

Impact of Social Media on User Engagement through the Lens of Media System Dependency Theory

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Abstract. Social media has penetrated into our lives, triggering engagement both online and offline. However, the current research is limited to the exploration of online engagement, so this study expands the scope of research to offline, and explores the impact of media dependence on online and offline communication based on media-system dependency. This study adopts the method of questionnaire and selects three topics of clothing, food, and sports events to provide data support. The results of the study show that similar to common topics such as clothing and food, online engagement has no effect on offline communication, and for topics of sports events with certain interest orientation, media dependence will not affect its offline communication.

Keywords: Media System Dependency Theory (MSD); Social Media; User Engagements.

1. Introduction

Social media is a content production and exchange platform based on user relationships on the internet (Kaplan & Haenlein, 2010). Social media can inspire active contributions and feedback from interested people, blurring the line between media and audience. Content travels in both directions between social media and users, creating an exchange. In social media, people can quickly form a community, and use the content of common interest as the topic to fully communicate (Liberatore, Bowkett, MacLeod, Spurr, & Longnecker, 2018). Social media has strong connectivity, and through links, various medias are fused together (Haythornthwaite, 2005). Therefore, the virtual community created by social media is intertwined with real life, and the social circle of users continues to expand, expanding the types, scope and channels for users to obtain information on the internet.

There are currently a large number of studies focusing on the online behavior of social media users (Chen & Chiu, 2023; Dolan, Conduit, Frethey-Bentham, Fahy, & Goodman, 2019; MUHAMAD & Shahrom, 2020; Shahbaznezhad, Dolan, & Rashidirad, 2021), but few studies involve the impact of social media on users' offline behavior. As social media is an internet community, users act as a role to participate in social networking, and the formation of user networks will inevitably have an impact on users' offline interpersonal communication (McInroy, McCloskey, Craig, & Eaton, 2019). Therefore, this paper proposes a theoretical model for studying social media use based on media-system dependency (MSD) and social media-related research literature. This study also investigates the impact of social media dependence on users' online participation in offline communication behaviors through questionnaires, and provides strategic guidance for the development of social media.

2. Theoretical Background and Literature Review

2.1 Media-system dependency (MSD)

Media are an important part of the structure of modern society and have interrelationships with individuals, groups, organizations and other social systems. The media system is regarded as an information system. Therefore, MSD focuses on the study of the media system's dependence on scarce information resources and its impact. The basic assumption of MSD is "when a new media matures in society, there will be a dependent relationship between people and the media. This dependence is bidirectional. The stronger side is the media, which controls people in terms of

dissemination content. The more people want to receive the dissemination content, the stronger this dependence relationship will be” (Ball-Rokeach, 2008). Thus, media dependence theory combines psychoanalysis and social systems theory, and for the first time regards the audience as an active part of the communication process.

In MSD, the factors that affect people's dependence on the media include personal goals, personal environment and social environment (Ball-Rokeach, 1985). The difference in personal goals often reflects the difference in the environment in which individuals are not only influenced by the information provided by the media, but also by the information received from the social environment.

With the rapid development of social media, MSD is used to study the audience's dependence on social media (Carillo, Scornavacca, & Za, 2017). For example, the study found that under the condition of uncertain information, the degree of media dependence will increase, which confirms the relationship between information uncertainty and media dependence in MSD (Lowrey, 2004). There are also studies using MSD to analyze social application addiction, and to study the relationship between social media dependence and interpersonal satisfaction and self-esteem (Acun, 2020; Demircioğlu & Köse, 2020; Uram & Skalski, 2022). However, there is still a lack of research on social media users' online participation in offline communication behavior through MSD.

