

Article

Unintended CSR Violation Caused by Online Recommendation

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Abstract: This paper investigates whether online recommendation of products that exhibit corporate social responsibility (CSR) penalizes the purchase intention of non-CSR products. When consumers browse online retail stores and consider buying a particular product, online recommendation is made (e.g., “Customers who viewed this item also viewed”). This recommendation is often made between products of which attributes have a trade-off relationship (e.g., CSR vs. price). (A trade-off is where one thing increases, and another must decrease. A trade-off relationship between CSR and price suggests a pair of competing products are available: a more expensive, CSR product and an economical, non-CSR product.) We borrowed from the psychological literature of evaluability to hypothesize that when a CSR product is recommended, consumers would decrease their purchase intention of the economical product. However, when an economical product is recommended, consumers would maintain their purchase intention of the CSR product. We further hypothesized that this asymmetric effect would disappear when reinforcement information regarding the CSR is provided. Two carefully designed experiments conducted in China supported these hypotheses. Our findings contribute to the growing literature on online retailers by elucidating the psychological impact of online recommendations, which may influence manufacturers’ sales in an unexpected manner. The findings also indicate that online recommendations could be a potential source of channel conflict. While this study newly verifies the unintended CSR violation effect of online recommendations, future studies are required to expand our understanding of the CSR violation effect by investigating the effect under the trade-off relationship with other attributes of the product.



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1. Introduction

Over the last decade, online retailers, such as Amazon, have become instrumental e-commerce media, rapidly replacing traditional brick-and-mortar stores worldwide. According to eMarketer, online retail sales in the US reached \$262 Billion in 2013, accounting for 8% of the total retail sales. This share increased to 10% by 2017 [1]. Germany and the UK experienced similar trends, with e-commerce accounting for 7% and 13%, respectively, of the total retail sales in 2013, increasing to 10% and 15%, respectively, in 2017. This trend was more evident in China, with online commerce accounting for 10% of all retail sales in 2014, reaching 16.6% in 2018.

Along with the development of e-commerce in the last decade, online recommendation has become one of the most widely used marketing tools. Online recommendation encompasses various forms of advice generated by internet software, computer tools, or agents that are designed to help consumers with decision making and motivate them to make additional purchases based on their historical and current actions [2].

Previous studies confirmed that online recommendation helps consumers to search for information and evaluate products efficiently, improving the quality of their decision-

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making [3–5]. Furthermore, this recommendation helps companies to achieve their business goals by attracting customers, building customer loyalty, and generating sales [6]. For instance, Senecal and Nantel [7] found that subjects selected recommended products twice as often as non-recommended products. Research has also documented the commercial contributions of online recommendations [8,9]. Online recommendation helps consumers to reduce their search costs and identify desired products [10,11]. It encourages consumers to purchase additional products and increases online retailers' sales [12]. Some researchers have even recommended ways to advance current online recommendation practices [7].

In particular, recent research has actively investigated how to develop an online recommendation system in practice [13–15]. The practice of online recommendation has developed significantly through the rapid development of online personalization. Online recommendation has been personalized to enhance various aspects of customers' experiences using artificial intelligence (AI) and machine learning (ML) based on previous behavior and relevant data [13,16]. Moreover, a personalized interface helps experiencing satisfactory interactions between a system and its users [14,17]. These intensive human–website interactions can help improve a recommendation system by providing a better understanding of customer preferences and shaping their interests.

Some researchers explored how to improve the effectiveness of recommendation system by monitoring user behavior and enhancing web ergonomics [18,19]. For example, Bortko et al. [18] found that different levels of visual intensity of the elements in recommendation interface can help improve the effectiveness of recommendations by reducing the habituation effect in users. Furthermore, a recommendation system can be effectively developed by monitoring user behavior and using these behaviors as indicators to verify user preferences and interests when recommending products [19]. More specifically, some researchers explored solutions for providing the most effective recommendation system to users based on their behavioral, demographic, and psychological information using AI or deep learning (DL) techniques [15,20].

In practice, Amazon provides its customers with customized browsing experiences using an algorithm known as item-to-item collaborative filtering. This algorithm utilizes customers' purchase histories, rankings, and reviews of considered items, and recommends related items in the “customers who viewed this item also viewed” category (<http://fortune.com/2012/07/30/amazons-recommendation-secret/> (accessed on 29 March 2021)). Item-to-item recommendation has been found to successfully attract new customers and increase customer retention rates. Fortune [21] confirmed that integrating this algorithm into the customer purchasing process—from product discovery to checkout—has significantly contributed to Amazon's revenue growth.

