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The Effect of Gamification on Individual Behavior towards Gamified Public Welfare Activities on Social Media

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Abstract: *At present, Internet public welfare activities have attracted much attention, and an increasing number of people are participating in this new public welfare activities. Different from the former public welfare activities on social media, those emerging activities combine gamified elements which has not been studied before. Based on the SOR model, this paper illustrated from individual behaviors towards gamified public welfare activities and saw how the gamification affect participation on gamified public welfare activities. A quantitative method, survey was used in this study. The hypotheses were tested and the research question was answered. From the results, the perceived gamification was tested to have a strong relationship with individual participation in public welfare activities.*

Keywords: *gamification, public welfare, SOR model*

1. Introduction

The public welfare communication has experienced the great transformation in 21th century. Since 2009, the China Public Welfare Development Report published by Beijing Normal University has carried out a comprehensive examination, analysis and prediction of public welfare in China. It is predicted that the development of public welfare could be observed directly and thoroughly, among which online public welfare has been sprung up most. Weibo and WeChat, for example, a form of social media has been a significant role across industry, due to their extensiveness, timeliness and interactivity.

Nowadays, Internet public welfare activities have attracted much attention, and more and more people are participating in this new public welfare activity. Public welfare projects like Ant Forest of Alipay and Tencent public welfare projects in WeChat Moment have high popularity. Launched in August 2016, Ant Forest allows users to reduce their carbon emissions through walking, subway travel, online payment of electricity, gas and electricity fees, online payment of traffic tickets, online registration and online ticket purchase, and can be used to keep a virtual tree in Alipay. As of the end of May 2018, the participants of Ant Forest have reached up to 350 million people, planting and maintaining 555.2 million real trees, planting area of more than 760,000 mu, and it is estimated that the sand control area is more than one million mu [1]. The column of children gallery's one-yuan painting project launched by Tencent public welfare after Chinese valentine's day in 2017 has been widely spread in the WeChat Moment, with its simple form, convenient participation, and direct demonstration of painting purchase. The public welfare promotion effect is quite good.

Because of its characteristics of easier communication, interesting and transparent results, people are greatly encouraged to participate Internet public welfare enthusiastically and actively. The analysis found that these widely spread Internet public welfare has more or less gamification elements. The influence of gamification on the spread of public welfare activities and the willingness and behavior of ordinary users to participate in public welfare activities has aroused more thoughts.

In a meanwhile, a majority of literature related to application of gamification elements is about education field, such as Hu & Zhang (2018) published the article research progress and prospect of gamification learning, focusing on gamification learning and focuses on the advantages of gamification in improving user immersion, participation and loyalty [2]. Our study will mainly examine the communication effect of gamification public welfare, focusing on how the audience views gamification

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public welfare activities and how to participate in gamification public welfare, and we hope this study can fill the research vacancy and analyze hot topics, which has theoretical significance.

2. Literature Review

Owing to the influence of pragmatism, the study of public welfare activities on social media abroad mainly focused on the research on the communication strategies of non-profit organizations and the technological advantages of new media. For example, Bennett (2005) ever discussed the role of Twitter in helping charities raise funds and attract supporters [3]. On the other hand, some domestic scholars pay great have paid great attention to the dissemination, characteristics, motivation and potential problems of public welfare activities on social media, and seldom put their eyes on game elements and their potential influence in public welfare activities on social media.

Chen (2016) [4], for example, has ever studied experiential public welfare in China, defining it to be a form of public welfare activities, attracting the public to participate the activities through particular experience. In her research, it could stimulate the sense of responsibility of public and their willingness to donate something. In doing so, the effect of public welfare communication could get better. Wang (2017) has studied the communication characteristics of Internet public welfare projects, with particular case “Ant Forest”, analyzing Internet public welfare projects in five aspects: subjects, content, audience, methods and the effect of communication respectively [5].

This paper combines the existing gamification public welfare activities system on social media, comprehensively observing its common communication mechanism, and pays attention to the audience's cognitive attitude and usage, which encourages us to have the communication research on gamification public welfare activities to be completed.

