Case Study on Different Types of Corporate Social Responsibility (CSR) Communication on Social Media and Brand Loyalty: The Mediating Role of Brand Identification in the Dairy Industry of China

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Abstract

Corporate Social Responsibility (CSR) communication on social media has become an important way for companies to attract and maintain customers. As a highly interactive communication channel, social media provides companies with opportunities to showcase their CSR initiatives and corporate values. However, different types of CSR communication often have different communication effects. This study reviews previous research on the relationship between CSR communication, brand identification and brand loyalty, highlighting the theoretical foundations and empirical research. After that, a survey research method was used to collect data through questionnaires, and the data were statistically analyzed using SEM-PLS to verify the existence and extent of the mediating role. The research findings indicate that both societal CSR communication and environmental CSR communication have direct and indirect effects on brand identification and brand loyalty, respectively. However, despite the direct positive correlation observed between customer-related CSR communication and brand loyalty, neither the direct relationship with brand identification nor the indirect relationship through brand identification to brand loyalty was supported. This study combines the relationships between different types of CSR communication in social media, brand identification and brand loyalty and focuses on the mediating role of brand identification. It can be devoted to provide theoretical support and practical guidance for companies to develop more targeted CSR communication strategies.

Keywords: Corporate Social Responsibility (CSR), CSR communication types, social media, brand identification, brand loyalty, dairy industry

1. Introduction

In today's fiercely competitive market environment, consumers are not only concerned about the quality of products and services but also increasingly attentive to corporate social responsibility initiatives (Lee, 2008). Enterprises are expected to actively initiate or participate in social responsibility activities to gain consumers' trust and support (Sen & Bhattacharya, 2001). Moreover, CSR communication, as a crucial marketing tool, is widely employed by enterprises to shape brand image and enhance corporate reputation (Laroche, et al., 2013). Given that solely undertaking CSR initiatives is restrictive, enterprises need to disseminate CSR messages to a broader array of stakeholders to potentially influence their attitudes and behaviors toward the brand, thereby achieving a win-win situation for self-interest and altruism.

Corporate social responsibility (CSR) communication holds significant value for the sustainable development of enterprises. With the widespread adoption of the internet, social media has emerged as a primary platform for information acquisition, opinion exchange, and engagement in discussions (Muflih, 2021). Conducting CSR communication on social media is deemed indispensable if enterprises seek to establish closer connections with stakeholders (Hennig-Thurau, et al., 2013). Consumer loyalty toward enterprises or brands, as a component of corporate value, is also influenced by corporate social responsibility communication (Latif, Psamurez & Sahibzada, 2020). Simultaneously, when customers can discuss, evaluate, and share opinions on the social responsibility actions of enterprises on social media, such feedback enables enterprises to promptly understand consumers' needs and make necessary adjustments, thereby forming a virtuous cycle.

Social identity theory offers a crucial perspective for understanding consumers' responses to CSR communication on social media. The degree to which customers identify with CSR actions may influence their attitudes and behaviors toward the brand. This assertion has been supported by numerous scholars' research and corporate practices (Arıkan & Güner, 2013). Brands enable individuals to distinguish their identity from others in the social reference group. Consumer recognition of the brand can also lead to long-term relationships with the company (Islam, et al., 2021). Because brands are often designed around a sense of belonging, possessing certain brands often confirms consumers' sense of identification with the brand. Therefore, brand identification is considered a primary influencing factor in customer loyalty and company performance Kim (2019).

Nevertheless, the real results are not always what is anticipated, despite businesses' best efforts to change consumers' perceptions of and actions toward brands through a variety of CSR communication channels. Consumers who support firms that engage in good and successful corporate social responsibility (CSR) efforts should show stronger brand recognition and, consequently, enhanced brand loyalty, according to previous research (Currás-Pérez, Bigné-Alcañiz & Alvarado-Herrera, 2009; Hazel & Kang, 2018). Furthermore, social media should potentially have a greater impact on CSR communication's ability to influence customers since it serves as a platform for social engagement and the diffusion of knowledge. The truth, though, could be more nuanced because differing CSR communication strategies on social media might cause consumers to react and perceive brands differently, which might have an impact on how loyal and identifiable customers are to brands. For example, Boysselle (2015) discovered that by giving environmental involvement top priority in their CSR communication, small and medium-sized businesses in the food industry might increase perceived value and trust. Furthermore, Manimalar and Sudha (2016) showed that customer trust and brand loyalty are positively impacted by both morally and legally sound corporate social responsibility programs. In order to better understand customer demands and enhance their social responsibility communication strategy, businesses must analyze how customers react to various forms of CSR communication on social media. Nevertheless, comprehensive study on the mechanisms behind the various CSR communication forms' effects on social media and their particular effects on brand identification and loyalty is still lacking.

This research endeavors to bridge this knowledge gap by utilizing quantitative research methodologies and incorporating social identity theory to investigate the impact of various forms of corporate social responsibility (CSR) communication, specifically environmental, societal, and stakeholder CSR communication, on consumer brand loyalty. Additionally, the study intends to examine brand identification's mediating function in this process. Additionally, this research will provide new insights into consumer behavior and social media communication for the academic community, offering novel perspectives and research directions for related fields of theoretical inquiry. In practical terms, this study not only underscores the importance of social media as a communication platform but also its findings will serve as a crucial reference for enterprises in formulating social responsibility communication strategies. Specifically, by comprehending the mechanisms through which different types of CSR communication affect consumers on social media, enterprises can better grasp consumer needs, and optimize the content and methods of social responsibility communication, thereby enhancing brand identification and loyalty, and ultimately strengthening market competitiveness.

