Sharing in Social Networks: How Signalling Increases Product Appeal

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This research focuses on the practical challenge of marketing a product that can hardly be distinguished from others. We investigate how a digital social product feature, that enables consumers to share their product and service choices within a social network, enhances the demand for a product on the example of green electricity. Electronic word of mouth and viral marketing can serve as a signal to friends and family, e.g., about an individual’s willingness and ability to pay a premium, early adoption or a specific style.

Two online experiments with 780 participants were used to obtain a rich and unique data set that incorporates an external change in demand. The authors can show that the implementation of an online social feature enhances product attractiveness and actively stimulates consumption through the attraction of the feature. By isolating this effect and comparing it to the influence of price and traditional signalling, this research highlights how innovative product design can influence the attractiveness of products and subsequent demand through establishing the opportunity to publicly demonstrate product choice within social networks. Findings imply that the opportunity to easily show product usage online does not only benefit the manufacturer in means of higher product awareness due to online word of mouth, but becomes an important driver of consumer choice.

1. Introduction

As a result of the trend toward online expressions of opinion, firms are now able to create electronic word-of-mouth (eWOM) messages to stimulate peer influence and social contagion via social networks (Hennig-Thurau/Gwinner/Walsh/Gremler 2004; Van der Lans/Van Bruggen/Eliasashberg/Wierenga 2010). The most recent form of this trend, viral marketing, characterizes the activity of consumers who reciprocally and widely broadcast information that was initially created by marketing managers. The term “viral” reflects the common basis of these messages and conveys the notion of an infectious disease: such messages are often unbidden and effortlessly transmitted to other people (De Bruyn/Lilien 2008; Watts 2007). The process of developing goods in a manner that increases the likelihood that such products will be shared among individuals (namely, by offering a social product feature that enables individuals to easily communicate information regarding a product or its purchase) is known as viral product design. Recent research highlights the importance of viral features for peer-to-peer promotion; viral product design can be up to 10 times more effective in heightening product adoption than banner advertisements and twice as effective as e-mail campaigns as a result of the high number of people who may learn about a product (Aral/Walker 2010).

However, increased awareness is not the only interesting factor with regard to the implementation of viral product features that enable consumers to share usage or experience. By being able to communicate product or service usage, the individual receives another possibility to share his personality and choice with others. With the recently established frictionless sharing, Facebook allows companies such as music streaming services or newspapers to offer their services directly within the social network. By using these services, users let their friends know which articles they read or which song they listen to at this moment. Hence, in addition to the benefit that companies can obtain from the social features that are embedded in virally designed products and enable consumers to communicate to their peers about such products, consumers may personally benefit from products whose usage can be communicated, when sharing is voluntarily.

Through their inconspicuous way to enable conspicuous consumption, social features can therefore help companies to spread product awareness but may also increase the evaluation of the product per se to prospective buyers. Therefore the opportunity to communicate the usage

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or purchase of a product or service online should increase the appeal of such a product or service for consumers, even if it is generic, and it needs to be researched whether this opportunity can provide additional benefits for consumers as well as companies.

It is well known that individuals purchase certain products not only for the purpose of using them, but for various other reasons. The reasons for publicly communicating a product choice can include desires to raise esteem within a peer group, to create a positive effect on a person’s social identity due to the appealing nature of a product, and to assist others by informing them of purchase opportunities. By buying products and informing other people of such acquisitions, individuals are able to exhibit their beliefs and status and therefore raise their esteem within their peer groups because the conspicuous consumption of goods can demonstrate financial strength, status and style (Veblen 1899/1979; Westbrook 1987). A positive benefit for an individual’s social identity can be caused by the early sharing of product knowledge or product usage. For example, the status of being an early adaptor or showing especially elaborate style and taste, which can be demonstrated by sharing, can benefit a consumer through the esteem that his peers confer upon him (Grewal/Cline/Davies 2003). Such advances are achievable only when consumption is communicated publicly. In addition to social acceptance and recognition and distinction, the opportunity to share experiences and assist others (e.g., by communicating an opportunity to receive a discount) is appealing.

In contrast to traditional WOM, which was often limited to exceptionally interesting information pertaining to goods, the vast amount of viral marketing that occurs in online social networks is based on extensive communication regarding everyday products which are often bought online. As a result of informal and easy online sharing methods and the broad audience who may be interested in such methods, viral content pertaining to products such as coupon availability, promotions or games has become omnipresent in social networks for the establishment of product awareness. Therefore, it appears that not only do marketers benefit from the increased attention that viral marketing generates for their products, but that especially consumers themselves appreciate sharing opportunities. Because of the increased interest in sharing product consumption online and the influence of viral product design on marketing success, the incorporation of a social feature that enables consumers to share experiences online can be a product attribute that could distinguish a product from its competition. Furthermore, enabling consumers to easily communicate their product choices by incorporating social features offers enhancement opportunities for companies that can generate a higher market demand through social contagion (Langley/Bijmolt/Ortt/Pals 2012).