Due to its effectiveness, the use of a recommendation system has become pervasive worldwide. For example, it is viewed as the most important technology that improved the business of Taobao, the largest online customer-to-customer (C2C) business platform in China. With two billion commodities and one billion users, Taobao's recommendation system plays a critical role in matching users with relevant and desired products [22]. Moreover, recommendation systems are applicable to not only web-based online stores but also the mobile shopping environment. Mobile Taobao developed an effective recommendation system for mobile platforms to handle the distinct features of the mobile shopping environment [23]. Similarly, T-mall, the largest online business-to-customer (B2C) business platform in China, developed a personalized recommendation system for their online and mobile shopping environments to enhance its customers' experiences using various intelligent recommendation algorithms [24].

Furthermore, apart from the collaborative filtering technique, other recommendation techniques have also been developed by adopting a variety of relevant information. For example, previous studies investigated how to improve the effectiveness of recommendation systems by employing user-related knowledge, such as demographic information, in various industries, such as books, tours, and electronic products [25–27]. Moreover, information related to users' activities and their interactions with computer interfaces can

be useful in determining user preferences and needs; these data can further improve the effectiveness of a recommendation system [28].

While a considerable number of studies have investigated online recommendation, academic discussions have focused on its effects on newly recommended products and ignored its impact on previously considered products. Note that when new products are recommended, consumers evaluate them comparatively with previously considered products to make their choices. This suggests that online recommendation could either positively or negatively impact consumers' evaluations of the products they considered previously.

We borrowed from the psychological literature on evaluability to examine the unintended effect of online recommendations. Psychologists have shown that people change their evaluations between two products depending on how they evaluate the two products, in particular when the two products have a trade-off relationship. For instance, people evaluate two products differently when evaluating each product independently compared to when evaluating two products together [29,30]. We investigate this effect in the context of the trade-off relationship between corporate social responsibility (CSR) and price. The trade-off relationship between CSR and price has been documented extensively in the literature. For instance, consumers indicated greater willingness to pay for computers manufactured by ethical companies [31], athletic shoes manufactured by companies that conduct CSR activities [32], and fair-trade coffee [33]. In this study, we particularly focus on the trade-off relationship between CSR and price because, although CSR is often identified as an effective marketing tool, its commercial effectiveness remains debatable [34].

In summary, we experimentally tested whether the subjects' purchase intentions toward previously considered products increased or decreased when another product is recommended. We further tested when this effect disappeared. The two studies we conducted produced the following results. First, the subjects' purchase intentions toward an economical product decreased when a CSR product was recommended. However, their purchase intentions toward a CSR product did not decrease when an economical product was recommended (Study 1). This asymmetric effect of online recommendations disappeared when information reinforcing the CSR claims was provided; recommending a CSR product did not decrease subjects' purchase intentions toward an economical product (Study 2).

2. Theory and Hypotheses

2.1. Evaluability

When two attributes have a trade-off relationship, people find it difficult to evaluate which one is more important. Therefore, how they evaluate the product often determines which ones they evaluate as better. More specifically, Hsee et al. [29] and Hsee and Zhang [30] showed that people evaluate products differently in the Separate Evaluation (SE) mode (i.e., when each product is evaluated independently) than in the Joint Evaluation (JE) mode (i.e., when the two products are evaluated together). A potential explanation for their findings is evaluability, that is, hard-to-evaluate attributes become easier to evaluate and thus more important in the JE mode than in the SE mode.

Suppose that two products, X and Y, need to be evaluated. Each product has two attributes: an easy-to-evaluate attribute and a hard-to-evaluate attribute. In the SE mode, the easy-to-evaluate attributes will dominate people's evaluations. However, in the JE mode, the hard-to-evaluate attributes become easier to evaluate and more important, thus influencing their evaluations. In Hsee's [35] experiment, subjects were asked to indicate their willingness to pay for two used music dictionaries. One dictionary had 10,000 entries and no defects, and the other dictionary had 20,000 entries and a torn cover. When the two items were evaluated in the SE mode, the subjects indicated that they were willing to pay \$24 for the brand-new dictionary and \$20 for the defective one. However, when the two items were evaluated in the JE mode, the subjects' willingness to pay was reversed, i.e., they were willing to pay \$19 for the brand-new one and \$27 for the defective one. Hsee [35] accounted for this evaluation reversal using the evaluability hypothesis. Evaluability is the

degree of difficulty associated with evaluating a product based solely on the level of an attribute, independent of any contextual information [36]. In the dictionary experiment, for example, the defect was an easy-to-evaluate attribute because “even without a direct comparison, most people would find a defective dictionary unattractive, and a like-new dictionary, attractive” (Hsee [35], p. 249). In contrast, the number of entries was a hard-to-evaluate attribute because “without something to compare with, most students would not know how good a dictionary with 10,000 (or 20,000) entries is” (Hsee [35], p. 249). Therefore, in the SE mode, subjects placed more weight on the defect and were willing to pay more for the brand-new dictionary. In the JE mode, however, they compared the two dictionaries, placed more weight on the number of entries, and were willing to pay more for the defective dictionary with more entries.

