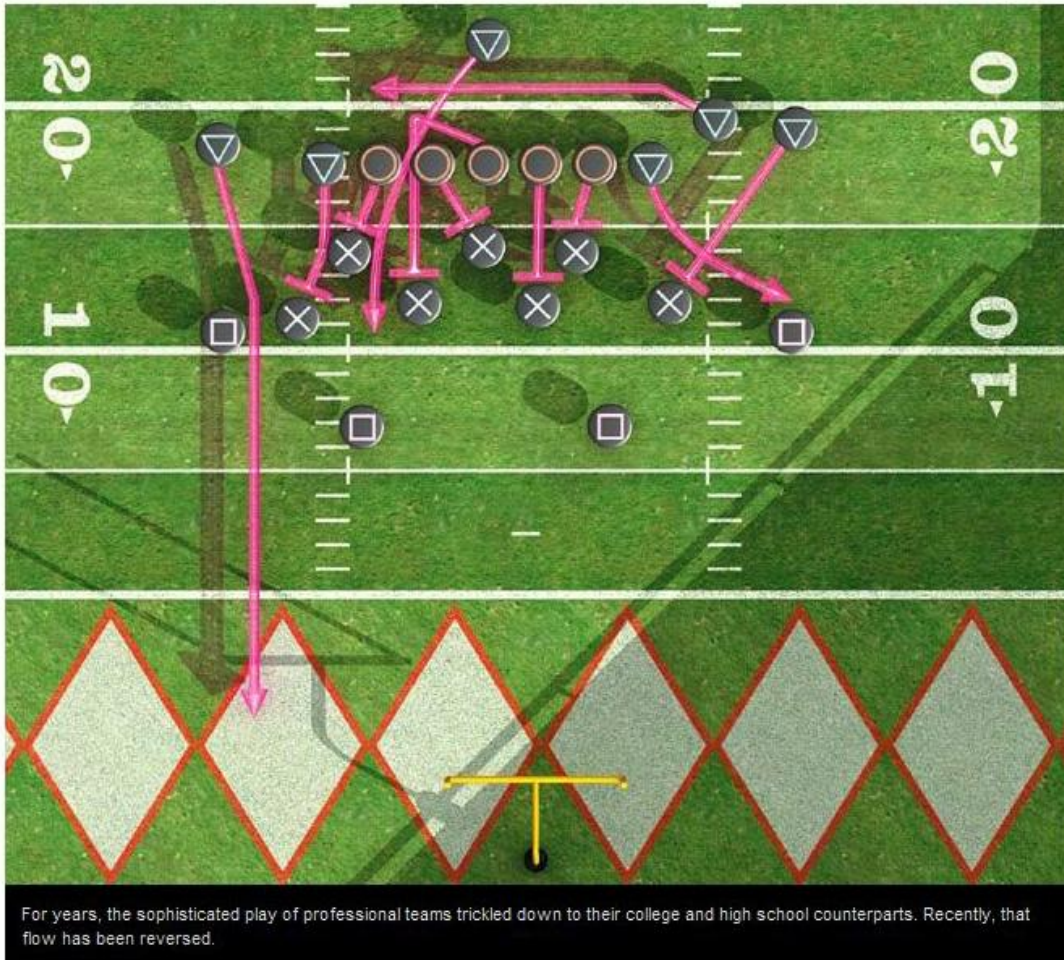
The Power of Simulation

Here's an article from the February 2010 edition of Wired Magazine. It illustrates the power of simulation: you truly do transfer skills from simulations to "real life" … and often with far better results.

Game Changers: How Videogames Trained a Generation of Athletes

By Chris Suellentrop January 25, 2010 | 12:00 pm | Wired Feb 2010



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The situation was desperate for the Denver Broncos. On the first Sunday of the National Football League's 2009 season, with only 28 seconds left in the game, they trailed the Cincinnati Bengals 7-6. The ball was on the 13-yard line — *their own* 13-yard line. On second down, Broncos quarterback Kyle Orton heaved the ball downfield, only to see a Bengals defender deflect the pass away from the receiver. And then something remarkable, close to miraculous, happened. Instead of falling to the ground, the ball popped into the air and landed in the outstretched arms of Broncos wide receiver Brandon Stokley, who started racing down the field. All across America, in living rooms and basements and sports bars, people broke into cries of wonderment and delight, heartbreak and disbelief.

Then they witnessed something even more startling.

