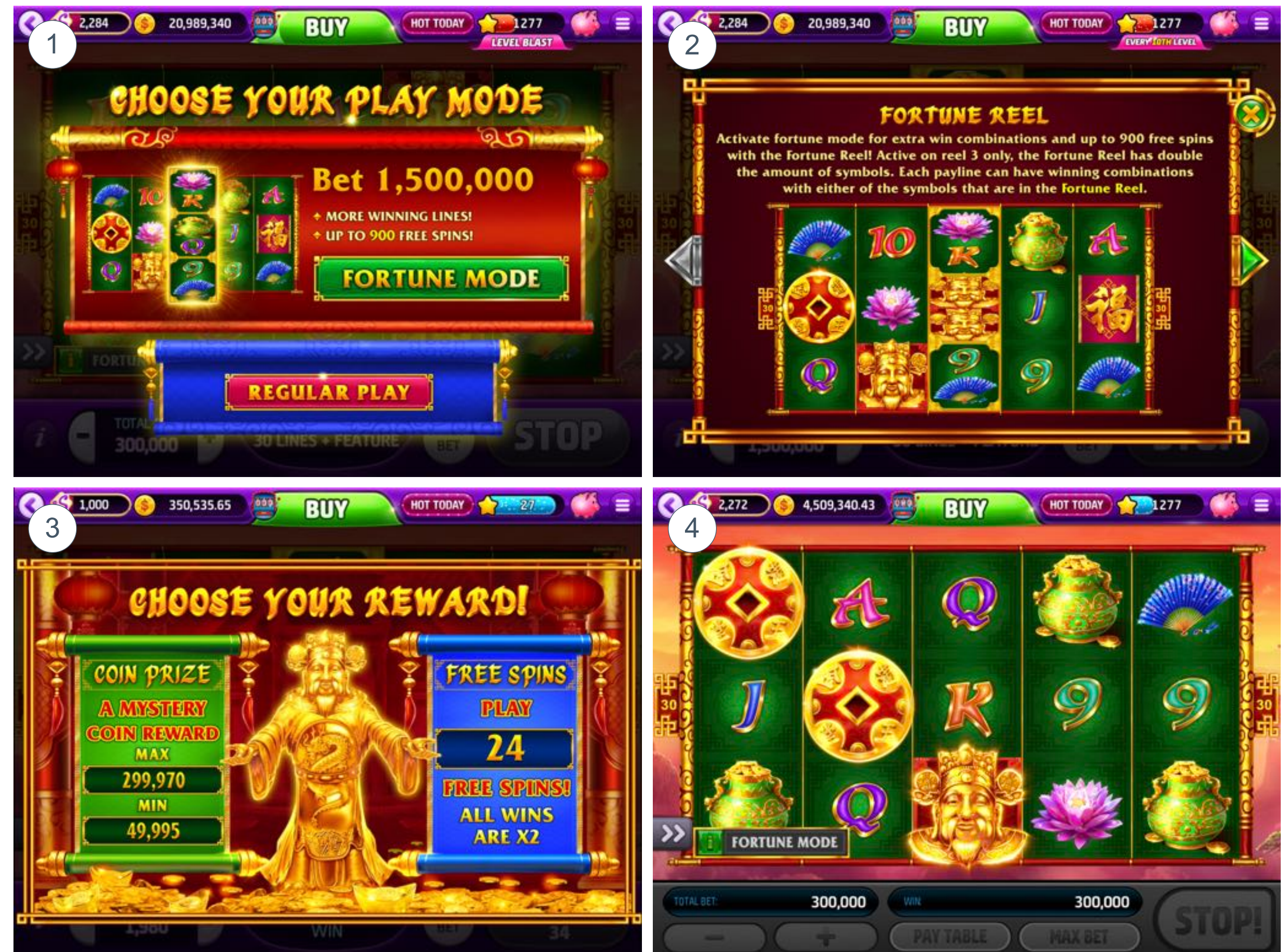
Release: 10/13/17

Insights:

- Add logic to the instant coin prize for collection-based play: If a machine or quest system collects special symbols, compensate players when they pick the instant coin prize for the symbols they would have collected during the free spins
- **Click here for more images in the Feature Database** 

Related machines with a similar mechanic:

- Bingo Blitz [*Monster Bonus*](#)
- House of Fun [*Five Monkey Gold*](#)
- House of Fun [*Golden Liberty*](#)



RESPIN TRANSITIONS TO BONUS WHEELS

Release a bonus game with multiple transitions. The bonus in DoubleU Casino *Halloween Heroes* goes from stacked symbols, to respins, to a wheel, and finally to a bonus award

Details:

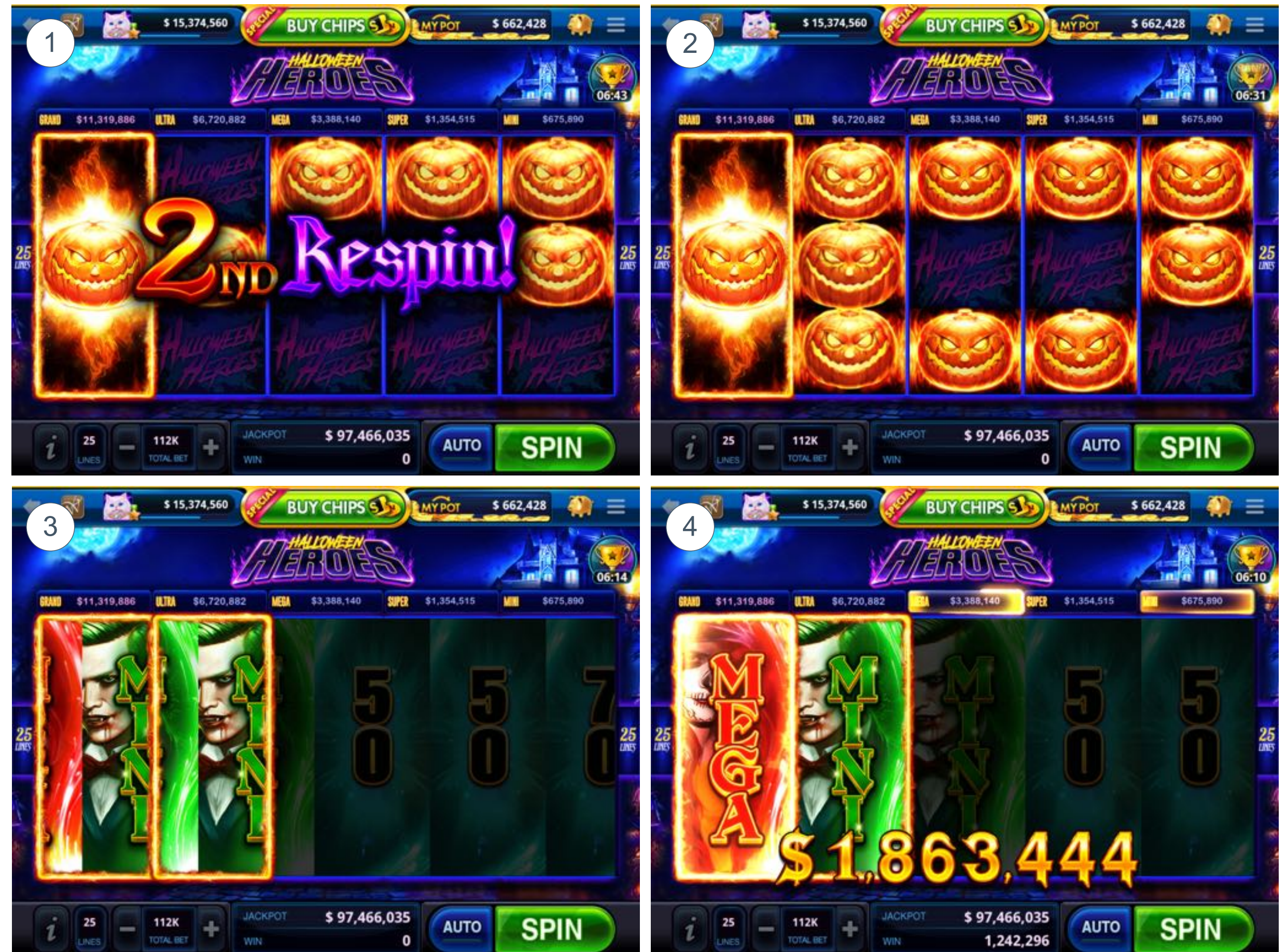
- Respins trigger when a full stack of *Pumpkins* land (1).
- Additional stacks may land and stick during the respins (2).
- Once the respins are complete, the stacks convert to winnable sleeves of a wheel (3).
- After the wheel spins, players are awarded the bonuses—coins, free spins, and/or jackpots—that land in each of the sleeves (4).

Release: 10/14/17

- [Click here for more images in the Feature Database](#) 

Related machine with a similar mechanic:

- Aristocrat [*The Walking Dead, the third version*](#), which is not yet released on the casino floors, but showcased at the 2017 G2E



ROMAN TOWERS

Introduce a new jackpot *Lock & Respin* mechanic with a *Roman Tower*, as showcased by one of Old Vegas Slots' newest machines

Details:

- Players see the *Roman Tower* in the lobby (1).
- The bonus is triggered by a *Bonus* symbol on reel 3 (2).
- Players start with three spins of the *Roman Tower*. Any time a number lands, the number locks and players receive another spin. Players lose a spin if a number does not land (3).
- The bonus award is the sum of all the numbers locked, multiplied by the bet (4).

Release: 9/27/17 VIP, 10/13/17 All

Insights:

- Reskin of Old Vegas Slots *Flame Tower*
- [Click here for more images in the Feature Database](#) 

Related machines with a similar mechanic:

- Old Vegas Slots *Lightning Bolt*
- Jackpot Party *Twin Fire*



BATTLE MODE FREE SPINS

Entertain players with a battle mode that plays out a story between a hero and villains. The free spins in *Heart of Vegas The Third Prince* demonstrates this mechanic

Details:

