

The Impact of Network Identity Expression on Social Relationships Based on Symbolic Interaction Theory

Ziming Li

Department of Sociology, Heilongjiang University, Harbin, Heilongjiang, China

Abstract: Based on symbolic interaction theory, this study systematically analyzed the impact of network identity expression on social relations through quantitative research methods, focusing on the relationship between individual symbolic behavior and social connection in the network environment. The study took symbolic interaction theory as the core, constructed a theoretical framework, collected data by designing a structured questionnaire, and verified the hypothesis using Pearson correlation analysis and multiple regression analysis. The results showed that the positivity, frequency of expression and symbolic diversity of network identity expression had a significant positive impact on the intimacy, maintenance and diversity of social relations, respectively, revealing the specific mechanism of symbolic interaction in shaping social relations in the network environment, and providing important empirical basis and theoretical support for deepening the theoretical research and practical application of network social interaction.

Keywords: Symbolic Interaction Theory; Network Identity Expression; Social Relations; Quantitative Research; Social Media

1. Introduction

1.1 Research Background and Significance

With the rapid development of Internet technology, social media has become an important platform for individuals to express themselves and interact with each other in modern society. Network identity expression, as a behavior of presenting oneself through symbols (such as text, images, and emoticons), is not only a process of personal identity construction, but also an important way to form and maintain social relations. Symbolic interaction theory points out that individuals

give meaning through symbolic interaction and constantly adjust their self-cognition and social relationships in their interactions with others [1]. In the network environment, this symbolic interaction presents new characteristics due to its virtuality, immediacy and extensiveness. For example, the "self-presentation" theory proposed by Goffman has been further expanded in the network context. Individuals shape their idealized network identities by carefully selecting symbols, thereby influencing others' evaluation of them and the establishment of social relationships [2]. Existing studies have shown that the frequency and emotional tendency of network identity expression have a significant impact on the intimacy and stability of social relationships [3].

The significance of this study lies in deepening the understanding of the social interaction mechanism in the network environment. By applying symbolic interaction theory, systematically analyzing the impact of network identity expression on social relations can provide new theoretical perspectives and empirical evidence for network sociology. Especially in the context of the increasing popularity of social media use, understanding how network identity expression shapes social relations through symbolic interaction can not only help reveal the behavioral logic of individuals in virtual space, but also provide practical guidance for promoting healthy social relationships. In addition, this study verified the theoretical hypothesis through quantitative methods, further enriched the applicability of symbolic interaction theory in the network environment, and laid a foundation for subsequent research.

1.2 Research Questions and Objectives

As a symbolic behavior, the impact of online identity expression on social relationships is constrained by multiple factors. Existing studies have shown that the way individuals express themselves in online environments (such as

positive emotional expression and symbolic diversity) may have different degrees of impact on the intimacy and diversity of social relationships [4]. However, existing studies mostly focus on the individual psychological effects of online identity expression, and rarely systematically explore its specific mechanism of action on social relationships from the perspective of symbolic interaction theory. For example, Boyd pointed out that identity expression in social media is affected by platform characteristics and user interaction patterns, but its deep impact on social relationships still needs further empirical testing [5]. In addition, how the frequency and symbol selection of online identity expression affect the maintenance and diversity of relationships through the interaction process is still an important gap in current research.

Based on the above background, this study aims to explore the impact of online identity expression on social relationships. Specific research questions include: How do the positivity, frequency and symbolic diversity of online identity expression affect the intimacy, maintenance and diversity of social relationships respectively? The research objectives are: first, to construct a theoretical framework of online identity expression and social relations based on symbolic interaction theory and clarify the correlation mechanism between variables; second, to design questionnaires and collect data through quantitative research methods, and to use statistical analysis to verify hypotheses; finally, to reveal the specific path of how online identity expression affects social relations through symbolic interaction, and to provide theoretical support and empirical basis for network sociology research.

2. Literature Review

2.1 Core Concepts of Symbolic Interaction Theory

Symbolic interaction theory is an important theoretical framework for sociological research. It originated from the ideas of George Herbert Mead and was later systematically developed by Herbert Blumer. Blumer proposed the three core concepts of symbolic interaction theory: meaning, interaction, and interpretation[6]. Meaning refers to the subjective meaning that individuals give to things through symbols (such as language and behavior), interaction is the

process of individuals communicating with others through symbols in social interactions, and interpretation is the process of individuals constantly adjusting and redefining meaning based on their interactive experience. This theory emphasizes that social reality is not an objective existence, but is constructed through the interaction between individuals. Mead further pointed out that an individual's self-awareness is gradually formed in the symbolic interaction with others, and this "symbolic interaction" is the basis of social behavior [7].

