THE EFFECTS OF USER IDENTITY AND SANCTIONS IN ONLINE COMMUNITIES ON REAL-WORLD BEHAVIOR

Research-in-Progress

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Abstract

This paper describes a field study to investigate whether and to what extent individuals conserve more electricity if they have the opportunity to signal their behavior to others in the online community. Moreover, the study intends to reveal how positive social sanctions (e.g., publicly rewarding people who reduce their energy consumption) and negative social sanctions (e.g., publicly warning people who increase their consumption) cause individuals to alter both their energy demand and their time dedicated to the online community. We discuss related work on identity disclosure in online communities, on promoting sustainable behavior with information systems, and on economic theory explaining the effects of prosocial motives on behavior. The study will be conducted as field experiment using an energy efficiency portal developed by us and operated by an Austrian utility company that currently facilitates 9,899 active users out of which 1,400 will be randomly selected as study participants.

Keywords: Online communities, environmental sustainability, identity disclosure, empirical research/study

Introduction

The widespread use of the Internet has led to the proliferation of online communities for various purposes (e.g., collaboration, learning, networking, friendship, and entertainment). In these communities, individuals congregate electronically to share opinions, advice, and ideas – including information about their identity. Previous research has examined individual motivations to contribute to online communities (Ridings and Gefen, 2004; Wasko and Faraj 2005, Wasko et al. 2009) and the social dynamics characterizing the interactions among their members (Ridings and Wasko 2010). Researchers and practitioners alike are concerned with the effects of the disclosure of identity-descriptive information in online communities (Forman et al. 2008), but it remains unclear why and how online identity disclosure influences individuals' behavior in the real world and what aspects of identity disclosure have the greatest effect in this way.

We will conduct a field experiment to examine the effects of online identities and associated sanctions in online communities on real-world behavior – more specifically, residential energy consumption. Residential energy consumption is continuously increasing. Today, households consume about one-third of the total energy generated in the U.S., where electricity generation is one of the leading sources of carbon dioxide emissions (U.S. Environmental Protection Administration 2009). Energy conservation contributes to environmental sustainability by reducing carbon dioxide emissions. The planned study is concerned with the design and evaluation of an online community called "Velix", which provides users with feedback about their energy consumption and which supports them by providing energy-saving tips. Velix is an information system whose overall goal is promoting environmental sustainability by motivating its users to engage in environmental friendly behavior (i.e., energy conservation) (Melville 2010; Watson 2010). We developed Velix in cooperation with an Austrian utility company. The customers of the utility company receive bonus points in exchange for reading their electricity meter on a weekly basis and entering the information online. Since April 1st 2010, 9,929 customers have joined Velix, and those customers entered more than 217,299 meter readings.

We present a novel approach to investigating whether customers conserve more energy when they have the opportunity to signal their behavior to others in the online community and whether positive social sanctions (e.g., publicly rewarding individuals who reduce their energy consumption) or negative social sanctions (e.g., publicly warning individuals who increase their consumption) cause customers to conserve more energy. Ariely et al. (2010) found that image motivation (or signaling motivation) causes individuals to behave more prosocially in public because of social norms that attach a positive image to prosocial behavior. Griskevicius et al. (2010) has demonstrated that image motivation increases individuals' intention to buy green products rather than conventional ones only when shopping in public. Social sanctions are reactions (or the promise or threat of reactions) by a group indicating its approval or disapproval of a behavior. These sanctions serve to enforce the behavioral standards of the group. Fehr and Fischbacher (2004) argued that opportunities for and acts of punishment generate beliefs that cause group members to cooperate. Our study includes 1400 customers to be studied during a period of six weeks. On the basis of the relevant literature, we hypothesize that customers conserve more energy when their identity and energy consumption are disclosed on Velix and that the display of negative social sanctions causes customers to conserve more energy. Our field experiment will be the first to allow the examination of the effects of online identity disclosure on economically and ecologically relevant real-world behavior, and to allow the comparison of the impacts of positive or/and negative social sanctions.

