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Doctored spins

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On the far side of the showroom, beneath the giant poster of a bikini-clad model with a diamond hanging from her navel, a bored-looking blond in a barely-there dress teeters on three-inch stilettos. Nearby, a showgirl shrink-wrapped in silver fabric, a metre-high feather atop her head, tries to make eye contact with convention-goers as they roam between exhibits. In the middle of the room, standing on a small platform, are three more young women: a pirate, a jester and a cigarette girl in knee-high leather boots.

If the Palais des Congrès de Montréal were hosting, say, a dentists' convention, these young ladies might be turning heads. But on this spring afternoon at the 2008 Canadian Gaming Summit, the real eye candy isn't in costumes or high heels. What turns heads on this floor are the slot machines.

It's the trade-show portion of this three-day meeting of the who's who of Canada's gambling industry. Hundreds of slot machines clutter the showroom floor, each trying to out-beep and out-blink the next, vying for attention like children in an overcrowded daycare. The people here are looking for the hottest new models, but they don't want to play them. They want to buy them. And unlike the people who will eventually play them, these guys know how slot machines really work.

Poker may get all the attention on television, but slots is by far the most popular game on casino floors. It is also the favourite game, by a wide margin, of problem gamblers. Gambling-addiction experts have traditionally focused their research on the addicts themselves, but some Ontario researchers have shifted their attention to the machines the addicts favour. And they've discovered that it may be the machine, not the man, that's at the root of gambling addiction.

The first slot machine was invented in the late 1800s by a San Francisco mechanic named Charles Fey. It had three reels decorated with horseshoes, spades, diamonds, hearts and bells. A spin that yielded a row of three bells netted a lucky gambler the top prize: 10 shiny nickels.

At first, gambling establishment owners bought slot machines to occupy the wives of the cigar-puffing,

whisky-swilling men around the poker and blackjack tables. Eventually, however, slots became popular among all gamblers, and Mr. Fey became a very busy man.

The basic design of the slot machine remained the same for some time. By the mid-1900s, however, the number of symbols on each reel had increased from 10 to 20. This decreased the odds of someone winning a jackpot, allowing casino owners to offer larger prizes. By 1970, a 22-symbol reel -- with 11 blanks and 11 winning symbols -- had become the industry standard.

On old mechanical machines, each symbol on each reel was equally likely to stop on the payline (the row of symbols representing the outcome) after each spin. Thus the chance of the jackpot combination coming up was one in 10,648. That's much lower than in Mr. Fey's day, when it was one in 1,000, but still too high to permit the really big jackpots that draw gamblers like kids to cupcakes.

So slot machine makers got creative. They made models with bigger reels that could accommodate more symbols. But players knew their odds of winning were better on the old machines and shunned the new ones. Next came slot machines with more than three reels, but they also proved unpopular. The problem of how to offer bigger jackpots without making bigger machines dogged casino owners for years. Then, on May 15, 1984, everything changed.

That's the day the United States Patent and Trademark Office granted a patent for a new kind of slot machine to a Nevada inventor named Inge Telnaes. In his description of the device, Mr. Telnaes wrote: "It is important to make a machine that is perceived to present greater chances of payoff than it actually has within the legal limitations that games of chance must operate."

What Mr. Telnaes had invented, in other words, was a slot machine that fooled gamblers into believing their odds of winning were good when, in truth, their odds of winning were lousy. He accomplished this by divorcing the gameplay from the reels. In the Telnaes slot machine, on which almost all current models are based, a microchip determined the outcome of each spin.

The outcomes were still random, but the machine differed from mechanical models in one significant way: It was programmed to stop with blanks on the payline more often than winning symbols. What Telnaes had created, in effect, was a slot machine version of a loaded die. Though most modern slot machines have animated reels, a disconnect remains between how slot machines appear to work and how they actually work.

"The game you see and play is not the game on the chip," says Roger Horbay, a former addiction therapist who now heads Game Planit Interactive Corp., a company in Elora, Ont. that advocates for consumer protection in the gambling industry.

When he was a therapist, Mr. Horbay counselled many gambling addicts. Some also struggled with substance abuse, which indicated they were likely predisposed to addiction. But the machine gamblers were different. Many didn't exhibit typical addict behaviours. Their problems didn't stem from a mental defect, Mr. Horbay believed, but from conditioning. The slot machines had made them addicts.

Slot machine players fall into trouble when they believe they can beat the game. But according to some gambling experts, players have good reason to believe that. Research has shown that the visuals presented to slots players suggest they should win two to five times the amount they wager. Since slot machines account for about 80 per cent of casino revenues, that's obviously not happening. And even though players know, logically, that the house always wins, many describe thinking differently when sitting in front of those spinning reels.

