

Article

Exploring the Outcomes of Customer Engagement in DSR: The Role of Affective Commitment and Gamification Affordance

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Abstract: Embedding gamified charity into digital social responsibility (DSR) programs has stimulated customers to behave in prosocial and pro-environment ways in daily life. Prior studies on customer outcomes of corporate social responsibility (CSR) have yielded fragmented findings in an offline environment. To reap the maximum returns of DSR, this study deconstructs sustainable customer engagement outcomes of DSR into external outcomes, including customer citizenship behavior, and internal outcomes, such as customers' intention to continue. Moreover, this study examined the role of affective commitment and gamification affordance within a single framework of customer response to DSR. The findings of an empirical study carried out in the DSR programs prove that the underlying psychological mechanisms between customer engagement in DSR and various customer outcomes are mediated by affective commitment and moderated by gamification affordance. This study contributes to the DSR stream of sustainable engagement outcomes by proposing a theoretical framework to clearly understand the psychological mechanisms and boundary conditions influencing the customer response to DSR.

Keywords: customer engagement; customer citizenship behavior; digital social responsibility; affective commitment; gamification affordance



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1. Introduction

Companies have implemented corporate social responsibility (CSR) practices in order to achieve sustainable performance while addressing their social and ecological concerns in a balanced manner [1]. CSR refers to corporates voluntarily incorporating social, environment and economic welfare into their business activities and represents the relationship between corporates and their stakeholders [2–4]. In the scope of corporations, CSR was identified as a significant strategy for improving competitiveness [5]; therefore, some major corporations aggressively implement innovations to demonstrate their social responsibility and to better their public perception and reputation [6]. Similarly, CSR efforts have potentially positive effects on customer engagement outcomes that encourage greater awareness of social welfare and promote behavior modification [7,8]. In this circumstance, motivating individuals to engage in CSR initiatives and express more pro-environmental and prosocial behaviors is a viable approach to increase both public benefits and corporate development [9]. However, the inability to comprehend how customers' respond to CSR practices will prevent CSR activities from maximizing returns [5]. Indeed, customers' reactions to CSR programs frequently involve additional psychological mechanisms [10,11].

The explosion of information and communication technology (ICT) has altered people's behaviors and lives, allowing businesses a remarkable opportunity to boost customer engagement [12]. As a direct consequence, businesses are increasingly integrating digital social responsibility (DSR) programs into their operations [13]. DSR is implemented in multidirectional programs on digital platforms and social media [14,15]. Since ICT has reduced the necessary work by potential contributors by delivering digital platforms to materialize

their intentions [1], similarly, the online channels enable corporations to develop more customer-centric and consumer-relevant social responsibility programs [16]. The evidence from China is the Ant Forest program embedded into Alipay, a public mobile gaming application combining ICT and CSR, which provides various engaging approaches to charity and promotes CSR engagement through customers' daily low-carbon lifestyles [6]. Therefore, customers actively reward companies' efforts toward CSR with sustainable behaviors such as continuing to participate, providing innovative thoughts, offering online support, and recommending socially to others [5,17]. Scholars have investigated the connection between DSR and performance and discovered that customer engagement improves both CSR and strategy performance [14]. Moreover, researchers discovered that the attitudes of customers toward DSR on social media are the predictors of customer engagement with DSR [15]. Nevertheless, there is limited focus on the mechanism of customer engagement outcomes of DSR, and the majority of sustainable customer behaviors given are based on the evidence of the influences of offline CSR [13]. Thus, the authors were motivated to explore the diverse outcomes of customer engagement in DSR, including CCB, and continue participating in DSR.

There are fragmented findings concerning the effectiveness of customer engagement in DSR. It was established that customers expect to transform their passive role to join in the value co-creation process and demonstrate philanthropic and voluntary behavior [18]. Furthermore, prior research on customer engagement has given abundant evidence of its efficacy in customer loyalty, trust, word-of-mouth referrals, commitment, and feedback [19–21]. Another body of research indicated that when a customer engages in a company's DSR program, instead of just purchasing a product or service, the company and the customer build long-term relationships [22,23]. These segmented findings reveal that the diversified outcomes of customer engagement in DSR might include both external outcomes, such as customer citizenship behavior (CCB), and internal outcomes, such as customers' intention to continue [5,6]. However, little research has examined relevant outcomes and psychological mechanisms within a single framework. To maximize the positive effect of CSR in a digital context, several studies have advocated for more comprehensive research into the initial conditions and occurrence mechanisms governing sustained customer engagement [1,13]. This study responds to these calls by proposing a moderated mediation model for the relationship between customer engagement and sustainable customer outcomes.

While the developing use of ICT can involve customers in CSR activities, one way to effectively bridge the connection between customer engagement and customers' sustainable responses may be found in affective commitment concept. Previous studies have proven that customer engagement directly influences affective commitment without exploring the customers' behavioral and intent manifestations [20,21,24]. Furthermore, customers who are affectively committed to a company generally feel obligated to that company and might have stronger inclinations to reciprocate [25]. Hence, a number of CSR studies have demonstrated that one of the key factors influencing CCB is customers' affective commitment [25,26]. In addition, continuance intention is largely determined by customer satisfaction; CSR offers customers psychological benefits (e.g., green effectiveness, enjoyment), which strengthen their intention to continue participating [6,8,27]. However, none of the existing literature emphasizes the relevance of affective commitment attributes in predicting the sustainable responses of potential consumers in DSR programs. Noting this, this study proposes affective commitment mediation as relevant psychological mechanisms.

