The Influence of Loneliness on Consumers' Willingness to Participate in Interactive Advertisements

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Abstract. In the environment of a society full of loneliness, the lonely economy came into being. The interactivity and sociality of emerging interactive advertisements happen to meet the needs of lonely consumers' desire of social connection. At the same time, consumers can also seek social comfort from interactive advertisements to alleviate their loneliness. Therefore, starting from loneliness, this paper selects symbolic connection as the mediator variable, trying to explain the potential mechanism of how loneliness affecting consumers' willingness to participate in interactive advertisements, and selects the parasocial feature of interactive advertisements as the moderator variable. On the basis of previous research, this paper designs two experiments, collects and analyzes data, and tries to confirm the following views: I. Loneliness will positively affect consumers' willingness to participate in interactive advertisements; II. Symbolic connection desire plays an intermediary role in the influence of loneliness on consumers' willingness to participate in interactive advertisements; III. The interactive object's parasocial feature of interactive advertisements moderates the influence of loneliness on consumers' willingness to participate in interactive advertisements.

Keywords: Loneliness; Interactive Advertisements; Symbolic Connection; Parasocial Feature.

1 Introduction

Although the development of Internet social platforms makes people's communication far more convenient than before, loneliness has become a common phenomenon in daily life.[1] The ubiquitous phenomenon of loneliness has also given birth to a consumption model known as "single carnival", it has created a new market space.[2] Previous studies have confirmed that loneliness has an impact on individual consumption

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behavior. At the same time, loneliness increases an individual's desire for social connections and is accompanied by a stronger need for belonging.[3]

In the progress of network technology and the development of media creativity, interactive advertisements came into being. Compared with traditional advertisements, interactive advertisements pay more attention to mobilize consumers' senses and enhance the audience's participation and experience.[4] Based on the desire for symbolic connection under the influence of loneliness, interactive advertisements use different elements to interact with audiences, which can make lonely audiences have a sense of interaction, and then increase their interest in interactive advertisements.

Therefore, this study introduces the emerging interactive advertisements into the field of loneliness consumption behavior. This study will explore the influence of loneliness on consumers' willingness to participate in interactive advertisements, and the mediating role of symbolic connection desire in the influence process. In addition, the study also takes the parasocial characteristics of interactive advertisements as a moderating variable to explore whether they will regulate the impact of loneliness on consumers' participation willingness in interactive advertisements.

2 Research Deductions and Hypotheses

2.1 The hypothesis of main and mediating effects of loneliness on consumers' willingness to participate in interactive advertisements

Loneliness is a subjective experience, sometimes caused by objective social exclusion.[5] Loneliness is an individual's subjective feeling of lack of social contact, isolation and isolation.[6] Some scholars also believe that loneliness is a feeling of being isolated and undesired when there is a difference between the desired social relationship connection and the actual social relationship connection.[7] Previous research has shown that loneliness can affect consumer behavior. In the field of consumer behavior, loneliness can trigger a strong consumer preference for nostalgic consumption,[8] increase consumers' preference for anthropic product,[9] increase consumers' preference for experiential consumption,[10] cause impulse purchases, and affect consumers' response to environmental stimuli such as advertising information.[11] In addition, loneliness also has an impact on consumers' consumption choices in different scenarios. For example, studies have found that they prefer mass products that conform to the choices of the masses in public occasions, because mass products can help them behave and integrate into the social group. [12] Lonely individuals have a stronger desire for social relationships and a stronger need for belonging, and lonely individuals also have a strong need to rebuild social relationships.[13].

According to the above, when loneliness brings bad experiences to consumers, it will make them pay more attention to environmental stimuli such as advertising information, and are more inclined to make up for social relations by blurring the distinction between objects and people, and they may seek symbolic connections with others according to their social desires. For the purposes of this article, symbolic connection is a symbolic way that consumers feel connected to interact with others. Interactive ad-

vertisements is a new type of network advertisements, which combines HTML technology and programming technology, takes sound and animation as the base sense, and uses simple pop-up, button, click and other ways as the communication method.[14] Interactive advertisements break through the passive user receiving mode of traditional advertisements, can realize the characteristics of two-way communication with users, and can interact with participants while carrying out information dissemination. Based on the above conclusions, the following hypotheses are proposed in this study:

H1: Loneliness positively affects consumers' willingness to participate in interactive advertisements.