Numerous researchers have replicated the effect of evaluability. One study showed that people reduced the weight they placed on negative attributes in the JE mode [37]. Another study showed that people put greater weight on the brand in the SE mode and place greater weight on the country-of-origin in the JE mode [38]. Meanwhile, consistent with Okada [39], who argued that hedonic attributes are difficult to evaluate, previous research showed that utilitarian advertising is favored in the SE mode, while hedonic advertising is favored in the JE mode [40]. A recent design study went one step further, arguing that the JE mode can encourage people to choose expensive but aesthetically pleasing products since beauty becomes evaluable and then important only in the JE mode [41].

2.2. CSR vs. Price

The trade-off relationship between CSR and price is regularly observed in the real world and has been extensively documented in related research. For instance, Creyer and Ross [31] examined consumers’ willingness to pay for two different computers, wherein the manufacturer of the slightly cheaper computer discharged poisonous chemical waste. They found that subjects were willing to pay less for the computer manufactured by the unethical company. Similarly, Pelsmacker et al. [33] reported that consumers were willing to pay more for fair-trade coffee. When Mohr and Webb [32] generated a trade-off relationship between CSR activities and price as the two major product attributes and studied consumers’ purchase intentions toward athletic shoes, they found that consumers were less sensitive to price when products were combined with CSR activities.

More importantly, prior studies suggested that CSR is more difficult to evaluate than price. Although CSR increases consumers’ evaluations of and preferences for products [42–44], its effects vary across individual levels of involvement, knowledge, and beliefs [42,45]. It should be noted that the three moderators of the effect of CSR are highly similar to the three moderators of evaluability [30]. Moreover, consumers often overlook CSR information because it is difficult to understand [46]. Therefore, some researchers proposed running campaigns to educate consumers about CSR [47]. Unlike CSR, price is an objective attribute that signals a product’s monetary value to consumers.

2.3. Evaluability between CSR and Price

Assuming that CSR and price have a trade-off relationship, and CSR is harder to evaluate than price, we hypothesized that economical products would be “penalized” when CSR products were recommended. More specifically, we hypothesized that only when a CSR product was recommended, consumers are able to compare the CSR information between two products and, therefore, CSR information would become easier to evaluate and play a critical role. In the absence of a recommendation and the resulting comparison of the CSR information of two products, we predicted that price would dominate consumers’ decision making because price is easy to evaluate and plays a critical role in their purchase decisions. Therefore, the importance of CSR depends on the mode of evaluation, while the importance of price does not.

These predictions are supported by the findings of previous studies showing that consumers penalize companies that harm nature or society while they do not appreciate companies' CSR activities [48,49]. In other words, consumers' negative responses to irresponsible corporate behaviors are stronger than their positive responses to responsible ones [42,45,50]. For instance, Creyer and Ross [31] found that subjects lowered their willingness to pay for computers manufactured by an unethical company but their willingness to pay for computers manufactured by an ethical company did not increase.

Hypothesis 1. *The recommendation of a CSR product decreases consumers' purchase intentions regarding an economical product.*

Hypothesis 2. *The recommendation of an economical product does not decrease consumers' purchase intentions regarding a CSR product.*

We further hypothesized that the provision of information about CSR would increase the evaluability of CSR information, which helps consumers to understand how good or how bad a CSR attribute is when making purchase decisions [47]. This suggests that, when reinforcement information about CSR is provided, CSR information plays a critical role in consumers' purchase decisions, regardless of whether a CSR product is recommended or not, thus leading consumers to compare the CSR information of two products.

Hypothesis 3. *The provision of reinforcement information about CSR does not decrease consumers' purchase intentions regarding an economical product when a CSR product is recommended.*

We tested the above three hypotheses using two experiments. In Experiment 1, we tested whether the recommendation of a CSR product decreased subjects' purchase intentions regarding an economical product (Hypothesis 1) and whether their purchase intentions regarding a CSR product did not decrease when an economical product was recommended (Hypothesis 2). In Experiment 2, we tested whether the provision of reinforcing CSR information caused this asymmetric effect to disappear (Hypothesis 3).