In this research, we show that a social attribute that enables consumers to exhibit their product usage online benefits preferences for a (green) product (in addition to the effect of heightened attention) and that this added social feature stimulates consumer choices more than an offline feature would. We therefore show that there is a benefit of viral product design not only for companies that use the viral spread of information to raise product attention and make their products more unique, but for single consumers that enjoy signalling their choice. To conduct our research, we designed an online experiment to determine whether the opportunity to share usage increases the appeal of a product. Our online experiment uses the example of (green) electricity and we analyse how the dependent behavioural intention towards green electricity (in comparison to conventional electricity) changes when the opportunity to signal choice arises. For most consumers, electricity is a product of rather low interest and complexity (Von Wangenheim/Bayón 2007). Green electricity is produced from solar, wind, geothermal, biogas, biomass, and low-impact small hydroelectric sources. Customers often buy green power plants to contribute to reducing greenhouse gases. We show that a social product feature that enables consumers to communicate product choice can increase preferences for green electricity. In fact, we can include a situation in which the same product becomes more interesting to participating individuals as a result of an exogenous reason (namely, the catastrophe in Fukushima in March 2011, which led to a heightened awareness regarding nuclear power and a vast increase in demand for green electricity). Our first contribution to the literature is therefore that consumers perceive the opportunity to share product consumption as an added benefit and that the presence of this opportunity enhances individual preferences for a product. Second, we demonstrate that individuals react more strongly to the online sharing opportunities than to offline sharing opportunities. Third, we can monitor that consumers who relate to the product and whose personal opinions are represented by choosing it are more likely to benefit from the possibility to signal product choice. Fourth, we provide additional insight by demonstrating that when the overall demand for the product rises, the additional benefit of the social product feature is slightly reduced but remains positive and important.

Focusing on the study object green electricity, this research shows how innovative product design could be used to aid environmental sustainability. Furthermore, the implementation of a social feature can help practitioners in general to market products that are rarely distinguishable from others, by adding a social dimension.

The following section describes the theoretical background and hypotheses development. Subsequently, we describe two experiments that are designed to explore the influence of social product features before and after the nuclear accident at Fukushima. We then model the choice situation to test our hypotheses. We conclude with a discussion of the results and highlight some managerial and practical implications as well as directions for future research.
2. Theoretical Background

Product communication within social networks is determined by several factors. The depiction of character and style in an online community is an appearance that can be managed by a consumer himself. We explain (costly) signalling as the theoretical reasoning for this behaviour. We then examine the research pertaining to electronic word of mouth and viral marketing to explain the necessity of further research in this area. Subsequently, we examine the possible influence of the opportunity to communicate product choices on consumer preferences that affects both consumers and companies.

2.1. Conspicuous Consumption and (Costly) Signalling Theory

Conspicuous consumption was first identified and described by Veblen and can be defined as buying and exhibiting precious items with the primary intent to show other people that one possesses wealth and status (Veblen 1899/1979). Products are not always purchased to merely satisfy an inherent need; rather, product purchases are also used to depict the character and behaviour of their users (Berger/Heath 2008; Richins 1994; Solomon 1983). Typical indicators of conspicuous consumption include using luxury goods for fulfilling social expectations for status or prestige (Sundie/Kenrick/Griskevicius/Tybur/Nohs/Beal 2010).

The concept of signalling theory refines this observation. Individuals can briefly exchange information regarding their status and fitness by the mere demonstration of possessions. For example, individuals may use expensive cars or real estate to demonstrate their capability of sustaining an expensive lifestyle (Berger/Heath 2007). As a result of social and environmental changes, the conspicuous consumption of luxury goods is often replaced by the consumption of eco-friendly, green products to signal distinction (Horton 2004). Research shows that green product purchases can signal to others that a buyer is willing to and capable of both financially and materially sustaining the prices of pro-social or pro-environmental products. Luxury goods typically offer high-class product features to meet the expectations of buyers, whereas eco-friendly products often require sacrifices in terms of usability or price. By choosing an eco-friendly product rather than a conventional product, an individual can demonstrate his environmental concern and willingness to act on this concern. Eco-friendly behaviour can furthermore be motivated by a real interest in preserving nature or by economic reasons, such as the long-term desire to conserve fuel (Cone/Hayes 1980; Dietz 2003). Costly signalling theory argues that this voluntary sacrifice can function to create and retain a pro-social reputation (Miller 2000; Zahavi 1975), which is a status that is considered to contribute to one’s social standing within a group (Dreber/Rand/Fudenberg/Nowak 2008; Hinz/Spaan/Hann 2010) and is often triggered by the visibility of the chosen product (Milinski/Semmann/Krambeck/Markotzke 2006). As indicated by the word “costly,” a favourable reputation is associated with a certain price. By buying an eco-friendly product, an individual sends a signal that he is pro-social, is interested in the well-being of others, can afford to spend a substantial amount of money and can cope with a potentially inferior product that may be compensated in terms of personal costs (Griskevicius/Tybur/Van den Berg 2010). For example, the Prius, a hybrid car with significantly higher fuel economy than competing cars in its class, may require consumers to reduce their expectations in some ways (e.g., regarding design or price). Nevertheless, the Prius has recently been proven to signal prestige and exclusivity through the knowledge that other people derive regarding the intentions of its owner from the distinguished design (Sexton/Sexton 2011). Such signals can thus create interesting opportunities for marketing eco-friendly products. Our first hypothesis tests, therefore, whether the possibility to signal product choice enhances the likelihood of a product to be chosen:

H1: A social feature that enables consumers to signal product choice heightens the attractiveness of a green product.

2.2. (Electronic) Word-of-Mouth and Viral Marketing

For signalling to have an important influence on the preference for goods, there must be an audience to receive these signals. The preceding explanations focus on the underlying reasons for an individual to publicly communicate product choices. We next focus on the downstream consequences of these ideas, beginning with the manner in which consumers choose to communicate publicly.