2.2 Usage of Social Media

There are many studies on the impact of social media use, and the research focuses on the impact on users' online behavior, including users' psychology (Ostic et al., 2021), interpersonal relationships (Subramanian, 2017), behavior decision-making (Voramontri & Klieb, 2019), social capital (Hwang & Kim, 2015) and consumption habits (Bedard & Tolmie, 2018). Each individual uses social media differently, and the influence of social media on users is also different, and users can meet their own social needs through social media, thus forming a dependence on social networking platforms, which in turn affects users' social behavior. However, the current empirical research on social media using MSD has not deeply explored the impact of social media dependence on users' online and offline participation. In addition, how to evaluate users' use of social media is a key issue, but currently there are few feasible studies on the measurement of social media dependence. Therefore, based on MSD and combined with the characteristics of social media, this study will build a model of the influence of social media dependence on user behavior, and prove the impact of social media dependence on users' online and offline engagement.

3. Model and Hypothesis

3.1 Model

Based on MSD, social media dependence can be defined as the degree to which social media is perceived to be helpful to achieve a series of key goals in daily work and life. Three categories of topics are selected from Xiaohongshu: clothing, food and sports events. Offline participation is more specifically offline communication, that is, offline communication and discussion with friends and family around you after obtaining information. Taking the choice of three types of topics as an individual's selective contact with social media, a model of the influence of social media dependence on online and offline participation in these three types of topics is constructed, as shown in Figure 1.

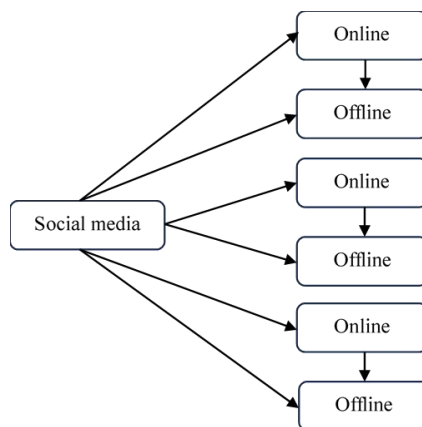


Fig. 1 Model of the Impact of Social Media Dependence

3.2 Hypothesis

According to MSD, an individual's dependence on media has three outcomes: selective exposure, degree of exposure, and post-exposure communication. Selective exposure includes the form, channel selection and degree selection of content presentation. This study regards the topics of clothing, food and sports events as individuals' selective exposure to social media. The degree of exposure is the degree of concentration of the user to receive some specific information, which is related to the enthusiasm of the user to participate in the media content. This study regards the degree of online engagement in three types of topics, such as posting, sharing, commenting or replying, as the degree of users' exposure to social media. Post-exposure communication is when users talk to other people in person about related topics after receiving media information, such as: groups/organizations, friends and family. This study regards offline communication on three types of topics as users' post-exposure communication on social media.

Studies have shown that whether social media has an impact on exposure and post-exposure communication depends on social media reliance (Pienaar, 2022). Only when the user's media dependence increases, the user's exposure and post-exposure to the media will increase, and the increased exposure will lead to more investment in media content, thereby realizing the user's motivation to use social media.

Therefore, this study proposes the following hypotheses.

H1a: Social media dependence positively affects online engagement in topics of clothing.

H1b: Social media dependence positively affects online engagement in topics of food.

H1c: Social media dependence positively affects online engagement in topics of sports events.

H2a: Social media dependence positively affects offline communication on topics of clothing.

H2b: Social media dependence positively affects offline communication on topics of food.

H2c: Social media dependence positively affects offline communication on topics of sports events.

Studies have shown that the degree of exposure to media dependence will affect the willingness of users to communicate with others to obtain information, thereby affecting the degree of post-exposure communication of users (Liu & He, 2021). Therefore, the higher the degree of online engagement in topics of clothing, food, and sports events, the more likely it is to communicate with others about similar topics offline. Therefore, the following hypothesis is put forward.

H3a: Online engagement in topics of clothing positively affects offline communication.

H3b: Online engagement in topics of food positively affects offline communication.

H3c: Online engagement in topics of sports events positively affects offline communication.