3. Experiment 1

3.1. Method

3.1.1. Stimuli

We carefully selected a Trans Flash (TF) card as the stimulus for Experiment 1. It is a thumbnail-sized plastic storage device, often used in mobile digital devices such as mobile phones. Although the function of TF cards is identical to USB drives, they are inserted into devices and thus, their aesthetics have no impact on consumers' purchase decisions. This is important because previous studies demonstrated that aesthetics influence consumers' purchase intentions when choosing between two products [41]. Most TF cards available in the market have identical designs in terms of color, shape, and weight. More importantly, some TF cards are CSR products and others are not. To make this experiment realistic, we utilized real-life CSR information.

We created two hypothetical TF cards with different CSR aspects and prices. For CSR, we borrowed from a real-world case and developed two hypothetical TF cards using the cards' actual materials—one explicitly free of conflict metals and the other making no promises in this regard. Conflict metals are metals mined from the eastern region of the Democratic Republic of Congo and neighboring countries. They are often illegally mined by militant groups in the region or smuggled out of the region. The use of conflict metals creates serious problems related to human rights, the environment, and other issues. The metal ores of these metals have become a major income source for armed rebel groups. Trading in conflict metals causes violent conflicts between the governments and the ravaged local civilians and triggers international disputes. The Electronic Industry Citizenship Coalition (EICC) requires electronic companies to refrain from using conflict metals and sign reports confirming that their products are free of conflict metals. The purpose of these

requirements is to protect human rights and take social responsibility. Regarding price, we used the real price range of popular TF cards and selected ¥89 and ¥69. Additionally, we considered the other product attributes that could potentially influence consumers' purchase intentions, strictly controlling the design and storage capacities of the two TF cards, naming the CSR TF card "TADE" and the economical TF card "LANF."

We performed a pre-test to confirm that the hypothetical pair of TF cards had the expected trade-off relationship. We recruited 81 participants to verify whether one of the two TF cards had a higher level of CSR and price than the other on a seven-point Likert scale. In total, 20 participants rated the CSR level of the CSR TF card, while 20 rated the CSR level of the non-CSR TF card. Regarding price, 21 participants rated the perceived price of the ¥89 TF card, while another 20 subjects rated the perceived price of the ¥69 TF card. They answered that the CSR TF card had a higher CSR level than the non-CSR card ($M_{\text{yes-CSR}} = 4.81$ vs. $M_{\text{no-CSR}} = 3.84$, $t = 2.14$, $p < 0.05$). Moreover, the subjects rated the expensive (CSR) TF card as more expensive than the economical (non-CSR) one ($M_{\text{expensive}} = 4.77$ vs. $M_{\text{economical}} = 3.69$, $t = 1.995$, $p < 0.05$). Therefore, we used these four values of the two attributes to develop a pair of competing TF cards as the stimuli for our study. One was made of traditional materials, made no promise that it was free of conflict metals, and cost ¥69 (economical product); the other was made of recyclable materials, was free of conflict metals, and cost ¥89 (CSR product).

3.1.2. Design

We recruited a total of 150 Chinese consumers through an online survey website in China and conducted the entire experiment on a professional survey website to simulate a real TF-card online purchase situation. The survey website recruited subjects and assigned them to one of the following four conditions. The subjects were rewarded equally for their participation when they completed participation. The survey questionnaire was prepared in both English and Chinese.

We employed a 2 (type of the considered product: Economical vs. CSR) \times 2 (whether a trade-off product is recommended: No vs. Yes) between-subjects design. First, we manipulated the type of the considered product by asking subjects to imagine the different products they considered buying. In the economical product condition, each participant was asked to imagine that he/she was searching for a TF card for his/her mobile phone and considering buying an economical (no-CSR) TF card. In the CSR-product condition, the subjects were asked to imagine that they were considering buying a CSR (expensive) TF card. Next, we manipulated whether a trade-off product is recommended or not. In the No-recommendation condition, we presented the considered TF card alone. In the Yes-recommendation condition, we provided the considered TF card along with another TF card under the title "Customers who viewed this item also viewed." We added this description to make the experiment realistic (see Figure 1).

In the survey, the participants were asked to indicate their purchase intentions by choosing the extent to which they wanted to buy the considered TF card on a seven-point scale (1 = not at all to 7 = very much).