To sum up, the primary goals of this research are as follows: 1. To investigate how various forms of corporate social responsibility (CSR) communication on social media impact consumer brand identification; 2. to look at the processes by which various forms of corporate social responsibility (CSR) communication on social media impact customer brand loyalty; 3. To investigate how brand identity functions as a mediator in the interaction between various forms of corporate social responsibility (CSR) communication and brand loyalty; 4. To make doable suggestions that businesses may use to improve the way they communicate about their social responsibility, which will help to build brand awareness and loyalty.

2. Literature Review

CSR communication types in social media

According to Carroll (1991), CSR (Corporate Social Responsibility) refers to corporations' duties and responsibilities concerning economic, legal, ethical, and charitable aspects of their operations. In order to satisfy the demands of many stakeholders and raise awareness of the significance of economic and environmental sustainability for businesses and society, many companies integrate CSR practices into their corporate missions and strategic planning (Hamidu, 2015). Additionally, social media, due to its interactive, real-time, global, and open nature (Mohr, et al., 2001), provides an effective communication channel for CSR initiatives.

Different types of CSR communication aid companies in conveying their responsibilities and commitments in various domains. On one hand, Ahn, et al. (2021) suggest that CSR can be categorized into societal CSR and environmental CSR. Societal CSR concerns a company's relationships with society and communities, which encompasses contributions to education, health, social welfare, and community development. Through societal CSR communication, businesses can demonstrate their concern for social issues, commitment, and contributions to societal well-being (Ismail,

2009), thereby enhancing their image and reputation in the public eye (Sen & Bhattacharya, 2001). On the other hand, environmental CSR pertains to a company's efforts and achievements in environmental protection and sustainable development (Graci & Dodds, 2008). It often involves environmental actions such as reducing carbon emissions, recycling, and adopting renewable energy, aiming to showcase a company's commitment to environmental conservation (Porter & Kramer, 2006).

Moreover, customer-related CSR communication is also considered an essential dimension. According to stakeholder theory (Freeman, 1984), CSR initiatives aligned with corporate strategies and values should be oriented toward meeting the needs and expectations of stakeholders (such as customers, employees, investors, suppliers, and governments), enhancing the company's image and reputation in the public and stakeholder's eyes, and fostering sustainable development and mutually beneficial cooperation. This study emphasizes that CSR communication content and methods are directly linked to customers, involving how companies meet customer expectations, address customer concerns, and collaborate with customers to achieve CSR goals.

Therefore, this study categorizes CSR initiatives into three types—environmental, societal, and customer-related—based on the content and purpose of activities (Chung, et al., 2020), and compares the communication effectiveness of different types of CSR communication.

Brand identification

Definition

According to Fatma et al. (2018), consumer brand identification is seen as a particular type of social identity. Social identification theory states that people tend to organize themselves and other people into certain social groups (Turner, et al., 1979). Individuals can define or place themselves in the social context by identifying with particular categories. This is accomplished by a process known as cognitive categorization, in which a person looks for connections or parallels between their identity and the company's branding characteristics because they regard themselves as a part of an organization. This relationship makes brands emotionally acceptable as a component of a person's social identity (Scott & Lane, 2000). Therefore, customers also need to engage in identifying and forming social exchange ties to attain self-definition (Dutton, et al., 1994), providing a sense of oneness between self-identity and the features of the company's brand.

CSR communication & Brand identification

Against the backdrop of rapid development in social media, brand identification has become a significant topic in the field of communication studies. Social media, characterized by high interactivity and user engagement, provides businesses with a convenient and efficient communication channel, enabling the widespread dissemination and sharing of corporate CSR actions and information (Mohr, et al., 2001). Consumers obtain specific information about corporate or brand social responsibility through social media platforms, including societal CSR, environmental CSR, and customer-related CSR information, which deepens their understanding and cognition of the brand's personality dimensions, thereby facilitating the generation of brand identification among customers (Kumar, et al., 2016). Hence, CSR communication on social media is not merely a transmission of corporate behavior but also a process of establishing emotional connections and identification with consumers.

In previous research, scholars have extensively explored the mechanisms and related factors influencing brand identification through social media (Li & Bernoff, 2011). For example, Laroche et al. (2013) discovered a favorable correlation between brand recognition and user involvement on social media. Interactive behaviors on social media not only foster the formation of brand identification but also strengthen the emotional bond between the brand and consumers (Laroche, et al., 2013). Additionally, the disseminative nature of the content on social media platforms is also believed to impact the formation and propagation of brand identification (Hennig-Thurau, et al., 2013). However, there has been a lot of discussion in the literature about how company culture and CSR programs affect customer attitudes and actions. Research by Marlin et al. (2009) and Lichtenstein et al. (2004) has shown that corporate social responsibility has a major impact on brand recognition. But there hasn't been much research done on the connection between consumer brand identity and corporate social responsibility (CSR) communication on social media, much less an in-depth examination of the ways in which various forms of CSR communication on social media affect brand identification. This research attempts to close this gap.

The analysis presented above leads this study to offer the following hypotheses:

H1a: Environmental CSR communication on social media has a positive impact on brand identification.

H1b: Societal CSR communication on social media has a positive impact on brand identification.

H1c: Customer-related CSR communication on social media has a positive impact on brand identification.

Brand identification & brand loyalty

Brand identification, a psychological state, is believed to stem from consumers' perceived connection with the brand and their positive evaluations (Bhattacharya & Sen, 2003), greatly stimulating their loyalty (Delgado-Ballester & Munuera-Aleman, 2001; Andreu, et al., 2015). Bhattacharya and Sen (2003) propose that more consistent and long-lasting preferences are how identity identification-related commitment manifests itself in the context of customer-company interactions. Similarly, Aaker (1997) suggest that when individuals identify with a company's brand, they emotionally attach to and care about the brand and its products. Subsequently, this sense of belonging and perceived unity motivates them to engage in behaviors aimed at "maintaining, supporting, and improving the organization."

