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Examining the impact of computer-mediated social networks on individual consumerism environmental behaviors

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ABSTRACT

Researchers have begun to examine the impact that information technology (IT) can have on the environmental behavior of individuals, organizations, environments and markets. Computer-mediated social networks (CMSNs) create a multi-nodal social environment where individual behavior is virtually impacted, and subsequently, physically modified. Human–computer interaction researchers have begun to study the impact that IT has on environmental sustainability. Interest has arisen around the influence on non-verbal cues in impacting social norms and encouraging consistent environmentally conscious behavior. Extant research has not yet considered the social interactions that occur within a CMSN and how such interaction might further facilitate the adoption of environmental behaviors. Using survey results of 234 individuals, this study examines the impact that CMSNs have on environmental consumerism, where individuals purchasing and consumption habits take one's environmental impact into consideration.

1. Introduction

Recent IS research has acknowledged the "adverse impact that human behavior has on the level of quality of the natural environment" (Elliot, 2011). We adopt the definition of environmental behavior as behavior that "consciously seek(s) to minimize the negative impact of one's actions on the natural and built world" (Kollmuss & Agyeman, 2002). Individual environmental behavior includes actions such as energy conservation, waste avoidance and recycling. (Kaiser, Oerke, & Bogner, 2007; Kaiser & Wilson, 2004). Research has called for IS research on this type of environmentally sustainable behavior, highlighting that information systems are critically involved in the "information acquisition and attitude formation" process (Melville, 2010, 2011). Malhotra, Melville, and Watson (2010) highlighted the importance of research on IT that provides "information to encourage green choices" by individuals. Dedrick (2010) highlighted the importance of understanding "how individuals' choices ... are influenced by attitudes regarding the environment." Similarly, Elliot (2011) stated that technology can have an influential role in changing individual's adoption of environmentally desirable behaviors. However, he did not provide an explanation of how information systems are involved in or can influence the behavior-changing process. An examination of the "possible modes of influence through which a community... may exert its effect" (Gallivan, Spitler, & Koufaris, 2005), more specifically in a computer-mediated environment is also of interest to the IS research community. Furthermore, research has shown that social interactions have a significant impact on the environmental behaviors of individuals (McKenzie-Mohr, 2000). Extant research has not considered the social interactions that occur within a computer-mediated social network (CMSN) and how such interaction might further facilitate the adoption of environmental behaviors.

Social norms, characterized as perceived "beliefs, attitudes, feelings, and behaviors" of a particular group (Terry, Hogg, & White, 1999), play a significant role in promoting environmentally conscious behavior (Goldstein, Cialdini, & Griskevicius, 2008; Kollmuss & Agyeman, 2002). Social norms develop as individuals interact with each other and develop guidelines of acceptable behavior (Kollmuss & Agyeman, 2002). More frequently, people are interacting on a daily basis within CMSNs, making it an ideal setting to study how this form of an information system facilitates the adoption of environmental behavior. Further, social structures and processes play an important role in liberating individuals from their current state of environmentally naïve ignorance (Vlek & Steg, 2007) through its social norms which are a "potentially powerful motivator of pro-social behavior" (Goldstein et al., 2008). Research that aims to explain how society influences individual beliefs and

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actions towards environmental sustainability (Malhotra et al., 2010), or more specifically how IT-enabled societal norms can achieve this intention, is a rich area for further IS research.

The term 'Sustainability 2.0' has been used to describe the impact that IT can have on the environmental behavior of individuals, organizations, environments and markets (Melville, 2011). Chiou, Wan, and Wan (2012) highlights that human–computer interaction researchers have begun to focus on the influence of IT in promoting "environmental sustainability and ecological consciousness," specifically acknowledging the important role that "social and moral values" play. Social media is a prime example of IT that has the potential to impact individual environmental behavior (Hovorka & Corbett, 2012). Recent IS research has highlighted the possible role of information systems in changing social norms surrounding environmental behavior (Watson, Boudreau, & Chen, 2010). CMSNs are social structures that can have an influential effect on social norms surrounding various issues (Butler, 2001). Communications via CMSN are technology-facilitated human interactions that clearly exhibit the perpetual interplay between social aspects of human behavior and the technology-enabled behavior. Individuals view their participation in CMSN as an extension of their physical self, thus it is a blended representation of a physical person and a technology feature that is "intrinsic to everyday activities and relations" (Orlikowski & Scott, 2008). Ellison (2007) states that connections on social network sites, also referred to as friends, "provide context by offering users an imagined audience to guide behavioral norms." This in-depth interaction can have a significant impact on how individuals behave when participating in an environmentally conscious environment. Additionally, this interaction can have a varied influence on an individual, the message-receiver, based on the perceived role of the message-giver, as well as the relationship between the two. CMSNs create a unique multi-nodal social environment within which individual behavior is virtually impacted, and eventually, physically modified. IS researchers have also been interested in understanding the influential impact of information channels that do not "provide the full range of social cues [and] nonverbal signals" (Rice & Aydin, 1991), such as a CMSN. Human–computer interaction research has also directly called for an examination of "primes associated with green consumerism would activate norms of social responsibility and environmentally sustainable conduct and thereby increase corresponding behaviors" (Chiou et al., 2012). Given the importance of CMSNs and its impact on individual behavior, IS research has remained fairly silent on the role of CMSNs on environmental behavior. In this research, we address this gap in the IS literature. Thus, we raise the following research question: How do computer-mediated social networks influence individual environmental behavior?

