Did Internet Use Enhance People's Impulsive Consumption? —— Based on the Theoretical Perspective of the "Digital Divide"

Xiaogang Zhu, Xinbin Xiao, Boran Li, Chunnian Liu*
Management School, Nanchang University, Nanchang 330031, China
**Corresponding author.*

Abstract

Internet use promotes consumers' consumption behaviours, including impulsive consumption and non-impulsive consumption, but different Internet uses may promote different consumption behaviours. From the perspective of the "digital divide" in Internet use, this paper analyses the effects and mechanisms of Internet use and different modes of Internet use on individual impulsive consumption and non-impulsive consumption using relevant survey data. This study found that the probability of Internet users' consumption behaviour is higher than that of non-Internet users. Social use has a significant positive effect on both Internet use and consumption behaviour and has a greater effect on promoting non-impulsive consumption, but the mediating effect between the two is the same. Recreational use has a significant impact on impulsive consumption, and there is a complete mediating effect between Internet use and impulsive consumption. Instrumental use has a significant impact on non-impulsive consumption, and there is a mediating effect between Internet use and non-impulsive consumption.

Keywords: *Internet use; Impulsive consumption; Non-impulsive consumption; "Digital divide"*

I. Introduction

According to the 47th Statistical Report on Internet Development in China released by the China Internet Network Information Center (CNNIC), by December 2020, the number of Internet users in China had reached 989 million, an increase of 85.4 million compared with the number of users in March 2020, and the Internet penetration rate had reached 70.4%. The rapid growth of Internet users has also been affected by the COVID-19 outbreak since late 2019. Among the vast number of Internet users, the number of online shopping users has reached 782 million, accounting for 79.1% of the total Internet users. The Internet has become one of the main channels of residents' consumption, and online consumption based on Internet technology has become a normal phenomenon in people's lives. The emergence of the epidemic has led to an overall contraction in offline consumption and the growth of online Internet consumption. Internet consumption is increasingly worthy of research attention.

The rapid development of Internet consumption has resulted in several chaotic situations. The temporal and spatial separation between consumers and commodities during consumption leads to consumers' inability to develop intuitive feelings about commodities through practical experience, contributing to unrealistic consumption judgements. Merchants produce deliberately false product utility propaganda and also make it difficult for consumers to obtain matching goods according to their actual needs. By controlling the relationship between fashion and celebrities, capital leads many fanatic fans to pay for the clothes of their idols. To increase profits, many Internet advertisers attach additional attributes to commodities to make them easier to consume. Internet consumption is not only about the use value of goods but also about their "symbolic meaning", for which consumption is often irrational and impulsive. Impulsive consumption induced by the Internet is becoming increasingly frequent, which not only increases the burden on consumers but is also a great waste of social resources. Therefore, this problem urgently needs social attention and guidance. On the other hand, the frequency of Internet use for consumption rapidly increased during the COVID-19 pandemic, but incomes fell sharply as work stopped; therefore, we did not find evidence that the COVID-19 pandemic led to increased impulse consumption on the Internet. Zhuasun's [1] research showed that in the early stage of COVID-19, the products that people consumed through the Internet were mainly

survival and protection materials such as food and masks, and Internet consumption caused by COVID-19 did not enhance impulsive consumption behaviour.

Impulsive consumption on the Internet is increasingly frequent, not just because the Internet decreases the threshold to obtain goods, but more importantly because of the different ways in which people use the Internet. These different modes of internet use, called the ”digital divide” in academic circles, use play different roles in consumption. Recent studies have begun to focus on the influence of Internet use on people's impulsive consumption behaviour but have not addressed the influences of different modes of Internet use on impulsive consumption.

Does Internet use truly promote impulsive consumption behaviour? What is the deeper logic behind this effect? Based on these research questions, the purpose of this study is twofold: first, to demonstrate whether Internet use truly increases the probability of impulsive consumption behaviour, as previous studies have argued; and second, to explore the mechanism of the Internet technology "use gap" in the process of Internet use and impulsive consumption.

II. Literature and Hypotheses

2.1 Impulsive consumption

Impulsive consumption behaviour has attracted increasing attention due to its universality in both offline and online environments. The analysis of impulsive consumption can provide more reasonable suggestions to improve consumer decisions. The existing research on consumers’ impulsive consumption behaviours mainly focuses on the following aspects:

2.1.1 Definition of impulsive consumption

Rook and Hoch [2] note that it is the individual consumer, rather than the product, that causes the impulsiveness of consumption. Rook explains consumers’ impulsive buying behaviour from the perspective of psychological impulsivity and impulsive behaviour. Rook [3] summarized the following four characteristics when analysing the impulsive buying behaviour of customers: impulsiveness, compulsion, emotionality and reckless. Sengupta and Zhou [4] defined impulsive consumption behaviour as “feeling a sudden and unexpected impulse and acting in a pleasurable way. This action is based on impulse without careful consideration of subsequent adverse consequences, but the kinetic energy brings immediate gratification”. Zhang et al. [5] found that impulsive purchases are actually sudden, irresistible and unplanned by consumers who are motivated by external stimuli, which is accompanied by strong emotional fluctuations and psychological conflicts. Consumers will have an emotional and cognitive reaction after the purchase.