2.1. Public Welfare on Social Media

In the early 20th century, under the influence of the theory, the Media and Social Responsibility, media was assumed responsibility for the public. To become the direction of the media efforts, for this reason, the media have launched public welfare. "Public News Theory" at the End of the 20th Century. It is believed that the media should organize the public to discuss public affairs. Influenced by this theory, the media began to pay attention. Its own public responsibility balances "commerciality" and "public welfare." Sending also promoted public participation in the public. The enthusiasm of the affairs and the improvement of the ability to handle public affairs, and sent some good for the rise of public welfare. Public foundation. With the rise of public welfare communication, foreign countries have more and more research on public welfare communication. With the influence of the trend of thought, the application of public welfare communication has always been a hot topic in academic research. Among them, public welfare advertisements, communication strategies and new media application have become fairly hot research areas.

The most popular communication theory of news comes liberal newspaper theory but goes beyond the development of liberal theory. It emphasizes that freedom must be based on responsibility. When the media enjoys the right to freedom, it need to fulfill its obligations and responsibilities to society and the public. The government must not only allow freedom but also promote freedom.

Today, the existing predictions proposed by previous scholars has been proved and the research on the technological advantages of new media public welfare has been prosperous, since the new media has been applied in the field of public welfare communication, (Chen, 2016). In 20th century, Japanese scholar Joi Ito [6] and the US father of web 2.0, O’Reilly Tim had ever predicted that web2.0, a new and interrelated text, will replace the traditional single item [7]. American scholar Mikko Lan conducted a web 2.0 experiment on the professional website of the non-profit platform http://www.minqin.net. He proposed that the web2.0-based online public welfare platform can increase the user's entertainment experience and change one-way communication into two-way interaction.

In this context, public welfare on social media is a kind of a social activities is a form of media expression of public welfare, and it has the same connotation and direction as public welfare (Hua Zhao, 2012). It is based on Web2.0 technology, launched public welfare activities on Wechat, QQ, SNS, Facebook, video podcast, live broadcast and other platforms (Ruiyu Yang & Xiao Ma, 2018). Accordingly, the carrier we focus on in this passage will be those social media with the function of interaction.

ISSN 2616-7433 Vol. 4, Issue 11: 1-12, DOI: 10.25236/FSST.2022.041101

2.2. Gamification and Public Welfare Activities

The concept of Gamification was first applied to the field of education. Until 2010, merchants such as Starbucks used the form of punching cards into market, and the industry began to use "gamification" to describe this strategy of attracting consumers. It is acknowledged that gamification is the application of game-design elements and game principles in non-game contexts (Nick Pelling, 2002). Another widely acknowledged definition said that "gamification" is the use of game design elements in non-game contexts (S. Detering, 2011) [8]. The "non-game context" was stressed in both definitions, to be more understandable, that means the purpose of gamification design usage directly link to achieve other goals rather than game experience, such as education, training, sale or health. The primary purpose of gamified public welfare activities is improving the effect of public welfare, from both economy and communication aspect. From this perspective, the gamified public welfare activities can be classified into one of non-game activities.

According to S. Detering (2011), game design elements are divided into five levels: Interface design; Design mechanics and patterns; Design principles; Conceptual models; Design methods. However, the last four level are too abstract to be implemented solutions but can be reflected in interface design elements, like badge, leaderboard and credits. In the book "Gamification by design", the game mechanics was clarified and defined as an incentive system consisting of integration, ranks, medals, and leaderboards (Gabe Zichermann, 2011) [9].

Factors that stimulate audience engagement in gamified activities are closely related to motives to engage in games. Players have different motivations when participating games which can be classified in four types (Jon Radoff, 2011):

a) Pursuing immersion

- Explore: Discover what most players don't know;
- Cosplay: Create virtual characters and interact with other players;
- Customize: Enjoy personalization;

b) Pursuing achievement

- Promotion: Obtain power, fortune and grade;
- Specialization: Get map, stuff or equipment cannot be found by other players;

c) Pursuing competition

- Power: Stronger competence;
- Control: In a leadership position;

d) Pursuing social behaviors

- Relationship: Build a long-term and stable relationship with players;
- Group Collaboration: Get satisfaction from group activities;

Gamification is not limited to the previously mentioned factors. As to which factors and which mechanisms of gamification are more effective, it depends on different purposes (Danni Zhao, 2013) [10]. Combined with the actual gamified public welfare on different social media, we sort out a list of common characteristics and elements which are widely implemented in existing public welfare activities as shown in Figure 1.