Social networks and opportunities for online social interaction have become an important topic within marketing and information systems management. In particular, the potential for enhancing product and service communication using eWOM is a research subject that has gained a significant amount of attention in recent years due to the cost-effective means of product communication and the vast influence that WOM behaviour can have on business success (e.g., Dellarocas 2003; Godes/Mayzlin 2004; Godes/Mayzlin 2009; Hinz/Skiera/Barron/Becker 2011; Libal/Bolton/Bugel/De Ruiter/Gotz/Risselada/Stephen 2010; Zhang/Agarwal/Lucas 2011; Trousov/Bucklin/Pauwels 2009). While classic WOM primarily benefits from close connections between emitters and receivers, viral marketing and its use to create social contagion are based on the wide broadcasting of information (Aral/Walker 2011; Arndt 1967). However, even in the online world, personal characteristics continue to be relevant; the position and social standing of an emitting person is important for eWOM success. Individuals with real sociometric opinion leadership tend to adopt new products early (Schreier/Prigtl 2008), but regarding contagion, influence is typically driven by a large mass of easily influ-
enced individuals rather than a few “special” individuals (Iyengar/Van den Bulle/Valente 2011; Katona/Zubicek/Sarvary 2011; Van den Bulle/Joshi 2007). On a consumer level however, virtual communities serve as reference groups, and consumer opinions are important sources of information. Hence, the act of sharing product usage online is an interesting tool for personalized product communication (Van Valk/Van Bruggen/Wierenga 2009). We therefore propose that consumers who relate to the product and whose personal opinions are represented by choosing it are more likely to benefit from the possibility to signal product choice.

**H2: The more a consumer’s lifestyle is represented by a product, the more attractive the possibility to signal product choice becomes.**

Thus far, most research has focused on the optimal strategies for receiving a substantial amount of viral word-of-mouth communication to enhance awareness and sales. However, the influence of sharing opportunities on consumers purchased choices has not yet been researched (Bampo/Ewing/Mather/Stewart/Wallace 2008; Chen/Xie 2008; Kozinetz/Vulck/Wojnicki/Wilner 2010; Zhu/Zhang 2010).

The desire to share this type of information online is closely connected to signalling theory. Signalling credible information of high quality heights online purchase intentions (Wells/Valacich/Hess 2011). For a consumer, communicating online as an emitter both enhances his self-worth and reputation and he becomes more central within his network (Hennig-Thurau et al. 2004). In addition to the differences between traditional and electronic WOM regarding the proximity of emitters and recipients, the main object of the communicated information differs. Traditional WOM typically addresses only special goods or services (e.g., the experience of buying a specific car or staying at a certain hotel) that are interesting and publicly visible (Berger/Schwarz 2011). Such topics are often included in regular conversations between friends or family, and the vivid re-narration and sharing of such experiences are important components of social life. The primary motives for traditional WOM are high product involvement and altruism (Sundaram/Mitra/Webster 1998).

In contrast, eWOM, especially viral eWOM, includes products and services that are not typically included in daily conversations but are often consumed privately. Therefore, the motives for providing eWOM differ from those motivating traditional WOM (Hennig-Thurau/Malthouse/Friege/Gensler/Lobschat/Rangaswamy/Skiera 2010). First, consumers who provide eWOM often desire economic incentives and social interaction, and such desires explain the popularity of sharing with and suggesting experiences for others. For example, consumers often suggest products or services online to get a discount on their own purchase. Second, concern for others, which is manifested in a “sharing is caring” approach, is an important motivator for eWOM, which is usually facilitated by the ease of use and the high number of peers within social networks. For example, consumers often display coupons online to ensure that other people can also use these coupons. Third, the potential to enhance self-worth by signalling product usage or opinion (e.g., by the extraverted sharing of a current location in a highly priced restaurant) is an important motive for eWOM, especially in view of the finding that individuals in social networks are attempting to establish a certain image (Brown/Brodieck/Lee 2007). Consumers value their ability to post content online, and the responsive participation of other consumers in the content that they have posted (Awad/Ragowsky 2008). Especially niche products are topics that are discussed by consumers online, which is one of the reasons why peer-based recommendations within electronic commerce may lead to a long tail of demand (Dellurocas/Gao/Narayan 2010; Ostreicher-Singer/Sundararajan 2012). Therefore, enabling consumers to use eWOM by incorporating a social feature offers enhancement opportunities for products whose usage was previously often not publicly shared. When consumers are able to communicate product usage, a two-sided effect should occur; in addition to the already proven contagion effect and the spread of information as a consequence of viral marketing efforts, a product should become eminently more attractive for consumers as a result of its signalling capability.

Social media enables the easy sharing of information and experience, and eWOM is often motivated by desires to enhance a person’s self-image; such desires have caused the public display of consumption of products to become a prominent topic in social networks in recent years. With regard to technical advantages, such as product features that require a certain interest in technology (e.g., social media), research suggests that this type of product can directly benefit from added features (Mukherjee/Hoyer 2001). Thus, designing a product feature that enables consumers to communicate their product choices online creates opportunities to contribute to consumer evaluations of products. In addition to financial incentives, such as gift certificate rewards, the opportunity to enhance self-worth and social status or to attract the interest of others particularly motivates individuals to share product usage and information regarding companies. For example, a consumer can show that he cares for others by sharing coupons or special offers in his social network, even when such purchases are intended to benefit oneself. As viral marketing opportunities enable companies to reach consumers easily and spread information widely, especially the higher number of addresses makes online social networks an interesting choice when it comes to articulating opinions and product usage. As a consequence, the ability to share product usage as facilitated by the implementation of a social feature online should benefit consumers by providing them with opportunities to signal information regarding products and thus share information about themselves directly to their social network. We therefore propose:
H3: The possibility to share product usage in a social network online is more highly valued than the possibility to signal product choice in a more traditional setting.