H2: Symbolic connection desire plays a mediating role in the influence of loneliness on consumers' willingness to participate in interactive advertisements.

2.2 The hypothesis of moderating effect of parasocial feature on consumers' willingness to participate in interactive advertisements

If loneliness will affect consumers' willingness to participate in interactive advertisements, it is because they can have a symbolic connection with others. So what kind of advertisements create a sense of social connection? The parasocial interaction, first proposed by Horton and Wohl (1956), is used here to distinguish types of advertisements. Parasocial interaction first refers to the study of the relationship between TV comedians and audiences: the interaction between actors and audiences during the recording of programs is not a real face-to-face social interaction, but a quasi-interpersonal relationship between actors and TV viewers that is controlled by actors one-way.[15] Later, some scholars defined this type of social interaction as: in order to meet the needs of interpersonal communication, individuals have clear goal-oriented behaviors through the media and the roles in the media, forming a strong connection. The interaction between media roles and participants in interactive advertisements also belong to the category of parasocial interaction. Therefore, it is speculated that whether interactive advertisements have parasocial feature is the key to bring symbolic connection to consumers. Therefore, the following hypothesis is proposed:

H3: The parasocial feature of interactive objects regulate the influence of loneliness on consumers' willingness to participate in interactive advertisements.

2.3 Theoretical model

On the basis of combing the research literature on loneliness and interactive advertisements by domestic and foreign scholars, this paper takes the symbolic connection desire as the mediating variable and the parasocial feature of interactive objects as the moderating variable, studies the influence path of loneliness on consumers' participation willingness in interactive advertisements, and builds a moderated intermediary model. The model is shown in Figure 1.

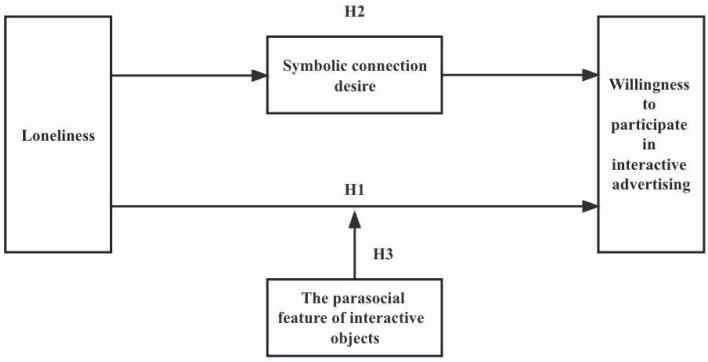

Fig. 1. The theoretical model

3 Experiment 1: Main Effect and Intermediate Effect Test

The first experiment measured the subjects' natural loneliness by using the revised UCLA Loneliness Scale. In addition, participants' willingness to participate in interactive advertisements were measured by allowing them to experience interactive advertisements, and the symbolic connection scale of Huang (2021) was used to measure the symbolic connection felt by the subjects. The main purpose is to verify H1 and H2.

3.1 Experimental design

In the experiment 1, Changan screen interactive advertisement with high interaction was selected, and advertising materials with strong character interaction were applied to create a sense of social interaction for subjects.

Experiment 1 consisted of three variables that needed to be measured: loneliness, willingness to engage in interactive advertisements, and symbolic connection. Among them, interactive advertisements participation willingness was mainly measured by the following question, "If you are willing to interact with or click to understand the content of the advertisement when viewing the above advertisement on the social platform" (1= "not at all", 7= "very much"). Other variables were also measured using a 7-level Likert scale, as shown in table 1 and 2. In the experiment 1, online questionnaire survey was used to distribute questionnaires and collect data through the Credamo platform.