2.1.2 Types of impulsive consumption

Stern [6] classified impulse buying based on extrinsic stimuli, as follows: 1) Pure impulse buying: a real impulse buying behaviour. 2) Suggestive impulse buying: the impulse purchase behaviour in which the buyer sees information about the commodity while shopping , which prompts the customer’s consumption demand. 3) Suggested impulse buying: consumers think that they may need an item in the future, causing impulse buying behaviour to occur. 4) Planned impulse buying: before entering the shopping area, the consumer has some purchase intention in mind, which produces the expectation or intention to buy the product. Bayley and Nancarrow [7] classified impulse buying based on consumers’ intrinsic motivations, as follows: 1) Self-confirming impulse buying: when a customer purchases for perceived future demand to prove their shrewdness. 2) Self-compensating impulse buying: impulse buying made by consumers to reward themselves for good results. 3) Self-redefining impulse buying: impulse buying inspired by consumers' desire or subconscious conflict. 4) Pathological impulse buying: consumers’ uncontrolled repeated purchase behaviour.

2.1.3 Factors affecting impulsive consumption

Jacqueline et al. [8] believe that consumers' personal characteristics, situational characteristics and product characteristics are the main factors influencing impulse buying behaviour. Therefore, these factors can be divided into three categories: external factors, internal factors and situational factors. Beatty and Ferrell [9] proposed a relatively complete cause-and-effect model for impulsive buying behaviour. The exogenous variables of the model include two situational variables (time and money) and two individual variables (shopping pleasure and impulse buying tendency). Peck and Childers [10] studied the influence of touch in the antecedent variable on impulsive buying. Sengupta and Zhou [11] conducted a deeper discussion on the individual variables of consumers, namely, impulse buying traits. This research showed that impulsive consumers showed a much greater impulse to consume the same tempting food, chocolate cake, than non-impulsive consumers. Luo [12] showed that the presence of others in the buying environment would have a normative evaluation effect on the buying decision. Shopping with friends is more impulsive, while shopping with family members is less impulsive.

2.2 The "digital divide" in Internet use

On the one hand, the rapid development of Internet technology has brought about the expansion of the netizen population; on the other hand, it has created differences in the availability and use of Internet technologies, the so-called "digital divide". The "digital divide" is somewhat a product of the development of the Internet era and has existed for less than half a century; however, it has become an important research field in communication, sociology, management, economics and other disciplines. At present, the existing research results related to the "digital divide" mainly focus on the "access" and "use" of digital technology.

2.2.1 Relevant research on "access gap"

Strover [13] found that groups with higher incomes, groups with higher education levels and groups with urban household registrations had earlier access to the Internet. Norris [14] divided the "digital divide" into three levels: the global divide, the social divide and the democratic divide, all of which fall in the shadow of the "access gap". DiMahhio [15] advocates that research on the "digital divide" should extend back to the social environmental factors that affect it and proposes social policies to narrow the "access gap" of the digital divide.

2.2.2 Relevant research on "use gap"

Chen [16] found that young people are more inclined to use the work and social functions of the Internet than non-young people. Van [17], from the perspective of social and economic status, argues that the "use gap" of the "digital divide" is actually related to class inequality. The author argues that users of higher social and economic status are more likely to benefit from using the Internet and are more likely to achieve access to information from the Internet through learning,, the purpose of the service itself, while those of lower social economic status were more likely to use the Internet for entertainment. Madden and Rainie [18] found that ethnic minorities and people of colour tend to use the Internet for social communication and entertainment rather than for study and work.

Based on this analysis, our first hypothesis is as follows:

H1: Internet use affects the level of consumers' social use, instrumental use and recreational use of the Internet.

2.3 Internet and impulsive consumption

At present, there are also several research results on the relationship between the Internet and impulsive consumption. Park [19] noted that Internet use can promote impulsive consumption, and product reviews, suggestions and promotional tips in online browsing can reduce consumers' self-restraint and promote impulsive consumption. Baumeister et al. [20] noted that website design elements that create consumers' shopping intention will affect consumers' impulsive online consumption behaviour. Zhou et al. [21] further noted that online limited-time discounts can better stimulate impulsive online consumption, and high online word-of-mouth interactions can more effectively stimulate impulsive online consumption than low online word-of-mouth interactions. Kivetz R et al.

described three aspects of impulsive consumption: emotional, cognitive and behavioural responses. Scholars generally agree that impulsive consumption is caused by environmental stimuli, but mechanisms by which environmental stimuli affect consumption are not agreed upon. The Internet enables electronic commerce, which makes consumer shopping behaviour free from the limitations of time and space. To increase consumers' network traffic and increase consumption frequency, online activities in the network environment have increased stimulation for consumers, especially innovation network promotion, which also makes consumers more impulsive.

Based on this analysis, our second and third hypotheses are as follows:

H2: Internet use has a significant effect on impulsive consumption.

H3: Social use, instrumental use and recreational use play mediating roles in the relationship between Internet use and impulsive consumption.

In addition, the trap question in the impulsive consumption scale used in this study is an anti-impulsive consumption tendency, which is named non-impulsive consumption to replace impulsive consumption within the same models in this research. This is employed not only to discuss the heterogeneity of this study but also to further advance research on this subject; therefore, the following comparative hypotheses are proposed in this study:

H4: Internet use has a significant effect on non-impulsive consumption.

H5: Social use, instrumental use and recreational use play mediating roles in the relationship between Internet use and non-impulsive consumption.

Ⅲ. Research Design

3.1 Data source

In this study, data were collected by online and offline methods in N city of a province in central China. Considering the limited consumption capacity of minors, our data collection objects only included adults over 18 years old. Questionnaires were collected by Internet distribution and on-site collection. The recovered questionnaire data were sorted and input and preliminary coding was conducted to obtain scores of impulsive consumption level, non-impulsive consumption level, Internet use and related information about different Internet uses of the sample group. The answers regarding Internet use frequency were "always", "often", "sometimes", "rarely" and "never". To better highlight the influence of Internet use on two different consumption tendencies, we classify "never" and "rarely" in Internet use frequency as "Not using the Internet", is the other answers are classified as "using the Internet", to obtain the new variable - Internet use (1= no, 2= yes). Through systematic data cleaning, the final effective data sample size was 361. The sample frequency distribution is shown in Table 1.