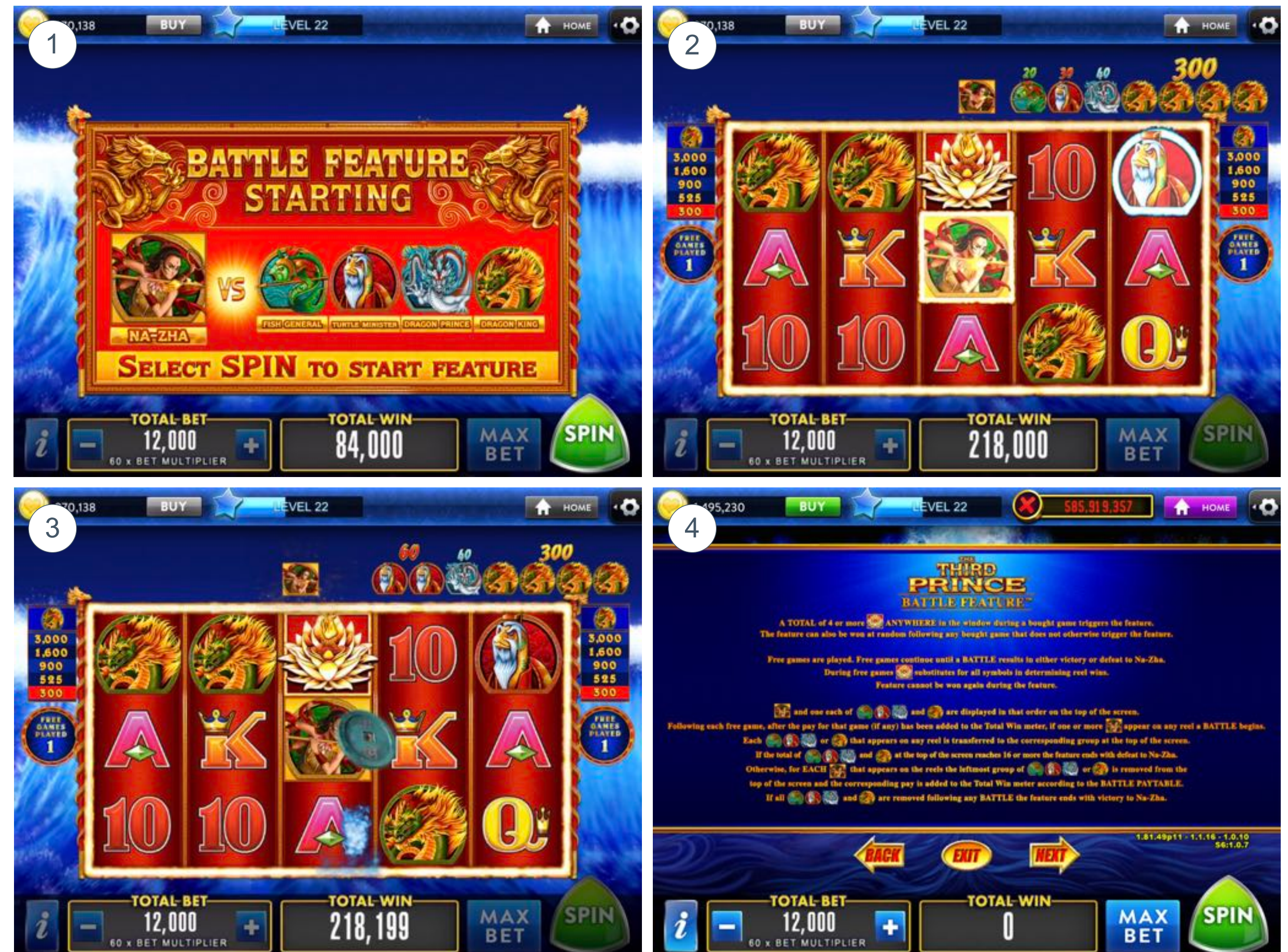
- Upon triggering the free spins, players are informed of the battle between *Na-Zha* and villain symbols (1).
- If *Na-Zha* lands during the free spins, he battles with the farthest-left villain at the top of the reel set. If villain symbols land, they are added to the group at the top (2).
- The farthest-left villain drops out of the battle and awards the corresponding win amount (3).
- If 16 villains are reached, *Na-Zha* is defeated. If all the villains are removed from the top, *Na-Zha* wins the battle (4).

Release: 10/6/17

- [Click here for more images in the Feature Database](#)

Related machines with a similar mechanic:

- POP! Slots [Pirates' Gems](#)
- Multimedia [The Kraken](#)
- Incredible Technologies [Medusa the Quest of Perseus](#)
- Quickspin [Beowulf](#)



TRIGGERED CHALLENGES

Randomly trigger a fill meter challenge with a timer to incentivize more bets per minute and larger average bet amounts

Details:

- The *Mega Monster Challenge* is randomly triggered during base game play (1).
- If free games are triggered during the *Mega Monster Challenge*, the timer is placed on hold until the completion of the free spins. Filling the meter within the time limit triggers *Mega* upgraded mini reels (2).

Release: 10/18/17

- [Click here for more images in the Feature Database](#) 

Related machines with a similar mechanic:

- House of Fun [Charming Frog](#)
- House of Fun [Sands of Time](#)
- DoubleDown Casino [Captain's Fortune](#)



MARKET TRENDS

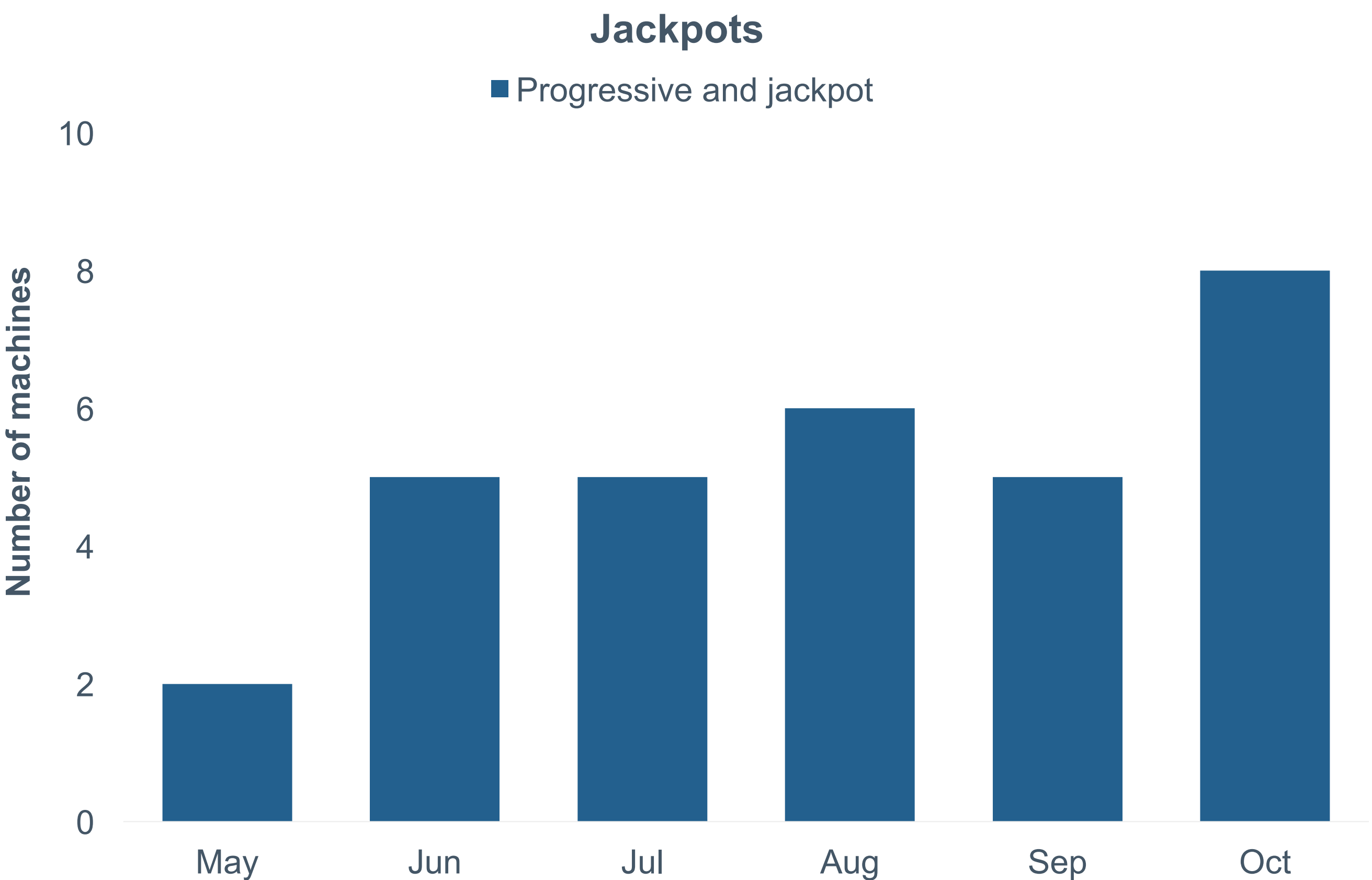
10/1/17 – 10/31/17

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

JACKPOTS

Machines combining progressive jackpots and jackpots continue to rise. This trend was first examined in the July 2017 Slots Design Report and has continued upward



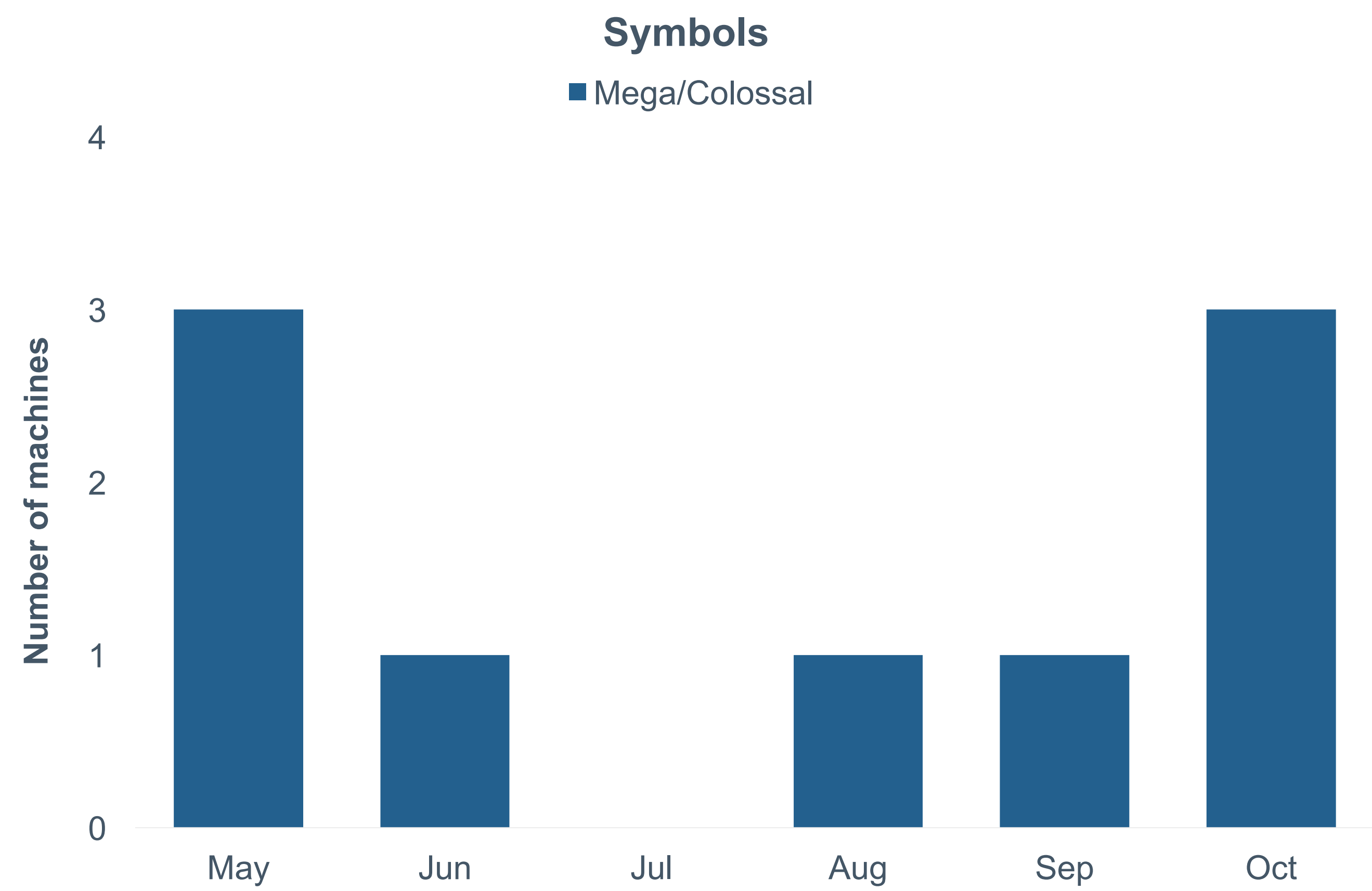
DoubleDown Casino [*WoF Red Hot Re-Spin*](#)



