University of Cambridge, when he and fellow student Mahbub ul Haq (later a policy director at the World Bank and Pakistan's minister of finance) began discussing an alternative to the GDP per capita benchmark. Haq argued for the usefulness of a simple, easy number, but Sen saw that as coarse. “What you need,” Haq told him, “is something as vulgar as GDP except concentrated on something meaningful like human life.” Their conversations laid the groundwork for what would become the HDI. “It was never intended to be a substitute for all the multitude of tables that the Human Development Report presents,” says Sen. “It’s a kind of appetizer and, indeed, a general alternative view in a highly simple form—to indicate that, in order to concentrate on human life, you do not have to get into such complexity that people go back to using GDP unalloyed.”

Although income-based measures like GDP and per capita income can still dominate discussions of poverty measurement, there are signs that the kinds of multidimensional models that Sen has long advocated are beginning to gain influence. The MPI’s Oxford developers credit Sen’s work as their foundation, and other researchers are following his lead; governments have begun to institute the measures on a national level. In 2009, Mexico instituted a multidimensional measurement of poverty levels, to better formulate national policy. A year earlier, French president Nicolas Sarkozy commissioned Sen and fellow Nobel laureate Joseph Stiglitz to define measures for a survey of his fellow citizens’ general well-being. (The resulting report, released last fall, suggested that the French government should adopt a multidimensional approach that focused not solely on income, but on a range of quality-of-life measures.)

Even though there are now dimensions of poverty that didn’t exist to the same extent when Sen was crafting the HDI in the late 1980s—for example, the effect of terrorism on personal security—he believes the index has stood the test of time. Findings from a long-term study of HDI results included in the recent Human Development Report revealed broad improvements across most developing countries. Sen is happy with these successes, but he says much work still remains to ensure that such gains not only continue, but spread across a wider spectrum of criteria that improve human quality of life around the globe.

—DAN MORRELL

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don’t want to try anger-management techniques such as relaxation, “yet they will spend hours trying to master a computer game,” Gonzalez-Heydrich continues. Succeeding at the game, known as RAGE Control (Regulate and Gain Emotional Control), is a careful balancing act. “You need to learn how to control your level of arousal,” he says, “but just enough that you can still react rapidly and make quick decisions.”

Participants play during sessions with Peter Ducharme, a licensed clinical social worker who has adapted traditional anger-management therapy to complement the game. During the course of five hour-long sessions, he teaches kids strategies to regulate their emotional states—including deep breathing and progressive muscle relaxation—and then encourages them to experiment to see which strategies aid their game play.

Gonzalez-Heydrich developed the game with Jason Kahn, a software developer and postdoctoral fellow at Children’s, hoping that it would both engage kids and allow them to practice these skills in ways that translate into other areas of life. Typical anger-management therapy teaches patients to step away from difficult situations and use techniques such as visualization to imagine themselves in a calm setting. In contrast, RAGE Control requires patients to soothe themselves in the midst of a high-pressure activity while simultaneously exercising key executive functions, such as the ability to “inhibit,” or stop shooting, when friendly spacecraft swoop across the screen.

This study is based on a long-standing hypothesis that children with severe anger problems have what amounts to a learning disability, triggered by flaws in portions of the prefrontal cortex responsible for emotional regulation. Over time, the game may strengthen these brain areas in the same way that physical therapy helps a stroke patient regain use of a limb. “We’re giving that part of the cerebral cortex and the network that connects it a way of getting exercise,” Gonzalez-Heydrich says. “Our theory is that this will help these kids improve.”

The researchers are less than halfway through this small pilot study led by assistant professor of psychiatry Elizabeth Wharff. Although it’s too soon for definitive conclusions, patients so far have enjoyed the game, and “their heart rates during the game have shown improvements with each round, which indicates their ability to learn self-regulation with targeted practice,” Ducharme says. The team plans to apply for funding to

If their heart rates rise above resting levels—signaling that they are overexcited—players lose the ability to shoot.

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launch a longer controlled trial eventually at Boston’s Manville School, which serves children with emotional and behavioral disabilities. They’re also developing a multiplayer version of the game for family therapy, which may help address the dynamics that contribute to angry outbursts. The entire family will wear heart-rate monitors, and if anyone’s pulse escalates, everyone loses the ability to shoot. “The trick is to not only get yourself calm, but also promote emotional regulation in your family members,” Gonzalez-Heydrich says. “The usual response of these kids would be to yell at their mothers, which makes Mom’s heart rate go even higher. We hope kids will learn that the right approach is to say something supportive.” Many parents, he adds, will benefit from the emotion-regulation practice as well.

The enthusiastic response from patients, parents, and therapists gives Gonzalez-Heydrich hope that RAGE Control may eventually offer an alternative to the powerful psychotropic medications often used to treat these children. He concedes that a shooting game is a surprising way to address anger disorders, but points out that RAGE Control lacks the “graphic reality” of many current video games. “We have to meet these kids where they are,” he stresses. “If we had a game where they were, say, picking daisies in a field, these kids just wouldn’t be interested.”

~ERIN O’DONNELL

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