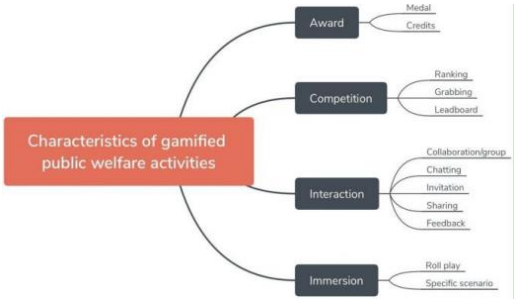

Figure 1: Characteristics of Gamified Public Welfare Activities

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On the other hand, people participating public welfare is motivated by many factors, including egoism and altruism. In the context of public welfare activities, Zhou (2015) found that by sharing the game with friends, users can gain a sense of accomplishment and satisfaction [11]. Xiong et al. (2015) indicated that interactive experiences give user pleasures so it is more likely for them to continue to participate. Berkkers & Wiepking (2011) issued eight mechanisms that drive charitable giving: (a) awareness of need; (b) solicitation; (c) costs and benefits; (d) altruism; (e) reputation; (f) psychological benefits; (g) values; (h) efficacy [12]. And Bussell & Forbe (2002) summarized the motivations of individual volunteer activity, who thought pleasure brought by altruism is the main motivation [13]. By integrating the former research and observations of existing gamified public welfare activities, we propose the four types of emotions brought by public welfare activities: 1) achievement 2) pleasure 3) identity 4) social responsibility. Through the analysis of the motivation for both game players and public welfare participant, we can find the overlap between the two. A mapping relationship based on previous analysis is built as illustrated in Figure 2.

Figure 2: Mapping Relationship of Gamification Elements and Public Welfar

Basing on the previous definition, we propose a definition for gamified public welfare: for the purpose of public welfare, use the design elements of the game, such as integration, grades, medals, rewards, rankings etc. to enhance user attention and user stickiness by providing users participation pleasure, thereby attracting users to participate and stimulate behavioral activities.

2.3. The SOR Model and Public Welfare Activities

The SOR Model was developed by Mehrabian and Russell in 1974 in the perspective of environmental psychology [14]. It suggests that stimuli from environments (S) influence an individual's reactions (O), which in turn lead to certain responses (R). Stimuli, the most general factors, is defined as those factors that affect the internal states of the individual, referring to the objective material, organic (e.g., stomach pains) or social components. Organism indicates psychological concepts that work as the intermediation between the external stimulation and final response, including perception, emotion, judgment, thinking, reasoning and motivation (Buxbaum, 2016; Bagozzi, 1986) [15]. The original SOR model (Mehrabian and Russell, 1974) proposed three dimensions of emotional states: pleasure, arousal and dominance (PAD). Pleasure refers to the positive or negative emotional states, ranging from unhappy to happy. Arousal is conceived as a mental activity describing levels of emotional intensity, using adjective words such as calm or exciting. Dominance is related to the degree to which the individual feels controlled in his emotional states (Bakker et al., 2014). Response in the SOR model refers to the final outcomes of the individual, which was generally divided into approach and avoidance behaviors.

Later the model was extended to be applied in analyzing online consumer behavior. Eroglu et al. (2001) empirically used SOR model to test the influence of the atmospheric qualities of online stores. The findings showed that the stimuli of the elements in virtual environments have the impact of consumers, which leads to their approach or avoidance responses, for example, buying the product [16]. Moreover, the researches of online consumers' behavior have not limited to purchasing decisions. Deng and Yi (2018) explored the supplemental commentary information adoption and discuss the relationship between information recognition, value recognition and information adoption based on the SOR model. It mentioned that the perception of supplemental commentary is positively affecting the

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information adoption which consists of user's intention and behavior to add supplemental comments [17].