Just before he reached the end zone, with 17 seconds remaining, Stokley cut right at 90 degrees and ran across the field. Six seconds drained off the clock before, at last, he meandered across the goal line to score the winning touchdown. For certain football fans, the excitement of a last-minute comeback now commingled with the shock of the familiar: It's hard to think of a better example of a professional athlete doing something so obviously inspired by the tactics of videogame football. When I caught up with Stokley by telephone a few weeks later, I asked him point-blank: "Is that something out of a videogame?" "It definitely is," Stokley said. "I think everybody who's played those games has done that" — run around the field for a while at the end of the game to shave a few precious seconds off the clock. Stokley said he had performed that maneuver in a videogame "probably hundreds of times" before doing it in a real NFL game. "I don't know if subconsciously it made me do it or not," he said.

Brandon Stokley's time-killing run along the goal line was a tactic straight out of videogames.

Today's football players have an edge that no athletes before them have possessed: They've played more football than any cohort in history. Even with the rise of year-round training, full-contact practice time on the field hasn't increased — in fact, it has actually gone down, as coaches have tried to limit the physical punishment that the game exacts. But videogames, especially the ubiquitous *Madden NFL*, now allow athletes of all ages to extend their training beyond their bodies.

If you're, say, an All-American quarterback at a top college program, odds are that you've been training on a very sophisticated, off-the-shelf simulator — a cross between a football tutorial and a real-time documentary, drizzled with addictive Skinnerian action-reward mechanics — for as long as you can remember. The many hundreds — even thousands — of hours that athletes put into videogame football give them more game experience (and, as Stokley demonstrated, sometimes more game awareness) than Bart Starr, Terry Bradshaw, or Joe Montana were able to log in previous eras. And there's the possibility, too, that all this electronic play is changing the structure of their brains, at least in some ways, for the better.

For more than 30 years, sports videogames have been focused on simulating real-life athletics more and more perfectly. But over the past decade, games have moved beyond just imitating the action on the field. Now they're changing it.

This revolution has sneaked up on many athletes, coaches, and fans. Sports and videogames — a combination that was one of the first diplomatic efforts in the emerging worldwide jock-geek armistice — have been interconnected since October 1958, when William Higinbotham, a nuclear physicist at Long Island's Brookhaven National Laboratory, hooked up *Tennis for Two*, an electronic game of virtual tennis that is widely regarded as the first videogame. The first home videogame console, Magnavox's Odyssey, included a digital version of table tennis, and then there was Atari's *Pong*. The genre quickly expanded to baseball, basketball, football, auto racing, track and field, boxing, soccer, martial arts — if two or more people competed in something in the flesh, pretty soon they could compete in a digital version.

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From the beginning, publishers and game designers were locked in an arms race of realism. George Plimpton mocked Atari 2600 owners for their underwhelming baseball game (*Home Run*) in a 1981 commercial for Mattel's Intellivision console. ("Here's an easy question for you," Plimpton said. "Which of these games is the closest thing to the real thing?") A couple of years later, a new wrinkle emerged when Electronic Arts signed Julius Erving and Larry Bird to the first-ever licenses to use athletes' names and images in a sports game, 1983's *One-on-One*. Soon there were releases like *Tecmo Bowl* and *R.B.I. Baseball*, which featured rosters of professional athletes playing for their real professional sports teams. It was a mind-blowing development for sports fans — and young athletes — who had previously been able to imagine themselves as their favorite players only during backyard pickup games.

Of all these games, *John Madden Football* — first published by Electronic Arts for the Apple II in 1989 and for the Sega Genesis console in 1990 — was perhaps the most committed to simulating its sport in all its complexity, including, for the first time, 11 players on each side. ("Most of my friends would tell you I started EA as an excuse to make a football game," company founder Trip Hawkins says. "And there's probably a fair amount of truth to that.") *Madden* and its sequels became the most commercially successful sports videogame ever produced. (That success was cemented in 2004 by an exclusive license with the NFL that eliminated direct competitors.) In 2008, *Madden NFL* sold more copies than any other title except *Wii Play*, according to the research firm NPD Group, making EA an estimated $263 million. While John Madden's career as an excitable TV commentator and analyst made him famous, the *Madden* videogame franchise — the Gospel of Coach John, available everywhere for $60 — has exerted a larger influence on football, from Pop Warner to the pros.

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It was only a matter of time before the generation that grew up playing *Madden* and games like it transformed the gridiron. For years, the sophisticated play of professional teams trickled down to their college and high school counterparts. Recently, that flow has been reversed. Now the way football is played in high school and college — a style dominated by the so-called spread offense, which involves a lot of passing and relies on quick reads by the quarterback to analyze the opposing team's defense — is bubbling up to the NFL. The sport is being taken over by something you might call Maddenball — a sophisticated, high-scoring, pass-happy, youth-driven phenomenon.

