A BITE OUT OF CRIME

An attacker bites his victim. A criminal munches on a sandwich before fleeing the scene. And those pearly whites might leave just the clue needed to capture the perpetrator.

The value of bite mark evidence became obvious during the trial of serial killer Ted Bundy, whose crooked teeth were imprinted in his victims' flesh. But until now, no matter how distinctive the teeth, forensic odontologists could only say that it was "probable" that the bite marks were made by a particular suspect.

L. Thomas Johnson, D.D.S., is working to change that. Johnson assembled an interdisciplinary team, including Marquette law professor **Daniel Blinka**, J.D., Ph.D., to create a database of dental imprints that investigators could use as a statistical measuring stick.

"Dentistry has always assumed that everybody's teeth are unique. But the problem is, there's no way that scientifically you can justify that," says Johnson, an adjunct professor of dentistry who has worked as a forensic odontologist for more than 40 years. "If we prove what we're setting out to prove with this pilot study, this database could be expanded to thousands of samples. We could have a database that begins to approach that of mitochondrial DNA, which is a virtual identification."

Johnson's team is collecting 400 dental imprints from men ages 18 to 44, the demographic that most often commits crimes that involve biting. Using software developed at Marquette, the researchers analyze the samples to precisely measure six identifying characteristics, including the width of the arch, width of the teeth, alignment and unusual characteristics such as missing or broken teeth. Then they statistically calculate how frequently those characteristics would occur in the population.

So why is all that data important? Suppose a court asks, "How common is it for an adult male to have a lower jaw width of 2.28 centimeters or smaller and to have tooth No. 24 turned at an inward rotation of 10 degrees or more?" Based on Johnson's preliminary data, he could say that he was "highly confident" that less than 3 percent of adult males would have that particular combination. As he accumulates more data, he expects to narrow the field even further.

The team is following the rigorous standards of the Scientific Working Group on Imaging Technology, and Johnson has several people measuring the dental imprints so that he can test the margin of error. The two-year pilot study is funded by the Midwest Forensic Resource Center in Ames, Iowa. Johnson's team is also working with the Wisconsin State Crime Laboratory.

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Many people assume that DNA is the end all, be all of criminal investigations, but that's not always true, Blinka says. During his time in the Milwaukee County District Attorney's Office, Blinka worked on a handful of bite mark cases, including a nationally prominent case in which bite marks were the sole evidence found at the crime scene.

"This is important because in the cases where bite marks do surface, we'll have the scientific mechanism to exploit any trace evidence that's left behind," Blinka says. "This is a powerful tool not only for pointing a finger at somebody but also for eliminating suspects."

But bite mark evidence has come under fire in recent years because of a handful of highly publicized cases in which it was incorrectly used. In one case, the testimony of a forensic odontologist contributed to the wrongful conviction of an Arizona man whose name was later cleared through DNA.

"Unfortunately, there have been cases where the quality of the evidence didn't meet the strength of opinion, which is what we're trying to counter here," Johnson says. "We want to put some science into this, and it's something only dentistry can do."

Daniel Blinka, J.D., Ph.D., on the left, is a law professor. **L. Thomas Johnson**, D.D.S., is a forensic odontologist and adjunct professor of dentistry. Together, they're creating a database that could advance the field of forensic odontology.

Dissecting financial fraud

Maureen Mascha, Ph.D., is teaching students to steal.

While this may sound incredulous, in a world where financial scandals have destroyed companies, it is necessary. Mascha, who researches fraud, teaches her accounting students how fraud may happen so that they are better prepared to identify it when they are hired as auditors.

"There is criminal liability for auditors who miss or overlook fraud," says Mascha, an assistant professor of accounting.

Mascha's research is partially supported by a grant from PricewaterhouseCoopers, the world's largest accounting firm. She is studying the issue of general versus application controls, which determines who has access to a company's systems. General controls manage all of a company's information technology systems and are essential to ensuring the integrity, reliability and quality of the internal control system. Application controls, which companies have focused on more than general controls, deal with the underlying transactions. While both contribute to the overall internal control environment, general controls are often harder to test and evaluate given their pervasive nature.

"The collapse of Enron was a breach of general controls," says Mascha.