Symbolic interaction theory has important value in the study of social relations, especially for analyzing how individual behavior affects interpersonal connections through symbols. For example, in the network environment, an individual's identity expression (such as social media posts) as a symbolic behavior not only reflects the intention of self-presentation, but also shapes the dynamics of social relations through interaction with others (such as likes and comments). Existing studies have shown that symbolic interaction theory can effectively explain social behavior patterns in virtual space and provide a theoretical basis for understanding the impact of network identity expression on social relations [8]. This study takes this theory as the core and explores how symbolic interaction in the network environment affects multiple dimensions of social relations through identity expression, as shown in Figure 1.

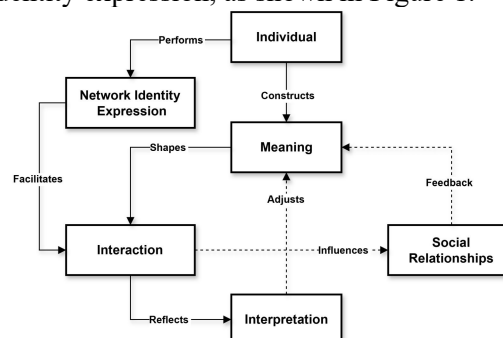


Figure 1. Schematic Diagram of Symbolic Interaction Theory

2.2 Related Research on Online Identity Expression

Online identity expression refers to the behavior of individuals presenting themselves through symbols (such as text, pictures, and videos) in virtual space. This process is deeply influenced by the technological environment and cultural background. Turkle's early research pointed out

that the anonymity of cyberspace enables individuals to try different identity expressions and thus explore diversified self-identity[9]. With the popularization of social media, the forms of online identity expression have become more diverse. For example, through status updates, emoticons, and short videos, users can more flexibly present emotions and attitudes. Hogan proposed the concept of "exhibitionary self", believing that online identity expression is a performative behavior. Individuals create an idealized image on social media by carefully selecting symbols[10].

In recent years, scholars have further explored the social impact of online identity expression. Papacharissi's research found that identity expression on social media is not only a tool for individuals to present themselves, but also an important way to build and maintain social relationships. The emotional tendency and frequency of expression significantly affect the intimacy of relationships[11]. In addition, the symbolic diversity of online identity expression has also received attention. For example, the use of diverse symbols (such as pictures and emoticons) can enhance the attractiveness of interaction and promote the diversity of relationships. However, existing studies rarely systematically analyze the specific mechanism of network identity expression on social relations from the perspective of symbolic interaction theory. This study will fill this gap, focusing on the positivity, frequency and symbolic diversity of network identity expression, and explore its deep impact on social relations.

2.3 Factors Affecting Social Relations

As a core topic in sociological research, the formation and maintenance of social relations are affected by many factors. Granovetter's "weak tie theory" points out that the strength (closeness) and diversity of social relations are affected by the individual's network structure, and weak ties play an important role in information dissemination and resource acquisition [12]. In the network environment, the dynamic characteristics of social relations are more prominent. Wellman et al. proposed the concept of "networked individualism", believing that Internet technology has enabled social relations to break through traditional geographical restrictions, and individuals have established and maintained a wider network of

relationships through virtual interactions [13].

Further research shows that individual behavioral characteristics and social interaction patterns have a profound impact on social relations. Lin's social capital theory emphasizes that the quality and stability of social relations are closely related to the individual's social capital, and the accumulation of social capital depends on the frequency of interaction and emotional investment [14]. In the online context, the symbolic behavior of identity expression has become an important factor affecting social relations. For example, positive emotional expression can enhance the intimacy of relationships, while frequent interactions can help maintain relationships. However, existing literature rarely combines symbolic interaction theory to explore how network identity expression affects multiple dimensions of social relations through symbolic behavior. Based on symbolic interaction theory, this study will systematically analyze the specific role of network identity expression on the intimacy, maintenance and diversity of social relationships.

3. Theoretical Framework and Research Design

3.1 Analysis of the Applicability of Symbolic Interaction Theory

Symbolic interaction theory was systematized by Herbert Blumer, emphasizing that individuals construct social reality through symbolic interaction. Its core includes three aspects: meaning, interaction and interpretation. In the online environment, individuals express their identities through social media platforms, and the symbols they use (such as text, images, and emoticons) carry specific meanings. These symbols are interpreted and given new meanings by others in the interaction, which in turn affects the establishment and maintenance of social relationships. As a symbolic behavior, network identity expression conforms to the analytical framework of symbolic interaction theory because it is not only a process of self-presentation, but also a process of shaping social connections through interaction with others.