3. Method

We conduct an experiment with two data collection phases to explore the influence of a social product feature on consumer preferences. To investigate this potential influence, we needed a product that was often bought online, basically interesting to many consumers and high in status-signalling potential. We chose (green) electricity, because similar to other products, such as online news pages or music streaming services that frequently contain a social feature to signal usage on Facebook, electricity providers can easily be substituted (at least in the country where the experiment took place) but electricity does not suffer from the fact that participants need to process complex style choices or are not in need of the product at all.

In our experiment, we examine the effect of a social product feature that enables the signalling of the choice of green electricity within a frequently used social networking site. We test whether the addition of this feature makes this product a more likely choice and determine how strongly this effect influences consumer preferences. Obviously, consumers are not interested in demonstrating consuming conventional electricity, as most people do so. Furthermore, depicting a nuclear symbol or similar would alienate participants from choosing conventional electricity and bias the data, which is why we only offer the feature for green electricity. Hence, the approach is designed as it would be the case in reality. We then broaden our dataset by including a changed social setting in which green electricity has become a product of greater demand following an external intervention to generate findings that capture a broader range of interest and demand. Specifically, we can capture the increased interest regarding the product in the data and trace the changes in response behaviour that are caused by the change of interest in the topic and by the demand of the product due to the atomic catastrophe at Fukushima. Therefore, we can show that offering a social product feature increases the awareness of a product and demonstrate that offering the opportunity to share product usage can also benefit products that are already high in demand.

3.1. Green Electricity

Electricity is a generic product, and product experiences for customers differ primarily according to price (Von Wangenheim/Bayón 2007). In many countries, for example Germany, where the experiment took place, markets are liberalized, and consumers can decide from which provider to purchase their electricity. Also from an international perspective, the number of energy suppliers that provide green power programs and thus can supply green electricity without switching providers has grown steadily and switching providers more frequently is likely to increase over time in many countries as markets mature (Bird/Wuestenhagen/Aabakken 2002). The rates are typically composed of a basic service charge and a certain price/kWh. Consumers usually pay higher prices for consuming electricity that is obtained from eco-friendly sources, such as solar power, wind farms or hydro-electric power plants. Providers label their electricity as “green” when such electricity is primarily produced by non-nuclear, sustainable technologies, and its price contributes to a continuous development of these technologies. As this product can neither be touched nor seen by others and does not affect the performance of household appliances, the choice of green energy is a personal-ethic decision that is typically made in private and is yet not typically communicated widely in consumer social networks. However, it is a product with the potential to signal the attention and financial premium that consumers pay and could therefore benefit from a feature that enables signalling.

We began our investigation during the first weeks of February 2011. After we completed our experiment and began to analyse the data, an accident occurred and caused changes in the interest and demand for green electricity. The nuclear plant in Fukushima suffered severe damage, and the possible consequences dominated newspaper headlines for weeks in Germany, where our experiment was conducted. In contrast with other countries, German public opinion caused changes in the future arrangement of its power supply and the government decided to pursue a complete nuclear phase-out by 2022. In response to this atomic accident, many residents switched to green electricity providers, and the demand for green electricity increased by up to 700 % (Hottelet 2011). Therefore, in contrast with the participants in the first data collection phase, the participants in the second phase (following Fukushima) were more interested in green electricity due to the predominant issue of governmental and personal changes in electricity sources and the discussion in society regarding whether the sudden aversion from nuclear power was logical. Many German Facebook users opted to demonstrate their opinions with a manifestation similar to our social product feature to state their views on Facebook, as shown in Fig. 1. Therefore, we assumed that consumers would be more interested in the product and that the preference for the product would be higher, we repeated the data collection to capture the differences and provide insights into the use of a social feature regarding a product whose demand was higher.

3.2. Sample

In the first data collection phase, 389 persons participated in the first data collection phase compared with 391 participants in the second phase. We attracted participants by offering the opportunity to win three prizes of
50 €. Freshman students were contacted by email at their university address. To provide a more diverse sample, we also addressed participants in a social career network. When searching for participants after the incident at Fukushima, we again used email to contact students and ensured that only individuals who had not previously received an invitation obtained this new invitation by solely contacting new freshman and using a different homepage domain. We sent invitations via the same online career network as used previously; to exclude memorization effects; we ensured that none of the former participants would receive invitations. Only participants who stated that they used Facebook were included in this experiment, in the end, 271 students and 526 non-students participated.

3.3. Stimuli

Electricity contracts are often concluded online (Eisenblätter 2011); thus, an online experiment seemed appropriate for this experiment. We designed two different treatments to be able to contrast online and offline signalling. We created a social feature, which can be described as a new opportunity to signal product choices to others. The button, as depicted in Fig. 2, was a feature that consumers could link to their Facebook profiles and display on their profile pictures and that could enable them to communicate an update in the network newsfeed to indicate that they had chosen to purchase green electricity. The button is social because it communicates this message to other users in the social network, and it is viral because this communication occurs in view of numerous Facebook friends who can then also choose to participate.