The next section reviews the literature on identity disclosure in online communities, promoting sustainable behavior in information systems research, image motivation in economics, and social sanctions in social psychology. The third section states our hypothesis. Section four describes our empirical study. Section five presents our conclusions.

Related work

Research on identity disclosure in online communities

We refer to an online community as a voluntary collectivity "whose members share a common interest or experience and who interact with one another primarily over the Internet" (Forman et al. 2008; see Sproull 2003 for a review of online community research). What motivates some users to disclose identity-descriptive information online? Previous research in economics, marketing psychology, and organizational behavior suggests that identity concerns influence behavior (e.g., Tajfel and Turner 1979, Dutton et al. 1994, Akerlof and Kranton 2000, Ma and Agarwal 2007). In the context of online communities, research affirms that identity motives play a role in shaping online behavior (Turkle 1996, Donath 1999, McKenna and Bargh 1999, Ma and Agarwal 2007). Individuals wish to feel connected to others in groups and are looking for self-verifying feedback from them (Jones and Pittman 1982, Swann 1983, Brewer 1991, Baumeister and Leary 1995, Tyler et al. 1996, Hornsey and Jetten 2004). The need that individuals feel to communicate and verify their identity motivates them to disclose identify-descriptive information to others, which may include the way they dress, the way they act, and what they purchase (Swann 1983, Akerlof and Kranton 2000). Research indicates that the online disclosure of identity-descriptive information facilitates the formation of relationships, common bonds, and social attraction, which members of a community value (Ren et al. 2007). If online identity disclosure is driven in part by the desire for identification with a community and self-verifying feedback from other community members, expressions of identity should be aligned with what the community perceives as good: i.e., expression of identify should be consistent with community norms (Forman et al. 2008). Norm conformity involves searching for information about the behaviors of other community members and imitating them. Research suggests that conformity with community norms is strong evidence of motives related to social identity and group referencing behaviors (Postmes et al. 2000, 2005; Sassenberg 2002).

Research on promoting sustainable behavior with information systems

IT enables large-scale customer engagement, providing added value while positively influencing consumption behavior (Oinas-Kukkonen & Harjumaa 2008). Researchers have begun to explore the potential of IT to foster sustainability under the umbrella term "Green IS" (Watson et al. 2008). IT has the potential to promote sustainability within all elements of an organization (Watson et al. 2010). Literature reviews on Green IS have been presented by Molla (2009), Ijab et al. (2010), Bengtsson & Ågerfalk (2010), Melville (2010), and Jenkin et al. (2011). Some Green IS artifacts can be found in the academic literature. For instance, Froehlich et al. (2009) presented "UbiGreen", a mobile tool for tracking and supporting green transportation habits, and Björkskog et al. (2010) developed "Energy Life", a system that uses wireless sensors and mobile and ambient interfaces to promote energy conservation. Similarly, Holmes (2007) presented a public art project that measures energy usage, and Grevet et al. (2010) developed a space for the social visualizations of energy conservation behavior. Finally, Graham et al. (2011) studied the effects of an online intervention on college students' driving behavior. These examples illustrate the opportunities that the combination of technological expertise and socio-psychological theory offers for IS research. From a technological standpoint, the high penetration rate of the Internet (ITU 2010), falling prices for broadband Internet access (ITU 2010), and the rapid diffusion of mobile devices (Pitt et al. 2011) allow ubiquitous information access by organizations and consumers (Watson et al. 2008). From a socio-psychological standpoint, the extensive use of theories from sociology and psychology contributes to our understanding of the social context of IS (Lim et al. 2009; Sidorova et al. 2008)