This study focuses on the influential role that CMSNs have on individual environmental behavior. This research is critical since environmental sustainability initiatives cannot succeed without conscious and informed environmental behavior by individuals. Further, given the wide and extensive use of CMSNs in various aspects of our lives (Church & Salam, 2010; Jacks & Salam, 2009), how such environmentally friendly behaviors can be encouraged or influenced through CMSNs is of significant interest to IS research and practitioner communities. Further, businesses are continually improving their product offerings with those products that minimize its negative impact on the environment. Business strategies can include the usage of CMSNs to promote the awareness of these products through CMSN postings, with the hope that consumers will eventually purchase those products. This study will examine how influential these strategies are towards increasing environmental consumerism.

The remainder of this paper is organized as follows. We present the research model and the theoretical framework, develop hypotheses through an in-depth discussion of each construct and relationship, discuss the results from survey data collection and analysis, discuss limitations of the study and provide a brief conclusion that highlights future research opportunities and the contributions of this study.

2. Conceptual background

Midden, Kaiser, and Teddy McCalley (2007) examined the role that technology plays in shaping individual conservation behavior through encouraging the individual to make specific intentions as well as providing suggestions of ideal conservation behavior. They highlight the possibility of technology acting as a persuasive agent in order to promote environmentally desirable behaviors. An individual's continual engagement in the CMSN further solidifies their changed behavior (Ellison, Steinfield, & Lampe, 2007). Research has provided an example of how an environmentally focused IT application that incorporates a social network site aimed towards a sustainability intention could be viewed as IT's involvement in the process of belief formation and sustainability actions (Malhotra et al., 2010). The continued use and engagement in the CMSN fostered changes in the employee's behaviors (Melville, 2010). These studies fall under the stream of research on Sustainability 2.0 as the main focus is on how technology can create an environment that furthers environmentally favorable behaviors. This research aims to expand upon this stream by examining how CMSNs impact individual environmental belief formation and actions.

Personal values are partly shaped by the individual's interaction with society (Bandura, 1986). This research examines how the unique societal structure within a CMSN plays a role in shaping an individual's environmental behaviors. CMSNs can be viewed as social structures since individuals constantly interact in these virtual environments and take social cues on appropriate behavior (Ellison, 2007). Carroll (2010) highlighted the impact that majority influence can have in a computer-mediated group, and this research aims to highlight how this also applies to environmental behavior. In this study, we use social information-processing and social cognitive theory (Bandura, 1986; Compeau & Higgins, 1995; Fulk, Steinfield, Schmitz, & Power, 1987; Gallivan et al., 2005; Subramani & Rajagopalan, 2003) to provide a foundation for examining how through the interactions in a CMSN, individuals are influenced by cues from others, which impact their beliefs and behaviors.

2.1. Social information-processing theory

Social information-processing (SIP) theory has previously been applied to explain group influence, stemming from social networks on individual attitudes toward a health information system (Rice & Aydin, 1991) and toward communication media and media usage (Fulk et al., 1987). Recent research has applied SIP theory to social network sites to examine the efficacy of viral marketing for specific products or services (Subramani & Rajagopalan, 2003). SIP has also been identified as occurring within vague or ambiguous situations (Rice & Aydin, 1991). Beliefs and behaviors surrounding environmental behavior are classic examples of situations where it is difficult to identify how to operationalize environmental behavior. However, SIP has been examined in social networks where "members exchange information and develop similar perceptions and opinions ... and reduce uncertainty about a ... phenomenon" (Rice & Aydin, 1991). This social environment serves as an "important source of information and cues for behavior and action for individuals" (Subramani & Rajagopalan, 2003).

A key tenet of SIP is that individuals learn in a social context, specifically where there is an opportunity to "share information