Through reviewing previous literature, it is found that many authors apply SOR model to analyze online consumer behavior. The model provides an explanation of how people's decision may be influenced by different types of online stimuli, in which organic components work as inter-mediation. People's participation in public welfare activities, as a kind of behavior, can be influenced by existing stimulation, for example, gamification, where their internal perceptions locate between. Therefore, we will further consider the possibilities to analyze public welfare activities in relation to SOR model (Figure 3).

2.4. The Impact of Gamification on Individual Behaviours: in View of SOR Model

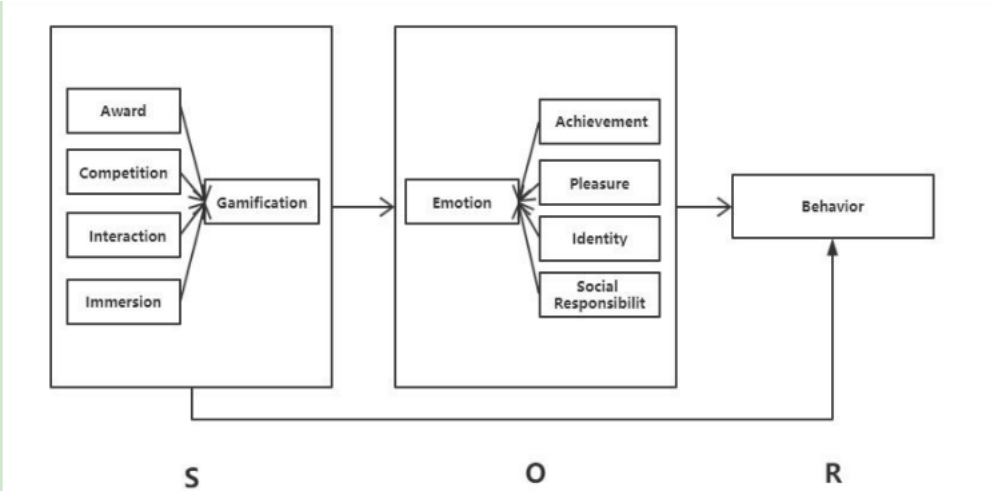

Figure 3: Stimulus-Organism-Response Model

As shown in Figure 3, there are three components constitute the SOR model: (1) a set of stimuli; (2) an organism component, and (3) a set of responses or outcomes linked by an organismic. The model is widely used in contemporary marketing to investigate online consumer behavior. There exists possibility to integrate the SOR model and form a new unifying framework to drive the study of gamification.

In terms of the study of online consumer behavior based on SOR model, Forgas (1998) found that positive affect induced less systematic attention to stimulus information and greater reliance on top-down inferences. As a result, website designers struggle to develop sites that customers perceive as “informative” and “entertaining”. As to gamification, companies also make a great effort to catch participants’ eye by means of adding various stimuli such as medals, ranking list and cooperation tasks that can arouse their desire. As we introduce about gamification, the four main characteristics of gamified public welfare activities are award, competition, interaction and immersion, which can be regarded as the stimulus elements of gamified public welfare activities.

Therefore, following four stimulus elements are concluded: award, competition, interaction, and immersion.

After having participated in gamified activities, participants will have a perception of the gamified activity, which is called “organism”. In this study, the organism refers to participants' emotion (attitude). This study will investigate the influence of gamification elements on the emotions, attitudes and concepts of the audience involved in internet public welfare activities. Games can bring people pleasure. Therefore, by combining the former research and observations of existing gamified public welfare activities, we propose the four types of emotions brought by public welfare activities: 1) achievement 2) pleasure 3) identity 4) social responsibility.

With the perception of the gamified activity, participants will decide whether to take next actions such as continue to engage in it, share it with their friends or stop to further participation (Rimantas Gatautis, 2016). Similarly, the motivations of participating public welfare activities can be regarded as the emotions in the model, which are brought by the stimulus and then lead to certain behaviors. So individual behaviors will be regarded as “response” in this model [18].

ISSN 2616-7433 Vol. 4, Issue 11: 1-12, DOI: 10.25236/FSST.2022.041101

Flow theory states that when people focus on an activity, they will have a heart flow experience, leading to a pleasant feeling and a sense of achievement (Csikszentmihalyi & Rathunde, 1993) [19].