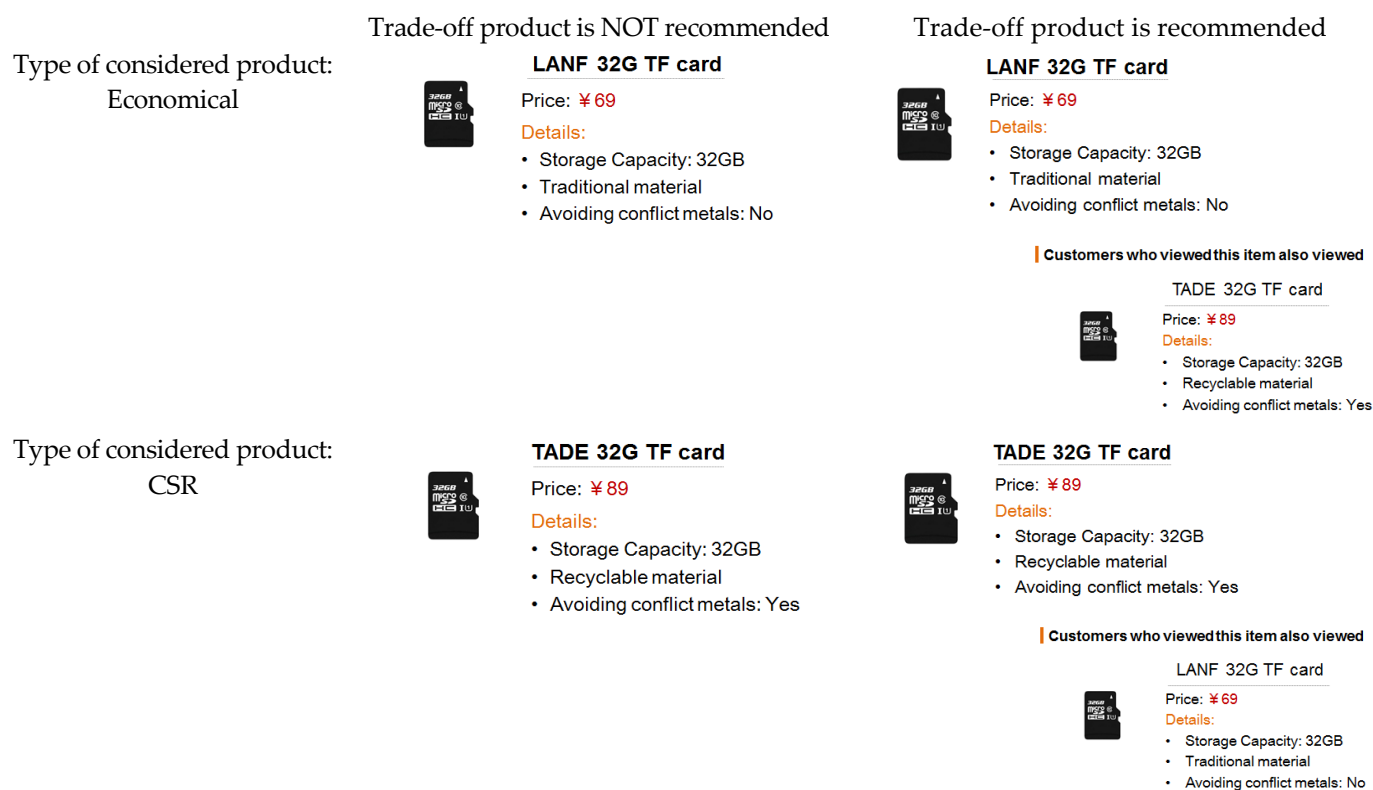


Figure 1. Stimuli (Study 1).

3.2. Results

Purchase Intentions Regarding the Considered Product

Purchase intentions were submitted to a two-way analysis of variance (ANOVAs) with type of the considered product (Economical vs. CSR) and whether a trade-off product is recommended (No vs. Yes). The analyses showed a marginally significant interaction effect between the considered product and the recommendation ($F(1,147) = 3.023, p = 0.084$), and a significant main effect of the considered product ($M_{\text{economical}} = 4.94$ vs. $M_{\text{CSR}} = 5.48, F(1,147) = 7.151, p = 0.008$). Further analysis revealed that this effect was driven by the participants' decreasing purchase intentions regarding the economical product when the CSR product was recommended ($M_{\text{no-recommendation}} = 5.26$ vs. $M_{\text{yes-recommendation}} = 4.62$; simple effects analysis, $F(1,147) = 4.876, p = 0.029$) (see Figure 2). One might argue that if subjects' purchase intentions between two products differ, our findings would not support our hypothesis. However, our analysis revealed that the purchase intention for CSR products (5.45) is NOT higher than that of economical products (5.26; difference = 0.190, $F(1,147) = 0.423, p = 0.516$). Thus, our findings are valid.