Table 1 Sample frequency distribution

Variable	Item	Frequency	Percent
Internet use	No	102	28.3
	Yes	259	71.7
Gender	Male	103	28.5
	Female	258	71.5
Age	18-30	241	66.8
	31-50	85	23.5
	51-70	34	9.4
	71-87	1	0.3
Household	Urban	217	60.1

registration	Rural	144	39.9
Civil state	Unmarried	307	85.0
	Married	54	15.0
Politics status	Masses	299	82.8
	Democratic party	7	1.9
	Member of Communist Party of China (including probationary)	55	15.2
Education	Primary school and below	34	9.4
	Junior high school	51	14.1
	Senior high school or vocational school	68	18.8
	Junior College	87	24.1
	Undergraduate	87	24.1
	Master degree or above	34	9.4
Religion	No	313	86.7
	Yes	48	13.3

3.2 Variable measurements

3.2.1 Dependent variable: Impulsive consumption, non-impulsive consumption
In this study, an impulsive consumption scale was designed by referring to the Impulse-Consumption Purchasing Scale and Impulse Purchasing Propensity Scale [22]. There were 13 items reflecting impulsive consumption and 5 items reflecting non-impulsive consumption. The answers were all on a 5-point scale. Cronbach's coefficient of the whole impulsive consumption scale was 0.919, greater than 0.8. We believed that the scale had good internal consistency and met our measurement requirements. We further conducted the KMO test and found that the KMO value was 0.907, greater than 0.8. Therefore, we determined that the data were suitable for the factor analysis and further reduced the dimensions by extracting the two common factors "impulsive consumption" and "non-impulsive consumption", with the two variable score level representative sample groups of impulsive consumption and non-impulsive consumption.

3.2.2 Mediation variables: Social use, instrumental use, recreational use
Wen [23] summarized prior Internet "use gap" research and identified five aspects of Internet use: study, work, business, social, and entertainment uses. To further simplify these five uses, study, work, and business are combined as "instrumental use" in this paper; "instrumental use", "social use" and "recreational use" are the mediating variables in this study. In the survey project of CGSS (China General Social Survey), the following questions were asked:

Social use: In the past year, how frequently did you surf the Internet for the following things—social activities, such as communicating with people via Email, QQ, WeChat, Skype, etc. In the past year, how frequently did you surf the Internet for the following things—self-display, such as WeChat friends circle, QQ Space, micro-blog and other platforms for self-display, record and share feelings.

Instrumental use: In the past year, how frequently did you surf the Internet for the following things—access to information, such as through the network platform to obtain relevant information, such as the network encyclopaedia, ZhiHu, etc. In the past year, how frequently did you surf the Internet for the following things—business transactions, such as through Alipay, WeChat transactions, etc.

Recreational use: In the past year, how frequently did you surf the Internet for the following things—leisure and entertainment, such as games, music, video, etc.

Answers were on a scale of one to five from "never" to "always". The Cronbach coefficient of the first two items was calculated to be 0.69 and 0.68, respectively, both greater than 0.6, which indicates good internal consistency. Therefore, these values were summed and averaged to obtain the score of the three Internet use modes of the sample

group. The higher the score, the higher the level of Internet use.

3.2.3 Core independent variable: Internet use

The independent variable of this study is the Internet use frequency, which divides the sample group into two categories: Internet use and non-use. Based on this classification, the different influences of the "access gap" of Internet use on impulsive consumption behaviour can be found in later studies.

3.2.4 Control variables

According to the results of previous studies and correlation analyses, the gender, age, household registration, civil status, politics status, education and religion of the sample group were controlled in this study. The specific distribution of variables is shown in Table 1 below, and the correlation between the control variables and explained variables is shown in Table 2 below.

Table 2 Variable descriptive statistics

Variable type	Variable	Mean	Standard	Min	Max
Dependent variable	Impulsive consumption	0.00	1.00	-2.64	2.19
	Non-impulsive consumption	0.00	1.00	-2.13	2.34
Core independent variable	Internet use	1.72	0.45	1	2
Mediation variable	Social use	3.82	1.03	1	5
	Instrumental use	4.48	0.70	1	5
	Recreational use	4.20	0.98	1	5
Controlled variable	Gender (1 = male; 2 = female)	1.72	0.45	1	2
	Age	28.40	12.18	18	87
	Household registration (1 = urban; 2 = rural)	1.40	0.49	1	2
	Civil status (1 = unmarried; 2 = married)	1.15	0.36	1	2
	Politics status (1 = masses; 2 = democratic party; 3 = member of Communist Party of China)	1.32	0.73	1	3
	Education (1 = uneducated ⋯ 7 = Master degree or above)	4.68	1.46	2	7
	Religion (1 = no; 2 = yes)	1.13	0.34	1	2

Table 2 shows the mean value, standard error, minimum value and maximum value distribution of all variables involved in this study. The factor score of the dependent variable impulsive consumption is between -2.640 and 2.194, and the factor score of non-impulsive consumption is between -2.129 and 2.343, with little difference in the overall interval between the two. The mean value of the variable Internet use is 1.717, indicating that the number of people who use the Internet in the sample as a whole is larger than that of people who do not use the Internet. In addition, the mean value is much larger than the standard error, indicating that the variable Internet use in the sample group has little fluctuation. The mean values of the three mediating variables of Internet use are all high, indicating that the sample group has a high level of use in the three aspects, showing an overall pattern of instrumental use >recreational use > social use. The average value of the three aspects is far greater than standard error and the overall fluctuation of the three aspects is small. For the control variables, the following information can be obtained from the data: the mean value is far greater than the standard error and the fluctuation is small; there are more females than males in the sample; the sample population tended to be young; there are more people with urban household registrations than those with rural household registrations; the political status of the sample group is mostly “masses”; the average level of education is above “high school, vocational school, technical secondary school or technical school”; and most people in the sample had no religion.

