Feeling Frustrated? Don't Hate the Game

The disturbing imagery and violent storylines of videos games are often accused of fostering feelings of aggression in players. But a new Rochester-led study shows hostile behavior is linked to gamers' experiences of failure and frustration—not to a game's violent content.

The study, published online in the March edition of the *Journal of Personality and Social Psychology,* is the first to look at players' psychological experiences with video games instead of focusing solely on the games' content. Researchers found that failure to master a game and its controls led to frustration and aggression, regardless of whether the game was violent or not.

"Any player who has thrown down a remote control after losing an electronic game can relate to the intense feelings of anger failure can cause," says lead author Andrew Przybylski, a researcher at the Oxford Internet Institute at Oxford University, who says such frustration is commonly known among gamers as "rage quitting."

That experience is not unique to gaming, says coauthor **Richard Ryan,** professor of psychology at Rochester. For example, in sports, players may lose a game as a result of a bad call. "When people feel they have no control over the outcome of a game, that leads to aggression," he says. "We saw that in our experiments. If you press someone's competencies, they'll become more aggressive, and our effects held up whether the games were violent or not."

GAME PLAY: Video games induce hostility through frustration, not violent content, a new study says.

For the study, researchers manipulated the interface, controls, and degree of difficulty in custom-designed video games across six lab experiments. Nearly 600 college-aged participants were tasked with playing the games—many of which included violent and nonviolent variations—and then were tested for aggressive thoughts, feelings, or behaviors.

Across the experiments, researchers found it was not the narrative or imagery, but the lack of mastery of the game's controls, and the degree of difficulty players had completing the game, that led to frustration.

—Melissa Greco Lopes

Prototype Blood Test May Be a 'Game Changer' for Alzheimer's

A study involving Rochester researchers has yielded the first accurate blood test that can predict who is at risk for developing Alzheimer's disease. Published in the journal *Nature Medicine,* the study may point to new treatments to head off the disease before neurological damage becomes irreversible.

By focusing on 10 specific lipids found in blood plasma, the team predicted with greater than 90 percent accuracy which individuals in the study group would go on to develop Alzheimer's or a precursor condition known as amnestic mild cognitive impairment. While the accuracy of the test needs to be verified in a larger population, the cost of the simple blood test required to detect the lipids is a fraction of that for other techniques and, unlike alternatives, it identifies risk before cognitive symptoms appear.

Mark Mapstone, a neuropsychologist at the School of Medicine and Dentistry and lead author of the study, says the ability to identify individuals at risk of developing Alzheimer's before the clinical signs of impairment appear "has long been a Holy Grail of the neuromedicine community."

"Biomarkers that can allow us to intervene early in the course of the disease could be a game changer," he says.

While there are several screening methods to detect Alzheimer's disease, they require costly procedures that are undertaken only after symptoms appear. If commercialized, a blood test to detect specified blood lipids would likely cost less than $200 and, once the findings have been confirmed in larger studies, would make the test more accessible as a screening tool for clinical trials and potentially help guide treatment.

—Mark Michaud

ISTOCKPHOTO

Judging the ABA's Ratings

The sometimes controversial ratings of judicial nominees by the American Bar Association may be tilted against minorities and women. A Rochester-led analysis of 1,770 district court nominations from 1960 to 2012 found the ABA systematically awards lower ratings to minorities and women than to white or male candidates. Political ideology and party affiliation had no bearing on the influential seal of approval, the research indicated.

The study found that African Americans were 42 percentage points less likely to receive a high rating from the ABA than were whites trained at similarly ranked law schools, with similar legal experience, and nominated by the same president. Women were 19 percentage points less likely to be highly rated than men with comparable educational and professional qualifications.

"The record numbers of minority and women nominees currently having judicial candidacies derailed by this vetting process makes this a particularly pressing issue," study author **Maya Sen**, assistant professor of political science, wrote in a paper published in the *Journal of Law and Courts.*

Sen examined how often a judge's rulings were overturned, an indicator many scholars agree is a good measure of judicial performance. Using a variety of statistical controls and comparisons, she found no meaningful difference between judges who were rated highly or poorly by the ABA.