To evaluate the effectiveness of psychological commitment, this study investigates whether DSR initiatives with a higher level of gamification affordance are more likely to encourage customers to produce sustained engagement reactions. In ICT-based workplaces, gamification affordance was proven to have a positive effect on customer satisfaction and psychological ownership, hence, influencing customer decisions [6,23]. In fact, numerous Chinese firms, including Alipay and Meituan, have incorporated gamification into corporate philanthropy. Customers become more involved in DSR programs by engaging in gamified activities and being supported in transforming their actions into real-world cir-

cumstances [1,28]. Consumer engagement is believed to raise consumers' perceived value and foster positive interactions that reinforce consumers' affective commitment [24], which may affect sustainable customer response to DSR. Previous research in the environmental field has shown that individual sustainable attitudes and green behaviors are shaped by gamified applications [29,30]; this is because enabling gamification affordances motivated customers participation intentions through improving hedonic value [31,32]. It would seem, then, that customer CSR performance would benefit from effective CSR gamification design. Therefore, additional research is necessary to understand the extent to which the mediating influence of affective commitment is moderated by gamification affordance as a DSR performance variable.

To fill these gaps, this study develops a framework that specifies when and how customers respond sustainably to DSR. In order to provide a comprehensive explanation to the process, this study deconstructs customer response to DSR into internal outcomes and external outcomes to reveal the effects of customer engagement in DSR on different types of customer outcomes. This study also examines the mediation of affective commitment to empirically investigate the underlying psychological mechanisms. In addition, the study explores the moderating effect of gamification affordance on these mechanisms. This study contributes to the literature on CSR and customer engagement in digital environment. The study findings also provide a guidance to DSR initiatives on how to optimize the sustainable outcomes of customer engagement in their interaction strategies.

2. The Literature Review

2.1. Sustainable Customer Engagement Outcomes

It is believed that the co-creation of shared value represents one of the most potent engines driving business expansion [33], and interest in customer engagement has gained increased attention [21]. Existing studies provide diverse definitions of customer engagement. For example, some researchers concentrated on the single behavioral dimension that goes beyond mere economic transactions [34,35]. In contrast, Brodie et al. (2011) conceptualized customer engagement in the psychological approach, which developed from the interactive and co-creative experiences of a customer during the service process [36]. However, most researchers have adopted a multidimensional perspective to characterize customer engagement that encompasses the level of cognitive, emotional/affective and behavioral activity related to direct interaction [37–39]. In particular, Chuah et al. (2020) put forward that sustainable customer engagement behavior refers to behavioral manifestations that focus on environmental or community sustainability rather than just economic transactions [5].

Customer engagement is a mindset that influences customer behavior, which is crucial to the firm's DSR [19]. Prior studies have largely concentrated on the essential drivers of customer engagement in CSR, such as CSR image, customer initiative preference [15,19,40], customer brand identification, customer satisfaction [38], and perceived brand fit [5]. However, to fully understand the underlying mechanism of customers response to DSR, it is necessary to explore the potentially diverse outcomes of customer engagement in CSR, encompassing effects on the business or brand, social issues (e.g., environmental improvements) and stakeholders, which also include raising public awareness of social responsibility and promoting responsible behavior [7,9]. On the one hand, advances in ICT and the growth of social media have facilitated customer interactions, so customer engagement affects customer extra-role voluntary and discretionary citizenship behaviors [5,41]. On the other hand, the customer's continuously participating intention in CSR initiatives is a viable approach for addressing social concerns and advancing social welfare [23].

Specifically, CCB is extended beyond customers' in-role behavior that contributes to the success of company's service [42], which enables customers to give constructive feedback, offer assistance proactively, recommend the business to others forwardly, and tolerate service faults willingly [18]. Applied to CSR issues, the value of co-creation accrued in CSR initiatives extends to the value of society [40]. CCB are extensively recognized to

contribute to business performance, which includes improving market efficiencies and supporting service improvement [4,42]. In addition, according to the theory of planned behavior, which was established to predict and evaluate human continuance participation intention and actions [43], the intention to continue participating in DSR is identified as one's internal psychological intention to take part in CSR consistently [23]. Similarly, DSR programs can achieve rapid expansion through efficient retention and acquisition of customers [28]. Therefore, based on the existing literature, this study suggests that sustainable customer engagement outcomes include both external and internal outcomes, consisting of CCB and customers' intention to continue [5,6].

2.2. Affective Commitment

Customer commitment can be defined as the psychological link that exists between customers and organizations, allowing customers to preserve a valuable partnership [26]. The concept of customer commitment covers three distinct dimensions: continuance commitment, normative commitment and affective commitment [44]. In contrast to continuance and normative commitment, prior research has demonstrated that emotional bonds such as affective commitment predict customers' behavior more accurately than cognitive belief [24,26]. Affective commitment in customers is both an attitude reaction and emotional attachment, which highlights customers' sentiments of belonging to organizations and signals desires to retain meaningful relationships with companies [45]. Previous research emphasized the affective commitment of employees in the organizational context [11,46], whereas the commitment of customers in the service sector has been limited in exploration [26,45].