Table 3 Matrix table of correlation coefficients among variables

Variable	1	2	3	4	5	6	7	8	9
Impulsive consumption	1	0.120**	0.404***	-0.603***	-0.532***	-0.480***	-0.094*	-0.498***	0.064
Non-impulsive consumption	0.000	1	-0.193***	0.071	0.055	0.022	-0.206**	0.071	0.057
Gender	0.455***	0.203***	1	-0.226***	-0.500***	-0.526***	0.116**	-0.575***	-0.060
Age	-0.546***	0.019	-0.191***	1	0.362***	0.351***	0.094*	0.469***	0.038
Household registration	-0.489***	0.097*	-0.500***	0.330***	1	0.388***	-0.121**	0.647***	-0.002
Civil state	-0.582***	0.034	-0.526***	0.371***	0.388***	1	0.064	0.454***	0.019
Politics status	-0.072	-0.179***	0.130**	0.082	-0.130**	0.038	1	-0.052	-0.050
Education	-0.490***	0.135**	-0.550***	0.381***	0.617***	0.441***	-0.050	1	-0.008
Religion	0.034	0.042	-0.060	0.027	-0.002	0.019	-0.096*	-0.002	1

*, **, and *** represent 10%, 5%, and 1% levels of significance, respectively.

Table 3 is the matrix table of correlation coefficients among the variables. The lower left part of the table shows the Pearson's correlation coefficient and the upper right part shows the Spearman's correlation coefficient. Because the explained variable is a continuous numerical variable, the Pearson's correlation coefficient in the lower left part is uniformly read as the strength index of the correlation between the control variable and the explained variable.

As seen from Table 3, gender, age, household registration, civil status, and education are all significantly correlated with the explained variable impulsive consumption at a statistical level of 1%, and political status is significantly correlated with non-impulsive consumption. Therefore, it is reasonable to include these as controls in this study. In addition, religion was not correlated with two of the explained variables, even though several religious culture strongly advocate for frugal living customs, which affects the propensity to consume; therefore, we also use religion as a control variable in the model.

3.3 Framework

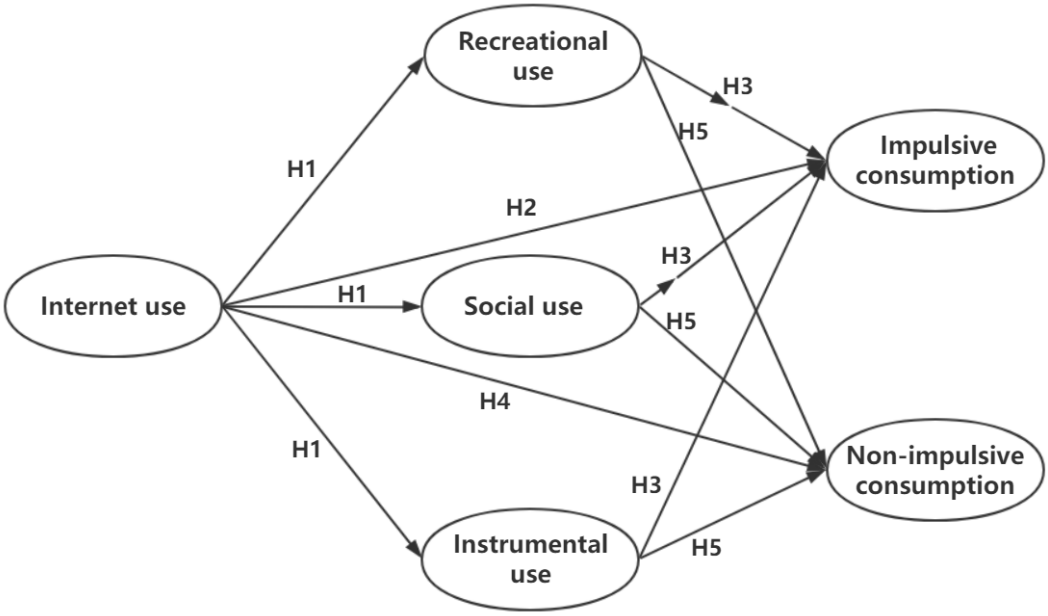

Figure 1: Research framework

Figure 1 shows the technical route involved in this study. The explanatory variable has different effects on the two aspects of the explained variable through the mediating variable "use gap". The specific effects can be seen in the interpretation of the results in the empirical section below.

3.4 Econometric model

According to Wen and Ye's concept of a new mediating effect test [24], we designed the following MLS model.

$$Y = cons + c * X + \beta * control\ vairables + \varepsilon \quad ---------- (1)$$

$$M = cons + a * X + \beta * control\ vairables + \varepsilon \quad ---------- (2)$$

$$Y = cons + c' * X + b * M + \beta * control\ vairables + \varepsilon \quad ---------- (3)$$

where X represents the independent variable, M represents the mediating variable, Y represents the dependent variable, $cons$ represents the constant term, and ε represents the random error term.