Furthermore, loyalty might be considered the inevitable result of a consumer's affiliation with their self-identity. Cognitive consistency causes customers to favor goods or services from brands that reflect their self-identity when they grow to identify with those brands (Yoo et al., 2000; Malär et al., 2011). Customers like brands that are consistent with their self-identity as a way of self-expression and identity formation through brand identification (Escalas & Bettman, 2003).

The close relationship between brand identification and brand loyalty has been validated by many scholars, especially in the fields of marketing and business management. Aaker (1996), Fournier (1998), and Schmitt (2012) argue that the relationship between consumers and brands is not merely a transactional one but also an emotional and identity-based connection that needs to be built and maintained to enhance brand value. Early literature such as Aaker (1996) introduced the concepts of brand equity and brand awareness, providing a theoretical foundation for subsequent research. Schmitt (2012) explored the formation of brand identification from a consumer psychological perspective, offering a new insight into understanding the psychological mechanisms of brand identification. Additionally, Kapferer (2012) studied effective brand management strategies to foster brand identification as a result of achieving brand loyalty. These literature share a certain degree of inheritance and complementarity.

However, most of the literature was published in the 1990s to the early 2000s. While they put forward some classic theoretical viewpoints, their research conclusions may no longer apply to today's consumers and brand management environment due to changes in social and market conditions. Therefore, empirical research on these theoretical viewpoints remains necessary.

The analysis presented above leads this study to offer the following hypotheses:

H2: Brand identification has a positive impact on brand loyalty.

Brand loyalty

Definition

Brand loyalty is one of the key concepts of marketing, and it has long been the focus of research in many diverse fields, drawing considerable interest from both practitioners and scholars. In the 1970s, the idea of brand loyalty was first put out. Brand loyalty was defined by Jacoby and Kyner (1973) as the inclination of customers to favor and regularly buy a specific brand when presented with options. This idea was subsequently developed and elaborated upon in later formulations. The essence of brand loyalty, for instance, is defined as consumers' identification and emotional connection to the brand. This relationship is demonstrated by actions and viewpoints such as sustained brand support, good word-of-mouth promotion, and readiness to keep buying (Dick & Basu, 1994; Oliver, 1999).

CSR communication & brand loyalty

Consumers conveniently and efficiently access CSR information from businesses, including societal, environmental, and customer-related CSR information, through social media platforms, which aids in the formation of perceptions and attitudes towards brands (Laroche, et al., 2013). Customers may feel that the firm shares their values and objectives during this process (Morsing & Schultz, 2006), which may significantly strengthen the emotional bond and brand loyalty that they have with the company (Sen & Bhattacharya, 2001; Mohr, et al., 2001). As a result, brand loyalty is crucial for both building and maintaining a brand and is one of the fundamental drivers of corporate success.

There are still certain obstacles and restrictions, even though it has been demonstrated that CSR communication on social media positively affects consumer brand loyalty. First of all, there is a double-edged nature to the way information is disseminated on social media. Unfavorable press resulting from CSR communication can harm a brand's reputation and erode consumer loyalty (Sen & Bhattacharya, 2001). Second, the relationship between CSR communication on social media and customer brand loyalty is made more complex and uncertain by the possibility that social culture, industry competition, and customer preferences will all have an impact on how information is disseminated on these platforms (Kaplan & Haenlein, 2010). For example, Hanson and some scholars in 2018 suggested that when companies promote environmental sustainability activities, particularly in the goods sector, consumers tend to have a more positive view of the brand. Florence and Béatrice (2011) support this finding, noting that environmental

communication can enhance brand assets, especially when it aligns with the brand and is perceived as credible.

Lee and Rhee (2023) called into doubt this, arguing that environmental efforts have no effect on brand image and loyalty, but social and governance activities do. Therefore, companies need to manage the dissemination effects and control influencing factors, targeting different target audiences and contexts, to ensure that CSR communication achieves the expected increase in brand value and loyalty.

The analysis presented above leads this study to offer the following hypotheses:

H3a: Environmental CSR communication in social media has a positive impact on brand loyalty.

H3b: Societal CSR communication in social media has a positive impact on brand loyalty.

H3c: Customer-related CSR communication in social media has a positive impact on brand loyalty.

The role of mediating

Lee and Rhee (2023) called into doubt this, arguing that environmental efforts have no effect on brand image and loyalty, but social and governance activities do. However, solely relying on CSR activities and communication may not be sufficient to directly establish customer loyalty to the brand, as consumer brand identification is considered to play an intermediary role in this relationship (Ahn, et al., 2021). When a company attempts to communicate CSR activities, if the organizational/brand characteristics and values implied by these activities align with the characteristics and values of the customers, customers perceive the brand as enhancing their self-esteem (Lichtenstein, et al., 2004), leading to trust in the brand and further support for it (Vos, Lemon, & Ross, 2010). This is because CSR information reflects the company's characteristics, values, concern for customers, and necessary benchmarks for quality standards (Brown & Dacin, 1997; Mohr & Webb, 1997). Customers tend to reward such behavior by being loyal to the brand (Maignan, et al., 1999).

In academia, researchers have different opinions regarding whether CSR initiatives and communication can directly influence consumer loyalty. Studies by Liu, et al. (2019) and Morteza, et al. (2021) have shown that there is no consensus on what influences CSR on consumer loyalty in the hotel industry. Customer satisfaction, brand image, and trust are examples of factors that might operate as moderators or mediators in the interaction between them. Furthermore, other studies looking at how corporate social responsibility affects consumer behavior have produced varying results, either indicating no influence at all or a negative effect (Sen & Bhattacharya, 2001; Berens, et al., 2005). Latif et al. (2020) found that samples from various nations had varied relationships between CSR actions and consumer loyalty. The effect of corporate social responsibility (CSR) on consumer loyalty is negligible in nations like Pakistan and Italy, and marginally significant in China. This shows that there is a complicated and context-dependent link between CSR actions and customer brand loyalty.