4. Research method

4.1 Questionnaire design and collection

The questionnaire consists of two parts. The first part is a survey of basic personal information, and the second part is items related to the model. Before the official distribution of the questionnaire, the questionnaire was pre-tested and the items of the questionnaire were adjusted. The questionnaire was produced through Wenjuanxing, and the questionnaire was distributed through Xiaohongshu. A total of 220 valid questionnaires were collected.

The descriptive statistical analysis includes: age, gender, education level, occupation, number of electronic devices owned, and weekly online time. The results are shown in Table 1. Participants are mainly young people, with 50% aged between 20 and 30 years old. The proportion of men and women accounted for 45.5% and 54.5% respectively. Bachelor degree or above accounted for 97.3%, of which 66.8% were students. 81% of participants spend 10-70 hours online every week.

Table 1. Descriptive Statistical Analysis

	Items	Frequency	Percentage (%)
Age	20 years or below	60	27.3
	20-30 years	110	50
	30-40 years	46	20.9
	40 years or above	4	1.8
Gender	Male	100	45.5
	Female	120	54.5
Education level	Senior high or below	6	2.7
	Bachelor	171	77.7
	Postgraduate	42	19.1
	Others	1	0.5
Occupation	Student	147	66.8
	Corporate employees	59	26.8
	Civil servant	2	0.9
	Freelancer	2	0.9
	Others	10	4.5
Weekly online time	10 hours or below	21	9.5
	10-30 hours	62	28.2
	30-50 hours	84	38.2
	50-70 hours	32	14.5
	70 hours	21	9.5

The second part of the questionnaire is the items of variables. The media dependence in the model is formed by the user's motivation to acquire media content. This study measures social media dependence from three aspects: understanding motivation, positioning motivation and expressive motivation. Among them, understanding motivation is not only the user's understanding of social media content, but also the user's self-understanding and evaluation. Positioning motivation is a practical guide for user acquisition practice and interaction with others, making guidance, judgment, modification and decision-making for one's own behavior. The expressive motivation is that users can not only obtain information, but also create or disseminate information in various forms, presenting one's thoughts, feelings and opinions. The measurement of engagement in the three types of topics on social media selects the online engagement methods, engagement frequency and engagement scope of various topics, and selects the offline discussion objects, discussion frequency and discussion scope of various topics. For the remaining questions, a

five-point Likert scale was used: strongly agree (5 points), agree (4 points), not sure (3 points), disagree (2 points), strongly disagree (1 point).

4.2 Reliability and validity

Cronbach's coefficient was used to measure the reliability of this study, and exploratory factor analysis was used to measure the validity. In order to avoid some problems caused by Cronbach's coefficient, such as reliability expansion, measurement variables having equal importance, etc., the validity analysis is carried out by combining reliability ($CR > 0.6$) and average variance extraction ($AVE > 0.5$).

The Cronbach coefficient of each indicator variable and the factor loading of each variable was calculated by SPSS25, and the combined reliability (CR) and average variance extraction (AVE) were calculated. The results are shown in Table 2. The Cronbach of the seven variables were all greater than 0.70, the CR were all greater than 0.6, the AVE were all greater than 0.5, and the factor loadings of each variable were greater than 0.5.

Table 2. Results of Validity Analysis and Reliability Analysis

Construct	Item	Loading	Cronbach's α	CR	AVE
Social Media Dependence (SMD)	SMD1	0.872	0.934	0.709	0.619
	SMD2	0.634			
	SMD3	0.633			
	SMD4	0.843			
	SMD5	0.830			
	SMD6	0.703			
	SMD7	0.597			
	SMD8	0.577			
	SMD9	0.751			
	SMD10	0.833			
	SMD11	0.675			
	SMD12	0.636			
	SMD13	0.692			
	SMD14	0.582			
	SMD15	0.618			
	SMD16	0.780			
	SMD17	0.814			
	SMD18	0.782			
Online Engagement of "Clothing" (OEC)	OEC1	0.869	0.823	0.779	0.645
	OEC2	0.769			
	OEC3	0.768			
Offline Engagement of "Clothing" (FEC)	FEC1	0.790	0.787	0.766	0.673
	FEC2	0.702			
	FEC3	0.775			
Online Engagement of "Food" (OEF)	OEF1	0.862	0.921	0.889	0.726
	OEF2	0.882			
	OEF3	0.811			
Offline Engagement of "Food" (FEF)	FEF1	0.884	0.906	0.784	0.692
	FEF2	0.854			
	FEF3	0.752			
Online Engagement of "Sports Events" (OES)	OES1	0.825	0.864	0.828	0.702
	OES2	0.834			
	OES3	0.856			
Offline Engagement of	FES1	0.830	0.822	0.774	0.674