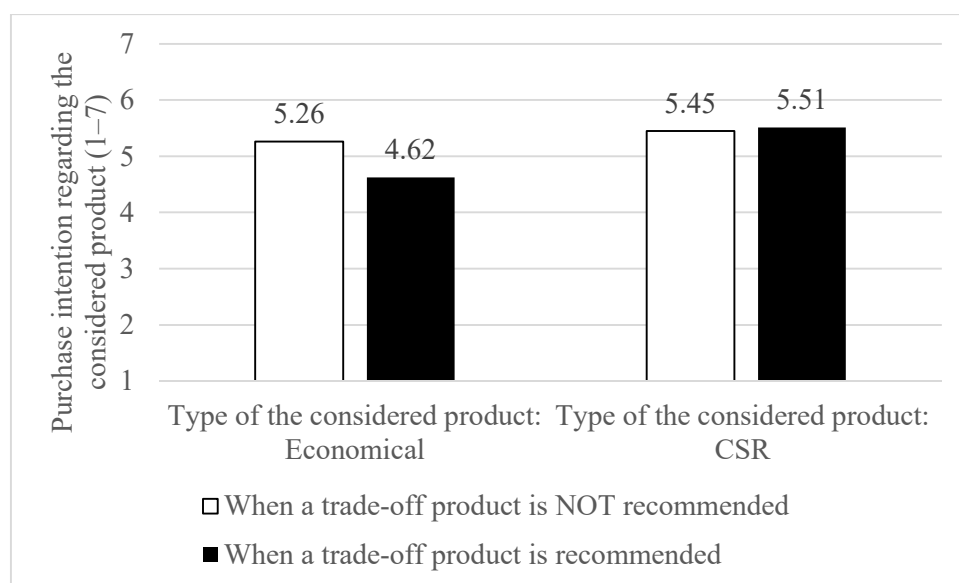


Figure 2. Purchase intentions regarding the considered product as a function of the type of the considered product and recommendation (study 1).

3.3. Discussion

These findings indicate that when consumers consider buying one of two trade-off products, recommendations of economical products do not affect the purchase intentions toward CSR products, while recommendations of CSR products penalize the purchase of economical products by encouraging consumers to avoid non-CSR products. These results suggest that the sales of regular products could be hurt when CSR products are recommended on the same screen.

The findings of Experiment 1 provide an important implication for a manager whose major task is to provide a customized recommendation for the customers to help their search cost. However, our findings also suggest that the manager pays careful attention when providing a recommendation of a product with embedded CSR attributes because of this unintended effect of CSR violation. To expand our understanding of CSR violation effect, we need to consider the existence of the relevant information of CSR before consumers make their purchase decision because consumers often search for information about multiple products before making a final choice. In this case, consumers can be exposed to the information related of CSR during the information search stage. To overcome this limitation, we conducted another experiment to investigate what happens to consumers when they are informed about the CSR aspects of the considered products.

4. Experiment 2

Experiment 2 was conducted to test whether increasing the evaluability of CSR would eliminate the asymmetric effect obtained in Experiment 1.

4.1. Method

4.1.1. Stimuli

The stimuli in Experiment 2 were identical to the stimuli utilized in Experiment 1, except for the provision of CSR reinforcement information, a detailed description about conflict metals, to the respondents.

4.1.2. Design

We recruited a total of 146 Chinese consumers through the same Chinese online survey website used in the previous experiment. As in Experiment 1, we employed a 2 (type of considered product: Economical vs. CSR) \times 2 (whether a trade-off product is

recommended: No vs. Yes) between-subject design. First, the participants were informed about the CSR aspects of TF cards, i.e., conflict metals, such as where they were mined from, how they were mined or distributed, and whether their use was associated with human rights, environmental, and other issues. The subjects were also informed that the EICC required electronic companies to refrain from using conflict metals (see Figure 3).



TADE 32G TF card

Price: ¥ 89

Details:

- Storage Capacity: 32GB
- Recyclable material
- Avoiding conflict metals*: Yes

*Conflict metal refers to the metal mined from eastern region of the Democratic Republic of Congo (DRC) and neighbor countries. Such conflict metal is often illegal mined by the militant groups in the region or smuggled from this area. Conflict metal creates serious problems of human rights, environmental and other issues. The metal ores have become a major income source for armed rebel groups of Africa and Congo Democratic Republic. Trading of conflict metal causes bloody conflict between governments and ravaged local civilians. Therefore, this kind of metal triggers international disputes. EICC requires electronic companies to promise not to use conflict metal and sign report of free of conflict metal. The purpose is to protect human rights and take social responsibility.

Figure 3. Stimuli (Study 2).

Next, the participants were assigned to one of the four conditions and asked to indicate their purchase intentions regarding the considered TF card. We predicted that, regardless of whether a recommendation was made or not, the subjects would evaluate and place weight on the CSR aspects, which would lower their purchase intentions regarding the economical product.