Research on image motivation

In recent years, several economic theories have evolved that have explained the effects of prosocial motives on behavior (for a review, see Meyer 2006). Prosocial motives are important in motivating conservation behavior (e.g., Van Vugt 2009). Conservation behavior can yield a prosocial reputation (Semmann et al. 2005; Wedekind and Braithwaite 2002), and individuals seem to be sensitive to the reputational aspects of conservation behavior (Bateson et al. 2006). Behavior that signals that one is pro-

environment may help one to foster a positive image of oneself, while behavior that implies being wasteful may create a negative image of a person. A number of economic models state that if individuals are looking for social approval, they should signal behavior that is perceived to be positive according to others' values and norms (e.g., Andreoni and Bernheim 2009; Benabou and Tirole 2006; Ellingsen and Johannesson 2008). Several laboratory experiments found that prosocial motives imply that individuals act more prosocially in public than in private settings (e.g., Andreoni and Petrie 2004; Dana et al. 2006; Rege and Telle 2004). Ariely et al. (2010) used a laboratory experiment to investigate whether increasing the number of observers increases the image value of prosocial behavior and consequentially leads to great effort. The authors found that subjects exert significantly more effort in public, where they are able to signal their effort to others. Griskevicius et al. (2010) used a laboratory experiment to examine how image motives influence subjects' conservation behavior. They found that in their experiment, image motives increased the desire to buy green products instead of conventional ones when they were shopping in public. The findings suggest that while green products do not perform as well as conventional goods, they offer an image-enhancing benefit: green goods enable individuals to appear prosocial rather than pro-self. Soetevent (2005) used a field experiment to examine whether eliminating anonymity affected donation decisions in Dutch churches. Donations to charity were randomly gathered using either collection bags or more open baskets. The use of open baskets, which allowed others to identify donors' contributions, increased donations by 10 percent.

Research on social sanctions

Social sanctions are group reactions (or the promise or threat of group reactions) that indicate approval or disapproval of a behavior and that help to accomplish the behavioral standards of the group. Rege and Telle (2004) investigated how social approval affects cooperation in public good games. They showed that identity revelation helps to increase voluntary contributions. The authors argued, however, that this policy might also work in the opposite direction. If social approval incentives are conditional and if the share of subjects adhering to social norms is low, then revealing each subject's identity and contribution may decrease voluntary contributions. Laboratory studies on public good games (e.g., Fehr and Gächter 2002) have indicated that the addition of sanctioning opportunities increases cooperation. Fehr and Fischbacher (2004) argued that punishment opportunities and associated punishment acts generate beliefs that cause group members to cooperate. Bénabou and Tirole (2006) developed an economic theory of prosocial behavior that combines individual altruism and greed with concerns regarding social image and self-respect. The theory states that public rewards or punishments (whether image-related or material) create doubt about the true motives for prosocial behavior and that prosocial behavior may be crowded out by extrinsic incentives. Even in private situations, individuals may act in a manner that is consistent with internalized social norms because, otherwise, they will suffer from guilt, shame, or fear. Internalized social norms result from social sanctions meted out in response to the violation of these norms (Trivers 1971). Even the suspicion that others dislike an individual's behavior can induce compliance (Loewenstein 2000). Economists have recognized the importance of self-identity for behavior (Akerlof and Kranton 2000). Individuals not only care about their image in the eyes of others but also care about their self-image. They engage in prosocial behavior to self-signal positive traits. Bodner and Prelec (2003) and Bénabou and Tirole (2004) presented economic models in which self-identity was essential to explaining prosocial behavior. According to these models, individuals are not necessarily concerned about the outcome of prosocial behavior per se; they care about how prosocial behavior affects their self-identity.

Hypothesis

The present study aggregates the literature on identity disclosure in online communities, sustainable behavior in information systems research, image motivation economics and social sanctions in social psychology. Our main conjecture is that individuals differ in their propensity to signal their behavior and respond to social sanctions. Previous research has emphasized the role of identity disclosure. For example, Forman et al. (2008) suggested in the context of online communities that consumers use reviewer disclosure to supplement or even replace product information when making buying decisions and online reviews on Amazon. Our main conjectures are that customers conserve more energy when

their identity and energy consumption are disclosed on Velix and that the display of negative social sanctions causes customers to conserve more energy.