Dai and Liu (2015) believe that the interaction in the game can bring two benefits. On one hand, it enhances the feelings of the users who participate in the game, while on the other hand, sharing the game content can strengthen the interpersonal relationship [20].

Zhou (2015) found that by sharing the game with friends, users can gain a sense of accomplishment and satisfaction. Xiong et al. (2015) indicated that interactive experiences give the user pleasures so it is more likely for them to continue to participate. Based on these theories above, In the context of public welfare activities, Berkkers & Wiepking (2011) issued eight mechanisms that drive charitable giving: (a) awareness of need; (b) solicitation; (c) costs and benefits; (d) altruism; (e) reputation; (f) psychological benefits; (g) values; (h) efficacy. And Bussell & Forbe (2002) summarized the motivations of individual volunteer activity, who thought pleasure brought by altruism is the main motivation.

Therefore, the following hypothesis is proposed:

H1: The characteristics of gamification can cause positive emotion in participating public welfare activities on social media.

H1a: The award in gamification can cause positive emotion in participating public welfare activities on social media.

H1b: The competition in gamification can cause positive emotion in participating public welfare activities on social media.

H1c: The interaction in gamification can cause positive emotion in participating public welfare activities on social media.

H1d: The immersion in gamification can cause positive emotion in participating public welfare activities on social media.

H2: Individuals' emotion of participating in gamified public welfare activities can positively lead to individual behaviors.

H3: The higher level of perceived gamification can lead to higher level of individual participation.

Also, we intend to figure out what drives individuals to participate in Ant Forest Q1: Which drives users participating in the gamified public welfare activities more, public welfare motivations or gamification characteristics?

3. Method

This study will be conducted using a cross-sectional survey to test the hypotheses above. The population of interest for this study is people who participate in gamified public welfare activities on social media. Due to the budget constraints, the survey will be conducted by convenience sampling and Snowball sampling. Found the respondents we know firstly and with their help to expand the sample size because of the social connection between samples. A questionnaire will be sent to each respondent via online questionnaire platform Qualtrics. The online questionnaire was eventually completed by 211 respondents with the effectiveness rate 71%. The questionnaire was designed with four parts of questions: demographics, perception of gamification characteristics, attitude or emotion toward gamified public welfare and the behavior of participating.

3.1. Measurement of Key Variables: Perceived gamification level

Perceived gamification level refers that to what extent the gamification of public welfare activities could bring respondents the same experience as typical games. Based on relevant theories on gamification, the conception of gamification could be divided into four abstract characteristics: award, competition, interaction and immersion, and It was measured with 7 items adapted from previous studies (Melinda Jacobs, 2013). A typical activity (Ant Forest) served as a particular example will be used to measured these four characteristics, asking respondents to choose what they perceived in this activity. The specific elements they select will be classified into the four characteristics mentioned above via semantic scale. ($M=4.12$, $SD=1.26$, $\alpha=.10$). Initial factor analysis revealed one dimension with eigenvalues above 1.0, and owing to the complicated of issue, the variance was not high and only

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61.42% of the variance could be explained. Only 1 item remain in the scale of gamification with acceptable reliability one dimension: (1) interest for participating in games.

3.2. Measurement of Key Variables: Emotion

Emotion refers to the specific emotions that driven by participating in gamified public welfare activities. It was measured through 13 items through 4 dimensions including four traits: pleasure, achievement, identity and social responsibility based on Green and Webb's research (Green & Webb, 1997). The questions will use 6-point Likert scale, from strongly agree to strongly disagree, "To what extent do you agree" about the statements on each item. The above four dimensions were added and then divided by four to establish an integrated measurement of individual behaviors (M=4.01, SD=1.12, α=.09). After initial factor analysis, 5 items with acceptable reliability identify 2 dimensions as follows: (1) personal subjective initiative (M=4.4, SD=1.35, α=.11) .(2) society appeal (M=3.65, SD=1.2, α=.10).