House of Fun [*Spells & Wins*](#)

SYMBOLS

Mega/Colossal sized symbols bounced up in October with three machines released



Quick Hit Slots [*Mixteca*](#)

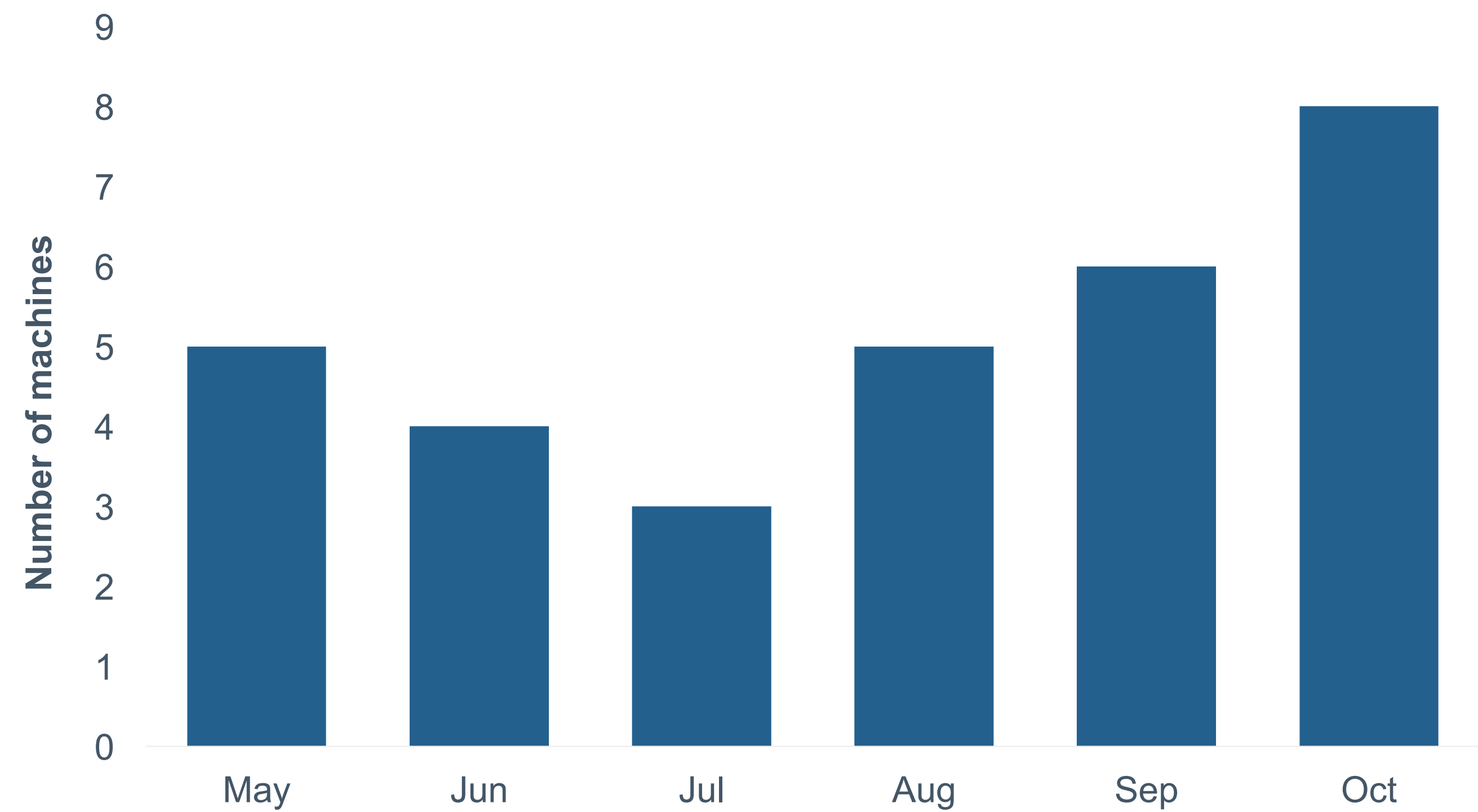


Hit it Rich [*Jungle Goddess*](#)

THEMES

IP machines continue to be strong. IP released: Jackpot Party *The Flintstones*, Hot Shot Casino *Smooth Criminal*, Hit it Rich *Batman Begins*, *Halloween*, *Elvira's Monster Madness*, *The Munsters Strange Neighbors*, *Blondie*, and *Grease*

Themes



Jackpot Party *The Flintstones*



Hot Shot Casino *Smooth Criminal*

DEEP DIVES

SOCIAL CASINO

- *Brave Red* – House of Fun
- *The Munsters Strange Neighbors* – Hit it Rich
- *Spooky Castle* – DoubleHit Casino
- *Money Rain Deluxe* – Big Fish Casino

BRAVE RED

House of Fun *Brave Red* includes *Boosters* that are won during the last round of a pick 'em bonus. *Boosters* add enhancements to free game play

- Base game is an n x n reel set with a fill meter (1).
- Collecting symbols fills the meter and awards a three-round pick 'em bonus. In the final pick 'em round, players may win *Boosters* for the *Super Free Games* (2).
- Each free games node on the map displays *Boosters* (3).
- *Super Free Games* are triggered by reaching *Super Free Games* nodes on the map (4).
- Players are given a choice between two symbols to become wild during the bonus (5).
- The respin has special symbols: 1) multipliers, 2) 'Win it again', which awards the total prize amount for the feature twice, and 3) 'Play it again', which clears all positions and restarts the feature (6).

Release: 10/4/17 (mobile), 9/5/17 (Facebook)

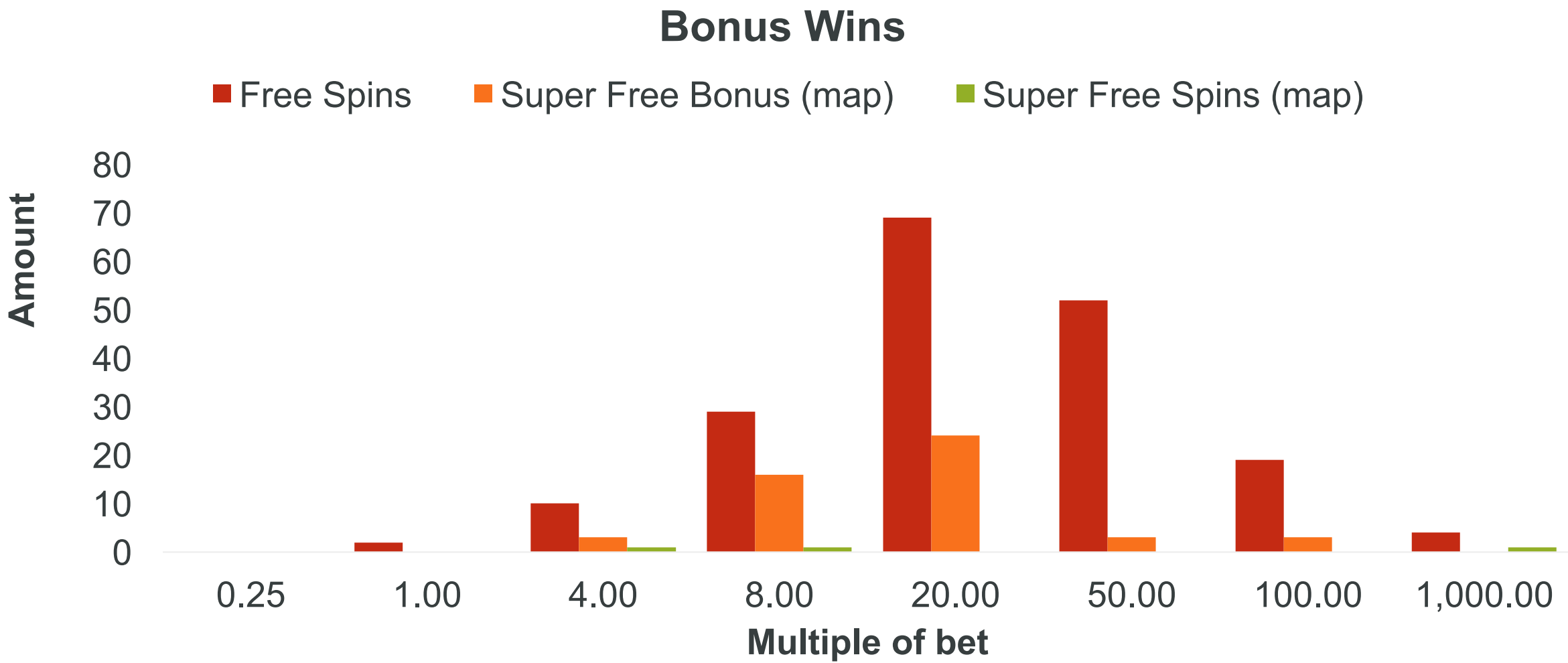
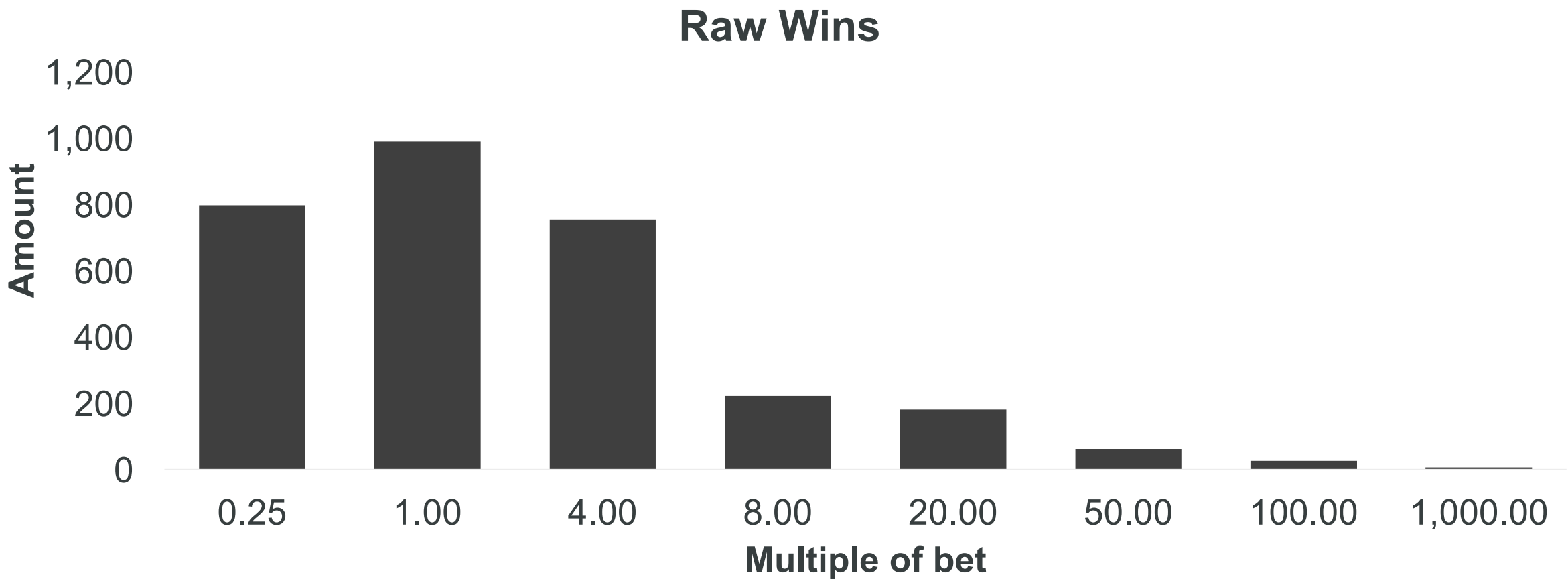
- [Click here for more images in the Feature Database](#) 