"These games nowadays are just so technically sound that they're a learning tool," says Tim Grunhard, an All-Pro center for the Kansas City Chiefs in the 1990s who now coaches high school football in the Kansas City area, where he encourages his players to use *Madden* to improve their knowledge of football strategy and tactics. "Back when I was playing football, we didn't realize what a near or a far formation was, we didn't really understand what *trips* meant, we didn't understand what cover 2, cover 3, and cover zero meant," Grunhard says, charging through jargon that's comprehensible only to *Madden* players and football obsessives.

These days, Grunhard says, high school players have a much deeper understanding of offensive formations and defensive coverages, a development he attributes to their long hours on videogame consoles. "It just seemed to help out," he says. "The kids understood where the counterplay or power play was going to open up. Or the middle linebacker lining up for a blitz — where the gaps were going to open up."

No wonder younger quarterbacks are finding more and more success at the college and professional levels. This season, a 19-year-old freshman started for USC, a perennial Pac-10 power. In the NFL, rookie quarterbacks are entering the league and excelling immediately at an unprecedented rate (think of the Steelers' Ben Roethlisberger, the Falcons' Matt Ryan, and the Ravens' Joe Flacco). In decades past, young passers sat on the bench for a year or two while they mastered reading NFL defenses. Now, having learned to differentiate between zone and man-to-man coverage over the course of years on their Xboxes and PlayStations, the rookies are less in need of such apprenticeship.

It's one thing to suggest that videogames may be making us smarter. It's another thing altogether to say they might be making us better athletes. But when you add it up, the evidence starts to look pretty overwhelming. At the Pop Warner Super Bowl in 2006, the winning team had 30 offensive plays, which it had learned through *Madden*. ("I programmed our offense into *Madden* to help me memorize our plays," one 11-year-old told *Sports Illustrated*. "It was easier than homework.") Dezmon Briscoe, an all-conference wide receiver for the University of Kansas, credited *Madden 2009* with teaching him how to read when defenses "roll their coverages" — move their defensive backs to disguise their strategy. Chuck Kyle, a high school coach who has won 10 state championships in football-mad Ohio, has programmed his team USA playbook into *Madden* and uses it to teach players their assignments. So have coaches at Colorado State, Penn State, and the University of Missouri, among other schools. An offensive lineman for the Tampa Bay Buccaneers used the videogame as a preparation tool for an entire season, scouting his opponents digitally. While even-more-sophisticated software is available for virtual sports training, coaches and players at all levels of football say that *Madden*'s off-the-shelf simulation is good enough.

Marshall Faulk, former superstar running back for the St. Louis Rams (he appeared on the cover of *Madden 2003*), says that when he entered the NFL in 1994, "probably 10, 15, 20 percent" of the players were gamers. "Now? Anywhere from 50 percent on up," he says. "Because *Madden* is sort of a mainstay in football, a lot of the kids playing in the NFL now grew up on it. It makes you a better football player." Faulk may be understating the title's popularity in the league: When I asked Stokley how many NFL players are *Madden* players, his estimate was even higher: "Everybody."

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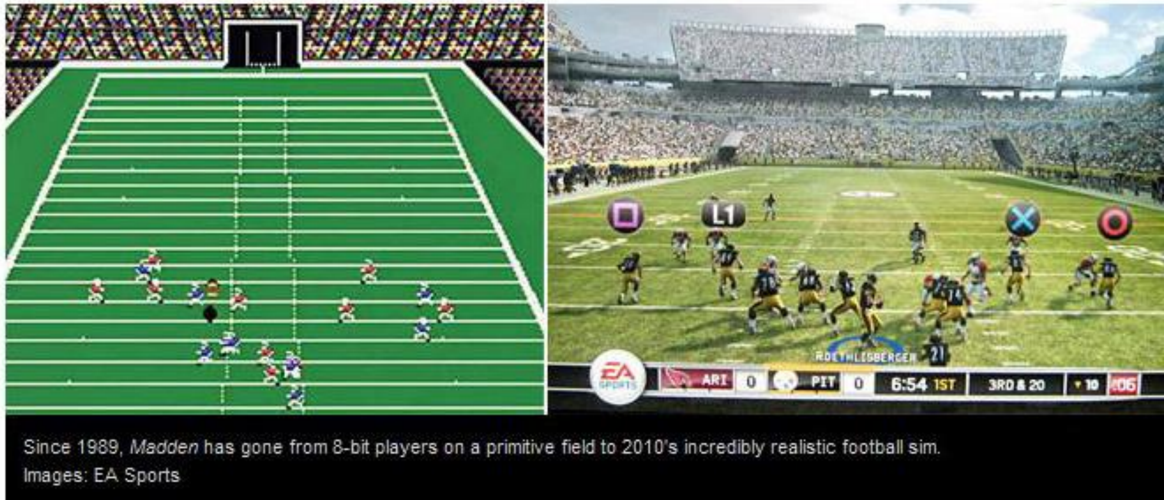

