

News

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NSF Grant Supports Study of Interactivity in Digital Media

As the ever-growing network of digital media speeds through the start of the 21st century, adding “interactive” options at an almost dizzying pace, a group of Penn State communications researchers plans to evaluate how all that interactivity really affects those who consume the media.

While things such as chat functions on social-networking sites, customization options for Web portals and scrollbars in mobile texting devices regularly get hailed as advances, the researchers hope to find out whether the interactive options really lead to richer user engagement with the medium and its contents.

The National Science Foundation has awarded \$432,313 to support the timely project, which will be conducted over a two-year period and involve graduate and undergraduate students in the College of Communications.

The researchers will experimentally investigate three species of interactivity corresponding to the three central elements of communication—source, medium and message—as proposed by Distinguished Professor S. Shyam Sundar, the principal investigator on the project. The work is based on his model of interactivity effects published recently in the Oxford Handbook of Internet Psychology. The researchers propose a series of six separate experiments, all focusing on the ways in which different kinds of interactivity influence user engagement as well as other outcomes of interest.

“The scope of the NSF grant will allow us to study not only individual effects but also combinatory and cumulative effects that arise from source, medium and message-based interactivity,” said Saraswathi Bellur, a fourth-year doctoral student in the College of Communications and one of the two project coordinators. The planned studies “will also help address the larger academic debate about paradoxical effects of interactivity, where very high levels of interactivity could be either positively engaging or overwhelm the user and lead to

negative effects," she added.

Bellur noted that the grant provides an excellent opportunity to test the overall theoretical model.

"In addition to the laboratory experiments that allow us to have better control over the participants and procedures, the field experiments in this research will provide us an opportunity to explore user behavior and psychology in a more natural environment," said Qian Xu, the other project coordinator, who is also a fourth-year Ph.D. student advised by Sundar.

One specific area of the research will compare "power users"—those who are avid and expert users of technology—and regular users. Researchers hope information from those groups will shed light on interactivity's potential to bridge the "digital divide," which separates those who regularly have access to and use technology and those who do not.

"A scientific understanding of the psychological effects of interactivity is critical for a society that is becoming saturated with interactive digital media," said Sundar, co-director of the Penn State's Media Effects Laboratory. "Research results will feed directly into design of interfaces for a variety of purposes, from learning systems to serious games."

Researchers believe dissemination of the work will likely spawn a wave of theoretically driven interactivity research.

"A whole new science is emerging to address people's interaction with digital artifacts," said Sundar, who helped launch a new discipline and Department of Interaction Science this summer at Sungkyunkwan University in Seoul, Korea, by collaborating with an international team of social scientists and engineering professors, as part of a World Class University program supported by the Korea Science and Engineering Foundation.

Sundar's research investigates social and psychological effects of technological elements unique to Web-based mass-communication. In particular, his studies experimentally investigate the effects of interactivity, navigability, multi-modality and agency (source attribution) in Web interfaces upon online users' thoughts, emotions and actions.

A frequently cited source on technology, Sundar has testified before the U.S. Congress as an expert witness and delivered talks at several universities in the United States, Germany, Netherlands, Hong Kong, South Korea and India. His work has appeared in such leading journals as *Communication Research*, *Journal of Communication*, *Behaviour & Information Technology*, *Media Psychology*, *Journal of the American Society for Information Science and Technology*, and *The Information Society*.

He teaches courses in the psychology of communication technology, communication theory and research methodology.

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