4.2. Results

Purchase Intentions Regarding the Considered Product

Purchase intentions were submitted to a two-way analysis of variance (ANOVAs) with type of the considered product (Economical vs. CSR) and whether a trade-off product is recommended (No vs. Yes). As expected and in contrast with the results of Experiment 1, we did not find an interaction effect ($F(1,143) = 0.162, p = 0.688$). Instead, the main effect of the considered product was significant; participants were more likely to buy the CSR product than the economical product ($M_{\text{economical}} = 4.42$ vs. $M_{\text{CSR}} = 5.29, F(1,155) = 11.148, p = 0.001$). This result indicates that, regardless of whether a recommendation was made or not, participants wanted to buy the CSR product, which supports Hypothesis 3 (see Figure 4).

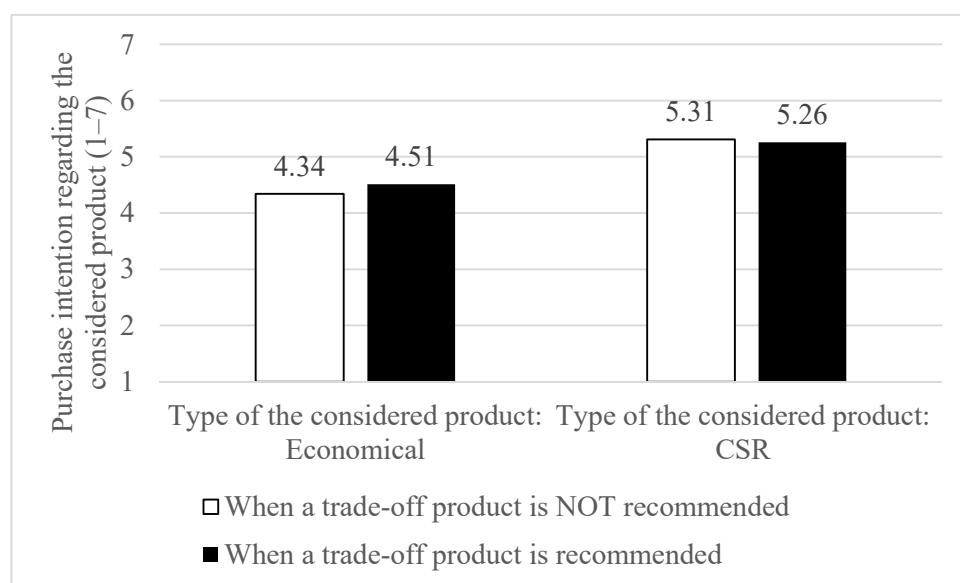


Figure 4. Purchase intention regarding the considered product as the function of the type of the considered product and recommendation when corporate social responsibility (CSR) information is provided (Study 2).

4.3. Discussion

When CSR information is elaborated and becomes easy to evaluate, consumers avoid economical products regardless of whether a recommendation is made, suggesting that CSR products penalize economical products. This finding implies that a previous exposition of consumers about the CSR information can influence consumers' evaluation by diluting the CSR violation effect of the recommendation. Thus, it would be critical for a manager to consider consumers' behaviors before they are exposed to a recommendation related to CSR products. While our findings newly verify the unintended effect of the CSR violation of online recommendation and provide meaningful implications to a manager to design more beneficial recommendation, future study is immediately called for further expanding to other key attributes of products or product categories.

For example, our experiments focus only on utilitarian products. However, contemporary CSR activities are often observed among luxury products. Future research must expand the horizon of the impact of CSR recommendation in the luxury industry. In addition, our experiments tested the impact of online recommendations with an assumption that one product in a trade-off relationship with a considered product is recommended. Although our general setting helped us to integrate psychological literature with online recommendations of CSR products, it would be helpful in the future if the numbers and the types of online recommendations in different purchasing environments are additionally considered.

5. General Discussion

From the two experiments, we found that online recommendations which involve a trade-off between CSR and price influence consumers' purchase intentions regarding considered products. Subjects decreased their purchase intentions regarding an economical product when a CSR product was recommended. However, their purchase intentions toward a CSR product remained unchanged when an economical product was recommended (study 1). This asymmetric effect disappeared when reinforcement information regarding CSR activities was provided (study 2). In summary, our findings are in line with the previous evaluability literature. Because CSR information is more difficult to evaluate than price, it is often ignored in the SE mode. Therefore, when CSR products are jointly evaluated with no-CSR products, CSR information becomes easier to evaluate and

plays a more important role. In our two experiments, we showed that CSR information gains evaluability and the power to influence decision making when a trade-off product is compared (see Table 1).

Table 1. Hypotheses and findings obtained from two studies.