Table 1. The revised UCLA loneliness scale

	1	2	3	4	5	6	7
1. I feel a lack of company.							
2. I feel like I have no one around me to turn to or rely on.							
3. I often feel a desire to meet people.							
4. I feel left out.							
5. I feel cut off from others.							

6. I can't find anyone to be with me when I need it.	
7. I feel myself becoming withdrawn.	
8. Despite having company, I feel like no one really cares about me.	

Table 2. The symbolic connection scale

	1	2	3	4	5	6	7
1. Such ads give me a sense of participation or interaction.							
2. This form of advertisements make me feel connected or interactive with others.							
3. Through this advertisement, I feel that the brand is approachable.							
4. I like this form of advertisements.							

3.2 Reliability and validity test

Finally, 99 valid questionnaires were obtained, with an effective rate of 66%. Through the reliability test of the questionnaire, it was found that the Cronbach·α of loneliness and symbolic connection scales were 0.939 and 0.845 respectively, both of which were greater than 0.8, indicating good reliability of the scale. Through the validity test of the questionnaire, it was found that the KMO value of loneliness was 0.915, and the KMO value of symbolic connection was 0.759. The KMO value of each scale was higher than or close to 0.8, and the Bartlett value reached the significant level, indicating that there was a strong correlation between the statements in the loneliness and symbolic connection scale, and factor analysis could be performed. The principal component and maximum variance methods were used for factor analysis, and a common factor was extracted for loneliness and symbolic connection respectively, which could explain the total variance of 70.628% and 68.306%, respectively, indicating that each sub-variable was fitted as one dimension and had strong explanatory ability for the variables.

3.3 Results and findings

3.3.1 The main effect of loneliness on participation willingness.

The correlation analysis shows that the correlation coefficient between loneliness and participation willingness is 0.795 ($p<0.01$), indicating a significant positive correlation between loneliness and participation willingness. Similarly, the correlation coefficient between symbolic connection and participation willingness is 0.791 ($p<0.01$), indicating that there is a significant positive correlation between the two.

Regression analysis was used to further explore the relationship between loneliness and participation intention. The running data are shown in Table 3. It can be seen that the linear regression analysis is carried out with loneliness as independent variable X and participation willingness as dependent variable Y. The formula of the model is: Y=1.025+ 0.660X, and the adjusted R2 value of the model is 0.628, which means that loneliness can explain 62.8% of the change in participation willingness. When F-test was conducted on the model, it was found that the model passed the F-test (F=166.587,

p=0.000<0.01). The analysis shows that: The loneliness had a significant positive effect on participation willingness. Therefore, H1 is established.

Table 3. The regression analysis of loneliness and willingness to participate

	Regression coefficient	95% CI	VIF
Constant	1.025** （5.557）	0.659 ~ 1.391	-
Participation willingness	0.660** （12.907）	0.559 ~ 0.762	1
Sample capacity	99		
R^2	0.632		
Adjusted R^2	0.628		
Value of F	F（1, 97）=166.687, p=0.000		

3.3.2 The mediating effect of symbolic connection desire.

This study used stepwise regression to verify the mediating role of symbolic connection desire between loneliness and participation willingness in interactive advertisements. The running data are shown in Table 4 and 5.

Table 4. Mediating effect test

	Participation willingness	Symbolic connection	Participation willingness
Constant	1.025** (5.557)	0.551** (2.484)	0.398* (2.085)
Loneliness	0.660** (12.907)	0.829** (12.737)	0.388** (6.089)
Symbolic connection			0.475** (5.906)
Sample capacity	99	99	99
R^2	0.632	0.626	0.730
Adjusted R^2	0.628	0.622	0.724
Value of F	F (1,97)=166.587, p=0.000	F (1,97)=162.234, p=0.000	F (2,96)=129.821, p=0.000

* p<0.05 ** p<0.01

Table 5. Summary of mediating effect

Path	conclusion	c total effect	a*b mediating effect	c' direct effct	Effect ratio
Loneliness→Symbolic connection→Participation willingness	Partial mediation effect	0.660	0.394	0.388	59.697%