3.3. Measurement of Key Variables: Individual behavior

Individual behavior refers to the frequency of the subsequent behaviors in and beyond the gamified activities of social media. Individual behavior was measured by testing frequency of the subsequent behaviors of involving in gamified public welfare activities as well as a 6-point Likert scale, from strongly agree to strongly disagree. As suggested in the SOR model, which refers to the subsequent individual behaviors and was first applied to the field of psychology, (Mehrabian and Russell, 1974), a learning theory proposed by cognitivism. This study added seven items relating to the frequency of the subsequent behaviors of involving in gamified public welfare activities on social media, including the following seven statements:(1) sharing the gamified activities to others; (2) attempting to obtain game props; (3) participating in paid online public welfare activities; (4) focus on the follow-up implementation of gamification public welfare activities; (5) participating in other public welfare activities on social media; (6) participating in non-gamified public welfare activities; (7) participating in offline public welfare activities. All of the seven items were added and then divided by seven to establish an integrated measurement of individual behaviors (M=2.27, SD=.69, α=.06).

4. Results

A total of 211 respondents with 150 effective ones completed the survey.

Table 1: Total variance interpretation

Initial eigenvalue				Extract the sum of squares of loads			Sum of squaresof rotating loads
Component	Total	Percentage variance	The cumulative %	Total	Percentage variance	The cumulative %	Total
1	7.559	58.145	58.145	7.559	58.145	58.145	5.011
2	1.458	11.213	69.357	1.458	11.213	69.357	4.005
3	.845	6.503	75.860				
4	.610	4.695	80.555				
5	.532	4.090	84.645				
6	.451	3.471	88.115				
7	.431	3.313	91.428				
8	.307	2.364	93.792				
9	.257	1.979	95.771				
10	.176	1.351	97.122				
11	.154	1.181	98.303				
12	.134	1.032	99.335				
13	.087	.665	100.000				

Ninety-seven percent of the respondents were between the ages of 20 and 29. Sixty-three percent were female and 37% were male. The respondents had a variety of place of residence and 44% of them

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were in first-tier cities. Most of them have good educational background and 48% of them had a Master degree or higher. They were varied in their disposable monthly income and 43% had 2001 to 5000 yuan at them disposal every month. As for the frequency, 38% played the Ant Forest more than once a day, while 32% of the respondents played less than once a week.

In the reliability analysis of the scale measuring Gamification, Alpha=0.894>0.8. In the validity analysis of Gamification, KMO=0.842, which is between 0.8 and 0.9, so it is very suitable for factor analysis. Besides, we examine the Bartlett test results, where the chi-square value is 606.563, P= 0.000<0.05. Both the KMO test and the Bartlett spherical test show that there is a significant correlation between variables, which may share potential factors, so factor analysis can be performed.

In the reliability analysis of the scale measuring Emotion, Alpha=0.935>0.8.

In the validity analysis of Emotion, KMO=0.899, which is between 0.8 and 0.9, so it is very suitable for factor analysis. Also, we examine the Bartlett test results, where the chi-square value is 1524.258, P= 0.000<0.05. Both the KMO test and the Bartlett spherical test show that there is a significant correlation between variables, which may share potential factors, so factor analysis can be performed.

Table 2: Sum of squares of rotating loads

Component	Percentage variance	The cumulative %
1	38.549	38.549
2	30.808	69.357

Table 3: Rotating component matrix[a]

	Component	
	1	2
Q3_13	.884	
Q3_12	.880	
Q3_11	.871	
Q3_8	.760	
Q3_5	.720	
Q3_4	.685	
Q3_6	.652	
Q3_3		.791
Q3_9		.749
Q3_1		.731
Q3_10		.727
Q3_2		.684
Q3_7		.641

As shown in Table 1, Table 2 and Table 3, two components of Emotion were extracted. The ratio of the two factors to the total information was 69.357%. After the factor rotation, the variance contribution rate and interpretation ratio of the two factors were 38.549% and 30.808% respectively. Due to the complexity of the actual situation, the factor interpretation ratio can be considered to be satisfactory.

In the reliability analysis of the scale measuring Behavior, Alpha=0.829>0.8.

In the validity analysis of Behavior, KMO=0.817, which is between 0.8 and 0.9, so it is very suitable for factor analysis. Also, we examine the Bartlett test results, where the chi-square value is 250.715, P= 0.000<0.05. Both the KMO test and the Bartlett spherical test show that there is a significant correlation between variables, which may share potential factors, so factor analysis can be performed.

