I N APRIL, a landfill in New Mexico disgorged proof of a decades-old rumour.

The story goes back to 1983, when James Heller was given an unusual job. His bosses at video-game maker Atari wanted him to drive out to the desert with 750,000 copies of their latest game, and bury them there. Over decades the story acquired the status of urban legend, an illustration of the quality of the game in question, *ET: The Extraterrestrial*. Despite a $21 million outlay, Atari's expected blockbuster was an unmitigated flop, and was later dubbed "The worst game of all time".

Now consider *Flappy Bird*, a game that, despite having been created by a single developer in a couple of days, became an accidental global obsession. At its peak earlier this year, *Flappy Bird* was being played by so

THE OBSESSIONEERS

As psychologists begin to diagnose what gets us addicted to games, we are zeroing in on a recipe for obsession. Douglas Heaven finds that it could hurt us – or heal us

many people on their phones that Dong Nguyen was making $50,000 a day. "*Flappy Bird* was designed to play in a few minutes when you are relaxed," he said at the time. But things took a dark turn. People became so obsessed with the game that they showered Nguyen with angry abuse online. In the end it was too much for him. Nguyen withdrew *Flappy Bird* from public circulation.

It has never been possible to know ahead of time whether your painstakingly crafted game will soar to the heights of *Flappy Bird* or require desert burial. Game designers relied on a combination of intuition, sheer luck and years of toil – and have often been taken by surprise by the runaway success of their own games. But that's all about to change. Although game science is in its infancy, it is already feeding insights from psychology back into design to produce what looks like very much like a recipe for obsession. It has attracted the attention of interests beyond

the gaming industry. Will they use it to hurt us – or help us?

We have been aware of some basic ingredients of habit-forming games since at least the 1990s. That could explain the similarity of so many popular puzzle games like *Tetris*, *Bejeweled* and *Puyo Puyo*: random shapes appear on a screen that the player must match up with complementary shapes to clear the board and score points. Rearranging these shapes is undeniably, deeply, satisfying.

But why? The psychological underpinnings have only recently begun to be examined in any detail. Many researchers have suggested that a love of matching patterns taps into a basic human compulsion, giving the same fix we get as an infant pushing shaped blocks into their corresponding holes. "It's hard-wired in our brain to organise things," says Angelica Ortiz de Gortari at Nottingham Trent University, UK.

Perhaps no game has harnessed psychology as deftly as *Candy Crush Saga*. Its basic construction is familiar: presented with a grid full of colourful "candies", you line up at least three matching sets in a row to meet different targets and progress to subsequent levels. Unlike some other puzzle games, *Candy Crush* has become an instant, unstoppable juggernaut and a pop culture phenomenon.

Since its introduction two years ago, the game has become the focus of obsessive analysis and sordid confessions. Journalists have openly declared themselves addicts, with more than a few admitting they have paid extravagant sums to play. They played on the train, at work, at weddings, while driving and during bathroom breaks (according to one anonymous web confessor, when she finally got off the toilet after 4 hours of play, her legs collapsed beneath her).

This is no niche market; no group seems immune to its charms. So what did *Candy Crush* get so right?

Its designers appear to have hit upon a formula that's beginning to emerge from the academic discipline of game studies as the "ludic loop". Ludic loops are tight, pleasurable feedback loops that stimulate repetitive, if not compulsive, behaviour. "It definitely takes us back to behaviourist psychology," says Natasha Dow Schüll at the Massachusetts Institute of Technology, whose research on games anthropology led her to study this phenomenon in popular gaming.

Her formulation has come largely from her studies of slot machines and their allure to addicts. Slot machines perfectly illustrate the concept of the ludic loop. They lure people