

# UPfront



Mary-Kate and Ashley Olsen twins dolls by Mattel. Staff photoillustration

to have the condition and in near equal measures.

It turns out there are thousands of twins out there and they are easy to find. For years, the state Department of Licensing has asked applicants if they are twins or triplets. Because identification numbers are based on names and birth dates, officials wanted to avoid giving the same numbers to two or more people.

In 1998, Dedra Buchwald, then a professor of medicine at the University of Washington and now at WSU Spokane, realized that Washington twins could be useful for health researchers. Her interest led to the creation of a twin registry, which Duncan took over in 2013 and brought to WSU Spokane when he came two years later.

“We want to do this research that really reflects what happens in the real world,” says Duncan. “But you want to maximize experimental rigor so that

your results actually have some tangible meaning. The twins allow you to do certain things that you wouldn’t otherwise be able to do.”

Let’s imagine you wanted to know if soda consumption leads to a higher body mass index, the relationship between height and weight referred to as BMI. In a world looking for the causes of obesity, soda consumption has become a major target of both critics and policymakers. If soda really is making people unhealthy, policymakers can build a case for some sort of regulatory remedy.

If you look across a group of twins, treating them as unrelated individuals, you’ll see such a relationship exists. But that’s only a correlation. You want to find out if the soda consumption causes the higher BMI. If it does, an identical twin who drinks more soda than his or her sibling should have the higher BMI.

It turns out that Duncan looked for such a link recently and didn’t find it.

“This was contrary to our hypothesis,” says Duncan, “and it certainly would have made our lives much easier if the data had come out like we would have expected. But it didn’t, which throws a little kink in the association there, the causal pathway between soda and BMI.”

For each door that closes, another opens. Lacking a causal relationship between soda consumption and BMI, researchers can now look for something else. Perhaps there is something genetic that influences both soda consumption and increased BMI, says Duncan.

Whatever the reason, Duncan sees twins as a powerful tool for pinpointing the actual causes of healthy and unhealthy behaviors and serving up solid real-world evidence for health-promoting changes in public policy. ✨

## Seeing double

The Washington State Twin Registry is a powerful aid in promoting better health

Glen Duncan is an outlier in an obesogenic environment. While he’s fit and trim, two in three Americans carry too much weight for their own good and are largely sedentary during work and leisure time. It would help if he had a twin to compare himself with. As it is, he studies other twins in the hope of teasing out why some people are drawn to healthy behavior, others not.

Duncan has long been a runner, from high school races to weekend 10Ks. For the past ten years he has practiced jiu-jitsu and Muay Thai, a combat sport called the “art of eight limbs”—knees, shins, fists, and elbows, times two.

“I’m one of those people that goes nuts if I’m not active,” says Duncan, a professor in the Elson S. Floyd College of Medicine and chair of the Nutrition and Exercise Physiology program. “At this point I need it physically, psychologically. To me it’s the best possible drug in the world.”

Yet for millions of modern humans, life is a stream of near inertia aided by the technology of cars, cubicles, and computers. If only people could get 150 minutes of moderately intense exercise, a recommended weekly dose of doing more than what Duncan calls “tooling around the neighborhood.”

But when you try to put science to this challenge, it runs into the need for controlled circumstances, and the hard-to-control realities of Life in the Real World. You can learn a lot by rigorously

feeding mice different pellets or giving them various treadmill drills. But you’re still just learning about mice.

And forget about comparing a college professor living in the “walkable” Seattle neighborhood of Greenlake to a programmer who spends hours a week in a slow I-5 commute from Lynnwood. The variables, be they genetic or environmental, are too numerous to calculate, let alone control. So if you wanted to nudge either of their behavior in a more healthy direction, be it through bike lanes or soda bans, you would be hard pressed to gather evidence that meets science’s demand for valid statistical correlations, let alone causes that can be cleanly and clearly tied to effects.

It turns out that twins offer a promising stream of data that can serve up remarkably solid inferences and conclusions. Fraternal twins share half their genetic material. Identical twins share almost all their genetic material. Both groups face many of the same environmental effects. By comparing and contrasting fraternal and identical twins, researchers can tease out genetic and environmental effects on health.

Here’s how twin logic works: If a health condition is genetic, it should be shared by identical twins but not be as common between fraternal twins, who have less genetic information in common. If a health condition is caused by something in the environment, both fraternal and identical twins will be more likely

A SAMPLING OF COUGAR TWINS: Clockwise below, from top left: Mandy '10 and Haley '10 Parsons (golf team), Kamel x'14 and Kahshan x'14 Greene (football team), Sahar and Sepideh Nesaei (mathematics doctoral students), Ryan '01 and Brandon '00 Pickering ('98 Rose Bowl team), Morgan '14 and Micaela '14 Castain (women's soccer), and Katrina '10 and Kanethia '10 Williams (social sciences). Parsons photo Brian Plonka/The Spokesman-Review; Castains photo Greg Davis. Other photos WSU