The research design is as follows: As a benchmark model, Equation (1) is a multiple linear regression model containing explanatory variables and control variables, with the condition that the explanatory variables must significantly affect the explained variables. Equation (2) is a mediating model, a multiple linear regression model of mediating variables, explanatory variables and control variables. The condition that the explanatory variables significantly affect the mediating variables should be met. Equation (3), a result model, contains explanatory variables, intervening variable and control variables within a multiple linear regression model; this model needs to meet the conditions that the mediation variables significantly affect the interpretation and the explanation variables significantly or insignificantly affect the explanatory variables; the former condition is known as partial mediation, while the latter is complete mediation. When these three conditions are satisfied, we consider it to have passed the mediating effect test.

In addition, c represents the total effect, $a*b$ represents the indirect effect, and c' represents the direct effect. When this formula satisfies the relationship expressed in Equations (1) and (2), the X coefficient is significant, and in Equation (3), the M coefficient is significant. In this case, if the X coefficient is significant in Equation (3),

there is a partial mediating effect, and if the X coefficient is not significant, there is a complete mediating effect. The proportion of the mediating effect is expressed as $(a*b)/c$. In general, to make our mediation effect test more robust, a bootstrap test is also needed.

IV. Results and discussion

4.1 Internet use and impulsive consumption

Table 4 shows us the relationship between Internet use and impulsive consumption. The specific impact is interpreted through model 1-7.To explore the relationship between Internet use and impulsive consumption, we made a baseline Model 1. The results of Model 1 showed that Internet use had a significant effect on impulsive consumption at a statistical level of 1%. After controlling for other variables, Internet users were 76.4% more likely to engage in impulsive consumption than non-Internet users. H1 is supported.

Model 2 is a regression model between Internet use and social use. The results of this model show that Internet use will increase social use of the Internet in the sample group at a statistical level of 1%. Internet users had a 71.9% higher social use of the Internet than that of non-Internet users.

Model 3 is a regression model between Internet use and instrumental use. The results of this model show that Internet use increases instrumental use of the Internet in the sample group at a statistical level of 1%. Internet users had a 47.5% higher level of instrumental use of the Internet than that of non-Internet users.

Model 4 is a regression model between Internet use and recreational use. The results of this model show that Internet use increases recreational use of the Internet in the sample group at a statistical level of 1%. Specifically, Internet users had a recreational use of the Internet that was 60.7% higher than that of non-Internet users.

Models 2-4 show that Internet use had the strongest promoting effect on social use of the Internet, while it had a relatively weak promoting effect on the instrumental use of the Internet. H3 is supported.

Model 5 is a regression model based on Model 1 and includes the mediating variable of the social use of the Internet. The results of this model show that social use had a significant effect on impulsive consumption and Internet use still had a significant effect on impulsive consumption, but the degree of effect was weakened compared with the effects seen in Model 1, which is consistent with our hypotheses about the mediating effect. Therefore, we believe that social use plays a mediating role in the relationship between Internet use and impulsive consumption. This role is partial mediation and the mediating effect ratio is (0.719*0.108)/0.764=0.102, that is, 10.2%.

Model 6 is a regression model based on Model 1 and includes the mediating variable of instrumental use of the Internet. The results of this model show that instrumental use had no significant effect on impulsive consumption and Internet use still had a significant effect on impulsive consumption, but the degree of this effect was weakened compared with that of Model 1, which was inconsistent with our hypotheses about the mediating effect. Therefore, instrumental use does not play a mediating role in the relationship between Internet use and impulsive consumption.

Model 7 is a regression model based on Model 1 and includes the mediating variable of recreational use of the Internet. The results of this model show that recreational use had a significant effect on impulsive consumption and Internet use still had a significant effect on impulsive consumption, but the degree of this effect was weakened compared with that in Model 1, which is consistent with our hypotheses about the mediating effect. Therefore, we believe that recreational use plays a mediating role in the relationship between Internet use and impulsive consumption. This partial mediation results in a mediating effect ratio of (0.607*0.927)/0.764=0.737, that is, 73.7%. According to Model 5-7, H4 is supported.

Table 4 Regression model results of impulsive consumption.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Impulsive consumption	Social use	Instrumental use	Recreational use	Impulsive consumption	Impulsive consumption	Impulsive consumption
Gender	0.160 (1.38)	0.520*** (4.47)	-0.324*** (-2.83)	0.355*** (4.12)	0.104 (0.89)	0.161 (1.33)	-0.169** (-2.25)
Age	-0.025*** (-5.98)	0.005 (1.42)	0.005 (1.50)	-0.024*** (-6.64)	-0.025*** (-6.02)	-0.025*** (-5.83)	-0.003 (-1.18)
Household registration	0.034 (0.23)	0.022 (0.16)	-0.042 (-0.46)	-0.087 (-0.97)	0.032 (0.21)	0.034 (0.23)	0.115 (1.13)
Civil state	-0.789*** (-4.70)	-1.202*** (-7.79)	-0.104 (-0.84)	-0.571*** (-4.18)	-0.658*** (-3.83)	-0.788*** (-4.70)	-0.260*** (-3.15)
Politics status	-0.076* (-1.68)	-0.097 (-1.60)	-0.060 (-1.24)	0.001 (0.04)	-0.066 (-1.42)	-0.076* (-1.68)	-0.077*** (-2.85)
Education	-0.021 (-0.59)	0.208*** (4.11)	0.010 (0.30)	-0.117*** (-4.99)	-0.044 (-1.15)	-0.021 (-0.59)	0.087*** (3.29)
Religion	0.146 (1.37)	0.217* (1.82)	-0.161 (-1.13)	0.198** (2.25)	0.122 (1.16)	0.146 (1.40)	-0.038 (-0.54)
Internet use	0.764*** (4.19)	0.719*** (4.44)	0.475*** (3.72)	0.607*** (4.82)	0.686*** (3.86)	0.763*** (4.02)	0.201* (1.72)
Social use	—	—	—	—	0.108** (2.29)	—	—
Instrumental use	—	—	—	—	—	0.004 (0.07)	—
Recreational use	—	—	—	—	—	—	0.927*** (11.92)
Constant	0.014 (0.02)	1.831*** (3.20)	4.467*** (10.77)	4.314*** (9.53)	-0.185 (-0.30)	-0.002 (-0.00)	-3.985*** (-8.51)

