Exploring the Cross-Cultural Effects of Feedback for Pro-Environmental Behavior Change

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A particularly popular form of environmental human-computer interaction (HCI) research is the design and study of eco-feedback technology, which is defined as technology that provides feedback on individual or group behaviors with a goal of reducing environmental impact (see Mccalley, L.T. and Midden, C. 1998, Holmes, T.G. 2007, and Froehlich, et al., 2010). Eco-feedback technology is based on a two-part hypothesis that (1) most people lack awareness and understanding about how their everyday behaviors such as driving to work or showering affect the environment and that (2) technology may improve awareness, understanding, and ultimately change behavior by automatically sensing these activities and feeding related information back through computerized means (e.g., mobile phones, ambient displays, or online visualizations). Researchers have built eco-feedback technologies for a variety of domains including energy consumption (Holmes, T.G. 2007), water usage (Ajzen and Fishbein, 1970), transportation (Froehlich, J., et al. 2009), and waste disposal practices (Holstius, D., et al. 2004). Although past research has uncovered that changing environmental behavior is a psychologically, socially, and culturally complex problem (Shipworth, M. 2002), there is little work on studying the cultural differences in the perception of and reaction to eco-feedback technology.

We hypothesize that people from different cultural backgrounds will require different forms of feedback technology to effectively motivate pro-environmental behavior change. In our current work, we are specifically focused on differences between Western and Eastern cultures and how these differences manifest themselves when engaging with eco-feedback technology. For example, a well-known finding in cross-culture personality research is that Westerners (e.g., Americans) tend to be more individually oriented and that Easterners (e.g., Chinese) tend to be more socially oriented (Yang, K. 1986). The implication here is that feedback designs that focus on social groups or the larger collective may be a more effective motivator of pro-environmental behavior for Eastern individuals than their Western counterparts. A second example involves the ways in which Western and Eastern cultures tend to react to feedback about the self. In an experiment conducted by Heine, et al., 2001, participants from various cultural backgrounds received negative feedback about their performance on a task. Whereas North Americans tended to discount the significance of the negative feedback, the Japanese were highly responsive and showed evidence of reduced confidence in their ability to perform tasks similar to the experimental task. We are interested in examining how positive and negative feedback work differently when motivating pro-environmental behavior for individuals coming from either a Western or Eastern culture.

Through our research we expect to find the key cultural differences with respect to designing environmental feedback technologies. Our work will be based first in field research in homes in China, Japan, and the U.S., followed by design intervention studies with those same populations. We expect this work to inform commercial technologies that are starting to roll-out in an effort to cause individuals to engage in pro-environmental behaviors.

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