To be able to compare the offline feature with an online signalling opportunity and show that the possibility to signal within social networks is higher appreciated than traditional techniques, we designed a sticker, which is depicted in Fig. 3, as an offline social feature that could be placed on the mailbox or front door. Many suppliers of green electricity offer similar stickers to their customers.

3.4. Design

These features were components of the choice setting in which participants selected their electricity bundles of choice. An overview of the presented attributes is presented in Fig. 4.

We chose four different electricity types (2 green types and 2 conventional types) and four different prices (which were presented as basic rates and calculated for a typical two-person home). The potential status-signalling product (i.e., green electricity) was combined with no additional feature, sticker, button, or sticker and button together.
Therefore, in the different choice sets, each of the energy products were designed like this: each type of electricity was randomly assigned to every kind of price (to account for the effects of differences in pricing), green electricity was randomly assigned each type of feature (none, button, sticker, button and sticker), and conventional electricity was assigned to no signalling feature. The allocation therefore replicated how companies would assign the features; the attraction of the feature was subject to the potentially signalling-worthy choice. Each participant received 10 randomized sets of 3 different energy products he had to choose from. Unbalanced or dominated sets (either in terms of types of electricity, price or types of added features) were removed. In this context, each of the 10 choice situations was similar to the design of a common internet form for electricity supply. An example is depicted in Fig. 5.

The participants completed the experiment online during the first weeks of February 2011 and in May 2011. Fig. 6 shows the structure of the experimental process. After answering two general questions regarding their knowl-
edge of the opportunity to change their electricity provider and whether they currently used conventional or green electricity, the participants were shown the sticker and received an explanation of how the sticker enabled them to demonstrate their usage of green electricity. We openly asked their opinion about the sticker. Then we did the same with the button. We then explained the procedures of the following choice task to all of the participants: they would view 10 sets with three different energy products and subsequently indicate their preference.

As socially desirable response tendencies can present problems in survey research, especially with regard to ethical questions (Steenkamp/De Jong/Baumgartner 2010), we included a scale that was capable of measuring both self-deception and impression management to exclude participants who answered dishonestly. The scale was a further development of the Balanced Inventory of Desirable Responding (Paulhus 1984) and was reliable for both self-deception ($\alpha = .60$) and impression management ($\alpha = .55$), (Winkler/Kroh/Spiess 2006). The respondents rated themselves on six 5-point scales. Examples of the items on the scales include “I am always honest with others” and “I have occasionally taken advantage of someone.” Half of the items were reversely coded. Finally, the participants indicated their gender, age, income and educational level. Seventeen participants whose participation was regarded as implausible due to their high rates of socially desirable responses were eliminated in advance and are not included in the data presented.

3.5. Measures and Model

The dependent measure therefore is the choice or non-choice of a specific energy product. The social feature variables, such as the sticker, the button and the combination of both, are binary and indicate whether the added feature was presented in the bundle. These variables (Sticker, Button, Sticker&Button) are coded as 1 if the specified feature was present and 0 otherwise, the term Sticker&Button is not an interaction term, but specifically coded as given in the data.

Price

The effect of the different prices on choice is estimated relative to the reference price of 50.75€. Therefore, the remaining three prices are included as dummy variables in the model. We clearly expect consumers to avoid higher prices. In reality, green electricity is often more expensive than conventional electricity. However, some suppliers manage to deliver at a competitive price and we need to establish how important the price becomes for the decision, as higher pricing is often named as the reasons why consumers do not change providers. Furthermore, allowing prices to build a trade-off between the product in the choice set leads to more realistic results and allows us to compare the differences in price to the importance of other variables.

Ecological Lifestyle Index

To assess the attitudes of the participants toward green consumption and test our second hypothesis, the questionnaire asked the participants to rate their environmental concerns and behaviour on nine 5-point scales. This scale was obtained from one of the country’s largest mar-
Heightened Demand

To identify the differences resulting from the heightened interest and demand regarding green electricity (HD) that was caused by the discussion of the external shock and the nuclear energy topic in the media, we pooled the data and captured the differences in terms of interactions with an HD dummy variable that is coded as 0 before Fukushima and 1 after the event. We clearly expect the higher demand to be reflected in the choice data. We observe the interaction of this heightened demand variable with the different features to account for the change in the importance of the features that was caused by Fukushima and the consequent increase in interest and preferences. To account for the change in demand and monitor its effect on the importance of the social features, we interact the HD variable with the social features in the model as Sticker x HD, Button x HD and Sticker&Button x HD.

Furthermore, we account for past behaviour by incorporating the current energy choice of the participants. Therefore, we include the GreenEnergyUser variable as a dummy in the model (1 = green electricity customer, 0 = else).