One improvement Sen suggests would be to make the ABA's confidential vetting process more transparent—a recommendation echoed by critics across the political spectrum.

—Susan Hagen

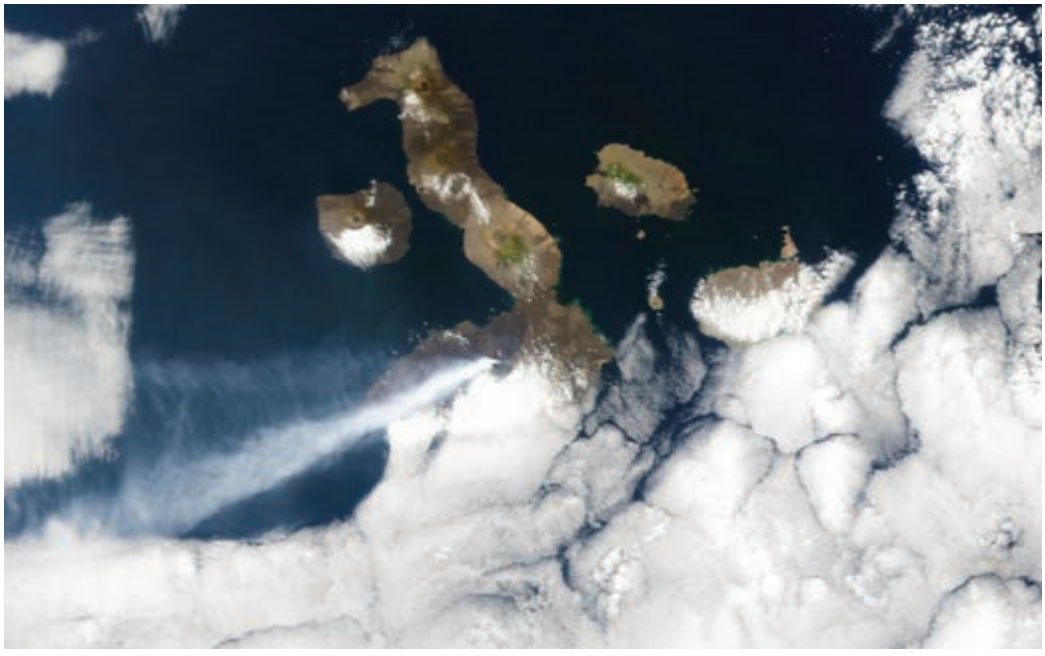
An 'App'-titude for Singing

Voice students who want to perfect how they sing their vowels could get help from a free application created by a group of Rochester students. Developed as part of a computer science class, the app, called Vowel Shapes, automatically analyzes vowel sounds produced by a singer and generates a visual representation of the sound in real time. Students can see how slight changes in the shape of their mouths and the position of their tongues lead to changes in their singing.

Team Moose, as the student group named themselves, developed the program in response to challenges described by **Katherine Ciesinski,** a mezzo-soprano and professor at the Eastman School who was looking for ways to support students as they learn to sing vowels. The program compares sounds as they are sung to a prerecorded set of vowels. As the sung sound matches the sought-after sound, an oval on a screen changes to green, giving singers feedback on their performance.

Led by **Ehsan Hoque**, assistant professor of computer science, the team was formed by **Veronika Alex** '14, **Josh Bronstein** '14, **Nathan Buckley** '15, **Tait Madsen** '15, and master's student **Cynthia Ryan** '12.

—Leonor Sierra



VOLCANIC PLUME: A satellite image captures steam and ash rising from the Sierra Negra volcano.

What Lies Beneath the Volcanoes of the Galápagos Islands?

With more than 50 eruptions in the last 200 years, the Galápagos Islands are home to some of the most active volcanoes in the world. Yet until recently, scientists knew far more about the history of finches, tortoises, and iguanas than of the volcanoes on which these unusual fauna had evolved.