Scholars have recently demonstrated an interest in investigating intermediate elements, including those found by Vafeiadis et al. (2021) and Limbu et al. (2019), in connection with brand loyalty. The mediating function of brand identification between various forms of CSR communication on social media and consumer brand loyalty, however, has not been well studied in the literature. This study attempts to close this gap.

The analysis presented above leads this study to offer the following hypotheses:

H4a: Brand identification mediates the relationship between Environmental CSR communication in social media and brand loyalty.

H4b: Brand identification mediates the relationship between Societal CSR communication in social media and brand loyalty.

H4c: Brand identification mediates the relationship between customer-related CSR communication in social media and brand loyalty.
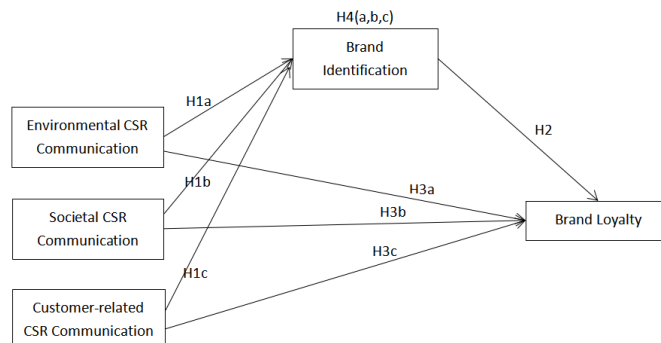

Figure 1. Research Framework

3. Methodology

This study uses case analysis to take Yili brand in China's dairy industry as an example to further analyze this quantitative study. Firstly, consumers are extremely sensitive to food safety issues because they are directly related to consumer life safety and physical health. Dairy products, as one of the daily sources of high-quality protein and nutrition for humans, may bring about significant trust crises for the entire brand due to any oversight (Meng, et al., 2020). Moreover, given the interdependence between the dairy industry and the ecological environment, if companies aim to achieve sustainable development, it is imperative and urgent for them to proactively undertake corporate social responsibility, including consumer-related responsibilities, environmental responsibilities, and social responsibilities (Wang & Li, 2024).

In this context, social media platforms become particularly important. These platforms not only provide an instant and interactive communication environment, allowing companies to respond quickly to consumer concerns, but also enable companies to showcase their efforts and achievements in corporate social responsibility. Weibo, as a Chinese social platform similar to Twitter, allows users to follow interesting people or topics, browse popular topics and news, and post comments and reposts (Luo, et al., 2018). This broadcast-style rapid dissemination of information through relationship-based network trust has enabled Weibo to take root and develop rapidly in China since its establishment in 2009 (Pyrotechnic propagation, 2023).

For the following reasons, Yili, a Chinese dairy brand, was chosen for the study. Firstly, Yili is the biggest dairy corporation in China and the most comprehensively categorized brand in the Asian dairy market (Feng, 2023). Moreover, SOHU Marketing Observation (2023) pointed out that Yili has been rated as the "Number One in the Dairy Industry Social Responsibility Development Index" for six consecutive years, making it the leading enterprise in corporate social responsibility in China. Additionally, Yili opened an official Weibo account in 2016 and currently has 914,000 followers.

This study employs a quantitative method of online survey questionnaires to collect data. A simple random sample was taken from the fan list of Yili's official Weibo account. A total of 500 survey questionnaires were distributed via a link from "Questionnaire Star." After screening, 412 valid questionnaires were obtained. There were two sections to the questionnaire: the first part included some basic information about the respondents, their use of Weibo, the frequency of purchasing Yili products, and their awareness of corporate social responsibility. The second part consisted of mature measurement scales of variables. For the independent variables, this study categorizes Yili's CSR communication on Weibo into three types, including environmental CSR (ECSR), societal CSR (SCSR), and customer-related CSR (CCSR). Their measurement scales were adapted from Öberseder, et al. (2013). The consumer brand identification assessment was modified from Karen L. Becker-Olsen, et al. (2011). Furthermore, Chaudhuri and Holbrook's (2011) measuring technique for customer brand loyalty was modified. A 5-point Likert scale, with 1 representing "strongly disagree" and 5 representing "strongly agree," was used to rate each topic.

4. Data Analysis and Results

In order to verify the research hypotheses and meet the study's objectives, SPSS 29 and SmartPLS 4 software were used to analyze the screened data and test the hypotheses. This study aims to provide a deeper knowledge of consumers' reactions to various forms of corporate social responsibility (CSR) on social media and shed light on their link with brand identity and loyalty through methodical data analysis and empirical research.

Respondent profile

The survey collected a total of 412 valid responses. As shown in Table 1, approximately 54% of the respondents were female. Regarding age distribution, the majority of respondents fell into the age groups of 18-25 (33.3%), 26-35 (41%), and 36-45 (17.7%), which aligns with the demographic characteristics of approximately 80% of 90s and 00s users on Weibo. 73.1% of respondents were married, while the remaining 26.9% were single. In terms of education level, the majority of respondents had a university degree, accounting for 54.4%. 25.1%, 10.3%, and 9.2% of respondents held a junior college degree, master's degree, and high school degree, respectively. Apart from 12.1% and 4.4% of respondents with monthly incomes between RMB 8,001-RMB 9,999 and above RMB 10,000, the majority of respondents (83%) had a monthly income below RMB 8,000. Specifically, 88 respondents reported monthly incomes of RMB 2,000 or less, 71 reported incomes between RMB 2,001 and RMB 4,000, 96 reported incomes between RMB 4,001 and RMB 6,000, and 89 reported incomes between RMB 6,001 and RMB 8,000. With percentages ranging from 11.9% to 19.7%, respondents' residence areas were evenly split across seven distinct regions of China.