"Sports Events" (FES)	FES2	0.806		
	FES3	0.827		

4.3 Hypothesis verification

In this study, the nine hypotheses proposed were tested using the maximum likelihood method in Structural Equation Modeling (SEM), which is processed by AMOS25. The results of the model fitness are shown in Table 3, and the indicators basically meet the standard.

Table 3. Model fitness index

Index	Value	Criterion
X ² /df	2.08	≤3
RMSEA	0.071	≤0.08
CFI	0.946	≥0.9
GFI	0.902	≥0.9
TLI	0.929	≥0.9

The path analysis of the model is shown in Figure 2, and the coefficient estimates on the path reflect the direction and degree of influence between latent variables.

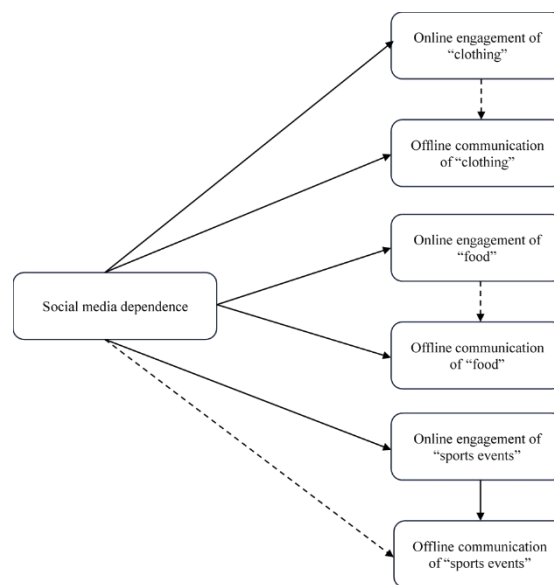


Fig. 2 Path Analysis

The results of the hypothesis verification are shown in Table 4.

Table 4. Hypothesis verification results

Hypothesis	β	P value	Verification
H1a: Social media dependence positively affects online engagement in topics of clothing.	0.377	<0.001***	Established
H1b: Social media dependence positively affects online engagement in topics of food.	0.360	<0.001***	Established
H1c: Social media dependence positively affects online engagement in topics of sports events.	0.368	<0.05*	Established
H2a: Social media dependence positively affects offline communication on topics of clothing.	0.197	<0.05*	Established
H2b: Social media dependence positively affects offline communication on topics of food.	0.193	<0.05*	Established
H2c: Social media dependence positively affects offline	0.051	>0.05	Not established

communication on topics of sports events.			
H3a: Online engagement in topics of clothing positively affects offline communication.	0.394	>0.05	Not established
H3b: Online engagement in topics of food positively affects offline communication.	0.375	>0.05	Not established
H3c: Online engagement in topics of sports events positively affects offline communication.	0.523	<0.001***	Established

5. Analysis and Discussion

5.1 The direct impact of social media dependence

Social media dependence has a direct positive impact on online engagement in the three topics of clothing, food, and sports events, so hypotheses H1a, H1b, and H1c are established. This is because users perceive the degree to which social media helps to achieve a series of key goals in daily work and life through selective exposure to topics such as clothing, food and sports events. The higher the degree of perception, the more actively users will participate online. Therefore, users' dependence on social media will directly and positively affect users' online engagement.