BRAVE RED STATS

Game play	
Hit frequency	30%
Volatility	7.7
Spins until a bonus	42
Distribution of RTP as % of total RTP	
Base game	51%
Bonus game	49%
Free Spins	43%
Super Free Bonus (map)	5%
Super Free Spins (map)	1%
RTP range	
RTP <u>observed</u> after 10K spins*	118%
Real RTP lands between (w/90% confidence)*	106% - 131%

See the Appendix for the RTP analysis methodology



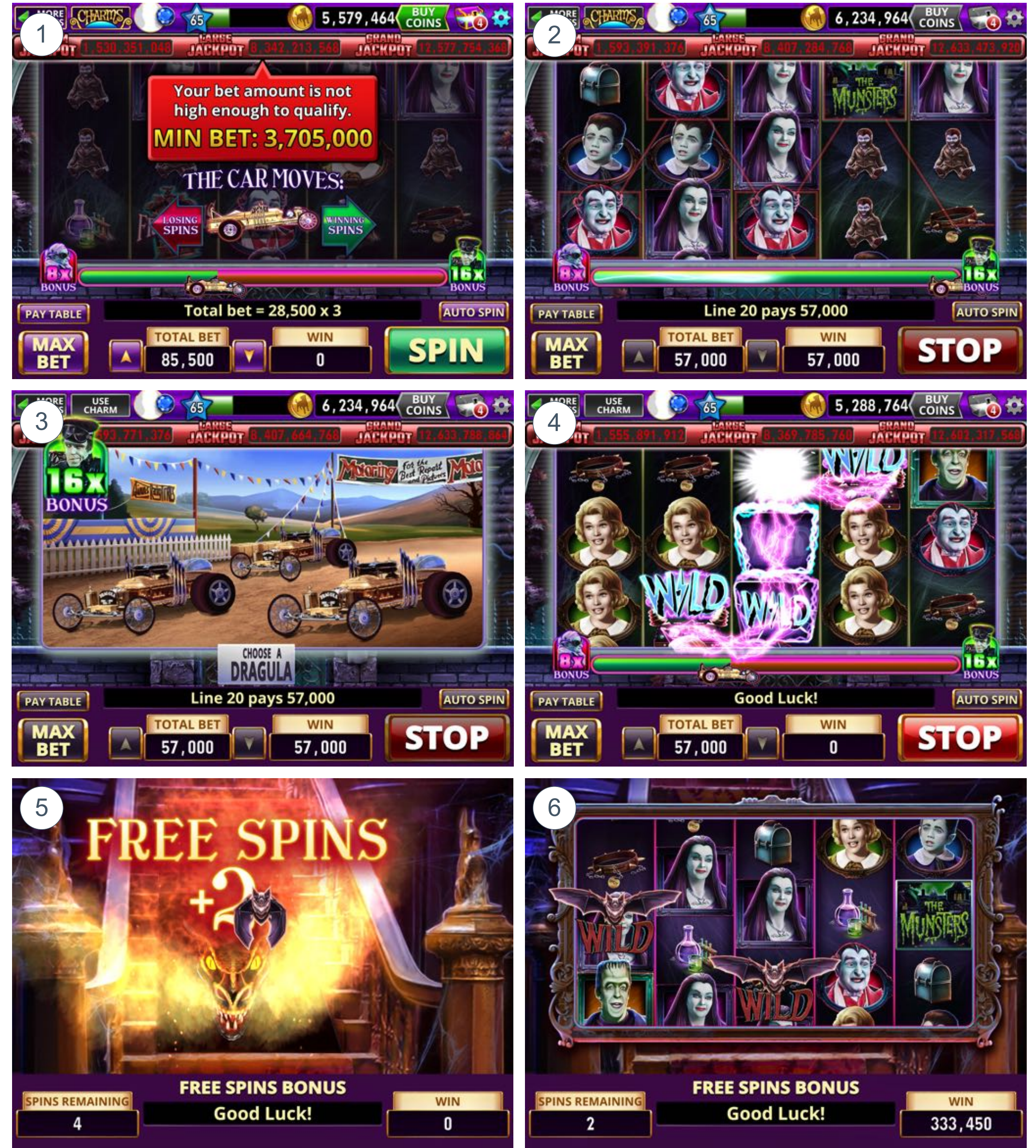
THE MUNSTERS

Hit it Rich *The Munsters Strange Neighbors* features a fill meter that advances with a win and reduces with a loss

- A fill meter is visible upon machine-entry (1).
- A car moves left after a losing spin and right after a winning spin. Reaching one side and filling the meter awards a multiplied bonus game (2).
- Players pick one of three cars in the bonus, revealing a coin prize (3).
- Wilds appear on reels 2 and 4 anytime during play and convert any symbols between the two wilds (4).
- Spot may appear randomly during free spins, awarding two additional spins with roaming wilds (5).
- Roaming wilds, which move every spin within their reel, are placed on the reels (6).

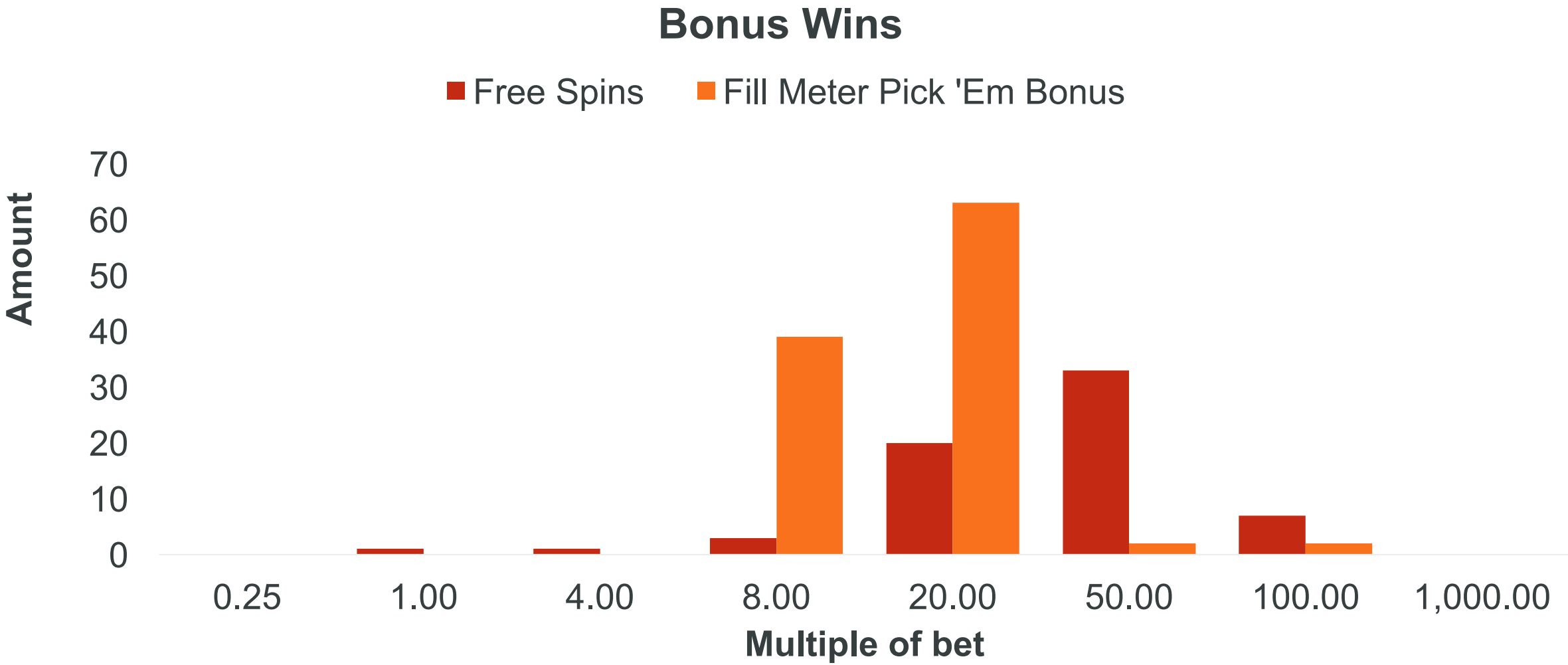
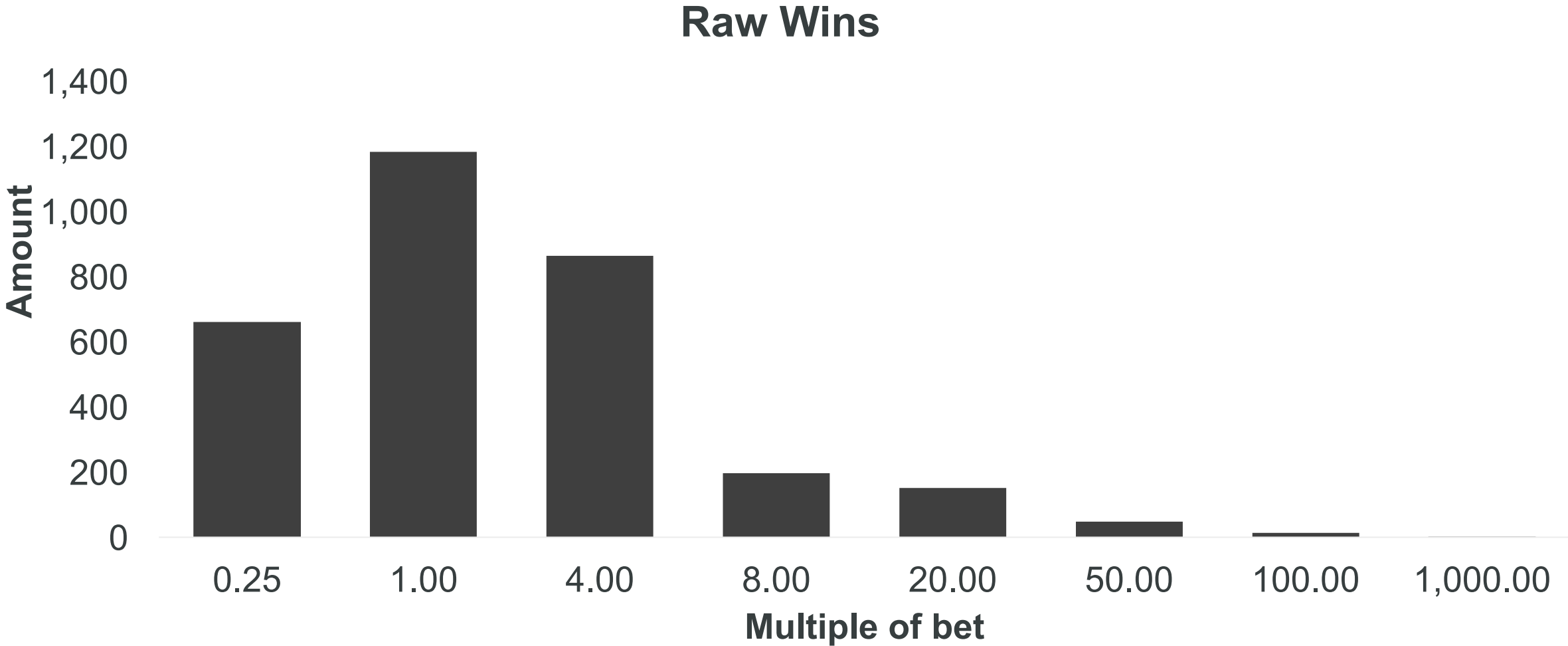
Release: 10/6/17