We specify the model with the dependent binary variable of electricity choice (1 = decision for green energy product, 0 = else) as:

\[ P(\text{Green Electricity} = 1) = \frac{1}{1 + e^{-z_i}} \]

\[ z_i = \beta_0 + \beta_1 \text{Sticker} + \beta_2 \text{Button} + \beta_3 \text{Sticker&Button}, \]
\[ + \beta_4 \text{Price}_{500.23} + \beta_5 \text{Price}_{50.10} + \beta_6 \text{Price}_{46.25}, \]
\[ + \beta_7 \text{ELI}, + \beta_8 \text{Sticker} \times \text{ELI}, + \beta_9 \text{Button} \times \text{ELI}, + \beta_{10} \text{Sticker&Button} \times \text{ELI}, \]
\[ + \beta_{11} \text{HD}, + \beta_{12} \text{Sticker} \times \text{HD}, + \beta_{13} \text{Button} \times \text{HD}, + \beta_{14} \text{Sticker&Button} \times \text{HD}, \]
\[ + \beta_{15} \text{Green Energy User}, + e_i \]

4. Results

4.1. Descriptive Analyses

In the first sample, 50.8 % of the participants were male. The average age was 29.4 years. Although we acquired two very similar samples according to sociodemographics, with 49.2 % of the participants in the second data set being male with an average age of 30.3 years, as shown in Tab. 1, there was one major difference between the two groups: 23.1 % of the pre-Fukushima participants used green electricity in their households compared with 32.0 % of the participants in the data collection phase following the accident. This result again indicates the heightened personal interest and demand for green electricity in the second data collection phase (χ² (1) = 7.620, p < .01). We clustered the open questions regarding the participant opinions of the social features. The results showed that on average 50.1 % of the participants directly referred to the button as a signalling or a product feature, whereas 60.4 % made such references for the sticker. Overall, the feedback for both social product features was more positive in the second phase (after the accident that increased interest) than in the first data collection phase, and criticism of the social attributes as mechanisms to brag was especially scarce.

With two data collection phases, we got two data subsets that were very similar to each other regarding structure and age. As a consequence of the incident, the percentage of green electricity users was higher in the second phase, which represents the change that occurred in demand. Tab. 1 provides an overview of the pre- and post-Fukushima samples, their main characteristics and an amplified display of the clustered answers to the open questions.

As demonstrated by the clustered open questions, the participants interpreted the social feature correctly and understood its meaning and use. The participants did not demonstrate any significant preference for a specific energy type within the two groups of conventional or green electricity (e.g., they were not concerned with whether the percentage of solar power was higher than the percentage of wind power, and there were no differences between the mixes of coal and nuclear power). Therefore, we chose to interpret the data as representing decisions for or against green electricity.

4.2. Choice Analyses

We estimated the parameters using a binary logistic regression. The odds are used to determine the strength of the influence. In this context, the odds are defined as the ratio of the probability of choosing green electricity over the probability of choosing conventional energy, which equals the exponent of β. The results are presented in Tab. 2. Please take into account that the results arise from 23,400 observations (10 choice sets that included 3 energy products each and were gathered from 780 participants) without balanced weighting.
To ensure our results were not biased by the sample composition (e.g., students driving the importance of the social network feature), we tested the model for different data subsets. The results imply no relevant change of the importance of the different variables.

### Price

The prices influenced the odds as expected: in comparison with an average price of 50.75€ for a two-person household, the two lower prices increased the likelihood ratio (Price$_{46€}$: $\beta = 1.289$, Exp($\beta$) = 3.630, $p < .001$; Price$_{50€}$: $\beta = .582$, Exp($\beta$) = 1.789, $p < .001$). As expected, the higher price of 56€ decreased the likelihood of choosing green electricity rather than conventional electricity ($\beta = -.571$, Exp($\beta$) = .565, $p < .001$)

### Importance of the Social Features (H1 and H3)

The distribution of the choice for green electricity with regards to the feature present in the choice situation is depicted in Tab. 3. For this overview, we calculated the average choice for green energy within the choices each individual made. Please take into account that this table merely depicts the presence of the depicted features, but does not take into account other differences, e.g. different prices which characterized the available energy products. For example, out of 100 green energy choices that offered a button, 58 were selected by the participants before Fukushima. Furthermore, out of 100 green energy products that displayed both sticker and button, 58 were chosen by the participants after the Fukushima incident (please remember that this is not an interaction term, but a category of its own).
We hypothesized that a social feature that enables consumers to signal product choice heightens the attractiveness of a green product. Indeed, significant main effects were found for both the sticker and the button. Furthermore, we expected the possibility to share product usage in a social network online to be more highly valued than a possibility to signal product choice in a more traditional setting. Although the sticker was an important driver and raised the odds by the factor of 1.904 ($\beta = .644$, $p < .001$), the sticker was clearly outperformed by the influence of the button, which raised the odds in favour of green electricity by $\text{Exp}(\beta) = 4.406$ ($\beta = 1.483$, $p < .001$), which in general supports this hypothesis, even though we did not conduct more statistical testing. Interestingly, the importance of the button decreased tremendously after the Fukushima incident ($\text{Exp}(\beta) = .335$, $\beta = -1.904$, $p < .001$).

**Importance of Consumer Lifestyle (H2)**

Tab. 4 depicts the differences of the impact of the features on participants with a low or high ELI. For example, 44 out of 100 times an electricity product offered a button, participants that were not as interested in an ecological lifestyle chose it, but 50 out of 100 times participants that were interested in an ecological lifestyle did.