Respondents were also asked about their usage of Weibo, product purchasing behavior, and understanding of CSR. 145 respondents indicated that they occasionally used Weibo daily, while the remaining 182 and 85 respondents claimed to use Weibo often and always, respectively. The majority of respondents (approximately 29.6% and 40.8%) had been following the official Weibo account of Yili for 1 year & below and 1-3 years. The study also obtained responses from Weibo fans of Yili who had been following for 3-5 years and over 5 years, accounting for 17.2% and 12.4%,

respectively. Regarding purchase frequency, 41.3% and 44.9% of respondents hardly purchased Yili products every day and several times a week. Only 57 respondents purchased Yili products a few times a month. Finally, in terms of understanding CSR, 158 respondents had a neutral understanding of CSR. 25.1% and 8.1% of respondents considered themselves familiar and completely familiar with CSR. However, 20% and 8.5% of respondents considered themselves unfamiliar and completely unfamiliar with CSR.

Table 1. Demographics of Respondents

Characteristics	Frequency	Percentage %
Gender		
Male	189	45.9
Female	223	54.1
Age		
>18	9	2.2
18-25	137	33.3
26-35	169	41.0
36-45	73	17.7
46-60	24	5.8
Marital status		
Single	111	26.9
Married	301	73.1
Education level		
High school degree	38	9.2
Junior college degree	106	25.1
Bachelor degree	224	54.4
Master degree	40	10.3
Ph.D.	4	1.0
Monthly income		
RMB 2,000 and below	88	21.4
RMB 2,001-RMB 4,000	71	17.2
RMB 4,001-RMB 6,000	96	23.3
RMB 6,001-RMB 8,000	89	21.6
RMB 8,001-RMB 9,999	50	12.1
RMB 10,000 and above	18	4.4
Residential region		
Northeastern China	60	14.6
East China	54	13.1
North China	58	14.1
Central China	49	11.9
South China	51	12.4
Southwestern China	59	14.3
Northwest China	81	19.7
How often do you use Weibo APP every day?		
Occasionally	145	35.2
Often	182	44.2
Always	85	20.6
How long have you been following Yili's official Weibo account?		
1 year and below	122	29.6
1-3 years	168	40.8
3-5 years	71	17.2
5 years and above	51	12.4
How often do you buy Yili products?		
Always (Hardly everyday)	170	41.3
Often (Several times a week)	185	44.9
Occasionally (Several times a month)	57	13.8
Do you understand the content of corporate social responsibility?		
Completely unfamiliar	35	8.5
Unfamiliar	83	20.0
Neutral	158	38.3
Familiar	103	25.1
Completely familiar	33	8.1

Measurement model

Table 2 displays the items loading, Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE) for the variables measured. Cronbach's alpha and CR values of the 5 variables were measured to assess the internal consistency of the model. Except for Brand Loyalty, which had a Cronbach's alpha value of 0.885, all other variables had Cronbach's alpha values greater than 0.9. Additionally, all CR values were above 0.7. Therefore, these 5 constructs were considered to have internal consistency.

Regarding indicator loading, an item needs to be removed only if its loading value is less than 0.40. According to Table 2, all outer loading values were greater than 0.817, indicating that no items needed to be removed in this study. Moreover, for convergent validity, Fornell and Larcker (1981) suggested that AVE could provide a reference criterion. When AVE is greater than 0.50, the structure demonstrates convergent validity. Clearly, all AVE values in this study meet this criterion.

Table 2. Results of Measurement Model

Constructs	Measurement items	Loading	Cronbach's alpha	CR	AVE
Environmental CSR			0.936	0.948	0.724
ECSR1	Yili reduces energy consumption.	0.854			
ECSR2	Yili reduces emissions like CO2.	0.862			
ECSR3	Yili prevents waste.	0.817			
ECSR4	Yili recycles.	0.835			
ECSR5	Yili disposes of waste correctly.	0.847			
ECSR6	Yili invests in research and development regarding environmental protection.	0.844			
ECSR7	Yili's corporate environmental protection standards are higher than legal.	0.896			
Societal CSR			0.919	0.937	0.711
SCSR1	Yili employs people with disabilities.	0.850			
SCSR2	Yili employs long-term unemployed.	0.835			
SCSR3	Make donations to social facilities.	0.841			
SCSR4	Yili supports employees who are involved in social projects during working hours.	0.872			
SCSR5	Yili invests in the education of young people.	0.838			
SCSR6	Yili contributes to solving societal problems.	0.823			
Customer-related CSR			0.919	0.937	0.712
CCSR1	Yili implements fair sales practices.	0.826			
CCSR2	Yili labels products clearly and in a comprehensible way.	0.832			
CCSR3	Yili meets quality standards.	0.830			
CCSR4	Yili sets fair prices for products.	0.866			
CCSR5	Yili offers safe (not harmful) products.	0.857			
CCSR6	Yili offers the possibility to file complaints.	0.851			
Brand identification			0.927	0.942	0.732
BI1	Yili is an important brand.	0.852			
BI2	Yili has quality products.	0.864			
BI3	Yili has reliable products.	0.838			
BI4	Yili understands its customers.	0.849			
BI5	Yili is a brand I feel good about.	0.837			
BI6	Yili is a brand I trust.	0.890			
Brand loyalty			0.885	0.921	0.744
BL1	I am committed to Yili.	0.882			
BL2	I am willing to pay a higher price for Yili products than other brands.	0.850			
BL3	Next time I buy dairy product, I will buy the products of Yili.	0.843			
BL4	I intend to continue to purchase the products of Yili.	0.874			

The distinctiveness of several constructs in the measuring model—which guarantees that each item has a higher correlation with its construct than with other constructs—is referred to as discriminant validity. The Fornell-Larcker criteria (1981) and cross-loading analysis are two popular techniques for evaluating discriminant validity in PLS-SEM. The square roots of average variance extracted (AVE), as shown in Table 3, are bolded and all of them exceed the maximum correlation with any off-diagonal construct (Hair et al., 2017). Comparison of factor loadings and cross-loadings results can be observed in Table 4. Each construct's bolded factor loading values should be higher than those of the other constructs in order to verify the structure's efficacy (Hair et al., 2017). Furthermore, a novel criteria for evaluating discriminant validity in variance-based structural equation modeling is the Heterotrait-Monotrait Ratio of Correlations (HTMT). While some writers (Kline, 2011) recommend a threshold of 0.85, others (Gold et al., 2001) advise a value of 0.90. Referring to Table 5, all of the HTMT values derived from the measurement scales used in this investigation meet the requirement of being less than 0.85.