Hypothesis 1, which proposed that the perceived characteristics of gamification can cause positive emotion of participating public welfare activities on social media, was supported. A multiple regression analysis was conducted to test H1. One dimension of gamification, award (β=.507, p<.01) positively predicted the emotion of participating public welfare activities on social media (R 2=.375, p<.01). While other dimensions of gamification, competition (β=.129, p>0.5), interaction (β=.038, p>.05) and immersion (β=-.012, p>.05) were not statistically significant. A factor analysis was used to test the

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perceived characteristics of gamification scale and statistic shows all the items are in one group. All perceived gamification in the scale were counts as means. A simple linear regression analysis was conducted to test this hypothesis, the perceived gamification (R^2= .321, $p<.01$) (β=.566 $p<.01$), positively predicted the emotion of participating public welfare activities on social media.

Hypothesis 2, which proposed that individuals' emotion of participating in gamified public welfare activities can positively lead to individual behaviors, was supported. Based on the factor analysis of emotions, items in emotion scale be divided into two groups G1 and G2. A multiple regression analysis was conducted to test this hypothesis. G1 (β=.193, $p<.05$), G2 (β=.492, $p<.01$) all positively predicted the individual behaviors.

Hypothesis 3, which proposed that the higher level of perceived gamification can lead to higher level of individual participation, was supported. All perceived gamification in the scale were counted as means. A simple linear regression analysis was conducted to test this hypothesis, the perceived gamification (R^2= .958, $p<.01$) (β= .979, $p<.01$), positively predicted the emotion of participating public welfare activities on social media.

Question 1, which explored that the effects on participating welfare activities online without gamification and welfare activities offline, was answered. Two simple linear regression analysis were conducted respectively to test the influence from emotion to behavior. Basing on the factor analysis of emotions, items in emotion scale be divided into two groups, the VA (R^2= .307, $p<.01$) (β= .554, $p<.01$), positively predicted the behavior of participating non-gamification welfare activities online, and the VA (R^2=.070, $p<.01$) (β=.264, $p<.01$), positively predicted the behavior of participating welfare activities offline, which was much weaker (VA=0.385*G1+0.308*G2, G1 is means of first group items and G2 is means of second group items).

5. Discussion

Based on gamification mechanisms and charitable giving mechanisms theories, SOR model and the conceptual work of second-level adoption, this study examined individual behaviors towards gamified public welfare activities on social media. The study differentiated the characteristics of gamification to test to what extent that the characteristics respectively could influence individuals' emotion of participating in gamified public welfare activities and to what extent the gamification could influence individual's emotion of participating in gamified public welfare activities. Plus, the emotion mentioned before were also tested as intermediate between gamification and individual behaviors in the gamified public welfare on social media as well as other public welfares without gamification on social media or public welfares activities offline. In the meanwhile, gamification was tested to explain to what extent it could directly influence individual behaviors mentioned before.

The gamification mechanisms, charitable giving mechanisms and SOR model provide the theoretical framework for the study. The characteristics of gamification of public welfare activities are informed by the gamification mechanisms and individuals' emotion of participating in gamified public welfare activities is based on charitable giving mechanisms. The perceived gamification, individual emotion and individual behavior could be discussed based on SOR model for SOR model has been used in testing the relationship between Information recognition, value recognition and information adoption (Deng & Yi, 2018). In this context, the two distinctive theories, gamification mechanisms and charitable giving mechanisms, supplemented each other in explaining the factors influencing the individual behaviors in and out gamified public welfare activities on social media.

Gamification has been applied into education since 20th century. According to S. Detering (2011), perceived gamification could be divided into five levels and it could become motivations for individuals to engage in one event. The purpose of gamification is to achieve other goals rather than game experience, such as education, training, sale or health, has been diffused. The gamified characteristics have been applied in wider areas, including public welfare activities on social media. Accordingly, the gamified public welfare activities on social media emerged, Ant Forest, for instance. However, previous research has mostly treated the gamification as a technology approach to achieve its goal, but not defined gamification or measured it in communication perspective, owing to its experimental application in Internet public welfare activities.