Since 1989, *Madden* has gone from 8-bit players on a primitive field to 2010's incredibly realistic football sim.
Images: EA Sports

As mass entertainment, the National Football League was created by television — in the image and likeness of NFL Films and the sound of John "Voice of God" Facenda, who for years narrated slo-mo footage of the game's greats. Now it's the first sport to have almost entirely transitioned into the videogame age. For young NFL athletes, "I played him in *Madden*" is replacing "I watched him on TV" as the awestruck thing to say about the most respected veteran on the team. (A few years ago, when Junior Seau, the longtime San Diego Chargers linebacker, became a Miami Dolphin, teammate Channing Crowder said, "Dead honest: I played him at running back in *Madden '95* because he was the best player in the entire game.")

Players are using videogames in increasingly innovative ways. Lauren Silberman, a 25-year-old graduate student in MIT's comparative media studies program, wrote her master's thesis on athletes who use them to enhance their physical play — on the football field, on the baseball diamond, on the basketball court. Of the athletes she interviewed who could play as themselves, more than 90 percent did so regularly. More and more, players at even the college level are able to practice with virtual versions of themselves. (The sims are so realistic that a class-action lawsuit has been brought by amateur athletes who want EA to share a portion of the revenue with them.) Briscoe, the University of Kansas wide receiver, told me that NCAA Football 10 — the college-football equivalent of *Madden NFL* — had successfully imported "a majority" of his team's plays into its virtual playbook.

Baseball players have gotten in on the act, too. When Vladimir Guerrero, All-Star outfielder for the Los Angeles Angels, began his Major League career with the Montreal Expos, he would spend hours playing a PlayStation baseball game as himself.

But this activity isn't just an exercise in self-obsession. Whether they know it or not, these athletes may actually be strengthening their brains. Cognitive scientists have published a series of studies demonstrating that playing fast-paced action videogames — mostly first-person shooters like *Call of Duty* and *Halo* — can alter "some of the fundamental aspects of visual attention," as a paper published in the July 2009 issue of *Neuropsychologia* put it. By training on these games, researchers found, nongamers can achieve faster reaction time, improved hand-eye coordination, and greatly increased ability to process multiple stimuli. Studies have demonstrated that military pilots and laparoscopic surgeons can improve their professional skills by playing videogames. It's not much of a leap to think that athletes could, too.

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There are limits to how much virtual training will be able to boost on-field performance, of course. Don't expect football to follow on the heels of poker, a game in which Internet-trained players have upended the professional cartel. (Chris Moneymaker won't be quarterbacking the Titans next year.) A better analogy for virtual training could be weight lifting: It's an activity that won't turn you into a professional athlete, but if you are one, it will make you better at your sport. And once everyone starts doing it, you'll need to do it regularly to remain competitive.

For the first time in 30 years, John Madden wasn't in the broadcast booth as the NFL season kicked off. Sipping from a coffee cup and clad in a navy baseball cap, khaki pants, and an untucked plaid button-down, Madden was enjoying the games from a custom-built screening room at a production facility in his hometown of Pleasanton, California, the same place he once shot his TV commercials for tough-actin' Tinactin. He had invited a dozen videogame designers and software developers to join him. In the 21-year history of the *Madden* videogame, EA employees had never watched football live on a Sunday with the actual Madden — he had always been too busy calling the games with Pat Summerall and Al Michaels.

"When you have your name on something, your credibility goes with it," Madden told the group before kickoff, thanking them for their work on *Madden NFL 10*, the game's newest version. And then Madden settled into a low-slung, ornate throne in front of a 16- by 9-foot projection screen framed by nine 63-inch high-definition televisions. Over the next six hours, he would be, well, John Madden: In addition to analyzing the tactics and strategy of nonvirtual football, he praised Brett Favre for being Brett Favre, he made jokes about players' fashion choices, and he expressed mock frustration about the absence of mustard on Troy Aikman's dress shirt. ("I wish his tie was loose. The guy's perfect.")

Then Brandon Stokley snagged the ball on the play that would soon be dubbed the Immaculate Deflection and pulled his astonishing did-you-see-that Maddenball maneuver. Donny Moore, an EA designer who was sitting to Madden's left, leaped to his feet. "That's what happens in the game!" he screamed, ecstatic. Moore knew that an experienced gamer would never run right into the end zone and give his opponent time for a comeback. No coach taught Brandon Stokley to drain the clock like that. *Madden* the game did.

"They play our game!" Moore roared. The room erupted, as everyone clapped and cheered, not for the Broncos, but for the moment. It wasn't the first time — and it certainly won't be the last — that life was imitating *Madden*.

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