In terms of the influence of offline communication on the three types of topics, social media dependence has a direct positive impact on offline communication on topics of clothing and food, so it is assumed that H2a and H2b are established, and H2c are not. This is because it is relatively easy to talk about the topics of clothing and food with other people. Therefore, the increase in dependence on social media targeting topics of clothing and food is more likely to directly lead to an increase in offline communication. Topics of sports events are highly targeted and professional. Compared with offline communication with people with similar interests, it is easier for users to find people with similar interests online through social media and participate online. Therefore, the increase in dependence on social media for the topics of sports events doesn't directly affect the increase in offline communication.

5.2 The indirect effects of social media dependence

Online engagement in topics of clothing and food has no positive impact on offline communication, so H3a and H3b are not established. Therefore, social media dependence cannot have an indirect positive impact on offline communication through online participation in topics of clothing and food. This is due to the increased dependence on social media for topics of clothing and food, and users can obtain a lot of information. And the topics of clothing and food are popular topics, so it is easy to find offline communication companions and content without online engagement, and conduct offline exchanges and discussions. Therefore, the influence of online social media engagement on topics of clothing and food on offline communication is not obvious.

Online engagement in topics of sports events has a positive impact on offline communication, so H3c is established. Therefore, social media dependence has an indirect positive impact on offline communication through online engagement in topics of sports events. The topic of sports events has a certain degree of professionalism, and users need to find communication companions and content with similar interests through online engagement in social media, thereby triggering more offline communication and discussions. Therefore, through online engagement in topics of sports, social media dependence can indirectly affect offline communication.

6. Conclusion

Through the use of social media, users realize their own social motivations, thereby becoming dependent on social media, which in turn affects users' online and offline social behaviors. However, few existing studies empirically study social media users' online and offline social behaviors through MSD. Therefore, this study is based on the three results of selective exposure, degree of

exposure, and post-exposure communication in MSD about personal dependence on media, and combines social media characteristics to establish a model of the impact of social media dependence on users' online and offline social behaviors. Topics of clothing, food, and sports events are selected as personal selective exposure to social media. The degree of online engagement in these three types of topics is regarded as the degree of user's exposure to social media, and the offline communication is regarded as the user's post-exposure communication with social media. Social media dependence is measured by understanding motivation, positioning motivation and expression motivation, and the degree of online engagement of users and post-exposure communication is measured from online engagement behavior and offline communication behavior, respectively. Through the questionnaire, SPSS25 and AMOS25 were used for data analysis, and the research hypothesis was verified.

The research results show that social media dependence has a direct positive impact on online engagement in topics of clothing, food, and sports events. Social media dependence has a direct positive impact on offline communication on topics of clothing and food. Online engagement in topics of sports events has a significant positive impact on offline communication. As a result, social media dependence has an indirect impact on offline communication on topics of sports events. Social media dependence has no significant impact on offline communication on topics of sports events. Online engagement in topics of clothing and food has no significant impact on offline communication.

The measurement of social media dependence helps to understand the degree of dependence of different users on social media, thereby analyzing the social media content and degree of interest of users, and providing valuable reference information for recommendation of social media content. Since the dependence on social media has a direct positive impact on online engagement and offline communication on topics of clothing and food, online engagement on these two topics has no significant impact on offline communication. Therefore, for these two types of topics, on the one hand, the social function of social media can be enhanced to promote users' online contact and engagement, and on the other hand, users' offline communication and discussion can be increased by providing relevant information to users promptly on time. Since social media dependence has a direct positive impact on online engagement in topics of sports events, it does not affect offline communication, and online engagement in this topic has a significant positive impact on offline communication. Therefore, for topics of sports events, on the one hand, it is possible to enhance the social function of social media to promote online contact and engagement of users, such as recommending communication companions and content with similar interests. On the other hand, it can be considered to extend the user's offline social circle and expand social capital through the method of combining online and offline. Based on directly promoting users' offline communication and discussion, the indirect impact of social media dependence on offline post-exposure communication of topics of sports events is enhanced.

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