Observations	361	361	361	361	361	361	361
R^2	0.582	0.389	0.082	0.726	0.590	0.582	0.807
PseudoR^2	0.573	0.375	0.061	0.720	0.579	0.571	0.802
F	85.092	44.025	2.499	119.432	83.173	76.624	162.026

Values in parentheses are t values. *, **, and *** represent 10%, 5%, and 1% levels of significance, respectively.

4.2 Internet use and non-impulsive consumption

Table 5 shows us the regression relationship between Internet use and non impulsive consumption. The specific relationship is obtained through the interpretation of model 8-14.To explore the relationship between Internet use and non-impulsive consumption, we made baseline Model 8. The results of Model 8 show that Internet use had a significant effect on non-impulsive consumption at a statistical level of 1%. After controlling for other variables, Internet users were 87.3% more likely to consume non-impulsively than non-Internet users. H2 is supported.

The discussion of the results of Models 9-11 is consistent with that of Models 2-4; therefore, it will not be repeated here.

Model 12 is a regression model based on Model 8 and includes the mediating variable of the social use of the Internet. The results of this model show that social use had a significant effect on non-impulsive consumption and Internet use still had a significant effect on non-impulsive consumption, but the degree of the effect was weakened compared with that of Model 8, which is consistent with our hypotheses about the mediating effect. Therefore, we believe that social use plays a mediating role in the relationship between Internet use and non-impulsive consumption. This effect is partial mediation and the mediating effect ratio is (0.719*0.499)/0.873=0.411, that is, 41.1%.

Model 13 is a regression model based on Model 8 and includes the mediating variable of instrumental use of the Internet. The results of this model show that instrumental use had a significant effect on non-impulsive consumption and Internet use still had a significant effect on non-impulsive consumption, but the degree of this effect was weakened compared with that of Model 8, which is consistent with our hypotheses about the mediating effect. Therefore, we believe that instrumental use plays a mediating role in the relationship between Internet use and non-impulsive consumption. This effect is partial mediation and the mediating effect ratio is (0.475*0.666)/0.873=0.362, that is, 36.2%.

Model 14 is a regression model based on Model 8 and includes the mediating variable of the recreational use of the Internet. The results of this model show that recreational use had no significant effect on non-impulsive consumption and Internet use still had a significant effect on non-impulsive consumption, but the degree of effect was weakened compared with that of Model 8, which is inconsistent with our hypotheses about the mediating effect. Therefore, recreational use does not play a mediating role in the relationship between Internet use and non-impulsive consumption. According to Model 12-14, H5 is supported.

Table 5 Regression model results of non-impulsive consumption.

	(8) Non-impulsive consumption	(9) Social use	(10) Instrumental use	(11) Recreational use	(12) Non-impulsive consumption	(13) Non-impulsive consumption	(14) Non-impulsive consumption

Gender	-0.599*** (-3.98)	0.520*** (4.47)	-0.324*** (-2.83)	0.355*** (4.12)	-0.858*** (-5.79)	-0.383** (-2.59)	-0.571*** (-3.82)
Age	0.003 (0.74)	0.005 (1.42)	0.005 (1.50)	-0.024*** (-6.64)	0.001 (0.21)	-0.001 (-0.15)	0.001 (0.26)
Household registration	0.362** (2.33)	0.022 (0.16)	-0.042 (-0.46)	-0.087 (-0.97)	0.351*** (2.62)	0.391** (2.54)	0.356** (2.27)
Civil state	-0.202 (-1.25)	-1.202*** (-7.79)	-0.104 (-0.84)	-0.571*** (-4.18)	0.397** (2.54)	-0.133 (-0.88)	-0.246 (-1.50)
Politics status	-0.181*** (-3.15)	-0.097 (-1.60)	-0.060 (-1.24)	0.001 (0.04)	-0.133** (-2.53)	-0.141*** (-2.77)	-0.181*** (-3.15)
Education	0.074 (1.41)	0.208*** (4.11)	0.010 (0.30)	-0.117*** (-4.99)	-0.029 (-0.63)	0.067 (1.56)	0.065 (1.19)
Religion	0.050 (0.31)	0.217* (1.82)	-0.161 (-1.13)	0.198** (2.25)	-0.059 (-0.42)	0.157 (1.09)	0.065 (0.39)
Internet use	0.873*** (5.51)	0.719*** (4.44)	0.475*** (3.72)	0.607*** (4.82)	0.515*** (3.34)	0.557*** (3.52)	0.920*** (5.72)
Social use	—	—	—	—	0.499*** (9.44)	—	—
Instrumental use	—	—	—	—	—	0.666*** (9.86)	—
Recreational use	—	—	—	—	—	—	-0.077 (-0.78)
Constant	-0.997 (-1.47)	1.831*** (3.20)	4.467*** (10.77)	4.314*** (9.53)	-1.911*** (-2.94)	-3.971*** (-5.22)	-0.667 (-0.81)
Observations	361	361	361	361	361	361	361
R^2	0.140	0.389	0.082	0.726	0.301	0.340	0.141
PseudoR^2	0.120	0.375	0.061	0.720	0.283	0.323	0.119
F	8.670***	44.025***	2.499***	119.432***	24.179***	26.054***	7.852***

Values in parentheses are t values. *, **, and *** represent 10%, 5%, and 1% levels of significance, respectively.