H1: *Customers conserve more energy when their identity and conservation behavior is disclosed in the online community.*

Ariely et al. (2010) stated that individuals put more effort in behavior that is perceived as "good" based on the community's norms. The prospect theory refers to individuals' tendency to strongly prefer avoiding losses to acquiring gains (Kahneman and Tversky 1979). Based on the prospect and the visibility of individuals' action in online communities, we hypnotize that displaying negative social sanctions causes individuals to conserve more energy than displaying positive social sanctions.

H2: *The public display of negative social sanctions within the online community causes customers to conserve more energy than the display of positive sanctions.*

Empirical study

Technological platform

We developed an energy efficiency website called Velix in cooperation with an Austrian utility company to provide the company's customers with feedback on their electricity consumption and to support them by presenting them with energy-saving tips. The website serves as the basis for an energy-saving campaign for the company and is available to all household customers, who can easily register online. To promote the website, the utility company informed its customers via its customer magazine and collaborated with a local media corporation that placed ads in newspapers and the news website. Velix combines energy record-keeping with game-like tasks. Customers receive bonus points that encourage them to read their electricity meter on a weekly basis and enter the readings online. The meter readings are checked for plausibility using an algorithm the utility employs to prevent incorrect data input in self-reading processes used for billing. Once the second meter reading has been entered, Velix calculates the corresponding energy consumption figures and provides each user with feedback intended to stimulate energy conservation (see Figure 1). Since April 1st 2010, 9,929 customers have joined Velix, and they entered more than 217,299 meter readings. The website has about 500 visitors per day. The average time spent on Velix is about 5.5 minutes. To assure the reliability of the meter readings, we used multiple strategies. First, we instructed participants regarding where to find and how to read the electricity meter. Then, we implemented algorithms intended to verify the validity of the meter readings. For example, if a participant had entered a negative value or a meter reading lower than the previous one, he or she would receive an error notification. Additionally, we determined the validity of the self-reported data for a subset of customers. Finally, we compared the yearly energy consumption figures for 2010 and 2011. It was expected that the resulting correlation would confirm the validity of the self-reported data.

We created Velix for two reasons. First, we wanted to motivate a large number of users to engage in energy conservation by providing them with feedback on their consumption behavior. Second, we intended to experimentally assess which socio-psychological concepts (e.g., social norms) are best suited to promote residential energy conservation. Velix has allowed us to evaluate these concepts by conducting experiments with a large number of users in a real-world setting. Every new user is automatically assigned to an experiment after registration. On the basis of the assignment, Velix then provides the participant with a different type of feedback based on a specific socio-psychological concept.