Customers' affective commitment is growing in importance since the perspectives of customers play substantial mediating roles between CSR and customer responses [9]. In accordance with the social exchanges theory, intangible resources having symbolic benefits, including love and friendship, contribute to a favorable social exchange relationship [47,48]. The CSR efforts of a company contribute to the development of a customer-centric reputation, which, in turn, influences consumer attitudes toward the DSR programs [26]. Therefore, affective commitment is helpful to assert a solid relationship as it promotes various sustainable customer responses to CSR initiatives, such as multi-forms of customer loyalty, sensitivity to service quality and positive word-of-mouth [11,26].

2.3. Gamification Affordance

Based on the gamification literature, gamification refers to the integration of game mechanics into non-game situations to encourage behavioral changes [49], and gamification affordances mean the psychological experiences offered by gamified elements and mechanics in information systems [31,50]. Specifically, major perceived gamification affordances involve interactivity, visible achievement, autonomy support and competition [8,28]. The affordance of gamified setting improves customer participation habits, customer experiences and outcomes [23]. In addition, following the technology acceptance model (TAM), customers prefer to interact with effective and user-friendly new digital platforms [49], while gamification assists businesses in providing convenient access for stakeholders who require information on DSR initiatives. Through gamification, addressing sustainability concerns becomes more engaging, hence, reaching audiences with less enthusiasm for CSR issues [51]. Specifically, Ant Forest, which operates as a DSR program, attracts customers to behave in pro-environmental and prosocial behavior in daily life.

3. Theoretical Framework and Hypothesis Development

3.1. Customer Engagement in DSR and Sustainable Outcomes

The interactivity of modern digital platforms and socializing characteristics make it easier for customers to participate in voluntary activities, which are commonly known as CCB and extend beyond customers' in-role behavior [32,52,53]. Extant studies have well-documented the favorable impact of customer engagement on customer loyalty; customers

who are engaged will make a commitment behavior to benefit the relationship with the company [19,21,40,54]. However, CCB in the context of DSR, which is an external outcome of customer engagement, has been less examined [21].

CCB critically supports the firm's social responsibility initiatives in the online environment, including establishing dialogues between stakeholders and dissemination of relevant messages through social media [23,55]. A prior study posited that customer engagement behaviors generally extend beyond transactions, as well as giving reviews, recommendations and other forms of word-of-mouth in order to assist other customers who are in the same situation [38,41]. Customer engagement also engenders program advocacy and even tolerance for service deficiencies [5,54]. Meanwhile, engaged customers have a higher probability to provide informative feedback that is related to customer requirements and degree of satisfaction instead of merely being used for complaints [19]. Moreover, customers are easily persuaded by other online members, causing them to interact more and share positive content [54]. Based on the evidence presented above, we hypothesize:

H1a. *Customer engagement in DSR is positively related to CCB.*

Customers react in numerous ways to a firm's CSR initiatives [56]; while co-creation of social value is advantageous to the public, the intention to constantly participate in DSR is essential for raising social welfare by reinforcing prosocial and pro-environmental behavior [1]. Customer engagement in CSR can lead to both modification of customer behavior and advancement of the core cause or social issue at the center of the company's CSR practices [7]. Moreover, an old customer can bring in more benefits than a new one, and acquiring a new consumer is five times more costly than retaining the existing one [57]. However, the internal outcome of customer engagement in DSR, customers' intention to continue, is mentioned infrequently in the current literature.

The theory of planned behavior utilizes three main dimensions to predict customer intentions and behavior: attitude, perceived behavioral control and subjective norms [43]. Customer engagement is strongly tied to mobilizing behavior in the CSR context, which involves customers donating resources to mobilize other stakeholders' activities towards the business [35,40]. Customers contribute to social issues through paying money and time and adjusting their own daily behavior [7]. Moreover, supporting customers tend to contribute more effort to CSR initiatives [58], and they can recruit other stakeholders through their relationship network. To all stakeholders, participatory CSR activities are immediately related to awareness of social issues and possibly bring about behavioral and attitudinal change [9]. On these premises, we argue that if customer engagement in DSR initiatives can motivate the customers' socially responsible thoughts, then there is a probability that customer engagement in DSR can stimulate the customer's intention to continue participating. Therefore, we may hypothesize:

H1b. *Customer engagement in DSR is positively related to customers' intention to continue.*

3.2. The Mediate Role of Affective Commitment

In terms of social exchange theory, individuals believe they will gain a particular benefit from their social interaction behavior [59]. Such exchanges involve intangible assets such as friendship that promote positive social exchange relations [47]. Customers may have stronger intentions to reciprocate and assist the business when they feel they were served above and beyond the expected norm [42]. Moreover, since businesses implement DSR programs via the internet, which provides customers with easy access to engagement, customers perceive that the businesses are functioning according to their perceptions and are more inclined to develop feelings of affection [13]. Furthermore, customer engagement is the representation of emotional relationships that deepen the affective commitment of customers [24,60]. Several studies have also proven the positive impact of customer engagement on affective commitment [20,24]. For example, O' Brien et al. (2020) have proposed that the willingness to engage in CSR has an impact on customer affective commitment towards the not-for-profit organizations [21].