Symbolic interaction in the network environment is unique. First, the anonymity and virtuality of the network space allow individuals to more freely choose symbols to express their identities,

thereby affecting others' cognition of them. Second, the immediacy and extensiveness of network interaction amplify the scope of symbol dissemination, allowing the meaning of symbols to be interpreted and reconstructed on a larger scale. For example, "like" on social media as a symbolic behavior not only reflects the individual's identification attitude, but may also strengthen or weaken social relations in the interaction. Based on this, symbolic interaction theory provides a theoretical basis for analyzing the impact of network identity expression on social relations, and can effectively explain how individuals influence the quality and strength of social connections through symbol selection and interaction processes.

3.2 Research Hypothesis and Variable Setting

Based on symbolic interaction theory, this study focuses on the impact of network identity expression on social relations and proposes the following research hypotheses: (1) The degree of positivity of network identity expression positively affects the intimacy of social relations; (2) The frequency of network identity expression positively affects the degree of maintenance of social relations; (3) The symbolic diversity of

$$SC_i = \beta_0 + \beta_1 PE_i + \beta_2 FE_i + \beta_3 SD_i + \beta_4 Gender_i + \beta_5 Age_i + \beta_6 SMUT_i + \delta_i \quad (1)$$

The above formula indicates that the social intimacy SC_i of individual (i) is affected by the degree of positivity PE_i , frequency FE_i , symbolic diversity SD_i and control variables (gender, age, and duration of social media use), where β_0 is a constant term, β_1 to β_6 are regression coefficients, and δ_i is a random error term. This model assumes that each dimension of online identity expression has a linear effect on social intimacy, and similar models will be used to analyze maintenance and diversity.

3.3 Research Methods and Data Collection

This study adopts a quantitative research method and collects data through questionnaires to verify the impact of online identity expression on social relationships. The research subjects are adults who frequently use social media. It is planned to select samples from different age groups and gender groups through stratified sampling. The sample size is expected to be 500 to ensure the validity of statistical analysis.

Data collection mainly relies on a structured questionnaire, which includes the following

network identity expression positively affects the diversity of social relations. To verify these hypotheses, the following variables are set:

Independent variables: online identity expression, including three dimensions: Positive Expression (PE), Frequency of Expression (FE), and Symbol Diversity (SD). Positive expression refers to the positive emotional tendency of the expression content, frequency of expression refers to the number of times the content is published per unit time, and symbol diversity refers to the degree of use of different types of symbols (such as text, image, video).

Dependent variables: social relationships, including closeness (SC), maintenance (RM), and diversity (RD). Closeness refers to the closeness of the relationship, maintenance refers to the stability of the relationship, and diversity refers to the heterogeneity of the relationship objects.

Control variables: including gender, age, and social media usage time (SMUT) to control the interference of individual differences on the results.

To quantify the impact of online identity expression on social relationships, the following linear regression model is constructed:

parts: (1) demographic information, including gender, age, and duration of social media use; (2) measurement of online identity expression, using a Likert five-point scale to assess positivity, expression frequency, and symbolic diversity; (3) measurement of social relationships, also using a Likert five-point scale to assess intimacy, maintenance, and diversity. The scale design refers to existing literature, and a pre-survey (n=50) was used to test reliability and validity to ensure the reliability of the measurement tool.

Data analysis will use SPSS software, and the methods include: (1) descriptive statistics, analyzing sample characteristics and variable distribution; (2) correlation analysis, testing the relationship between independent variables and dependent variables; (3) multiple linear regression analysis, verifying research hypotheses and estimating the specific impact of online identity expression on social relationships. The effects of gender, age, and duration of social media use will be controlled during the analysis to improve the robustness of the results.

To ensure data quality, the survey will be distributed through an online platform (such as

Questionnaire Star), and logical verification questions will be set to screen invalid questionnaires. After data collection is completed, missing values and outliers will be processed, such as using mean interpolation to handle a small amount of missing data to ensure the integrity of the analysis.