This visual distortion of the odds, says Mr. Horbay, leads to major problems in treating slot-machine addicts. Other types of problem gamblers are easier to treat because they exhibit obvious irrational thinking. People who boast of world-class poker skills, for example, might actually have less talent than your average weekend hack. A therapist can help them realize that. Treating problem machine gamblers, however, is more complicated because they are coming to accurate conclusions. It's the information upon which they are basing those conclusions that's false.

"The games should be designed to play in accordance with the natural appearance of the games and the expectations of the gamblers who play them," says Mr. Horbay.

This opinion has been voiced before. Back in the 1980s, when the Nevada State Gaming Control Board conducted hearings to determine if it should approve Telnaes-style slot machines, some major players within the gambling industry considered the new machines to be unethical. In a letter to the board, the president of Bally Gaming Inc. wrote: "It would appear to us that if a mechanical reel on a slot machine possesses four sevens and it is electronically playing as if there were one seven, the player is being visually misled."

Despite these objections, the board approved the new slot machines. It would turn out to be a decision that changed the face of gambling. "It's the fundamental thing that happened that enabled slot machines to take over the gaming industry," says Kevin Harrigan, a University of Waterloo professor who has conducted extensive research on electronic gaming machines.

Today, three-quarters of casino patrons site slots as their favourite game. In Canada, where provincial governments run most gambling venues, slot machines are by far the biggest money-maker in casinos. Ontario reaped $4.7 billion from gambling in 2006-2007. The province's 23,000 slot machines accounted for $3 billion of that.

Much of the money is coming from gambling addicts. About 60 per cent of revenues from gaming machines come from the wallets of problem gamblers, according to a 2004 University of Lethbridge study. Many slots players find it difficult to pull themselves away because of a deceptive feature of Telnaes-style slot machines: the near-miss.

As anyone who has played slots knows, you see more than the symbols on the payline after each spin; you also see the symbols just above and just below. A near-miss, sometimes called a heartbreak loss, occurs when a symbol needed to win appears adjacent to the payline.

Near-misses create an "Aww, shucks" effect that keeps slots players glued to their stools. Studies

have shown that frequent near-misses lead to significantly longer playing times. As one researcher put it: "The player is not constantly losing, but constantly nearly winning."

In the late 1980s, a Japanese gaming company called Universal Distributing asked the Nevada Gaming Commission to approve a slot machine programmed to create "secondary decision" near-misses. As in other slot machines, the outcome of each spin on the Universal model was random. After a losing play, however, the new machine would select a combination of symbols from a collection of near-misses to display to the player.

The commission banned this type of slot machine. All other North American jurisdictions did the same. In its set of technical standards for electronic gaming machines, Ontario's gambling regulator, the Alcohol and Gaming Commission of Ontario, states: "The game must not substitute a particular type of loss to show the player."

This explains why the gambling industry claims near-misses are no longer a problem. In one often-cited article from a gambling trade magazine, the president of a company that tests electronic gaming equipment wrote: "In fact, near-miss games simply don't exist in North America, period."

Mr. Harrigan, the University of Waterloo professor, would beg to differ. While North American slot machines aren't programmed to fetch near-misses, his research has shown that high-paying symbols occur above and below the payline much more often than they could by chance alone.

"The North American design is more elegant," says Mr. Harrigan. "It's inherent in the design."

In Telnaes-style slot machines, the highest-paying symbols are programmed to stop on the payline infrequently. (Ontario's gambling regulator says a reel symbol must have only a "non-zero probability to occur.") The blank symbols adjacent to them, however, are programmed to come up the most of all. Therefore, when a high-frequency blank stops on the payline, a jackpot symbol will appear just above or below it.

Slot machine makers take care, though, not to produce too many near-misses, says Mr. Harrigan. If they occurred more than a dozen times or so as often as they would by chance, gamblers might catch on and the holy-crap-I'm-on-the-verge-of-winning effect would be lost. Oddly enough, the Ontario gaming regulator mandates that jackpot symbols "may not appear in their entirety more than 12 times, on average, adjacent to the payline, for every time they appear on the payline."

"They are actually legislating what is optimal for problem gambling," says Mr. Harrigan.

Advocates for the gambling industry dispute claims that slot machines are inherently deceptive or addictive. Bill Rutsey, chief executive officer of the Canadian Gaming Association, says the features that make slot machines fun to play are the same features criticized by people like Mr. Horbay and Mr. Harrigan. Gamblers are smart enough to realize the difference between winning and nearly winning, says Mr. Rutsey. "It's akin to a hockey game and somebody hits the post. It's exciting, but so what? Either it's a goal or it's not a goal."

That's true, of course, but critics claim there is nothing similar to the odds-distorting features of slot machines in other forms of gambling. It's illegal for craps table operators to use loaded dice. It's illegal for blackjack dealers to use stacked decks. It's illegal for casino operators to place magnets under roulette wheels. No such standards apply to slots.

"Distortion factors aren't allowed in other games," says Mr. Horbay. "The reason they're allowed in electronic gaming machines is because they're so damn profitable."