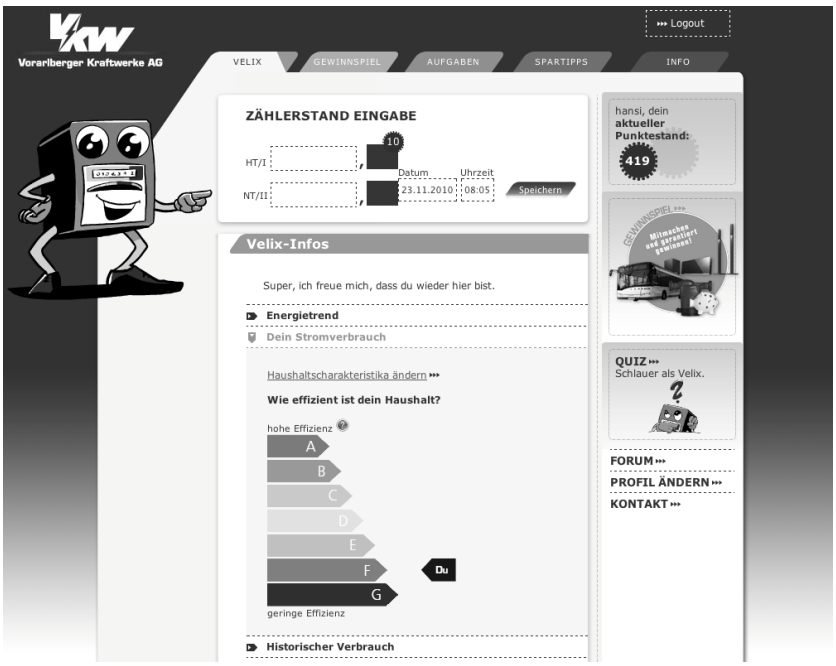

Figure 2: Data entry and energy consumption reports provided by Velix

Methodology

The experiment will include 1400 or more customers of a Austrian utility company and will start on September 1st, 2010. Figure 3 summarizes the experimental design. We will first conduct a survey in which we ask all customers to state their socio-demographic data. At the same time, we will measure all customers' baseline energy consumption. The baseline energy consumption will be determined using the meter readings obtained during the first two weeks of the study. Then, all customers will receive instructions regarding how to reduce their energy consumption. Next, customers will be randomly assigned to the public condition, private condition, or control group. In the public condition, energy use and sanctions will be visible to all group members, whereas in the private condition, they will only be visible to the individual subject. Within the private and public condition, customers will then be randomly assigned to one of three treatment groups, with 200 customers in each. The customers in the first group will be rewarded for decreasing their energy consumption (positive sanctions). The customers in the second group will be punished for increasing their energy consumption (negative sanctions). The third group will receive both positive and negative sanctions. The control group consists of 200 customers. The customers in the control group will receive no feedback detailing social sanctions. We will consequentially measure changes in customers' energy consumption. A detailed description of how we will provide feedback detailing customers' online identities and social sanctions can be found in the next subsection.

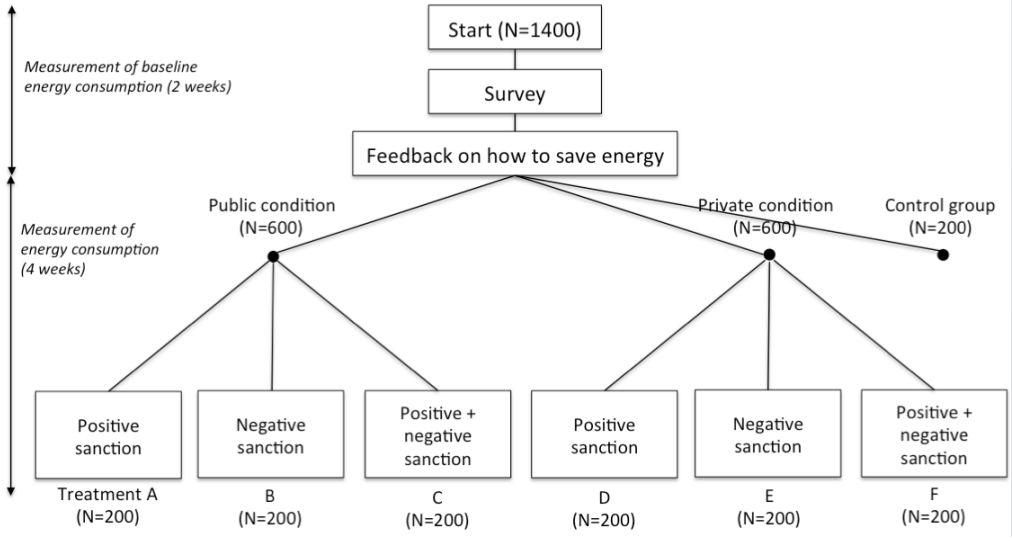

Figure 3: Experimental design

To assure the reliability of the meter readings, we will apply multiple strategies. First, we instruct customers on where to find and how to read the electricity meter. Second, we implement algorithms used to verify the validity of the meter readings. For example, if a subject enters a negative value or a meter reading that is lower than the previous one, he or she will receive an error notification. Additionally, we determine the validity of the self-reported data for a subset of customers. We will also compare the yearly energy consumption figures for 2010 and 2011. The resulting correlation should confirm the validity of the self-reported data.