Hypothesis	Finding	Reference
Hypothesis 1. The recommendation of a CSR product decreases consumers' purchase intentions regarding an economical product.	Supported: Participants' purchase intentions regarding the economical product decreased when the CSR product was recommended	Brown and Dacin [42], Sen and Bhattacharya [45], Bhattacharya and Sen [50]
Hypothesis 2. The recommendation of an economical product does not decrease consumers' purchase intentions regarding a CSR product.	Supported: Participants' purchase intentions regarding the CSR product did not change when the economical product was recommended.	Creyer and Ross [31]
Hypothesis 3. When the reinforcement information about CSR is provided, the recommendation of a CSR product does not decrease consumers' purchase intentions regarding an economical product.	Supported: When participants were informed about CSR, their purchase intentions regarding the economical product did not change when the CSR product was recommended. When participants were informed about CSR, their purchase intentions regarding the CSR product did not change when the economical product was recommended.	Pomeroy and Dolnicar [47]

The present work deepens the understanding of not only CSR but online recommendations as well. Prior studies showed that online recommendations help consumers to find desired products [10,11,51] and increase the sales of online retailers [12]. Different from previous studies that investigated whether consumers buy newly recommended products, we examined whether consumers change their purchase intentions regarding considered products when a trade-off product is recommended [7]. Consistent with the literature on evaluability [29,30], we demonstrated that online recommendations changed consumers' evaluation modes, which enhanced the evaluability of CSR, and thus decreased their purchase intentions regarding economical products. We also found that, when additional information about CSR was provided, the effect of online recommendations on consumers' purchase intentions regarding a considered product disappeared.

These findings have critical implications for marketers. Online retailers that provide recommendation services to their customers must understand the unintended effects of these services. Otherwise, they might read consumers' preferences incorrectly. Our findings suggest that incorporating consumers' psychological responses with their evaluation modes could improve online recommendation systems.

Furthermore, our findings indicate that online recommendations could act as potential sources of channel conflict. The fact that idiosyncratic objectives and the lack of coordination between two channel members can lead to undesirable consequences for both parties has been well established [52]. Note that the actions of retailers, such as changing displays or feature advertising, can evoke conflicts with their manufacturers [53,54]. Since channel conflicts are often observed in practice and hurt the effectiveness of marketing activities [55,56], researchers have investigated coordination mechanisms to develop better solutions [57,58]. Recently, some researchers examined this issue in the online context by focusing on online stores on one hand and offline stores on the other [59,60]. Our findings suggest that the distinctive marketing strategies of online retailers can induce conflicts with their counterpart manufacturers. While online recommendation services significantly influence consumers' purchase intentions regarding specific products, the manufacturers who produce these products are not involved in designing these services. Consequently, if manufacturers differentiate their products in terms of easy-to-evaluate attributes, such as price or function, online recommendations can negatively impact their sales. This could be a critical issue as online retailers are rapidly replacing traditional

retailers and online recommendations have become an increasingly effective marketing tool. We call for future research to conduct a more thorough investigation of the impact of online recommendations on all channel members.

6. Conclusions

This work investigates the impact of online recommendation on CSR violation. We designed two experiments in which online recommendations which involved a trade-off between CSR and price and examined whether they influenced consumers' purchase intentions regarding the considered products. Our findings showed that purchase intentions regarding an economical product were penalized when a CSR product was recommended. However, purchase intentions regarding a CSR product did not change when an economical product was recommended (study 1). Further, when reinforcement information regarding CSR activities was provided, purchase intentions regarding an economical product were not penalized when a CSR product was recommended (study 2).

While this study helps verifying the unintended effect of CSR violation by online recommendation, it has some limitations. As discussed previously, our study is needed to be expanded across different product categories such as a hedonic or luxury product for better understanding of the CSR violation effect of the recommendation. Particularly, it is well known that the CSR effect on consumers' purchasing intention would be different according to the product characteristics [61,62]. In addition, it would provide more realistic implications if online recommendation settings are more complicated in the experiment to reflect various online purchasing environments. Therefore, future research should consider various numbers and types of online recommendations regarding different types of products to better predict how consumers change their purchase intentions toward CSR products when online recommendations are made.

Additionally, future research should consider a wide variety of easy-to-evaluate and hard-to-evaluate attributes to obtain a better understanding how online recommendations influence consumers' purchase intention. It would be a meaningful expansion if one investigates the unintended effect of recommendation between various key attributes of the product which have a trade-off relationship. Finally, this study only explored a single piece of CSR information, i.e., conflict metals. Prior research suggests that environmental CSR differs from social CSR in the way each type influences consumers [34]. Future research could investigate the interplay between CSR and evaluability to gain deeper insights into the distinctions that may exist between different CSR types.

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