In conclusion, social use and recreational use play a mediating role in the relationship between Internet use and impulsive consumption, and the latter has a greater mediating effect. Social use and instrumental use play a mediating role in the relationship between Internet use and non-impulsive consumption, and the latter has a greater mediating effect. To make the mediating effect conclusion more robust, we conducted a bootstrap test on the mediating effect involved in the paper, and the test results after 1000 bootstrap samplings are shown in Table 6 below.

Table 6 Bootstrap test of mediating effect.

Path	Type	Effect (SE)	LLCI	ULCI	Conclusion
Internet use→Social use -→impulsive consumption	Indirect	0.078 (0.033)	0.013	0.143	Robust
	Direct	0.686 (0.175)	0.343	1.03	
Internet use→Recreational use→impulsive consumption	Indirect	0.563 (0.127)	0.315	0.811	Robust
	Direct	0.201 (0.122)	-0.037	0.44	
Internet use→Social use→Non-impulsive consumption	Indirect	0.359 (0.094)	0.175	0.543	Robust
	Direct	0.515 (0.159)	0.204	0.825	
Internet use→Instrumental use→Non-impulsive consumption	Indirect	0.316 (0.093)	0.135	0.498	Robust
	Direct	0.557 (0.154)	0.255	0.858	

According to the results of the bootstrap test, we believe that all the mediating effects obtained through the aforementioned regression passed the test and the conclusion is robust. We believe that different modes of Internet use mediate the relationship between Internet use and consumers' impulsive and non-impulsive consumption. The results of this empirical analysis this paper can be represented by two total effects and four mediation models shown in the following figure 2.

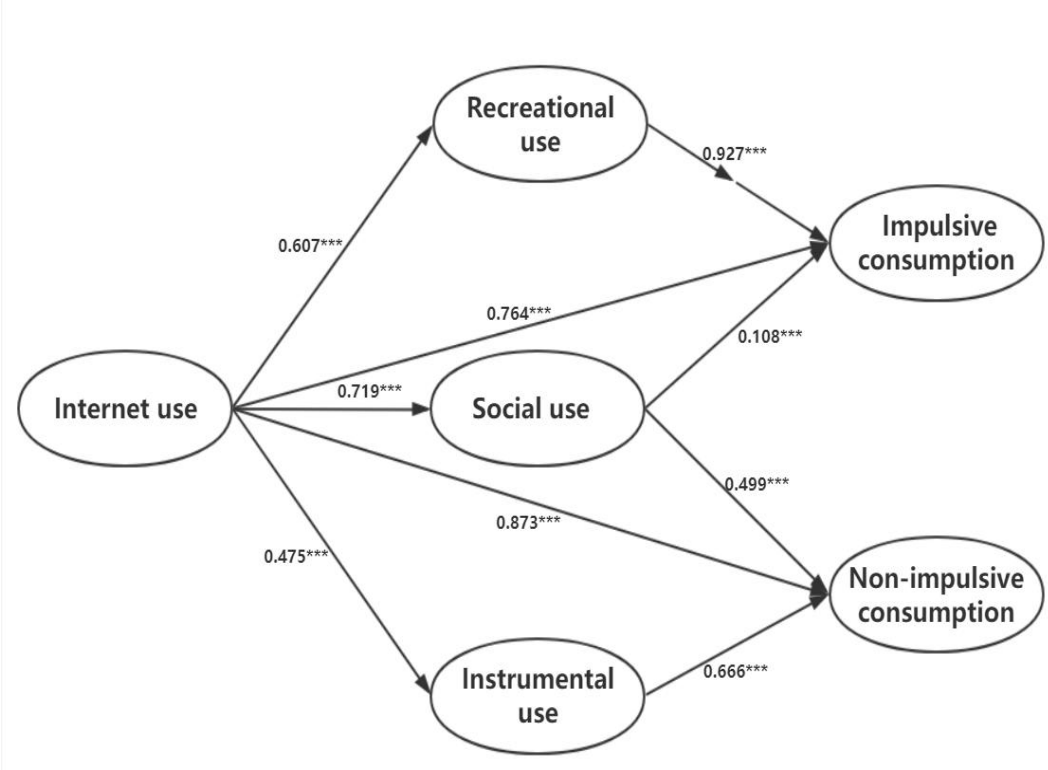

Figure 2: The Internet uses a mediating effect model on the impact of impulsive and non-impulsive consumption.