We stated that the more a consumer’s lifestyle is represented by a product, the more attractive the possibility to signal product choice becomes. We captured the attitude of consumers with the ELI index. Tab. 4 already hinted towards the results. The interaction of the ecological lifestyle index with the button showed that people who are more interested in eco-friendly consumption are more likely to be positively influenced by the social online feature to act on this interest ($\beta = .353$, $\text{Exp}(\beta) = 1.424$, $p < .001$). The same result was found for the sticker: the more interested one becomes in a green lifestyle, the more they are likely to favour green electricity when being able to publicly communicate their energy selection ($\beta = .518$, $\text{Exp}(\beta) = 1.678$, $p < .001$). This result was also observed when both options were available and interacted with the ELI scale ($\beta = .646$, $\text{Exp}(\beta) = 1.907$, $p < .001$).

**Heightened Demand**

The analysis yielded a significant main result for the HD indicator. After the catastrophe, individuals were generally more willing to choose green electricity over conventional electricity ($\beta = .234$, $\text{Exp}(\beta) = 1.264$, $p < .001$). Thus, even with higher demand and preferences, a large positive influence and decision weight of the social product features can be observed. Furthermore, the catastrophe altered the importance of the social features which was also shown in Tab. 3. The online social feature lost some of its attraction ($\beta = -1.094$, $\text{Exp}(\beta) = .335$, $p < .001$) after the catastrophe, as did the combination of both features ($\beta = -.174$, $\text{Exp}(\beta) = .840$, $p = .084$). Therefore, the importance of the social product features for the consumers was lower after interest and demand increased, but remained an important driver. However, in the Post-Fukushima setting, which included a vast increase in the popularity of social features against nuclear power, H3 is not supported.

The included indicator for the current energy supply of the participants performed as one would expect: participants who currently used green electricity were more likely to choose green electricity within the choice situation. With heightening the odds towards green electricity by 1.205 ($\beta = .186$, $p < .001$), the variable had a strong impact, but did not perform as well as others, e.g., the lowest price or the social feature. This can be explained by the fact that many consumers are delaying actions such as changing energy providers. Therefore, the variable did capture whether a participant had already made a contract for using green energy, but not if he was planning on switching, which is why the effect of being a green electricity customer vs. not (yet) being one on the choice of green electricity seems to be adequately measured.

### Table 3: Differences in the Choice due to Presence of the Features within the Chosen Green Electricity Products Before and After the External Shock

<table>
<thead>
<tr>
<th></th>
<th>Button</th>
<th>Sticker</th>
<th>Sticker &amp; Button</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Fukushima</td>
<td>58%</td>
<td>50%</td>
<td>56%</td>
<td>11%</td>
</tr>
<tr>
<td>Post-Fukushima</td>
<td>36%</td>
<td>51%</td>
<td>58%</td>
<td>15%</td>
</tr>
</tbody>
</table>

### Table 4: Influence of Participants’ Lifestyle (Median Split of the ELI Scale) on the Choice of Green Electricity according to the Presence of Different Features

<table>
<thead>
<tr>
<th></th>
<th>Button</th>
<th>Sticker</th>
<th>Sticker &amp; Button</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low ELI</td>
<td>44%</td>
<td>44%</td>
<td>51%</td>
<td>13%</td>
</tr>
<tr>
<td>High ELI</td>
<td>50%</td>
<td>57%</td>
<td>63%</td>
<td>13%</td>
</tr>
</tbody>
</table>

5. Discussion

This research addresses the important effects of social attributes that enable consumers to exhibit their product choice, on the preferences for products. We dedicate our research to the influence of viral marketing on the effect it has on individual consumers instead of focusing on seeding strategies and raising awareness.

5.1. Contribution to Literature

Our first contribution to the literature is that consumers perceive a social product feature that assists individuals
in communicating their purchase of a pro-social product as an added benefit and that the presence of this opportunity enhances individual preferences for a product. This is an important finding that can facilitate further research and marketing because it implies that there is a two-sided effect to the introduction of social product features. Therefore, companies and researchers should not only take into account how viral product design can aid raising the awareness regarding a product, but should also consider how every single consumer can benefit from social features and design them accordingly.

Second, this experiment showed that social media can be a valuable platform for sharing product usage and that the feature that enables signalling within social networks. This finding is consistent with previous findings about eWOM, namely that the easiness of sharing online is one of the reasons it is so attractive. The added social feature became an accepted attribute of the product and greatly influenced product choices. More specifically, the presence of the button even outperforms the lowest price regarding its influence on the probability ratio which implies that the disadvantages of a higher price might be moderated when consumers are able to signal purchase easily.

As our third contribution to literature, we show that consumers who relate to the product and whose personal opinions are represented by choosing it value the possibility to signal product choice even more than other consumers. The influence of the social features that signal green electricity use rise when individuals are more interested in an ecological lifestyle. In principle, one might also have expected the true interest in an ecological lifestyle to render the button that shows a person is consuming sustainable energy a less necessary feature. However, all of the results indicate that people who pursue this type of lifestyle are even more likely to communicate this pursuit. Therefore, companies and researchers can attract customers that are highly interested in a product by enabling them to share product usage, thereby addressing the social networks of them and potentially reaching and audience that is also likely to enjoy the product.