- [Click here for more images in the Feature Database](#) 



THE MUNSTERS STATS

Game play	
Hit frequency	31%
Volatility	4.5
Spins until a bonus	58
Distribution of RTP as % of total RTP	
Base game	62%
Bonus game	38%
Free Spins	22%
Fill Meter Pick 'Em Bonus	16%
RTP range	
RTP observed after 10K spins	83%
Real RTP lands between (w/90% confidence)	76% - 91%



SPOOKY CASTLE

DoubleHit Casino *Spooky Castle* awards multiple mini stepper machines with a replay feature awarded if no wins hit during the bonus

- Upon machine-entry, a player's bet unlocks additional progressive jackpots (1).
- Each reel holds a mini stepper bonus machine, available at any bet level (2).
- Hitting three or more mini stepper symbols awards a spin of each landed mini stepper symbol (3).
- When a non-winning bonus happens, 'Another Chance' appears, awarding a re-trigger of the mini stepper feature (4).
- Three scatters on reels 2, 3, and 4 trigger free spins (5).
- The mini stepper, called *Game-In-Game*, is available during the free spins bonus (6).

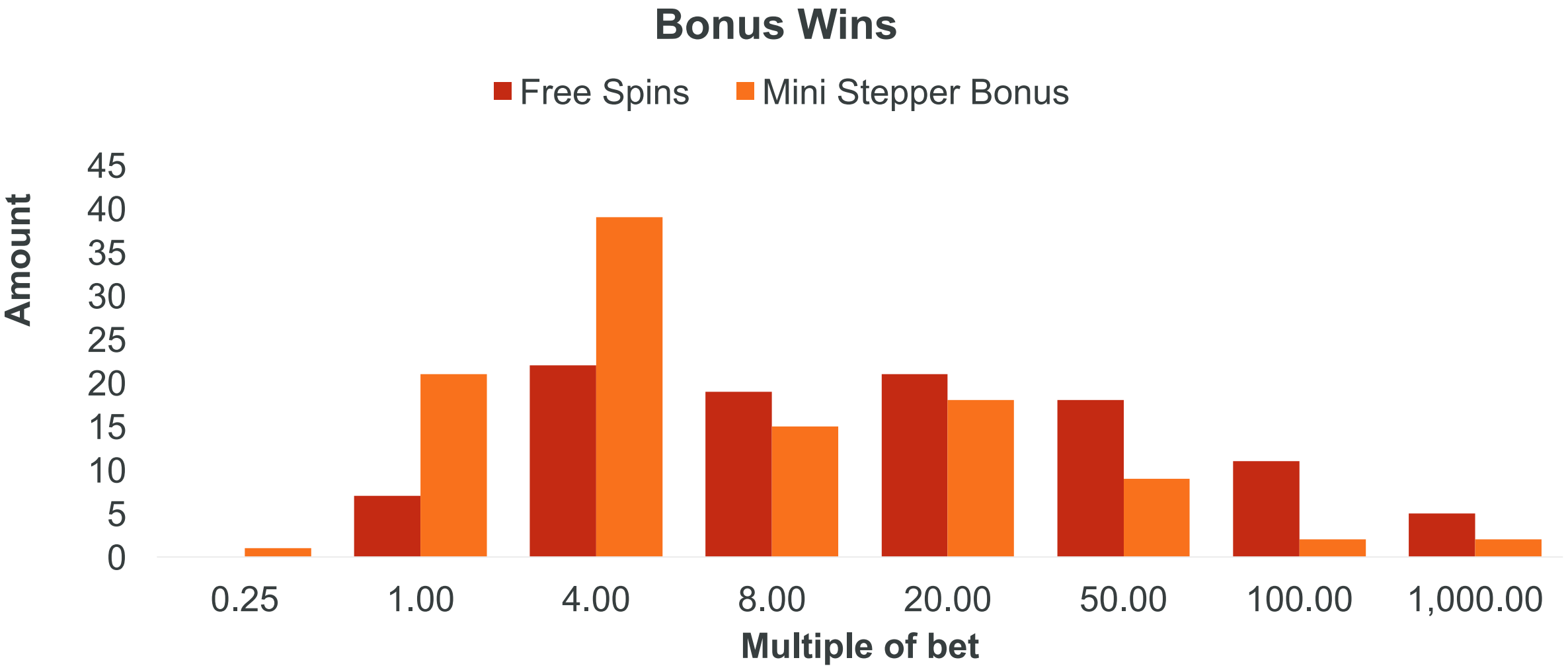
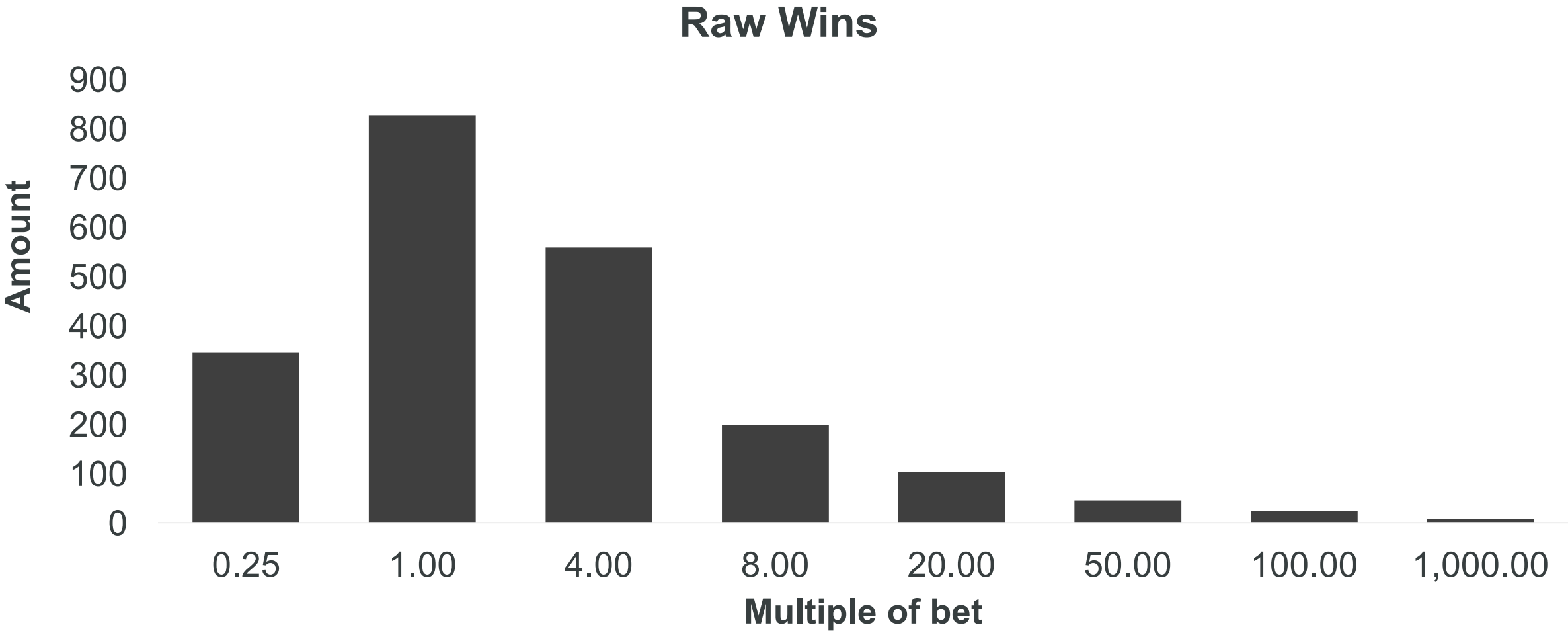
Release: 10/5/17

- [Click here for more images in the Feature Database](#) 