Table 3. Fornell-Larcker Criterion Results

Constructs	Brand identification (BI)	Brand loyalty (BL)	Customer-related CSR (CCSR)	Environmental CSR (ECSR)	Societal CSR (SCSR)
Brand identification (BI)	**0.855**				
Brand loyalty (BL)	0.599	**0.862**			
Customer-related CSR (CCSR)	0.370	0.491	**0.844**		
Environmental CSR (ECSR)	0.460	0.571	0.476	**0.851**	
Societal CSR (SCSR)	0.507	0.538	0.411	0.430	**0.843**

Table 4. Loadings and Cross-Loading

	Brand identification (BI)	Brand loyalty (BL)	Customer-related CSR (CCSR)	Environmental CSR (ECSR)	Societal CSR (SCSR)
BI1	**0.852**	0.491	0.291	0.403	0.384
BI2	**0.864**	0.515	0.353	0.403	0.469
BI3	**0.838**	0.515	0.313	0.372	0.454
BI4	**0.849**	0.500	0.253	0.376	0.391
BI5	**0.837**	0.522	0.342	0.396	0.443
BI6	**0.890**	0.528	0.341	0.410	0.455
BL1	0.575	**0.882**	0.420	0.535	0.509
BL2	0.462	**0.850**	0.424	0.463	0.420
BL3	0.526	**0.843**	0.448	0.482	0.477
BL4	0.493	**0.874**	0.403	0.483	0.443
CCSR1	0.326	0.390	**0.826**	0.401	0.410
CCSR2	0.269	0.388	**0.832**	0.373	0.262
CCSR3	0.293	0.424	**0.830**	0.429	0.333
CCSR4	0.340	0.453	**0.866**	0.408	0.367
CCSR5	0.314	0.395	**0.857**	0.407	0.367
CCSR6	0.327	0.430	**0.851**	0.394	0.335
ECSR1	0.383	0.483	0.396	**0.854**	0.355
ECSR2	0.431	0.498	0.404	**0.862**	0.398
ECSR3	0.390	0.517	0.429	**0.817**	0.356
ECSR4	0.380	0.443	0.394	**0.835**	0.330
ECSR5	0.375	0.459	0.394	**0.847**	0.365
ECSR6	0.362	0.464	0.405	**0.844**	0.382
ECSR7	0.412	0.525	0.414	**0.896**	0.375
SCSR1	0.428	0.476	0.373	0.421	**0.850**
SCSR2	0.387	0.398	0.326	0.297	**0.835**
SCSR3	0.468	0.468	0.324	0.375	**0.841**
SCSR4	0.458	0.475	0.363	0.359	**0.872**
SCSR5	0.409	0.444	0.339	0.377	**0.838**
SCSR6	0.406	0.452	0.352	0.340	**0.823**

Table 5. HTMT Criterion Results

Constructs	Brand identification (BI)	Brand loyalty (BL)	Customer-related CSR (CCSR)	Environmental CSR (ECSR)	Societal CSR (SCSR)
Brand identification (BI)					
Brand loyalty (BL)	0.658				
Customer-related CSR (CCSR)	0.399	0.543			
Environmental CSR (ECSR)	0.493	0.623	0.513		
Societal CSR (SCSR)	0.546	0.593	0.446	0.462	

Hypothesis testing
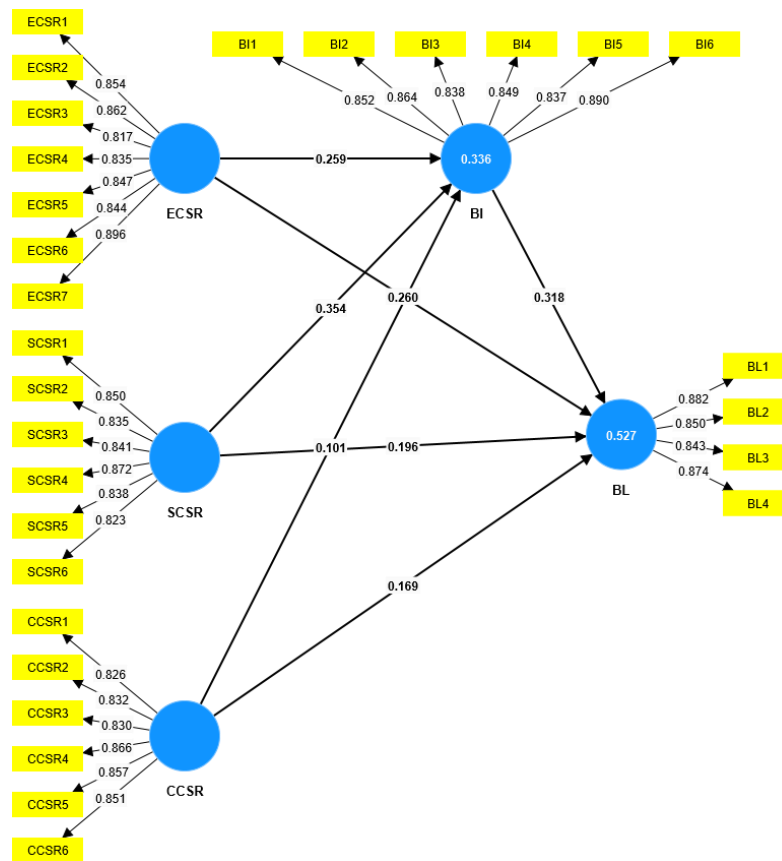
Figure 2. Structural Model after running PLS Algorithm