In the measurement, four characteristics (award, competition, interaction, immersion) of perceived gamification all contribute to arousing individuals' emotion in participating in gamified public welfare activities, among which the award contributes to most. In gamified public welfare activities on social

ISSN 2616-7433 Vol. 4, Issue 11: 1-12, DOI: 10.25236/FSST.2022.041101

media, the award could be perceived most obvious and individuals are encouraged to participate in particular public welfare activities on social media with the characteristic award. Furthermore, the result shows that with higher perceived award, respondents will have stronger emotion that driven by participating in gamified public welfare activities. Besides, the award also positively influences to individual behavior both online and offline public welfare activities.

Personal subjective initiative and the drive of social dedication are two groups of the specific emotions that driven by participating in gamified public welfare activities.

Personal subjective initiative plays a more important role in participating in the gamified public welfare activities on social media. The findings above of the study reveal that emotion has linear relationship between participating in online public welfare activities and participating in offline public welfare activities, while the specific emotions that driven by participating in gamified public welfare activities has more significant impact on participating in online public welfare activities. The findings indicate that the factors that stimulate participants to participate in gamification activities are closely related to the motivation to participate in the game.

Base on the SOR Model developed by Mehrabian and Russell in 1974, which was first applied in the perspective of environmental psychology, the perceived gamification level is a kind of self-perception rather than being motivated by other outside factors. As Maslow's hierarchy of needs states that respect and self-realization are high-level needs of people, ranking high is in good agreement with the user's self-realization needs. When participants reach a higher ranking on the list and compete with more friends, participants will actually get a certain degree of superiority to meet the needs of self-realization. At the same time, it will also gain the recognition from the other participants in the rankings. This process not only satisfies the needs of respecting themselves, but also realizes the need to respect the natural environment.

Perceived gamification has a positive effect on individual participation, which is mediated by emotions. The findings reveal that its level of influence is extremely strong that and higher than the one of gamification towards emotions. It is likely to indicate that the intermediate effect of emotions is not so large as we expected. The reason may lie in the fact that emotions play an important role in the process to enhance the influences.

Besides, in the SOR model, the organism refers to the body interaction and are not limited to emotions. Some of the organismic elements led by the gamification are physical responses.

Inevitably, this paper has several limitations. First is about the measurement scale used in questionnaire. Due to the length of questionnaire, we only proposed two items for each characteristics of gamification, around three items for each emotion and seven items for individual behaviors, which are not enough to explore more details of this research. In addition, questions in questionnaire are relatively simple and single level to measure the comprehensive problem. For further study, more items should be added into the measurement scale and improved to make the descriptions more distinguishable from each other. Second limitation is about the sampling method. Because of convenient sampling we chosen, the statistics is not representative and cannot reflect the actual situation, which may cause the final results not significant enough. If we have more resources, we will investigate more respondents involving more male respondents, various age group and background respondents.

6. Conclusion

We chose gamification public welfare activities as the research topic, which has attracted a lot of attention in recent years. After studying relevant literature, we became interested in exploring the influence of gamification elements on individual behaviors of participating in public welfare activities. After modifying SOR model based on relevant literature, establishing a model for exploring and testing the relationship between perception gamification, emotion and behavior, we tested hypotheses and answered questions with survey method.

Our research results enrich the exploration of the field of gamification public welfare activities. Starting with gamification elements, we tested the relationship between the degree of perceived gamification, emotion, and behaviors involved in online or offline public welfare activities, which is relatively new. However, few existing literatures directly discuss gamification of public welfare activities, and the common research perspective is to explore the role of gamification and the influencing factors of public welfare activities separately, lacking exploration of relevant relationships.

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Our research supplements the existing research vacancy, and provides theoretical reference for future studies, which has reference meaning.

In future studies, the influence of several gamification elements on people's perception and behaviors can be further explored, and the specific mechanism of this effect can be studied. In addition, the different influence of different groups can be further analyzed to provide guidance for the design of public welfare activities. The further study can also explore people's long-term public welfare behaviors, so as to compare the influence of gamification elements and other different factors, such as individual personality, value orientation and public welfare habits, on people.

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