4. Data Analysis and Results

4.1 Descriptive Statistical Analysis

Descriptive statistical analysis aims to present the basic characteristics of the sample and the distribution of various variables of online identity expression and social relationships. The gender distribution of the sample is relatively balanced, with males accounting for 51.2% (n=256) and females accounting for 48.8% (n=244); the age range is 18 to 55 years old, with an average age of 29.6 years old (standard deviation = 8.4); the average social media usage time is 3.2 hours/day (standard deviation = 1.1). The positivity (PE), frequency (FE) and symbolic diversity (SD) of online identity expression, as well as the closeness (SC), maintenance (RM) and diversity (RD) of social relationships are measured using a five-point Likert scale, with a score range of 1 (very low) to 5 (very high).

Table 1. Descriptive Statistics of Key Variables

Variable	Mean	Std. Dev.	Min	Max
Positive Expression (PE)	3.85	0.72	1.5	5.0
Frequency of Expression (FE)	3.62	0.89	1.0	5.0
Symbol Diversity (SD)	3.48	0.81	1.2	5.0
Social Closeness (SC)	3.92	0.65	1.8	5.0
Relationship Maintenance (RM)	3.78	0.70	1.5	5.0
Relationship Diversity (RD)	3.55	0.77	1.3	5.0

Table 1 shows that the mean value of the positivity (PE) of network identity expression is 3.85, indicating that the sample as a whole tends to express positive emotions; the means of expression frequency (FE) and symbol diversity (SD) are 3.62 and 3.48 respectively, indicating moderately high expression activity and symbol use diversity. The mean value of social relationship closeness (SC) is 3.92, indicating that the sample has a strong relationship

closeness; the means of maintenance degree (RM) and diversity (RD) are 3.78 and 3.55 respectively, reflecting that the relationship maintenance and diversity are at a moderately high level. The standard deviations are between 0.65 and 0.89, indicating that the data distribution is relatively concentrated and suitable for subsequent correlation and regression analysis.

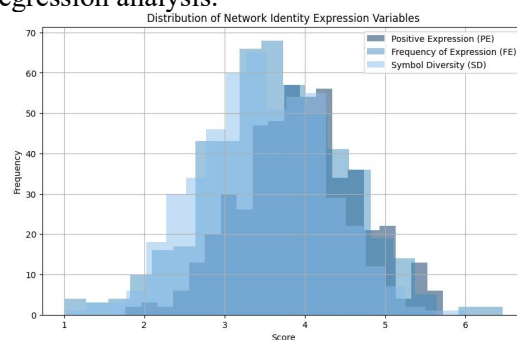


Figure 2. Distribution Characteristics of Each Dimension of Network Identity Expression

Figure 2 shows the distribution histogram of the positivity (PE), expression frequency (FE) and symbol diversity (SD) of online identity expression. The histogram shows that the distribution of PE is relatively concentrated, with a peak value close to 4, indicating that most individuals tend to express positively; the distribution of FE and SD is slightly scattered, reflecting the differences in individual expression frequency and symbol use. This phenomenon shows that positive emotional expression is more common in the online environment, while expression frequency and symbol diversity vary due to different individual habits.

4.2 Correlation Analysis between Online Identity Expression and Social Relations

To explore the relationship between online identity expression and social relations, Pearson correlation analysis was used to test the correlation strength between independent variables (PE, FE, SD) and dependent variables (SC, RM, RD). The analysis results are shown in the following table 2.

Table 2. Pearson Correlation Coefficients

Variable	PE	FE	SD	SC	RM	RD
PE	1.00	0.42	0.38	0.56	0.49	0.44
FE	0.42	1.00	0.45	0.47	0.52	0.39
SD	0.38	0.45	1.00	0.43	0.40	0.51
SC	0.56	0.47	0.43	1.00	0.62	0.48
RM	0.49	0.52	0.40	0.62	1.00	0.45
RD	0.44	0.39	0.51	0.48	0.45	1.00

Note: All correlation coefficients are significant at the $p < 0.01$ level.

Table 2 shows that there is a significant positive correlation between the dimensions of network identity expression and social relationship variables. The correlation coefficient between positivity (PE) and social relationship closeness (SC) is 0.56, showing a strong positive correlation, indicating that positive emotional expression helps to enhance relationship closeness. The correlation coefficient between expression frequency (FE) and relationship maintenance (RM) is 0.52, reflecting that frequent network interactions are conducive to the continued maintenance of relationships. The correlation coefficient between symbol diversity (SD) and relationship diversity (RD) is 0.51, indicating that diverse symbol use may promote the establishment of relationships with different types of individuals. These associations provide preliminary support for the research hypothesis, indicating that the dimensions of network identity expression are closely related to different aspects of social relationships.