Figure 2 presents the structural model estimated through the partial least squares (PLS) algorithm, yielding parameter estimates. Among these, R² (coefficient of determination) and f² are considered crucial metrics for evaluating the model's explanatory and predictive power. According to Chin (1998), R² values around 0.670 are deemed significant, while those around 0.333 are considered moderate. R² values approximately 0.190 indicate weak explanatory power. As shown in Table 6, environmental CSR, societal CSR, and customer-related CSR collectively explain 33.6% of the variance in brand identity, indicating a moderate level. Furthermore, brand identity and the aforementioned three types of CSR together account for 52.7% of the variance in brand loyalty, indicating a moderately high level.

Additionally, f² serves as a complement to R². According to Cohen (1988), tiny, medium, and large impact sizes are represented by f2 values of around 0.02, 0.15, and 0.35, respectively. Referring to Table 6, the f² value for H1c is the smallest at 0.011, below the threshold of 0.02. The remaining hypotheses fall within the range of 0.02 to 0.15, with H1b and H2 exhibiting relatively larger f² values of 0.143 and 0.141, respectively, almost reaching the threshold for a medium effect size.

To assess the predictive relevance of the data in the model, bootstrapping is performed in PLS. A Q^2 value greater than 0 is considered indicative of predictive relevance for the corresponding endogenous variables (Stone, 1974). Moreover, larger Q^2 values indicate stronger predictive relevance. Hair et al. (2017) established thresholds for Q^2: a value of 0.02 indicates low predictive significance, a value of 0.15 indicates moderate predictive relevance, and a value of 0.35 indicates strong predictive relevance. Referring to Table 6, it is evident that both brand identity and brand loyalty have Q^2 values exceeding the thresholds. Specifically, the Q^2 value for brand identity is 0.243, indicating moderate to high predictive relevance. Furthermore, the Q^2 value for brand loyalty reaches 0.385, surpassing the threshold of 0.35, demonstrating a high level of predictive relevance for endogenous constructs.

Table 6. Hypotheses Testing for Direct Relationships

Hypothesis	Relationship	Std. Beta	Std. deviation (STDEV)	T statistics	Decision	R^2	f^2	Q^2
H1a	ECSR→BI	0.259	0.059	4.373**	Supported		0.072	
H1b	SCSR→BI	0.354	0.056	6.298**	Supported	0.336	0.143	0.243
H1c	CCSR→BI	0.101	0.053	1.913	Not supported		0.011	
H2	BI→BL	0.318	0.067	4.717**	Supported		0.141	
H3a	ECSR→BL	0.260	0.062	4.204**	Supported		0.094	
H3b	SCSR→BL	0.196	0.062	3.179**	Supported	0.527	0.054	0.385
H3c	CCSR→BL	0.169	0.054	3.138**	Supported		0.043	

Note: **p< 0.01

Simultaneously, bootstrapping is essential, particularly for mediating relationships, which contributes to assessing the significance of path coefficients, standard deviation, confidence intervals, and other parameters. The t-value and p-value are commonly utilized to determine the significance of path coefficients. Generally, when the t-value of a path coefficient is high, indicating a substantial difference between the observed sample data and the null hypothesis, the corresponding p-value tends to be small, thereby signifying the significance of the path coefficient (Cohen, et al., 2013). According to Hair et al. (2017), when the p-value is less than 0.01, the corresponding path coefficient is considered significant.

As shown in Table 6, the impacts of three different types of CSR (environmental CSR, social CSR, and customer-related CSR) on consumer brand identification correspond to H1a, H1b, and H1c, respectively. The research results support H1a (β=0.259, p<0.01) and H1b (β=0.354, p<0.01). However, the study findings indicate that the direct impact of customer-related CSR on brand identification is not significant (β=0.101, p>0.01), thus rejecting H1c. Regarding H2, the mediating factor of brand identification exhibits a significantly direct effect on brand loyalty (β=0.318, p<0.01). Similarly, the research results also support H3a (β=0.318, p<0.01), H3b (β=0.318, p<0.01), and H3c (β=0.318, p<0.01).

Table 7. Hypotheses Testing for Indirect Relationships

Hypothesis	Relationship	Std. Beta	Std. deviation (STDEV)	T statistics	Confidence Level (BC)		Decision
					LL	UL	
H4a	ECSR→BI→BL	0.082	0.025	3.303**	0.040	0.137	Supported
H4b	SCSR→BI→BL	0.112	0.029	3.841**	0.059	0.173	Supported
H4c	CCSR→BI→BL	0.032	0.018	1.804	0.000	0.070	Not supported

Note: **p< 0.01

Finally, in addition to the hypotheses regarding direct relationships shown in Table 6, Table 7 lists all hypotheses regarding indirect relationships among the variables in this study, including H4a, H4b, and H4c. For H4a (β=0.082, p<0.01, t=3.303) and H4b (β=0.112, p<0.01, t=3.841), their indirect effects are significant. When the confidence interval of an indirect effect falls between 2.5% and 97.5%, it means that with 95% confidence in repeated sampling, the confidence interval contains the true parameter value (MacKinnon, et al., 2004). According to Preacher and Hayes (2008), when the Confidence Level (BC) falls between the lower limit and upper limit without crossing 0, it indicates the presence of a mediating factor. In Table 7, H4a (LL=0.040, UL=0.137) and H4b (LL=0.059, UL=0.173) meet this criterion. However, the research results (β=0.032, p>0.01, t=1.804) indicate that the indirect effect of customer-related CSR on brand loyalty through brand identification is not significant. Furthermore, the confidence interval for H4c ranges from 0.000 to 0.070 and crosses 0, hence H4c is not supported by the results of the hypothesis test.