SPOOKY CASTLE 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%



MONEY RAIN DELUXE

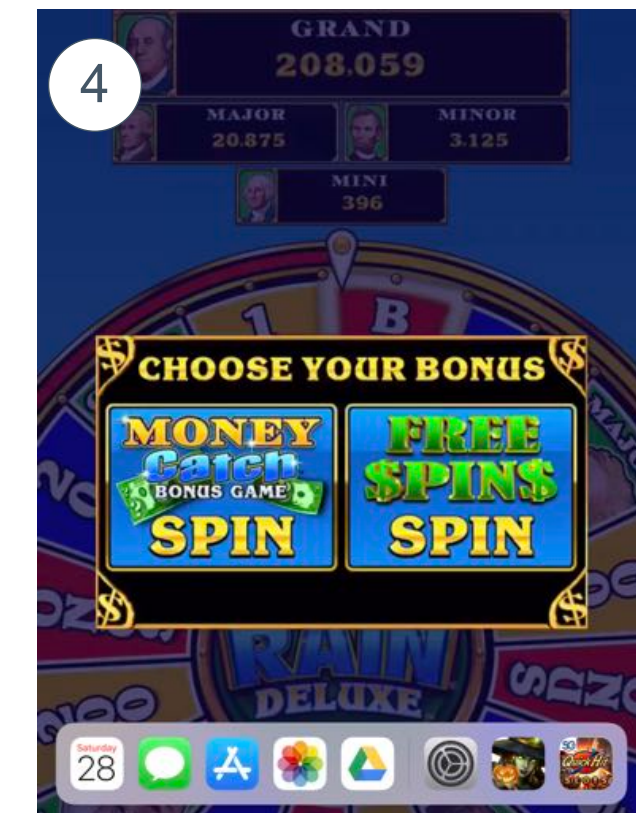
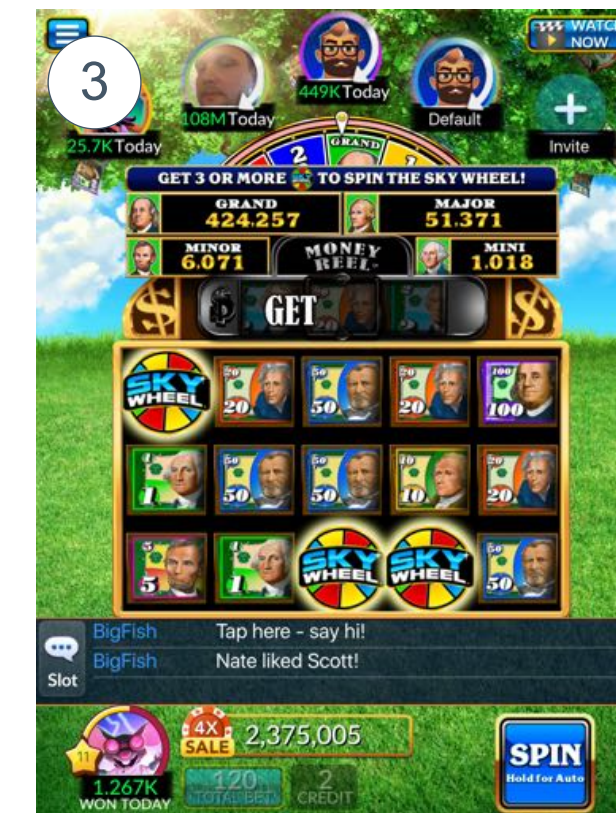
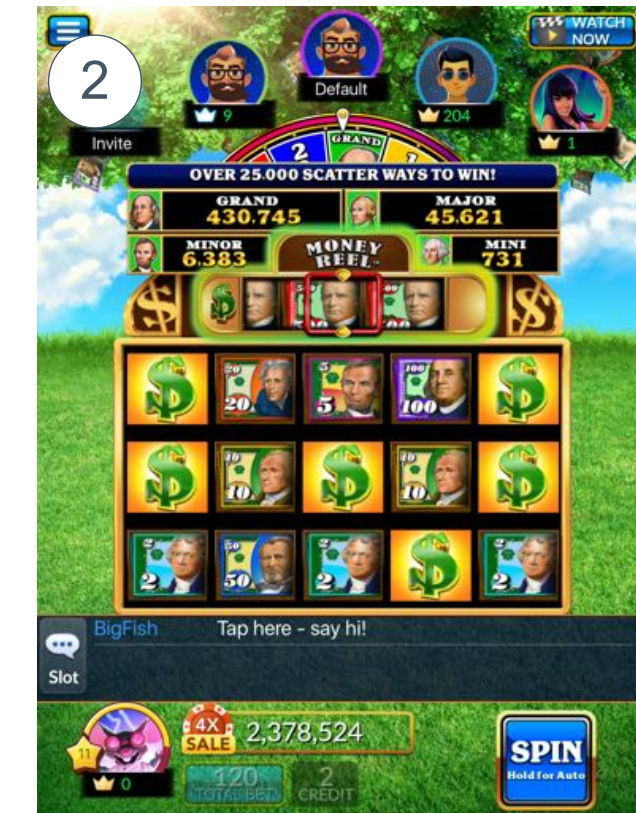
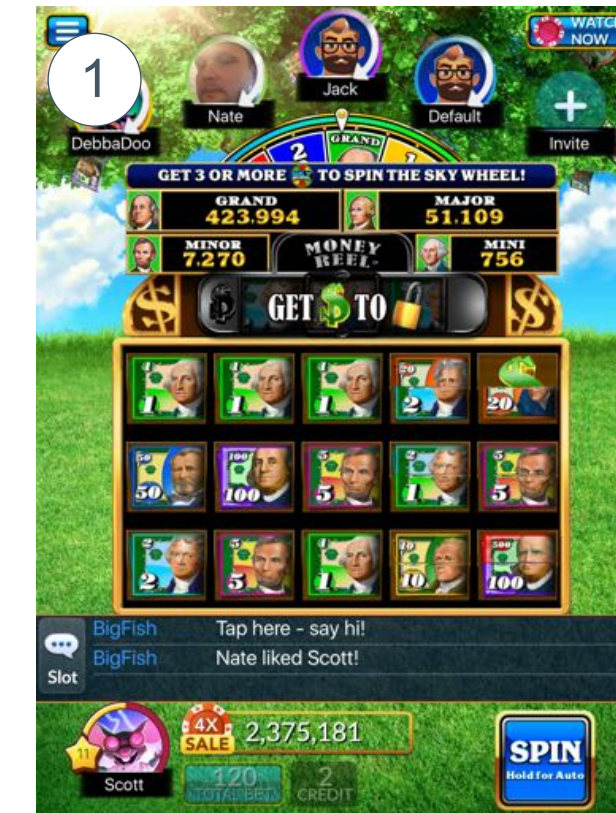
Big Fish Casino released *Money Rain Deluxe*, another RMG machine from Incredible Technologies. Players may unlock an additional reel or choose the seemingly skill-based pick ‘em bonus game

- All symbols are paid scatter pay (1).
- A ‘\$’ scatter unlocks and spins the *Money Reel* to determine the scatters converted symbol (2).
- Wheel symbols trigger the *Sky Wheel Bonus* (3).
- Landing on the bonus wedge presents a ‘Choose Your Bonus’ (4).
- Landing on a coin prize wedge awards a spin of the inner wheel for a multiplier, or a respin of the *Sky Wheel* (5).
- Choosing the *Money Catch Bonus* awards a pick ‘em bonus that appears skill-based to players (6).

Release: 10/4/17

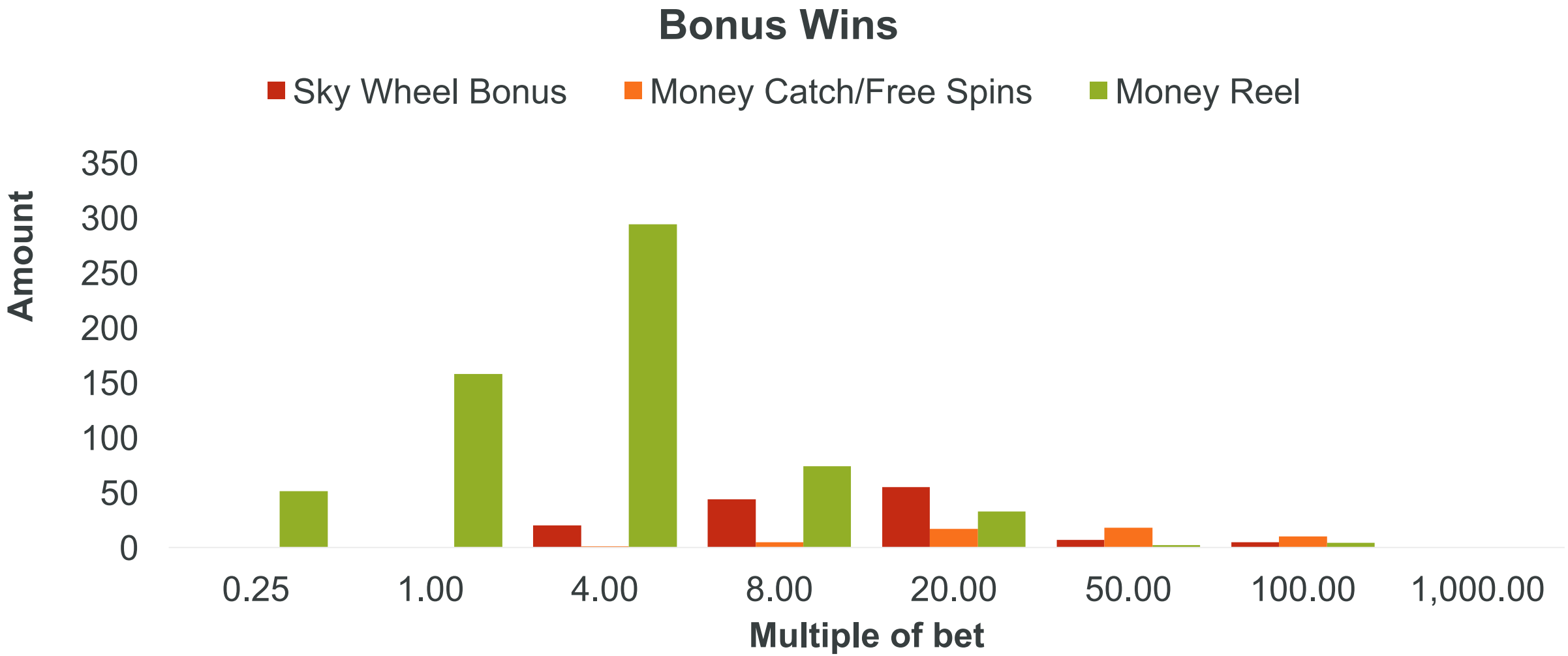
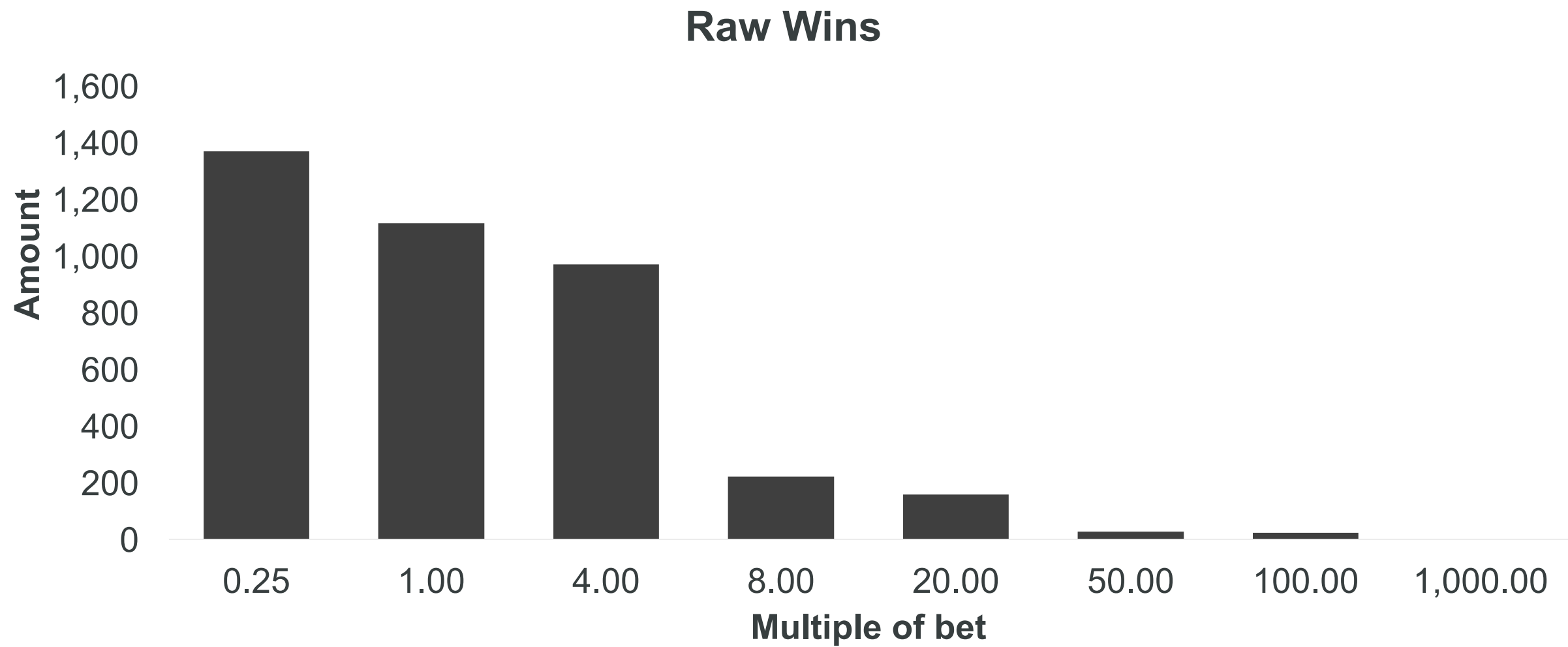
Insights:

- For additional information on the *Sky Wheel*, see *Crazy Money Deluxe* featured in the [September 2017 Slots Design Report](#)
- [Click here for more images in the Feature Database](#) 



MONEY RAIN DELUXE STATS

Game play	
Hit frequency	39%
Volatility	4.8
Spins until a bonus	12
Distribution of RTP as % of total RTP	
Base game	43%
Bonus game	57%
Sky Wheel Bonus	18%
Money Catch/Free Spins	18%
Money Reel	22%
RTP range	
RTP observed after 10K spins	85%
Real RTP lands between (w/90% confidence)	77% - 93%



REAL MONEY

- *Cash Commander* – Game Warehouse
- *Just a Game* – Fuga Gaming

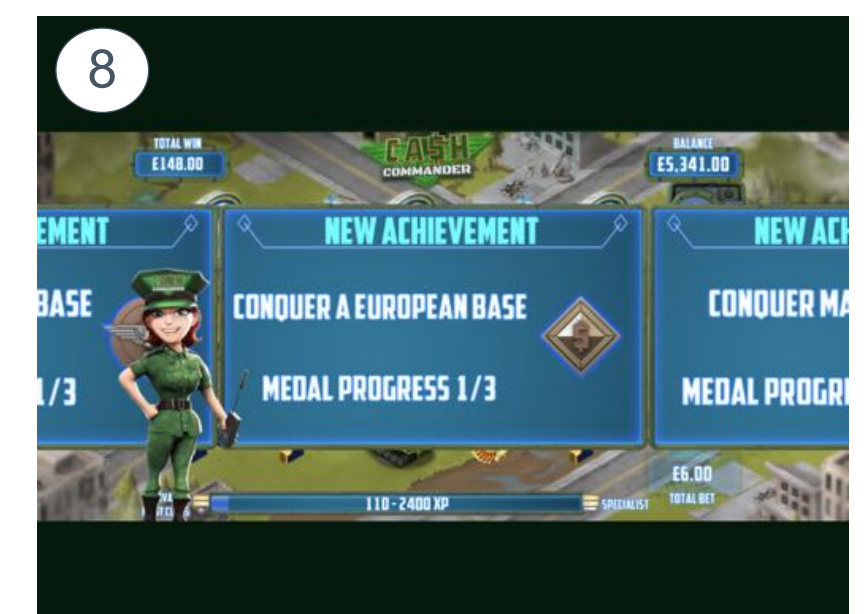
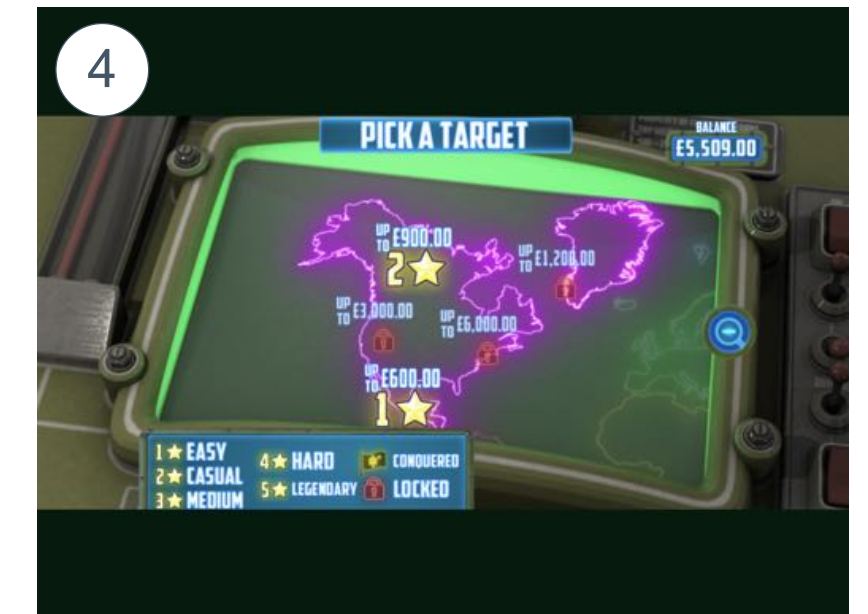
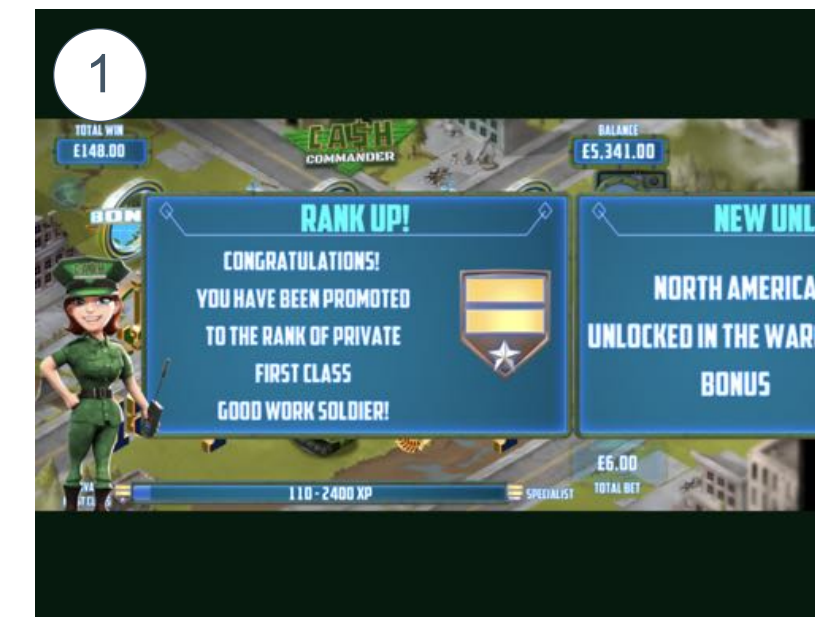
CASH COMMANDER

Games Warehouse *Cash Commander* RMG machine integrates mid-core mobile war battle mechanics into the base and bonus game

- Players receive XP levels to rank up and unlock additional features (1).
- Landing a *Silo* on reel 5 triggers either one *Strike Free Spin*, or up to seven *Bombardment Free Spins* (2).
- Base game includes some war-inspired mechanics:
 - *Cash Command*: vehicle symbols respin random losing symbols.
 - *Respin Target*: Winning combinations containing wilds trigger a respin of targeted positions (3).
- The bonus game, *Wargames Bonus*, gives players a choice of a country and target to attack. Areas with higher numbered stars are more difficult and have higher prize rewards—unlocked with higher player rankings (4).
- The bonus is rounds of attacking and defending against the enemy. In attack mode, players place three tanks on any path(s) to attack for credit awards, weakening the enemy's health (5).
- Higher ranked players unlock various *Care Packages* used during the *Wargames Bonus*, giving them an advantage (6).
- To defend against an attack, players place two guns in front of two of the paths. The bonus concludes when a player's, or the enemy's, health reaches zero (7).
- Achievements are awarded for defeating an enemy and *Medals* awarded after conquering an enemy three times (8).

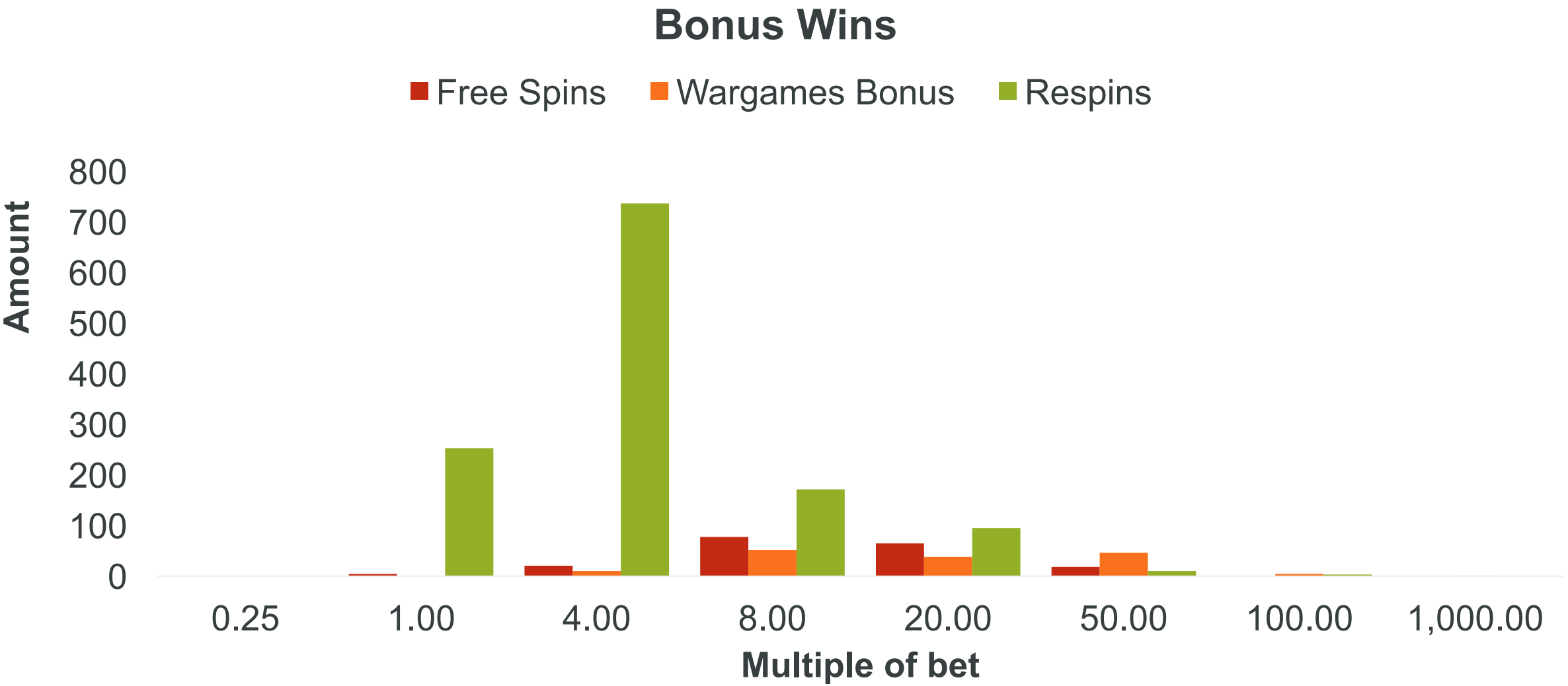
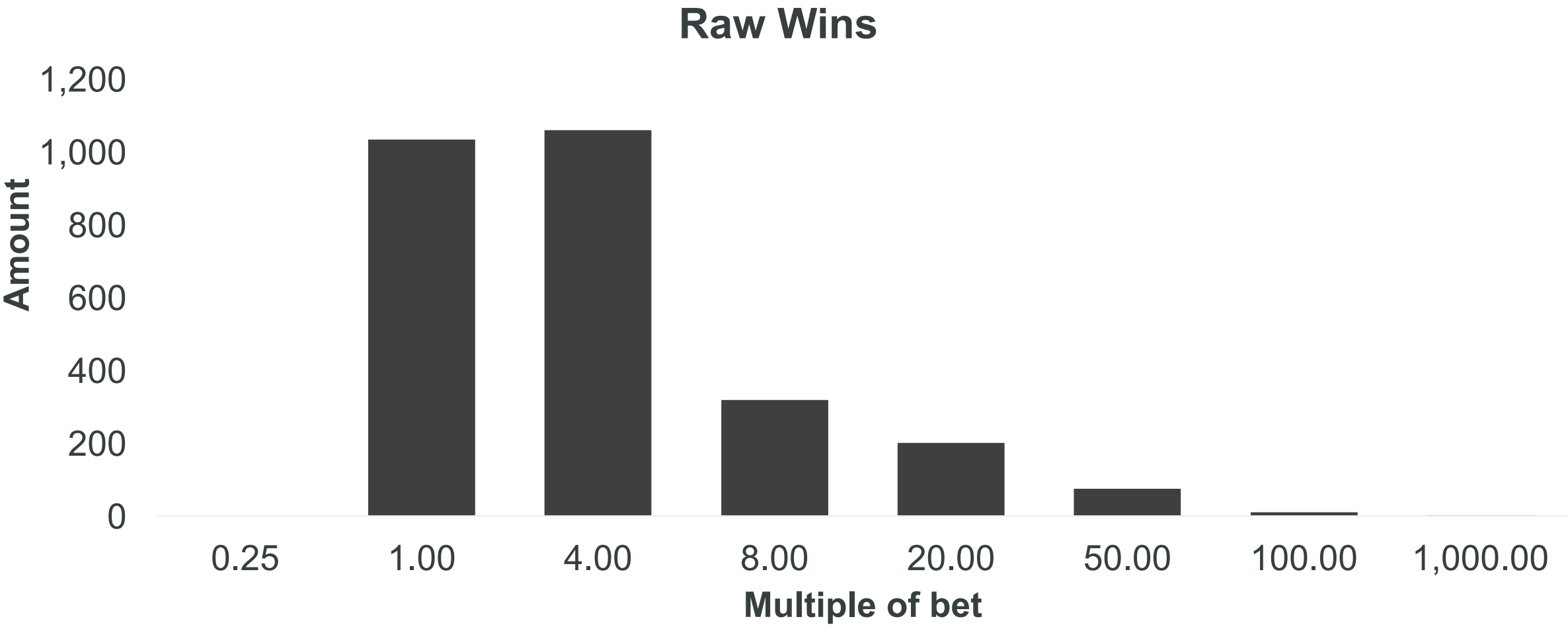
Release: 9/29/17