The existing research indicates that affective commitment significantly predicts customers' behaviors, whereas affective commitment is influenced by customers' whole perceptions [45]. For example, the views on company's CSR initiatives can favorably impact the brand selection and recommendation decisions of customers [7]. Moreover, a strong degree of affective commitment from customers exerts extra effort to assist the business through their advocacy and purchase behaviors [61]. In line, engaged customers are emotionally involved in the company and strive for the improvement of the business and its offerings, and they are more willing to share their experiences [62]. Therefore, we predict that the effect of customer engagement in DSR on CCB is mediated through affective commitment.

Additionally, engaged customers act in ways that are advantageous to the companies or programs, and to carry out such beneficial results, the affective commitments of customers are required [19]. Commitment is frequently expressed with heavy psychological attachment [60]. As long as the emotional connection between customers and business is established, customers tend to hold the commitment and sustain belief consistency [63]. Furthermore, CSR activities have the potential to raise customers' general well-being, which will lead to sustaining patronage in the long term [7]. If customers form a psychological bond with the firm, mutually beneficial long-term relationships will be fostered [64]. In addition, committed individuals prefer to participate in cooperative activities continuously because they wish to achieve the mutual objectives through the relationship [65]. However, past studies ignored the influence of customers' psychological reactions following involvement on the intention to continue participating [23]. On the basis of the above-mentioned pieces, we may claim that customers who are engaged in DSR are more likely to have affective commitment, which, in turn, is related to both their external and internal sustainable reactions. That is, the impact of customer engagement on sustainable outcomes of DSR is mediated through affective commitment. Therefore, we hypothesize:

H2a. *Affective commitment mediates between customer engagement in DSR and CCB (external outcome).*

H2b. *Affective commitment mediates between customer engagement in DSR and customers' intention to continue (internal outcome).*

3.3. The Moderating Role of Gamification Affordance

This research considers gamification affordance as a moderator in the current research model. The efficacy of gamification design in CSR programs not only increases customer engagement but also encourages their CCB [28]. In an online context, the individual's overall impression based on his or her own engaging experience has a significant effect on customer satisfaction [6]. Satisfied customers might feel affectively obligated to conduct a variety of extra-role behaviors that are favorable to the business or programs [28,32,42]. Moreover, by strengthening customers' psychological ownership, perceived gamification affordances can support CCB in online platforms [28]. Additionally, customers can obtain the psychological advantages of entertainment and flexibility, as well as the visible achievements from engaging in DSR, which makes them more actively contribute to social value co-creation [8,23]. Thus, customers could be inspired to conduct citizenship behavior more willingly when they are satisfied with the self-motivation social gain supported by gamification. We conjecture that customers who engage in CSR programs with a perceived higher level of gamification affordance will be more inclined to respond to DSR initiatives with more active CCB.

Similarly, gamification is an excellent method for promoting cognitive and behavioral modification [51]. According to marketing fields research [50,66], incorporating gamification components into an online platform can make it more fascinating and accessible, which will motivate customers to continue participating and strengthen customer loyalty [6]. The competitive nature of games allows customers to compare their performances with others and exhibit their achievements [8,31]. Meanwhile, with gamification, tackling sustainability concerns becomes more pleasurable, allowing CSR issues to be more effectively communicated to customers [51]. Moreover, the gamification information system serves

customers' needs on green efficiency and enjoyment that predicts customers' intention to continue pro-environmental behaviors [8]. Based on Skinner's (1984) theory of behavioral reinforcement, when individuals' behavior receives positive reinforcement, they tend to continue to perform the previous act [6]. Therefore, we predict that gamification affordance that serves as positive reinforcement improves the likelihood that customers continue to participate in DSR. In this respect, in CSR programs with a greater level of perceived gamification affordance, affective commitment has a stronger effect on the relationship between customer engagement and sustainable outcomes of CSR.

H3a. *Gamification affordance moderates the mediating effect of affective commitment on the relationship between customer engagement in DSR and CCB (external outcome).*

H3b. *Gamification affordance moderates the mediating effect of affective commitment on the relationship between customer engagement in DSR and customers' intention to continue (internal outcome).*

4. Methodology

4.1. Data Collection and Sampling

For the purpose of our research, we collected data from Ant Forest and Ant Farm customers of Alipay in China. Alipay is one of the largest mobile payment platforms in the world. Alipay applied computer games to CSR programs; both Ant Forest and Ant Farm have aroused the enthusiasm of individuals to participate in CSR activities [6]. In Ant Forest, consumers can obtain "green energy" through green behavior that decreases carbon emission, and Ant Forest helps the customers who have enough "green energy" to plant trees in the real world. Similarly, customers can acquire virtual rewards of "eggs", which can be used to become involved in real charity projects organized by Alipay. The goal of these games is to attract customers to contribute to social responsibility through games (e.g., environment and charity). Utilizing such applications is basic, with few further prerequisites for participation, such as previous knowledge or consumption. Users are only required to manually collect green energy by touching the screens of their smart phones before it expires. Furthermore, the CSR games of Alipay represent a corporate commitment to diverse stakeholders, such as customers, suppliers, local communities, non-profit organizations.