5. Discussion and Conclusion

This study categorizes CSR communication into social CSR communication, environmental CSR communication, and customer-related CSR communication based on the nature and objectives of CSR initiatives. It explores the influence of different types of CSR communication on brand loyalty in Weibo, with a focus on the mediating role of brand identification in these relationships. Through the SEM-PLS quantitative research method, we have drawn several important conclusions, indicating differences in shaping customer brand identification and loyalty concerning different types of CSR communication.

Firstly, Corporate Social Responsibility (CSR) communication on social media directly impacts brand identification and brand loyalty. This suggests that disseminating CSR information on social media can enhance customers' brand identification, subsequently increasing brand loyalty. This finding is consistent with previous academic research and further extends and complements existing studies. For instance, studies by Liu et al. (2023), Gupta et al. (2021), and Wu and Zhu (2021) have all demonstrated that CSR communication or CSR engagement on social media can enhance consumers' emotional connection to the brand. This emotional connection leads to brand identification and subsequently fosters brand loyalty through attitudes and behaviors.

However, unlike previous studies, this research further reveals that different types of CSR communication on social media—environmental CSR (ECSR), social CSR (SCSR), and customer-related CSR—show varying direct impacts on brand identification and brand loyalty. Specifically, this study finds that ECSR communication on social media has a direct positive effect on both brand identification and brand loyalty, emphasizing the necessity for companies to embrace sustainability and environmental protection, especially in the dairy industry. This finding is supported by similar studies conducted by Shafiul Alam and Zahidul Islam (2021), and Chuang & Chen (2023), although their research primarily focused on analyzing the ECSR dimension's impact on comprehensive brand indices, such as brand image, consumer trust, and brand loyalty, from a marketing perspective. Furthermore, this study also reveals that SCSR communication on social media significantly enhances customer brand identification and loyalty. This result aligns with the findings of Tiep et al. (2020), which demonstrate that SCSR can promote firm performance by enhancing corporate reputation and increasing consumer purchase intentions.

Secondly, in terms of mediation, our study found that social and environmental CSR communication indirectly influences brand loyalty through brand identification. While some scholars have studied the indirect impact of CSR communication on consumer brand loyalty, most have only considered SCSR and ECSR as dimensions of CSR, rather than examining them separately as independent variables. For instance, the studies by Chu and Chen (2019) and Liu, et al. (2023) indicate that CSR communication on social media can strengthen consumers' emotional connection to the brand, thereby enhancing brand loyalty. Our research not only confirms these findings but also expands on them by conducting a deeper analysis of the indirect effects of different types of CSR communication.

Notably, while our study aligns with existing literature in its overall conclusions, we have identified some new details. Customer-related CSR (CCSR) communication does not directly impact brand identification on social media, nor does it indirectly affect brand loyalty through brand identification. Similarly, Tiep et al. (2020) noted that CCSR, as part of the broader CSR dimensions, did not significantly influence corporate reputation and consumer purchase intentions as mediators. Their study also found minimal contribution to the dependent variable, Firms' Performance. These findings are largely consistent with our conclusions. However, our study supports the hypothesis that "customer-related CSR communication directly impacts brand loyalty." This may suggest that customers perceive CCSR information on social media as a marketing strategy aimed at selling products, thereby reducing the extent of brand identification. Despite not directly influencing brand identification, CCSR communication still plays a role in enhancing customer loyalty. Additionally, we found that brand identification has a direct impact on brand loyalty, further validating its crucial role in shaping brand loyalty. This underscores the importance of understanding how different types of CSR communication influence consumer perceptions and behaviors.

Overall, by exploring these relationships, we not only enrich theoretical understanding but also provide practical significance for brand management. Firstly, for brand management practitioners, actively utilizing social media platforms for CSR communication is an efficient and frugal way. Moreover, understanding the differential effects of different CSR types and content on brand identification and loyalty on social media can guide brand management strategic decisions, enabling more precise alignment with target customer groups. Businesses should tailor or adjust their CSR communication strategies on social media according to target audiences to strengthen brand-consumer relationships. Secondly, our research underscores the importance of cultivating brand identification as a means of enhancing brand loyalty. By investing in CSR initiatives that align with corporate values and resonate with customers, businesses can cultivate a loyal customer base and achieve sustainable business growth.

Additionally, it further enriches the research on the impact of CSR communication on brand identification and loyalty, with previous studies rarely focusing on comparing the effects of different types of CSR communication on audiences.

Furthermore, by offering empirical evidence in favor of brand identification's mediation function in the link between CSR communication and brand loyalty, our research makes a substantial contribution.

However, this study also has some limitations. For example, response bias may be introduced since our study uses self-reported data. Furthermore, other possible mediating factors that can affect the link between CSR communication and brand loyalty are not taken into consideration in this study, which solely concentrates on the mediating function of brand identity. To fully comprehend the mechanics of brand formation, future study might make use of a variety of techniques and take into account additional potential mediating variables, such as the link between customer personal values and brand image. Additionally, as social media continues to evolve and change, future research could also focus on the impact of CSR communication on other emerging social media platforms and consumer acceptance and response to CSR information on different platforms, providing more targeted management recommendations for businesses.

Authors contributions

Dr. Nurul Ain Mohd Hasan provided the initial guidance on topic selection and offered valuable feedback on the research framework, contributing significantly to the study design. Dr. Sharifah Sofiah Syed Zainudin participated in the discussions regarding research methodology and corrected the initial sampling method errors. Dr. Feroz De Costa guided me through the data analysis process using Smart-PLS software and reviewed the final results. All authors have read and approved the final manuscript.

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The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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