Rochester researchers are providing a better picture of the subterranean plumbing system that feeds the Galápagos volcanoes, as well as a major difference with another Pacific Island chain—the Hawaiian Islands. The findings were published in the *Journal of Geophysical Research: Solid Earth.*

A team led by **Cynthia Ebinger**, professor of earth and environmental sciences, measured the velocity and direction of sound waves generated by earthquakes as they traveled under Sierra Negra. The data allowed the researchers to construct the first 3-D image of the plumbing system beneath the volcano, using a technique similar to a CAT scan.

The Galápagos Islands formed from a hotspot of magma located in an oceanic plate—called Nazca—about 600 miles west of Ecuador, in a process very similar to how the Hawaiian Islands were created. Magma rising from the hotspot eventually hardened into an island. Then, as the Nazca plate inched its way westward, new islands formed in the same manner, resulting in the present-day Galápagos Archipelago.

—Peter Iglinski

NASA EARTH OBSERVATORY

HEADWAY: Yellowjacket football players took part in a Medical Center study indicating that the effects of head blows sustained over the course of a season can last more than six months.

Study: Off-Season Doesn't Allow Brains to Recover from Football Hits

Six months off may not be long enough for the brains of football players to completely heal after a single season, putting them at even greater risk of head injury the next season. That's according to a study led by **Jeffrey Bazarian,** associate professor of emergency medicine, and published in *PLOS ONE*.

In a study of the brains of 10 Yellowjacket football players before the start of the 2011 season, at the conclusion of the season, and after six months of no-contact rest, Bazarian's team found that imaging scans showed changes consistent with mild brain injury in about half of the players six months after the season ended, despite the fact that no one had a concussion. Brain changes in the football players were compared to a control group of five college students who didn't play contact sports. The new data also suggest that inflammation may be a key factor in whether players recovered within six months. Levels of inflammatory markers present in a player's blood sample correlated with a lack of complete brain recovery.

"At this point we don't know the implications, but there is a valid concern that six months of no-contact rest may not be enough for some players," Bazarian says. "And the reality of high school, college, and professional athletics is that most players don't actually rest during the off-season. They continue to train and push themselves and prepare for the next season."

Bazarian says the goal of the study is to help make football safer. One idea that has been proposed by organizations such as the Sports Legacy Institute is to implement a system similar to the pitch count used in baseball. In football, that would mean identifying a threshold number of head hits of a certain force, and removing players from a game once they reach that threshold.

The Rochester players who participated in the study wore accelerometers mounted inside their helmets, which were provided by Riddell, a leading manufacturer of football equipment. Researchers were able to track every hit, from seemingly light blows in practice to the most dangerous type of hit. They found that the players sustained between 431 and 1,850 head blows in the single football season, none of which resulted in a concussion.

Investigators observed brain changes with advanced technology similar to an MRI scan. They also measured changes with standard balance and cognitive tests and blood tests.

—Leslie Orr

Device Saves Lives in Heart Failure Patients

A new study shows for the first time that cardiac resynchronization therapy with a defibrillator saves the lives of mild heart failure patients over the long term.

Published in the *New England Journal of Medicine*, the study found that after seven years, for patients who received the therapy, called CRT-D therapy, the likelihood of death was 18 percent among patients with mild heart failure and a common condition that results in disorganized electrical activity throughout the heart. Among patients with the same condition who received a defibrillator only, the likelihood of death was close to 30 percent.

The finding translates into a 40 percent reduction in the risk of long-term death among patients with the heart condition known as left bundle branch block.

The study is a follow-up to the MADIT-CRT trial, which showed that early intervention in mild heart failure patients with left bundle branch block led to a significant reduction in heart failure.

Arthur Moss, professor of cardiology, has led the MADIT (Multicenter Automatic Defibrillator Implantation Trial) series of studies since 1990.

—Emily Boynton

HEART HELP: A new study says a defibrillator combined with cardiac resynchronization therapy is more effective than a defibrillator alone.

ADAM FENSTER (FOOTBALL); BOSTON SCIENTIFIC (DEFIBRILLATOR)