- RMG machines are not yet included in the Feature Database



CASH COMMANDER STATS

Game play	
Hit frequency	27%
Volatility	4.8
Spins until a bonus	6
Distribution of RTP as % of total RTP	
Base game	16%
Bonus game	84%
Free Spins	18%
Wargames Bonus	24%
Respins	42%
RTP range	
RTP observed after 10K spins	108%
Real RTP lands between (w/90% confidence)	100% - 116%



JUST A GAME

Fuga Gaming RMG machine, *Just a Game*, includes mystery symbols used to award base game features and determine the number of triggered free spins

- The machine includes three *Feature Counters* (1).
- Mystery symbols randomly transform into wilds, or one of the *Feature Symbols* (2).
 - The *Feature Symbols* are: expanding wilds, multiplier wilds, and respins (awarding 1- 5 respins).
- For each *Feature Symbol* that lands, the *Feature Counter* increases by one (3).
- Free spins trigger when all the *Features* land at least once (4).
- The free spins award is the sum of all *Feature Counters* (5).
- At the beginning of the free spins, players are awarded a *Free Spins Achievement* special pay.
- The amount awarded is based on the accumulated *Feature Counters* and total bet, which is then multiplied by 0.5 (6).

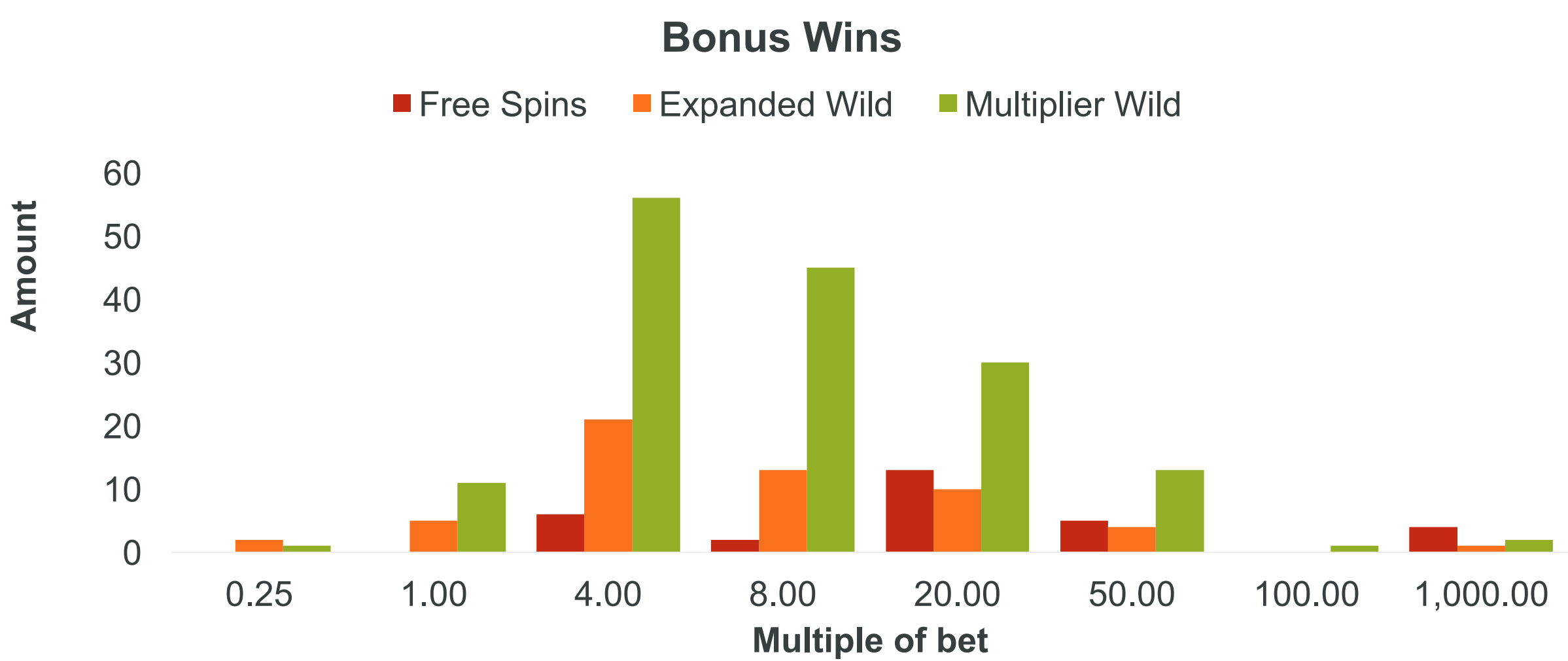
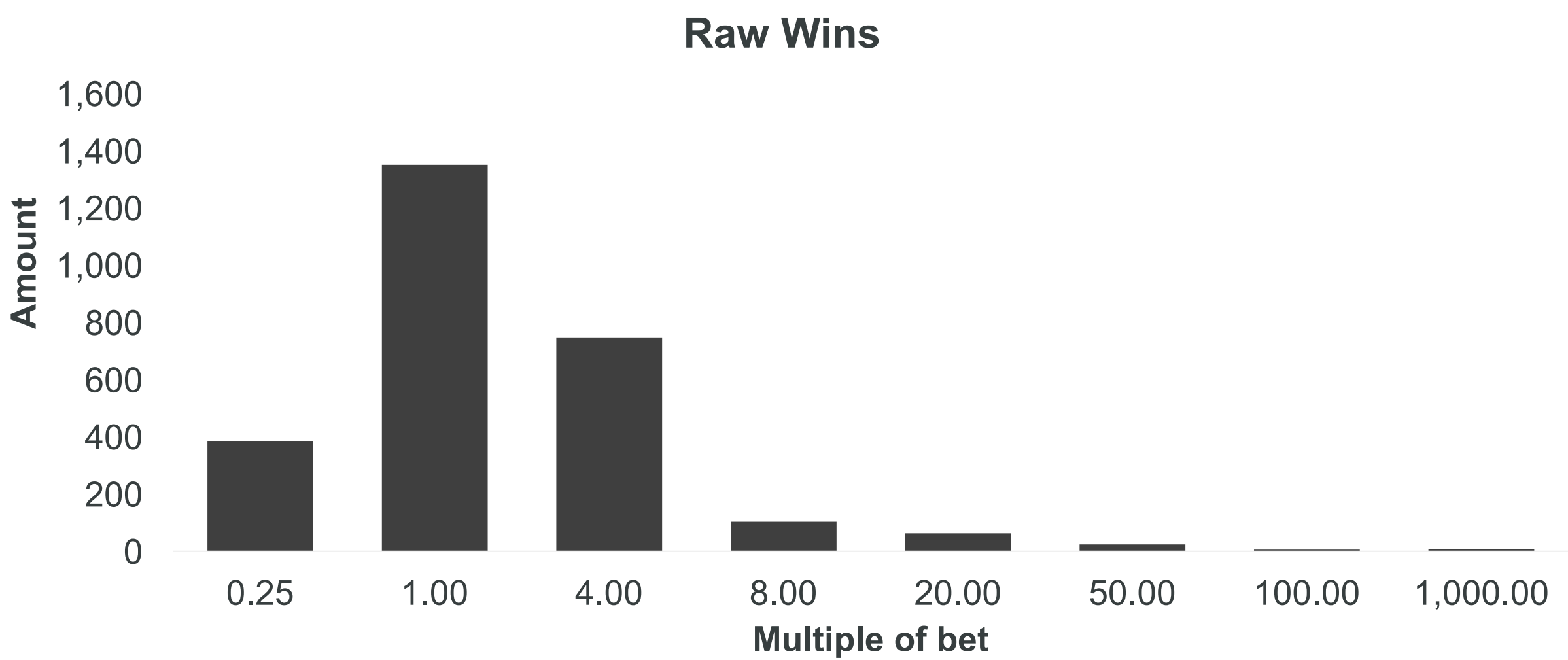
Release: 1/8/17

- RMG machines are not yet included in the Feature Database



JUST A GAME STATS

Game play	
Hit frequency	27%
Volatility	5.5
Spins until a bonus	40
Distribution of RTP as % of total RTP	
Base game	51%
Bonus game	49%
Free Spins	11%
Expanded Wild	6%
Multiplier Wild	16%
RTP range	
RTP observed after 10K spins	64%
Real RTP lands between (w/90% confidence)	55% - 73%



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 and an real money gaming accepted statistical process to determine 90% confidence levels of a machine's RTP. Recommendations, information and data comes from market research, app intelligence tools 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

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