The data for our research were collected through an online survey platform in China "www.credamo.com (accessed on 1 December 2022)". This online survey company monitored data rationality through IP addresses and timestamps, which can reject questionnaires from the same participant or computer programs. Participants received RMB 2.5 as a reward for a complete response. As the study involves human participants, the Ethical Committee of the School of Economics and Management reviewed and approved the instrument. In total, 576 questionnaires were obtained, and finally, 418 questionnaires were collected via data clean. The descriptive findings can be found in Table 1.

Table 1. Demographic statistics.

Descriptive	Detail	Respondents	
Gender	Male	273	65.3%
	Female	145	34.7%
Age	Under 20	37	8.9%
	21–30	208	49.8%
	31–40	148	35.4%
	41–50	21	5.0%
	Over 50	4	0.9%
Education level	Under bachelor	19	4.5%
	Bachelor	343	82.1%
	Master and above	56	13.4%

Table 1. *Cont.*

Descriptive	Detail	Respondents	
Work experience	Student	295	70.6%
	Under 1	27	6.5%
	1–5	71	17.0%
	6–10	15	3.6%
	Over 10	10	2.3%
Expense (unit: RMB/month)	Under 2000	185	44.3%
	2001–3500	143	34.2%
	3501–5000	44	10.5%
	5001–10,000	29	7.0%
	Over 10,000	17	4.0%

4.2. Measurement

The final version of the questionnaire was addressed by three marketing and CSR specialists to guarantee the validity of measurement scales. All of the constructs are measured using a 5-point Likert-type scale, ranging from strongly disagree “1” to strongly agree “5”. All the measurement items were adopted and developed from existing studies and were adjusted according to our background. Customer engagement was adapted from Abbas et al. [19] and Islam and Rahman [54]. The affective commitment measurement was drawn from Ahmed et al. [45] and Hur et al. [26]. The CCB measurement was adapted from Yi and Gong [18]. The measurement item for the customer’s intention to continue was adapted from Zhang et al. [6]. Gamification affordance measurement was borrowed from Xu et al. [28] and Du et al. [8]. Control variables such as age, gender and income were measured by single items. The completed version of the instruments is available in Table 2.

Table 2. Scale items and construct evaluation.

Construct	Scale Item	Factor Loading
Customer engagement	I am enthusiastic about Ant Forest or Ant Farm.	0.748
	I feel very positive about Ant Forest or Ant Farm.	0.865
	I become absorbed when I interact with Ant Forest or Ant Farm.	0.818
	I feel happy when I am interacting with Ant Forest or Ant Farm.	0.890
	I am willing to pay more to support Ant Forest or Ant Farm.	0.802
Affective commitment	I feel emotionally attached to Ant Forest or Ant Farm.	0.813
	Ant Forest or Ant Farm has a great deal of personal meaning for me.	0.797
	I feel a strong sense of belonging with Ant Forest or Ant Farm.	0.741
Customer citizenship behavior	I would provide feedback when surveyed by Ant Forest or Ant Farm.	0.762
	I would say positive things about Ant Forest or Ant Farm to others.	0.845
	I would recommend Ant Forest or Ant Farm to others.	0.792
	I would assist other users if they need my help.	0.824
	If service is not delivered as expected, I would be willing to put up with it.	0.726
Continuance intention	I intend to continue using Ant Forest or Ant Farm in the future.	0.911
	I will keep using Ant Forest or Ant Farm as regularly as I do now.	0.928
	I will continue using Ant Forest or Ant Farm as much as possible in the future.	0.886
Gamification affordance	Ant Forest or Ant Farm offers me the possibility to help me feel a sense of choice and freedom in playing it.	0.747
	Ant Forest or Ant Farm offers me the possibility to make visible my achievement in contributing in CSR.	0.857
	Ant Forest or Ant Farm gives me the opportunity to interact with others.	0.842
	Using Ant Forest or Ant Farm offers me opportunities to compare my performance with that of others.	0.761

4.3. Analysis Strategy

Our research chose the partial least squares (PLS) estimation method for data analysis. PLS is widely utilized to examine linear causal relationships among latent variables. PLS finds components that were optimized through factoring and maximizes variance explained regarding the construct's effect on the dependent variable. It also takes measurement errors into consideration. Furthermore, there is no necessity for normality in multivariate analysis, and sample size constraints are minimal. This paper used STATA 15 to verify the structural equation model (SEM) through the PLS method. PLS data analysis requires two steps. The first is to assess the measurement model's reliability and validity. The second step is to verify the hypotheses within the structural model.

5. Results

5.1. Measurement Model

This study examined the fitness of the measurement model using confirmatory factor analysis (CFA). We applied to confirm the construct reliability, convergent and discriminant validity. According to the findings provided from CFA analysis, all items with factor loadings are recorded over the continuum of 0.747 and 9.928, which indicates favorable scores. Table 2 also exhibits the factor loading of measurement items.

All Cronbach's alpha values and composite reliability values surpass the minimum acceptable value of 0.70, thereby validating the reliability of the indicator. The results revealed that all variables had an AVE value of 0.626 or higher, above the minimum acceptable value of 0.5, so the convergence validity was confirmed. In addition, each construct's AVE square root was higher than its correlation with other constructs, offering evidence for discriminant validity [67]. Based on the results drawn from the CFA analysis, the good fit of the construct was further supported [68], such that $\chi^2/df = 2.931$, CFI = 0.973, TLI = 0.962, SRMR = 0.038, RMSEA = 0.049. The results of Cronbach's alpha, composite reliability and average variance extracted (AVE) are shown in Table 3.