V. Conclusions and Recommendations

5.1 Internet use promotes consumers' impulsive and non-impulsive consumption

The promoting effect of the Internet on impulsive consumption was demonstrated in the early stages of research on this topic. Previous studies all show that the use of the Internet will stimulate users' impulsive consumption [25-27], which has been further verified in this study. Therefore, will the Internet only exacerbate impulse consumption? Existing studies have also confirmed the possibility that Internet use can reduce people's impulsive consumption behaviour [28] and this tendency has also been verified in this study. Internet users were 76.4% more likely to engage in impulsive consumption and 87.3% more likely to engage in non-impulsive consumption than non-Internet users. Therefore, we not only verify the positive effects of Internet use on users' impulsive consumption but also verify the positive effects of Internet use on users' non-impulsive consumption and find that the promoting effect of Internet use on users' non-impulsive consumption is more apparent. This is a new finding and there is an inevitable logic behind this seemingly contradictory conclusion. First, as an advanced technology, the Internet itself has no advantages or disadvantages. The effectiveness and environmental stimulation generated by the Internet depends on the way the users use it. Properly used, the Internet can help consumers reduce their impulsive consumption behaviours and produce more non-impulsive consumption behaviours, which can reduce the burden on consumers and save resources, and vice versa. This is an area of research that Park et al. did not previously regard. Therefore, we should guide consumers to use the Internet reasonably and rely on the Internet to produce more rational consumption behaviour.

5.2 Different Internet uses have different effects on different consumer behaviours

The "usage gap" in the process of using the Internet has always been an important issue of academic concern. Different people have different ways of using the Internet, which also have different effects on people's impulsive and non-impulsive consumption behaviours. Existing research results show that recreational use will lead to a longer stay in online stores, resulting in a greater probability of impulsive consumption, while instrumental use does not show this relationship [29]. Several scholars have verified that instrumental use is negatively correlated with impulsive consumption, while recreational use is positively correlated with impulsive consumption [30][31]. This study is consistent with these views and additionally discusses the impact of social use on impulsive and non-impulsive consumption behaviours. Specifically:

Social use has a significant positive effect on both Internet use and consumption behaviour and has a greater effect on promoting non-impulsive consumption, but the mediating effect between the two is the same.

Recreational use of the Internet has a significant positive effect on consumption, and as the consumer's recreational use of the Internet increases, the higher the probability of impulsive consumption. In addition, recreational use plays a complete mediating effect between Internet use and impulsive consumption (via the Bootstrap test), that is, the mediating effect rate is 100%. On the other hand, recreational use has a nonsignificant negative effect on consumers' non-impulsive consumption; therefore, we believe that recreational use does not enhance consumers' non-impulsive consumption behaviour.

Instrumental use has a significant positive effect on consumers' non-impulsive consumption, and the degree of the effect is close to that of recreational use. With increasing instrumental use of the Internet, consumers are more likely to engage in non-impulsive consumption, which means that consumers tend to consume more rationally.

Our research results on the relationship between Internet use and consumers' impulsive consumption behaviours are extended from consumer behaviour based on the study of the "access gap" by Van Dijk et al., which enriches the academic understanding of the relationship between the "digital divide" and impulsive consumption and

non-impulsive consumption behaviours.

5.3 Different demographic attributes have different effects on impulsive consumption and non-impulsive consumption.

Previous research has shown that attributes of individual consumers will also affect impulsive consumption. Young women tend to engage in more perceptual consumption, which leads to a greater possibility of impulsive consumption than that of young men [27]. College students whose permanent residence is in an urban area are more likely to engage in impulsive consumption than college students in rural areas. These conclusions are verified in this study: Compared with males, females have a higher probability of impulsive consumption and a lower probability of non-impulsive consumption, which indicates that females may be impulsive in the process of consumption. Second, with increasing age, the probability of people's impulsive consumption behaviour will gradually decrease, which indicates that with the continuous increase in people's cognition, people's consumption becomes increasingly rational. Third, people in rural areas are less likely to engage in impulsive consumption than people in urban areas. Urban areas are far richer than rural areas, which is more likely to induce impulsive consumption. Finally, married people are less likely to engage in impulsive consumption than unmarried people. The burden of marriage makes people consider the process of consumption; therefore, they are less likely to engage in impulsive consumption.

5.4 Recommendations and limitations

In conclusion, Internet use promotes consumers' consumption behaviour, which is reflected not only in impulsive consumption behaviour but also in non-impulsive consumption behaviour. On the one hand, Internet use makes users more likely to engage in impulsive consumption behaviours [25-27], which aggravate the burden on consumers and waste social resources; therefore, these behaviours are undesirable behaviours of Internet use. On the other hand, Internet use also promotes more rational and non-impulsive consumption behaviours [28]. These kinds of consumption behaviours can reduce the burden on consumers and saves social resources; therefore, they are desirable Internet use behaviours. Determining how to make people's Internet use develop in a desirable direction, promote non-impulsive consumption behaviours, and reduce impulsive consumption behaviours requires us to guide consumers in reasonable uses of the Internet.

Reasonable Internet use requires the technology to return to its original nature. The Internet should be able to improve the efficiency of people's lives, promote the efficient flow of resources, and reduce the waste of resources, rather than comparing and creating a bad atmosphere in society. The Internet can rapidly transfer information, which means it can also quickly form and spread trends. These trends are often imitated by other users; therefore, we need to pay attention to the purification of improper network consumption culture and attach great importance to promoting a rational consumption atmosphere. However, the publicity of the rational use of the Internet should not be ignored. People should be educated to regard the Internet not only as an entertainment and social tool but also as a learning tool to improve themselves, their lives and efficiency. Only in this way can people avoid impulsive consumption caused by the entertainment of the Internet.

Finally, this paper only discusses the impact of the "access gap" and "use gap" of the "digital divide" on the two aspects of impulsive consumption behaviour. As the content of the Internet has been more detailed in recent years, academic circles have begun to pay attention to the "content divide". The amalgamation of Internet users to elucidate Internet content level differences and a gap in content can provide information for subsequent researchers and can further deepen this research.

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