Implementation of feedback detailing social sanctions

The following section presents a description of how we will use the feedback detailing the social sanctions to which consumers may be subject depending on their behavior. All customers receive feedback about how to reduce their energy consumption. Then, all customers are asked to join the "league of energy savers". Customers can only be members of the league as long as they do not increase the current week's energy consumption compared to last week's energy consumption. If they increase their consumption, they are excluded from the league. Once they are excluded from the league, they will not be able to become a member again. To account for the seasonal variation in residential energy consumption, we consider the customers' consumption relative to the average consumption of the other customers. In the public condition, the feedback begins with an introduction screen that explains that the customers are allowed to join the league of energy savers and asks if they want to join. Next, the customers in treatment group A receive feedback showing a list of members and their recent activities; this list highlights those members allowed to join the league as a reward for reducing their energy consumption. Customers in treatment group B are provided with feedback showing a list of members and their recent activities; this list highlights members excluded from the league as a punishment for increasing their consumption. Group C receives feedback that displays both positive and negative social sanctions (see Figure 4). In the private condition, the feedback process beings with the introduction screen. The customers in treatment group D (positive sanctions) receive feedback indicating that they have been allowed the join the league as a reward for reducing their energy consumption. Customers in treatment group E (negative sanctions) are provided with feedback stating that they have been excluded from the league as a punishment for re-increasing their energy consumption. Finally the customers in treatment group F receive feedback on either positive or negative sanctions as applicable.

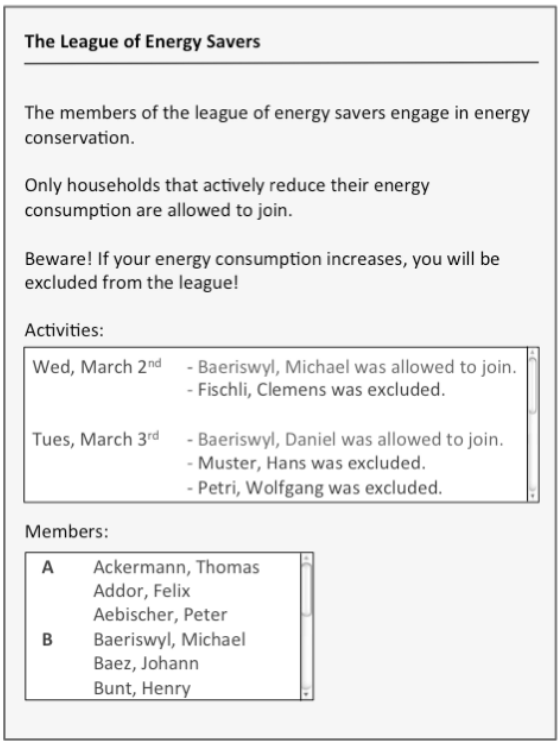

Figure 4: Social sanctions screen

Potential Contributions

Our study may make four potential contributions. First, our findings will contribute to our understanding of the impacts of online communities on real-world behavior. Second, our study may contribute to research on information systems that support environmental sustainability. Third, our experiment investigates a new method of promoting residential energy conservation and helping to foster a clean environment. Our findings may help practitioners in the field of energy conservation intervention to develop more user-oriented and effective modes of intervention. Websites like Velix have the potential to help mitigate climate change because they can address a larger numbers of individuals more effectively than can conventional energy conservation campaigns. Our study will also highlight the importance of carefully examining small details of design and implementation that may have substantial effects on user behavior. Finally, our study will contribute to the literature on online communities and the emerging research stream of Green IS.

Conclusion

In the presented study, we will examine the design and evaluation of an online community called Velix, which provides customers with feedback about their energy consumption and supports them by providing energy-saving tips. This paper presents a novel approach to investigating what influence online identity disclosure and sanctions in online communities have on economically and ecologically relevant behavior, more specifically, energy conservation.

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