Table 3. Soundness and convergent viability and discriminant.

Const	CE	AC	CCB	IC	GA	AVE	CR	Alpha
CE	0.826					0.682	0.915	0.868
AC	0.337	0.809				0.655	0.851	0.724
CCB	0.383	0.341	0.791			0.626	0.893	0.816
IC	0.518	0.462	0.120	0.908		0.825	0.934	0.918
GA	0.319	0.293	0.347	0.436	0.803	0.645	0.879	0.835

Notes: CE = customer engagement; AC = affective commitment; IC = intention to continue; GA = gamification affordance. CR = composite reliability; bolded values on the diagonals of columns are the square root values of AVE.

5.2. Structural Model

To investigate the structural model, the direct impact of customer engagement on affective commitment, CCB and intention to continue participating in DSR were first examined. In Figure 1, the results revealed a positive impact of customer engagement in DSR on CCB ($\beta = 0.365$, $p < 0.01$). A similar trend can be found in the studies by Chuah et al. 2020. Therefore, H1a was supported. The results also show that customer engagement positively influences customers' intention to continue participating in DSR ($\beta = 0.418$, $p < 0.01$), so H1b was accepted. In addition, none of the control variables were recorded as significant. The detailed results can be found in Table 4.

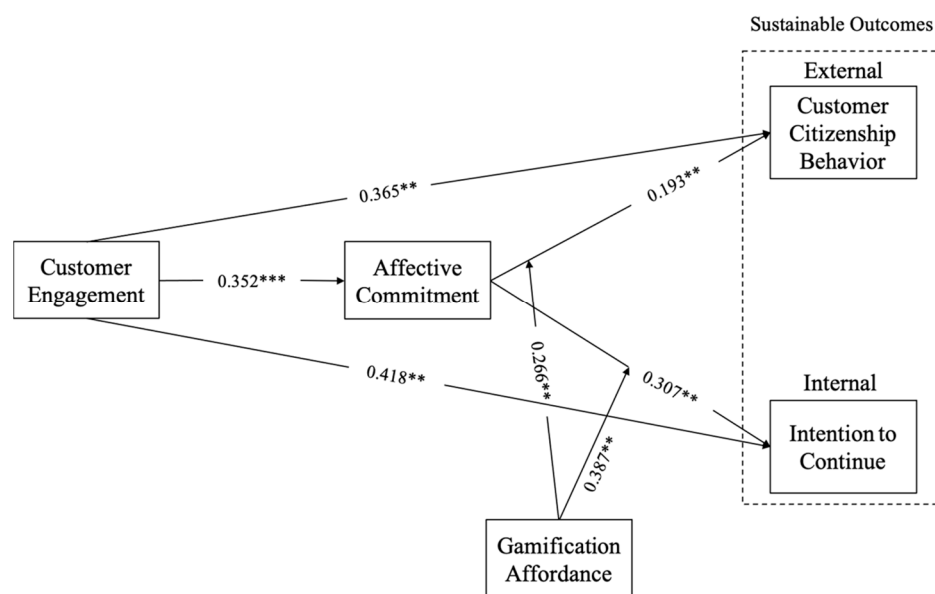


Figure 1. Results of the structural equation model. Note: *** $p < 0.001$; ** $p < 0.01$.

Table 4. Path analysis.

Effect	Coefficient	SE	z-Value	Effect Size
CE → CCB	0.365	0.255	2.775	Medium-Strong
CE → IC	0.418	0.221	0.924	Medium
CE → AC	0.352	0.213	6.261	Medium-Strong
AC → CCB	0.193	0.018	1.176	Medium
AC → IC	0.307	0.129	5.659	Medium-Strong

To examine the mediating effect in our research, we employed the bootstrap technique in STATA 15. In Table 5, the results confirmed that a relevant indirect link between customer engagement in DSR and CCB via affective commitment was significant ($\beta = 0.211$; 95% CI, 0.031 to 0.391). When affective commitment was included in the model, the direct effect of customer engagement on CCB was still statistically significant ($\beta = 0.362$; 95% CI, 0.128 to 0.596), which indicates the partial mediation effect of affective commitment on the relationship between customers engagement in DSR and CCB. Therefore, H2a was accepted. The results also proved the significance of the indirect link between customer engagement and customers' intention to continue participating in DSR via affective commitment ($\beta = 0.293$, 95% CI, 0.092 to 0.494). When affective commitment was incorporated in the model, the direct effect of customer engagement on customers' intention to continue participating in DSR remained statistically significant ($\beta = 0.421$, 95% CI, 0.274 to 0.568). That shows the partial mediation effect of affective commitment on the relationship between customer engagement in DSR and customers' intention to continue. H2b was supported.

Table 5. Results for mediation analysis.

Effect	Estimate	CI _{95%low}	CI _{95%high}
Direct effects			
CE → CCB	0.362	0.128	0.596
CE → IC	0.421	0.274	0.568
Indirect effects			
CE → AC → CCB	0.211	0.031	0.391
CE → AC → IC	0.293	0.092	0.494

Notes: CE = customer engagement in; AC = affective commitment; IC = intention to continue participating in CSR.