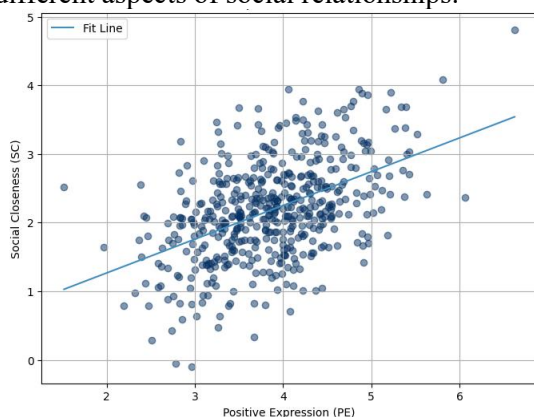


Figure 3. Scatter Plot of Positive Expression (PE) VS. Social Closeness (SC)

Figure 3 is a scatter plot and fitting line of positivity (PE) and social closeness (SC). The scatter plot shows that PE and SC show an obvious positive linear relationship, and the slope of the fitting line indicates that the increase of PE is significantly correlated with the improvement of SC.

4.3 Verification of Research Hypotheses

To verify the research hypothesis, the multivariate linear regression model proposed in Chapter 3 was used to analyze the effects of positivity (PE), expression frequency (FE) and symbolic diversity (SD) of network identity expression on social closeness (SC), maintenance (RM) and diversity (RD). The

regression analysis controlled the effects of gender, age and social media usage time to improve the robustness of the model.

The regression results show that for social closeness (SC), the regression coefficient of PE is 0.42 ($p < 0.01$), the coefficient of FE is 0.28 ($p < 0.05$), and the coefficient of SD is 0.19 ($p < 0.05$). The adjusted R^2 of the model is 0.48, indicating that the dimensions of network identity expression can explain 48% of the variation in SC. This supports Hypothesis 1: positivity positively affects social relationship intimacy, while FE and SD also contribute significantly to SC. For relationship maintenance (RM), the regression coefficient of FE is 0.39 ($p < 0.01$), the coefficients of PE and SD are 0.25 and 0.17 ($p < 0.05$), respectively, and the adjusted R^2 is 0.45, supporting Hypothesis 2: expression frequency positively affects relationship maintenance. For relationship diversity (RD), the regression coefficient of SD is 0.36 ($p < 0.01$), the coefficients of PE and FE are 0.20 and 0.15 ($p < 0.05$), respectively, and the adjusted R^2 is 0.43, supporting Hypothesis 3: symbolic diversity positively affects relationship diversity. The above results show that each dimension of network identity expression has a significant positive impact on different aspects of social relationships. Positivity plays the most significant role in enhancing intimacy, expression frequency contributes the most to relationship maintenance, and symbolic diversity significantly promotes relationship diversity. These findings validate the applicability of symbolic interaction theory in a network environment, address the question of how network identity expression influences social relations through symbol selection and interaction processes, and provide an empirical basis for understanding the mechanisms of network social interaction.

5. Discussion and Conclusion

5.1 Theoretical Significance of the Findings

Based on the symbolic interaction theory, this study systematically explored the impact of online identity expression on social relations, and verified that the positivity, frequency and symbolic diversity of online identity expression have significant positive effects on the intimacy, maintenance and diversity of social relations. The study found that individuals can significantly enhance the intimacy of social

relations through positive emotional expression in the online environment, which is consistent with the view of meaning construction in symbolic interaction theory, that is, individuals give positive meaning to interactions through positive symbols, thereby promoting the closeness of relationships. At the same time, the frequency of expression directly affects the maintenance of relationships, and frequent interactions strengthen the stability of relationships, reflecting the core role of interaction in the formation of social relationships. In addition, symbolic diversity promotes the diversity of relationships by enriching the forms of interaction, indicating the importance of symbol selection in online interactions.

From a theoretical perspective, this study expands the applicability of symbolic interaction theory in the online environment. Traditional symbolic interaction theory mainly focuses on face-to-face interactions, while this study applies it to virtual space, revealing how online identity expression as a symbolic behavior shapes social relations through the process of meaning, interaction and interpretation. This finding not only deepens the understanding of the mechanism of network social interaction, but also provides a new perspective for the application of symbolic interaction theory in the digital age. The research results further emphasize the mediating role of symbols in the construction of social relations and provide theoretical support for network sociology.