There are three models involved in the mediation effect analysis: Participation willingness= 1.025+ 0.660* loneliness; Symbolic connection= 0.551+ 0.829* loneliness;

Participation willingness= 0.398+ 0.388* loneliness+ 0.475* symbolic connection. After adopting stepwise regression, the loneliness has a significant regression effect on the participation willingness ($F=166.597$, $P<0.01$). In the subsequent regression analysis, the loneliness have a significant regression effect on the symbolic connection ($F=162.234$, $P<0.01$), and the loneliness and the symbolic connection have a significant regression effect on the participation willingness ($F=129.821$, $P<0.001$), so it is a partial intermediary effect. The mediating effect contributes 59.697% to the total effect. At the same time, Model 4 in PROCESS plug-in is used to conduct a simple mediation effect test, the results are as Table 6 and Table 7:

Table 6. Mediating effect test by PROCESS

Path	β	SE	t	p
Loneliness→Symbolic connection	0.573	0.056	10.306	0.000
Symbolic connection→Participation willingness	0.475	0.080	5.906	0.000

Table 7. Summary of mediating effect test by PROCESS

Path	Effect	LLCI	ULCI
Direct effect of X on Y	0.388	0.261	0.515
Indirect effect(s) of X on Y	0.272	0.164	0.383
Partially standardized indirect effect(s) of X on Y	0.242	0.155	0.329
Completely standardized indirect effect(s) of X on Y	0.328	0.208	0.440

As can be seen from Table 6 and Table 7, loneliness significantly affects symbolic connection ($\beta=0.573$, $SE=0.056$, $t=10.306$, $p<0.01$). Symbolic connection also significantly affected consumers' willingness to participate in interactive advertisements ($\beta=0.4750$, $SE=0.0804$, $t=5.9056$, $p<0.001$). In addition, the mediating effect is also significant (LLCI=0.208, ULCI=0.440, excluding 0), and the full standard effect coefficient is 0.328, indicating that the symbolic connection had partial mediating effect. Therefore, H2 is established.

4 Experiment 2: Moderating Effect Test

Experiment 2 measured the subjects' loneliness existing in the natural state by using the revised UCLA Loneliness Measurement Scale. Meanwhile, participants were invited to participate in interactive advertisements with different parasocial feature to measure their willingness, the main purpose of which was to verify H3.

4.1 Experimental design

In experiment 2, whether the interactive object in the interactive advertisement has parasocial feature is used as the experimental variable. The interactive advertisement (AD1) with a real person as the interactive object and the interactive advertisement (AD2) with a humanoid animal as the interactive object are selected as the experimental materials with parasocial feature. Two interactive advertisements (AD3 and AD4) with

inanimate objects as interactive objects were used as experimental materials without parasocial feature. And the other variables are the same as the measurement methods in experiment 1. In the experiment 2, online questionnaire survey was used to distribute questionnaires and collect data through the Credamo platform.

4.2 Reliability and validity test

The experimental materials were randomly presented to the subjects, and there were 75 questionnaires corresponding to each material. Finally, 235 valid questionnaires were obtained, with an effective rate of 78.3%. The number of questionnaires from different experimental materials from AD1 to AD4 was 63, 50, 47, and 75, respectively. Through the reliability test of the questionnaire, it was found that the Cronbach·α of loneliness and symbolic connection scales were 0.973 and 0.904 respectively, both of which were greater than 0.8, indicating good reliability of the scale. Through the validity test of the questionnaire, it was found that the KMO value of loneliness was 0.893, and the KMO value of symbolic connection was 0.763. The KMO value of each scale was higher than or close to 0.8, and the Bartlett value reached the significant level, indicating that there was a strong correlation between the statements in the loneliness and symbolic connection scale, and factor analysis could be performed. The principal component and maximum variance methods were used for factor analysis, and a common factor was extracted for loneliness and symbolic connection respectively, which could explain the total variance of 84.345% and 77.757%, respectively, indicating that each sub-variable was fitted as one dimension and had a strong explanatory ability for the variables.