H3a proposed that gamification affordance has a moderating effect on the relationship between customer engagement in DSR and CCB via affective commitment. As reported, gamification affordance strengthened the positive relationship between customer engagement in CSR and CCB via affective commitment ($\beta = 0.266$, $p < 0.05$). In H3b, that the mediated relationship between customer engagement in DSR and customers' intention to continue via affective commitment was significantly moderated by gamification affordance was supported ($\beta = 0.387$, $p < 0.01$). Figure 2 depicts the graphical interplay of the moderating effect. Furthermore, the details of the tabulation are presented in Table 6.

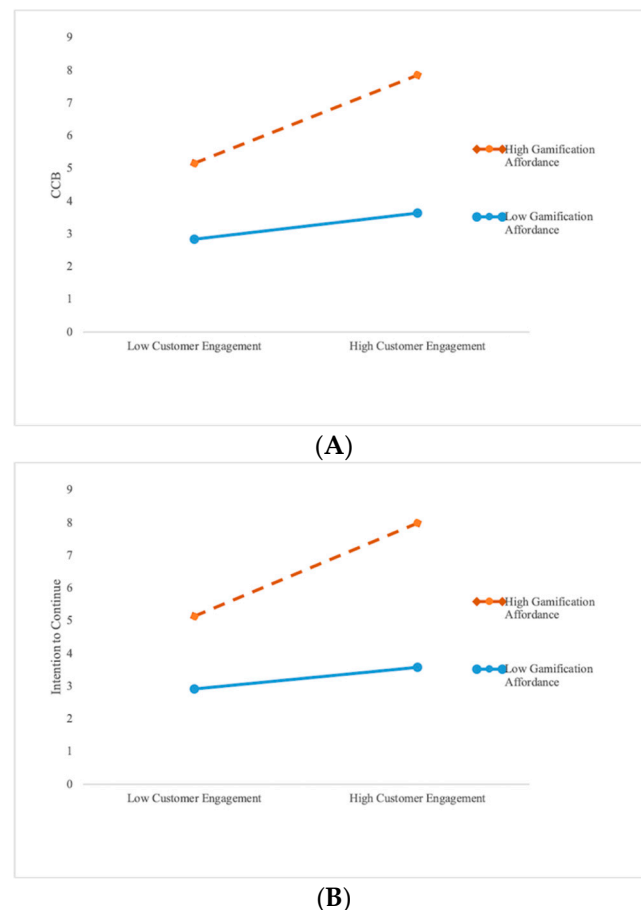


Figure 2. (A) Moderating effect of gamification affordance on the relationship between customer engagement and CCB via affective commitment. (B) Moderating effect of gamification affordance on the relationship between customer engagement and intention to continue via affective commitment.

Table 6. Moderated analysis.

Effect	β	Significance	Result
$CE \times GA \rightarrow AC \rightarrow CCB$	0.266	$p < 0.05$	Supported
$CE \times GA \rightarrow AC \rightarrow IC$	0.387	$p < 0.01$	Supported

6. Discussion

Our research explored the customer response to DSR through the commitment process, drawing on the social exchange theory. Beyond investigating the direct effect, our study aimed to identify an underlying mechanism through the mediating role of affective commitment for customer engagement and CCB, customer engagement and customers' intention to continue in DSR. That is, our research proved the indirect impact of affective commitment on the relationship between customer engagement in DSR and the diverse

sustainable outcomes of it, as well as the positive amplifying impact of gamification affordance on the relationships between customer engagement and their double sustainable outcomes via affective commitment.

Correspondingly, 94.1% of respondents were under the age of 40, and 58.7% were under the age of 30. As for monthly expenses, 60.1% of the respondents had monthly living expenses under 2000 yuan. DSR is now applicable to a larger group than CSR due to its lower participation cost and greater convenience. Moreover, in our study, 70.6% of the respondents were students. Furthermore, the majority of the respondents' highest education level was a bachelor's degree, accounting for 82.1%. Given that the DSR program is a new type of ICT-based green and philanthropic behavior application that typically operates in an online setting, we suspect that the student group seems to have more spare time to devote to DSR than the professional group. The engagement of individuals in DSR can stimulate their interest in sustainable programs. The long-term success of DSR depends on CCB and customers' continuous participation. Similarly, changes in the behavior and thought processes of individuals contribute to the sustainable development of society.

The research model was supported by the final results. H1a presented that customer engagement has a significant positive influence on CCB. The result verified the previous conclusion that CSR programs promote CCB [9], and sustainable customer engagement drives customer citizenship behavior [5]. Additionally, the continuance intention of customers was enhanced due to the integration of ICT and CSR programs [6,23]. H1b in the current research proposed that customer engagement is positively related to customers' intention to continue participating in DSR, which is consistent with the previous findings.

Findings related to H2a and H2b demonstrated that the link between customer engagement and CCB, as well as the link between customer engagement and customers' intention to continue participating in DSR, are both mediated by affective commitment. Affective commitment is a crucial outcome of customer engagement [21,24], which has a direct bearing on customers' behavior. Customers' perceptions of CSR can influence their affective commitment and induce CCB [26,45], as well as their participation intention [9].

