Georgia Tech mobile phone game trains players to make healthier diet selections

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After playing the game, which involves selecting the healthiest option from an array of choices, for just three weeks, participants began incorporating healthy changes into their diet. Credit: Andrea Grimes Parker/Georgia Tech

With Halloween and the holiday season fast approaching, many people will be watching their waistlines as they're tempted by a cornucopia of sugary and savory foods. Meanwhile a Georgia Tech College of Computing Ph.D. candidate has shown that playing health-related video games on a mobile device can help adults learn to live more healthfully by making smart diet choices. The finding is published in the paper, "Let's Play! Mobile Health Games for Adults," recently presented at Ubicomp 2010 in Copenhagen, Denmark.

OrderUP! is a different take on the recent trend of health-related gaming that includes "exergames," in which players get a genuine workout while playing. OrderUP! instead seeks to educate players about how to make healthy eating choices in situations nearly everyone encounters regularly in their lives. By casting players as virtual restaurant servers, Order UP! forces players to make healthy—and fast—menu decisions for a group of demanding, impatient customers. The research was supported by Humana, Microsoft and Nokia.

"Even a single-player casual game can potentially have affects beyond those who play it," said Beki Grinter, the project's principal investigator and associate professor in Georgia Tech's School of Interactive Computing. "The most important finding from the OrderUP! project was how the game was integrated into conversations players had with other players and non-players about things that they had learned, particularly things that confronted their assumptions about healthy choices."

The game works like this: One at a time, 10 virtual "customers" approach the counter with three possible food choices; for example, the choices could be a fried chicken thigh, a jerk chicken breast or gumbo. They're then asked to make the healthiest choice, with only a few moments to pick before the customer gets impatient and leaves. Players start with 1,000 health points, and as they make unhealthy choices for their customers (or as the customers get tired of waiting and leave) their health points drop. The object of the game is to continue serving food as long as possible.

"All health games, or any kind of 'serious' game with a purpose beyond entertainment, always have the challenge of making the game fun versus getting across the information you want to get across," said the game's creator, Andrea Grimes Parker, a Ph.D. student in Human-Centered Computing in Georgia Tech's School of Interactive Computing. "Our

participants said [OrderUP!] led them to have discussions about nutrition. People would ask them about the game, and that led them to start comparing food choices and information."

To gauge the game's effectiveness, Parker and her colleagues measured participants' health behaviors using the Transtheoretical Model (TTM), a well-established health behavior theory. TTM helped them characterize and measure four processes of change participants displayed: consciousness raising, self-reevaluation, engaging in helping relationships, and counter-conditioning.

The researchers tested OrderUP! with a group of 12 African American participants over varied ages, with the youngest in the 18-to-24 range and the oldest over 60. All participants were given Nokia N95 devices with OrderUP! preloaded and asked to play the game at least once a week for the three-week duration of the study. Participants played much more than that, indicating the game's strong entertainment value in addition to being a learning tool.

"Our focus on African Americans from the very beginning of the project ensured that we could design with contextually relevant motifs, with [relevant] data and personas—which made the game more engaging and relatable for the intended users," said Vasudhara Kantroo, a 2010 master's graduate in human-computer interaction who worked on OrderUP!

"We found that, after playing OrderUP! for just three weeks, we saw people engage in behaviors and thinking consistent with the processes of change identified by the TTM," Parker said. "In particular, we found that people learned how to make healthier choices when eating out, reassessed the healthiness of their current eating habits, began having productive conversations about healthy eating with people in their social network and, finally, actually started introducing healthier foods into

their diet."

Parker and her colleagues researched all nutrition data while designing the game, but in the interest of quick and engaging play, had kept nearly all that data out of the playing experience. "One finding that was a bit surprising was just how much people translated what they saw in the game to their own lives. Another surprise was that players wanted more detailed information about nutrition values," Parker said.

"[Our findings] suggest various lines of direction," Grinter continued. "What other technological interventions could be made that would be engaging and surprising enough that they would create conversation? What else might be done that, while focused on individuals, could have outcomes that draw in social networks. How are they drawn in? What, if any, are the lasting implications of that?"

OrderUP! fits into a larger research profile within the College of Computing of trying to determine how the ubiquity of mobile devices can be leveraged to improve users' health. For example, other projects have examined using mobile phones to help manage diabetes, as a means to access electronic health records, or simply as a way to quickly access health and nutrition information. The idea is rapidly gaining currency. First lady Michelle Obama's initiative to fight childhood obesity recently held a contest, "Apps for Healthy Kids," that awarded prizes to software developers, game designers and students for the best kid-targeted apps that promote healthier lifestyles.

"There's a wide open design space associated with mobile gaming," Grinter said. "Andrea's work is a part of understanding that space."

Future development of OrderUP! will include a longer study to measure player behavior change over an extended period of time, as well as an expanded game with more levels, more food choices and more

nutritional information available to the player.

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