4.3 Results and findings

The correlation analysis shows that the correlation coefficient between loneliness and participation willingness is 0.285 ($p<0.01$), indicating a positive correlation between loneliness and participation willingness. Similarly, the correlation coefficient between symbolic connection and participation willingness is 0.614 ($p<0.01$), indicating that there is a significant positive correlation between symbolic connection and participation willingness. In the 235 questionnaires, the average loneliness of the participants was 3.792, and the above average loneliness was defined as high loneliness, and the below average loneliness was defined as low loneliness. The classified data can be seen in Table 8. By combining different degrees of loneliness with interactive advertisements parasocial feature, a Multi-way ANOVA was conducted on participants' willingness to participate in interactive advertisements. The data are shown in Table 9.

Table 8. Participation willingness of different loneliness and different parasocial feature

Types of advertisement		Mean	Std. deviation	N
Have no parasocial feature	Low loneliness	3.84	1.720	67
	High loneliness	3.27	1.353	55
	Total	3.58	1.584	122
	Low loneliness	2.98	0.693	53

Parasocial feature	High loneliness	5.07	1.006	60
	Total	4.09	1.360	113
	Low loneliness	3.46	1.425	120
All types	High loneliness	4.21	1.484	115
	Total	3.83	1.499	235

Table 9. Tests of between-subjects effects

Source	Type III sum of Squares	df	Mean square	F	Sig.
Corrected model	147.029[a]	3	49.010	29.886	0.000
Intercept	3346.575	1	3346.575	2040.715	0.000
Parasocial feature	12.852	1	12.852	7.837	0.006
Loneliness	33.767	1	33.767	20.591	0.000
Loneliness * Parasocial feature	102.201	1	102.201	62.321	0.000
Error	378.818	231	1.640		
Total	3965.000	235			
Corrected Total	525.847	234			

a. R Squared = .280（Adjusted R Squared = .270）

Under Multi-way ANOVA, loneliness and participation willingness ($F=20.591$, $P<0.01$), parasocial feature of interactive advertisements and participation willingness ($F=7.837$, $P<0.01$), loneliness * parasocial feature of interactive advertisements and participation willingness are regression ($F=62.321$, $P<0.01$), the results are significant, and the interaction terms between loneliness and parasocial feature showed significant. From the above results, it can be seen that when loneliness affects participation willingness, the influence amplitude of the moderating variable (parasocial feature) is significantly different at different levels. Therefore, H3 is established.

5 Conclusion and Discussion

This study designed two experiments, one of which selected a representative interactive advertisement to verify the main effect by measuring subjects' loneliness and willingness to participate in interactive advertisements, and used a scale to measure the mediating role of symbolic connection in this process. In experiment 2, two interactive advertisements with parasocial feature and two interactive advertisements without parasocial feature were selected as experimental materials. Finally, the hypothesis of this study was verified through two experimental results and the following three conclusions were drawn: I. Loneliness positively affect consumers' willingness to participate in interactive advertisements; II. Symbolic connection desire plays a mediating role in the influence of loneliness on consumers' willingness to participate in interactive advertisements; III. The parasocial feature of interactive objects regulate the influence of loneliness on consumers' participation willingness in interactive advertisements.

Based on the above research, this paper proposes the following implications: First, enterprises should develop relevant marketing strategies for consumer loneliness. Enterprises should pay attention to the development of social functions of goods or services, excavate the meaning and emotional added value of interactive advertisements. For example, enterprises can include real people or anthropomorphic media interaction characters in interactive advertisements to attract consumers to click and engage. In addition, Enterprises and governments should pay more attention to the psychological state of consumers or citizens and actively guide them. Although lonely individuals will spontaneously find relevant measures to alleviate their loneliness, lonely consumers can not control the passive content reception. Some information content that helps to alleviate loneliness of consumers will provide help for lonely consumers.

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