Statement of Research

I am a communication and interdisciplinary social scientist of media, technology, society, and the diffusion of innovations. Since my dissertation in 2010, I expanded my diffusion research from looking at the spread of large-scale technological infrastructures for big data through cross-disciplinary collaborations in scientific/engineering organizations, to studying the flow of health interventions through social clusters in online communities, and the dissemination of pro-environmental behaviors through persuasive messages in modern societies. Traditional diffusion research examines innovation attributes (i.e., relative advantage, perceived complexity), adopter categories (i.e., early adopters, laggards), and social networks (i.e., opinion leaders with high centrality) as predictors of adoption. My work extends diffusion theory by looking at the role of the organization behind an innovation, the role of social clusters in diffusion networks, and message framing of an innovation in the adoption and diffusion process.

First, I specialize in studying the diffusion of cyberinfrastructure (CI) as a community and platform innovation. CI harnesses and aggregates big data for computational research across various knowledge domains, primarily in science/engineering. CI is a unique innovation in that it is a platform made up of multiple technologies, and the outcomes benefit both the individual and the community. This interest started with my dissertation project looking at CI adoption rationalities in the largest user community in the US during 2001-2011 (i.e., TeraGrid, https://en.wikipedia.org/wiki/TeraGrid). This work led to two solo projects funded by the National Science Foundation (NSF) to study the iterative cycles between CI development and use while being adopted and diffuse within XSEDE (www.xsede.org, the successor of TeraGrid), and the organizational capacity necessary to help scientific organizations adopt and implement CI. In early 2017, I started working with Dr. Christian Burgers at Vrije Universiteit (VU) Amsterdam to prepare for a collaboration to extend this work to the case of the European Union (EU). The largest EU CI community, European Grid Initiative (https://www.egi.eu/), is head-quartered in Amsterdam.

Second, I expanded my diffusion research to examine the flow of health interventions through social media in online communities. The adoption of a health intervention may require the joint decision and/or support of family, friends, and loved ones. With my collaborators, we became interested in exploring the role of strong ties in facilitating the diffusion of health interventions that are embedded in a complex relational context. In our collaborative work, we developed the Simplicial Model of Social Aggregation (Kee et al., 2016), with specific propositions to be tested in future research.

Third, I study the diffusion of water conservation as a pro-environmental behavior as an innovation. Such adoption decisions are challenging because people in general respond more readily to innovation with self-focused and short-term implications. Through a series of online experiments testing message framing strategies, my collaborators and I found that combinatorial use of two strategies, instead of traditional use of a single strategy, can more effectively lead to attitude change about water conservation. Parallel to the environmental project, my team also examine the message strategies/linguistic features of what drive likes, comments, and shares of WordPress blogposts, in order to further understand how message design can facilitate the diffusion of social media information. This work led to the A-B-C Framework of Information Diffusion on Social Media (Liang & Kee, 2018).

Collectively, I plan to continue examining diffusion of dynamic innovations across multiple contexts, including scientific/engineering organizations, health communities, pro-environmental societies, and social media such as WordPress blogposts. In future research, I would like to extend my diffusion research to examine the communication strategies employed by entrepreneurs in early start-ups (pre-revenue) to internally motivate organizational members and externally engage market consumers.

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