Fourth, we provide additional insight by demonstrating that when the overall demand for the product rises, the additional benefit of the social product feature is slightly reduced but remains positive and important. By increasing the interest in and demand for the product, Fukushima had an important effect on the behaviour of consumers. The change in the social acceptance of nuclear power and the desire of many individuals to dissociate themselves from this problematic technology were notable in the data. The clustered open-ended questions showed a change in opinion: even more people liked the idea behind these social features and were more willing to use them. Apart from this result, the importance of the attributes decreased in response to the changed interest of the public and the resulting change in demand. In the first data collection phase, people were less able to relate to the product and the addition of the feature was significantly more important. In the second phase, the preferences were influenced by a fundamentally greater demand that resulted from weeks of news coverage and discussions. Because many consumers had already demonstrated a willingness to opt for green electricity, the social features no longer played such an important role in decision-making processes as before the catastrophe; however, these features continued to be important drivers. Furthermore, the existence of the “anti-nuclear-button” on Facebook in the weeks following the accident could have been a diminishing factor. As many consumers want to be distinguished from other people (Cheema/Kaikati 2010; Khare/Labrecque/Asare 2011) to be viewed as the first users of a certain product or technology, the social features become less meaningful when an individual is not the first to use and demonstrate them. As a consequence, the attraction and degree of novelty of the social features at this time could have been lower.

5.2. Managerial Implications

In summary, our findings support several observations regarding signalling and behaviour in social networks. These findings provide greater insight into the role of social product features for product choice and the contribution of these features to the market shares of the products or services to which they are added. The contribution of our experiment suggests that social product features can become an important factor in the marketing mix and that especially manufacturers and retailers which act online should take advantage of the opportunities social networks provide.

Our research has practical implications for designing and marketing products. The results of this experiment indicate that managers should consider how they could establish a direct social feature for a product to ensure the opportunities to share product choices. This effect is two-sided. First, consumers perceive such features as added attributes that enable them to share their experiences, styles and choices with other people which distinguishes the product from similar ones. Second, the sharing of product usage in social networks shows other people that the product exists, is interesting and is consumed by one’s friends.

With the recently established social applications, which enable newspapers or music-streaming services to instantly share the reading or listening choices of their users as personalized on Facebook, a method of implementing social features has successfully been identified. The participating companies have encountered an increase in demand that can be ascribed to the new features and the above-mentioned two-sided effect. Thus far, WOM was a marketing enhancement that was limited to subjects pertaining to products that people are likely to discuss, such as how they found the perfect car and how much they enjoyed their recent vacation. Social online networks render eWOM and viral marketing as inciden-
tual but omnipresent experiences that are no longer limited to the high-value products that have typically benefited from traditional WOM. By incorporating a social product feature, marketing managers can now take advantage of these interesting possibilities and differentiate their products from other products using the means of social networks.

Because shopping and consumption are becoming more personal, many marketing managers link their company or product profiles to social networks (e.g., with the well-known “Like” or “+1” button). Users are often transferred to company homepages via such networks. Some companies even enable customers to shop directly on social media platforms without leaving these platforms to generate a “store-in-network” experience. With the ubiquitous presence of banners and other online advertisements, personal references become increasingly important. The implementation of social features can be an easy, cost-efficient method of encouraging participation in online sharing mechanisms without overspending the marketing budget on a currently uncertain marketing technology, such as in-network stores.

Furthermore, examining the opportunities for sharing information in social networks regarding the participation of individuals in the design process could prove to be an interesting activity for managers. An increasing number of companies rely on crowdsourcing, which can be defined as the public search for product concepts, designs or services and consumer co-creation, and could greatly benefit from the growth in awareness that can be attained by the social feature. More specifically, individuals could send status signals by communicating their expertise and commitment in their usual social networks and attract even more supporters; this effect could contribute to company goals by increasing sales and supporting the entire production and sales process.

5.3. Directions for Further Research

Finally, the actual design of a feature should also be a topic of interest. Engineering physical and digital products in a manner that increases peer-to-peer communication is a challenge that has not yet been sufficiently discussed. Implementing a button would allow a direct link from a social network to a company homepage or to a social company site; thus, such a button may serve as a new sales initiator. Our experiment was based on both online and offline features that were easy to use and optional for consumers, who could either utilize these features or chose not to communicate their product choices. The design of these features and the willingness to use such features clearly provide opportunities for future investigation.

Our experiment indicates several other directions for future research. This investigation and the derived insights are limited to one product in a general social network (offline) and the Facebook community. However, the effect of a choice that is triggered by the presence of a status signalling option should hold for other products or services for which product usage sharing is possible. For example, the same effect might also occur for products that are not eminently costly or status-enhancing per se but, for example, show early adopter behaviour. Future research could examine the products and settings in which social product features that enable signalling are not relevant. Such investigations could determine whether there exists a turning point for late adopters, after which sharing product usage in a social network is no longer interesting.

Another interesting area of research could be the wide usage of such a feature. We have shown that a social feature is an interesting tool to enable electronic WOM and viral product communication; in the long term, consumers will select companies whose product usage they are willing to share. Interesting research questions, such as how consumers react to a wide range of product usage sharing offers, which factors influence such selections, and how companies can succeed in a market in which competition for eWOM is common, should be addressed in future research.

As noted above, companies are beginning to participate in social networks and take advantage of opportunities for product and service communication. Examining our findings across the two combined data sets, we observe that consumers are willing to exhibit their product usage online. Future research should explore how this willingness is enhanced according to the increasing interest of consumers. Products such as cars are less likely to benefit from opportunities to share such purchases (at least in most Western countries). However, this likelihood could differ in other cultures, in which the costly signalling of high-value status goods is not perceived as boastful but is perceived as conforming to cultural norms. We hope that the research that is presented in this article prompts additional studies regarding the possibilities of signalling and its important role in consumer product evaluation.

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Keywords

Signalling, social media, green marketing, experiment

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