Moreover, our study proved that gamification affordance increased the mediated mechanism between customer engagement and their sustainable outcomes of DSR via affective commitment. That is, gamification affordance moderated the relationship between customer engagement and CCB via affective commitment. In addition, gamification affordance also moderated the relationship between customer engagement and customers' intention to continue participating in DSR via affective commitment. Gamification affordance increased the customers' satisfaction and psychological ownership of CSR initiatives, which led to a greater intention to participate in CSR continuously and CCB [6,28]. Therefore, the results backed up our theory about the outcomes of customer engagement in CSR.

6.1. Theoretical Implications

Our study extends the existing research on both CSR and customer engagement since it is designed to connect customer engagement with customer sustainable reactions through the sense-making process. Prior studies have paid little attention to the outcomes of customer engagement in DSR. Some researchers demonstrated the relationship of some customer extra-role behaviors (e.g., feedback, assistance and word-of-mouth) with customer engagement [20,21], but CCB as a comprehensive conception of customer extra-role behavioral reactions was neglected. Moreover, the continuance intention and long-term application of a program is crucial when considering the sustainability. Our study introduces the customers' continued intention to participate in CSR as a significant outcome of customer engagement, which aims to broaden the understanding in several streams.

Second, our study shows the mediating role of affective commitment. The psychological mechanisms that underlie customer response to CSR initiatives is unclear [5]. Although there is already literature about the relationship of customer engagement with affective commitment in virtual communities [20], they fail to account for the mediated mechanism of affective commitment in customer engagement and the outcomes in a DSR context. To

overcome the limitation, we introduced affective commitment as a psychological mechanism that influences CCB and customers' continued participation intention in the context of CSR. Thus, our research provides novel insights into the knowledge of when and how customers respond to DSR.

Unlike prior studies, our research explored the moderating role of gamification affordance in the mediated relationship between customer engagement and their diverse sustainable outcomes via affective commitment. Gamification elements are increasingly embedded into CSR programs with the developing of information and digital technology [28]; however, we know little about the interaction of customers' motivational factor (gamification affordance) and their planned behavior regarding the CSR initiatives. Given that the main advantage of games is that they contribute to perceived enjoyment, gamification CSR programs can make the whole process more attractive and stickier [6]. Our findings also lend support to the existing literature that suggests gamification affordance can influence various customer behaviors in CSR programs [23].

6.2. Managerial Implications

Although most companies realize the preponderance of customer engagement in achieving both CSR and business goals, their awareness of specific outcomes of customer engagement in DSR is misty. The research results suggest that firms should evaluate the extent to which their customers conduct citizenship behavior and repeat participation behavior if they are to achieve the expected profits from their DSR initiatives. In order to obtain the benefits of CCB, managers should target certain customer groups with comparable values in their DSR programs. For example, for environmental-conscious groups, CSR initiatives should provide adequate information to explain the objective and a fully functional platform in order to help customers easily support each other, communicate new DSR ideas and recommend the DSR programs to others. Therefore, businesses can both assist customers in making their lives worthwhile and help themselves develop a good reputation. Another purpose of businesses is to maintain the intention of customers to participate in DSR programs repeatedly so that they can accomplish the long-term development of firms and society. To enhance the intentions of continuance of customers, they should be given the freedom to select how they participate in DSR programs, including what type of DSR programs they want to support and how they prefer to fund those programs [5]. In short, the diverse outcomes of customer engagement in DSR depends on customers' satisfaction with DSR programs' significance, convenience and autonomy.

In addition, our research found that higher levels of CCB and customers' continued intention are achieved when customers set affective commitment to the company. Therefore, the key challenge for businesses is to better the overall experience of customers [26]. One approach to doing so is by raising the transparency and credibility of DSR programs; another is by improving the service quality through ICT, such as optimizing the platform's functionality. Therefore, customers who have their psychology requirements met are more likely to behave in a socially responsible manner and support the DSR programs in the long term.

The gamification affordance of DSR was proven to strengthen customers' awareness of social issues and responsible behaviors, thereby promoting CCB and customers' continued intention of DSR. Businesses can develop DSR projects that combine interesting gamified elements to attract customers to participate in, spread positive commendations and maintain the relationship. One method is to develop new games that communicate CSR information, provide customers with a convenient means to participate and boost the games' sociability and competitiveness to encourage interactions between customers. At the same time, the reward mechanism of DSR games should be adjusted to the various groups of customers. For example, the customers who participate less frequently in DSR programs could receive a slightly greater reward than customers who were actively involved for a long time, and the actively involved customers could obtain a special reward based on participation length.

7. Limitations and Future Research

This paper is subject to several limitations. First, the research focused on the diverse outcomes of customer engagement in DSR, CCB and customers' intention to continue participating may be inadequate. Further research is still needed to study other outcomes of customer engagement in DSR, which could extend this model to different results of customers sustainable response, thus, expanding the structure. Second, the current study applied a cross-sectional design for testing the causal inferences. However, the longitudinal design and time-lagged data can be used for validating the link between customer engagement and CCB. Third, we only collected data from Ant Forest and Ant Farm users; some other companies' DSR programs may be taken into consideration for future research. Fourth, the relationship between CCB and customers' intentions to continue have not been evaluated in the current research; the authors will further explore this in future study.

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