Along with a colleague from DePaul University in Chicago, Mascha is examining internal auditors and external auditors and how well both are able to recognize the difference between general and application controls since each type serves a distinctly different purpose. Their hope is that the findings will determine what auditors know and identify how to strengthen the audit process.

Punishing corporate crime

In the movie *Wall Street*, the character Gordon Gekko declares that "greed is good." Certainly greed is one of the most basic motivations for human conduct. However, the field of corporate and securities law is founded upon the premise that human greed should be channeled toward the more productive ends of capitalism and away from conduct that achieves financial gain through the exploitation of others.

It is this fascination with the concepts behind the punishment of corporate crime that fuels the research and teaching of legal scholar **Edward Fallone**, J.D. "When I was a law student, my corporate law professor treated the study of insider trading, hostile takeovers and corporate crimes as the dry recitation of legal rules to be memorized," explains Fallone, an associate professor in Marquette's Law School. "My approach to teaching is different. I teach these cases as human tragedies (and sometimes comedies) involving greed, betrayal and corruption. In my view, the law in this area serves the classic end of all laws: to protect ourselves from our own worst impulses."

In light of today's dramatic headlines of corporate malfeasance, Fallone is looking at the concepts behind the legal code governing corporate law. Specifically, when most criminal law is premised on determining blameworthiness and the condemnation of an individual's mental state, where is the mind in a corporation? Whose mental state is it? And what punishment will serve the greatest good, for both the injured party and society?

Fallone is examining whether specific corporate statutes should exist in Wisconsin to deal with these issues within the criminal justice system. His research looks at what he calls the "prism of assumptions" that created the laws as they exist today. "Maybe we have been looking at this in the wrong light. If we already go after individuals involved in a corporate financial scandal such as existed at Enron, what does society gain by also going after the company?"

CRIME

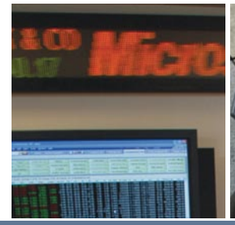
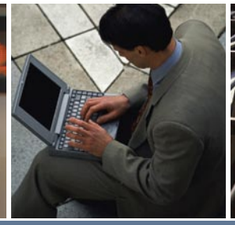
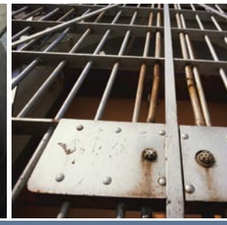
Sex offense — a family tragedy

What helps some families cope when a loved one is convicted of a sexual offense? Criminologist **Mary Ann Farkas**, Ph.D., and sociologist **Gale Miller**, Ph.D., are collaborating in a study designed to answer that question. Their findings may identify key social coping mechanisms for families, lead to the development of policies that improve the experiences of offenders in prison, and ease offenders' transition back into their families and communities.

Many families sever contact with a convicted sex offender. Often the emotional stress and logistics associated with traveling to a prison for visitation are simply too difficult to manage. For others, the stigma of the crime is overwhelming. A small segment of families find positive ways to respond. "If we can study them, we can learn how they were able to deal with the problem in ways that most people can't," says Miller, a professor of social and cultural sciences.

Miller and Farkas, an associate professor of social and cultural sciences, are interviewing adult members of up to 85 families who have maintained contact with imprisoned relatives. Through a series of three conversations with each adult, Miller and Farkas gather firsthand details of the perceptions, experiences and coping strategies the family members employed to maintain relationships after their loved one was arrested, convicted and incarcerated.

How families cope post-release is another focus of their research, which is endorsed by the Sexual Abuse Treatment Alliance. Registration, public notification and the strict monitoring and supervision of the sex offender may have divisive effects on the families. "Literature suggests that returning to an intact family makes a difference," says Miller. "This is partly about recidivism but also about a successful readjustment in terms of finding a job, locating housing, fitting into a community and being able to make a positive contribution. Family is kind of a critical gatekeeper in that."

Miller and Farkas are interviewing families in states that enforce a range of policies regarding conjugal and other visits, sentencing practices, post-release conditions and post-prison detention for some offenders.

We believe collaboration is an asset. In fiscal year 2006, Marquette faculty received $1.4 million for research equipment that will benefit not only Marquette faculty and students but also those at neighboring institutions.