5.2 Practical Significance of Research Findings

The practical significance of this study is reflected in providing guidance for the optimization of network social relations. First, the study shows that positive network identity expression can enhance the intimacy of relationships, which suggests that social media users should focus on the expression of positive emotions in interactions, such as improving the quality of relationships through encouraging language or positive feedback. Second, frequent network interactions help maintain relationships. It is recommended that users maintain social connections through regular communication (such as comments and likes), especially for long-distance relationships. This strategy is particularly important. In addition, the role of symbolic diversity shows that enriching

expression forms (such as combining text, pictures, and videos) can expand the diversity of relationship networks, which is of practical value in promoting cross-group communication.

For social media platforms, this study provides design and optimization suggestions. Platforms can promote positive interactive content through algorithmic recommendation and enhance emotional connections between users; at the same time, they can encourage diverse symbolic expression tools (such as emoticons and dynamic stickers) to enrich user interaction experience, thereby improving the quality of social relationships. These strategies not only help improve user experience, but also enhance the social function of the platform and promote the formation of healthy online communities. The findings of this study provide an operational practical path for individuals and platforms to build and maintain social relationships in the online environment.

5.3 Research Limitations and Future Directions

Although this study has achieved certain results, there are still some limitations. First, the study uses cross-sectional data, which cannot capture the dynamic changes between online identity expression and social relationships, and it is difficult to reveal the long-term evolution of the relationship between the two. Second, the research sample is mainly concentrated on adults who frequently use social media, and the representativeness of the sample may be limited, and the behavioral differences of inactive users or users from different cultural backgrounds are not fully considered. In addition, this study focuses on the three dimensions of online identity expression (positivity, frequency, and symbolic diversity), but does not explore the impact of other potential factors (such as the authenticity of the expression content) on social relationships.

Future research can be further expanded in the following directions. First, a longitudinal research design can be used to track the dynamic changes in online identity expression and social relationships, revealing the causal mechanism and long-term effects of the relationship between the two. Second, the sample range can be expanded to include groups of different ages, cultural backgrounds, and social media usage habits to improve the universality of the research conclusions. In addition, other dimensions of

online identity expression can be further explored, such as the authenticity of expression or emotional complexity, and their deep impact on social relationships. These directions will provide new perspectives for a more comprehensive understanding of the mechanisms of social interaction in the online environment.

References

- [1] Blumer, H.: Symbolic Interactionism: Perspective and Method. University of California Press, pp. 1-21(1969).
- [2] Goffman, E.: The Presentation of Self in Everyday Life. Anchor Books, pp. 17-76(1959).
- [3] Ellison, N. B., Steinfield, C., Lampe, C.: The Benefits of Facebook "Friends": Social Capital and College Students' Use of Online Social Network Sites. *Journal of Computer-Mediated Communication* 12(4), pp. 1143-1168(2007).
- [4] Walther, J. B.: Computer-Mediated Communication: Impersonal, Interpersonal, and Hyperpersonal Interaction. *Communication Research* 23(1), pp. 3-43(1996).
- [5] boyd, d.: It's Complicated: The Social Lives of Networked Teens. Yale University Press, pp. 29-53(2014).
- [6] Blumer, H.: Symbolic Interactionism: Perspective and Method. University of California Press, pp. 1-21(1969).
- [7] Mead, G. H.: Mind, Self, and Society: From the Standpoint of a Social Behaviorist. University of Chicago Press, pp. 135-226(1934).
- [8] Stryker, S.: Symbolic Interactionism: A Social Structural Version. The Blackburn Press, pp. 23-54(2002).
- [9] Turkle, S.: Life on the Screen: Identity in the Age of the Internet. Simon & Schuster, pp. 177-209(1995).
- [10] Hogan, B.: The Presentation of Self in the Age of Social Media: Distinguishing Performances and Exhibitions Online. *Bulletin of Science, Technology & Society* 30(6), pp. 377-386(2010).
- [11] Papacharissi, Z.: A Networked Self: Identity, Community, and Culture on Social Network Sites. Routledge, pp. 304-318(2011).
- [12] Granovetter, M. S.: The Strength of Weak Ties. *American Journal of Sociology* 78(6), pp. 1360-1380(1973).
- [13] Wellman, B., Quan-Haase, A., Boase, J., Chen, W., Hampton, K., Díaz, I., Miyata, K.: The Social Affordances of the Internet for Networked Individualism. *Journal of Computer-Mediated Communication* 8(3), JCMC834(2003).
- [14] Lin, N.: Social Capital: A Theory of Social Structure and Action. Cambridge University Press, pp. 19-42(2001).