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Understanding Public Online Donations on Social Media during the Pandemic: A Social Presence Theory Perspective

Completed Research Paper

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Abstract

The COVID-19 pandemic has had a huge impact on the global economy and health care, but online donations from the public on social media have increased significantly. However, the role of social presence in motivating people to donate online during the pandemic has been largely unexplored. This study examines the relationship between social presence on social media and online donation behavior during the pandemic using social presence theory. We explore the interplay between social presence, perceived threat, social properties of social media, and donation intentions. The results showed that social presence based on social media, perception of others and social interaction significantly affected social media online donation participation, and the perceived threat of COVID-19 significantly moderated online donation participation. Our research contributes to the understanding of online donation behavior during a pandemic crisis and provides insights into how social media can be leveraged for effective donation campaigns.

Keywords: Social media, online donation, social presence theory, perceived threat, COVID-19

Introduction

The emergence and widespread use of social media platforms have transformed the landscape of online philanthropy, providing a new avenue for people to donate to charitable causes (Paulin et al., 2014). This trend has been further amplified during public health emergencies, such as the COVID-19 pandemic,

where social media became a primary channel for public information dissemination and discussions (Kang et al., 2020), playing an instrumental role in facilitating online donations and raising awareness about various relief efforts (Bin-Nashwan & Al-Daihani, 2021). For individuals, it offers an avenue to seek help or contribute to crisis response, fostering community and shared responsibility (van Teunenbroek & Hasanefendic, 2023). Enterprises and organizations can leverage insights from online public donations to design effective campaigns and mobilize public support (Klafke et al., 2021). Social media platforms can enhance features for seamless and secure donations. Governments can also make informed policy decisions and allocate resources effectively during times of crisis.

Although the features and functions of social media explain the use of social media for online donations during the pandemic (Di Lauro et al., 2019; Rashid et al., 2021), the peculiarities of online social media donations during the pandemic need to be considered. For instance, many countries regulated people's social distances during the pandemic, making social media the primary means of communication for the public. Moreover, unlike previous online social media donations that relied heavily on interpersonal relationships (Chapman et al., 2022), pandemic donations had no specific target audience and lacked social connections between the donor and the recipient. Furthermore, the social emotion of chronic fear and anxiety prevalent have been considered obstacles to donations in previous studies (Chen et al., 2022), coupled with the challenges of generating trust and empathy solely through information available on social media platforms due to the lack of certainty and credibility in the virtual environment, underscore the importance of understanding the surge in online donation on social media during this crisis.

Social presence theory provides a valuable lens to examine this phenomenon, as it explores how individuals' perceptions of presence and connectedness in online environments influence their intentions, group decisions, and behaviors (Lin, 2021; Park et al., 2022). Online donations on social media platforms offer users opportunities to experience human warmth, social connectedness, and increased communication and feedback mechanisms. These factors enhance users' sense of social presence, making them more likely to engage in continued support and donations (Sura et al., 2017). Additionally, social media platforms serve as a reflection of individuals' emotions, cognition, and awareness, aligning with the elements that constitute social presence. Moreover, the unique context of a pandemic can amplify the importance of social presence, providing an opportunity to explore its relationship with online donation behavior. We speculate that there is a link between the social presence of social groups and the intention of online donation participation in the pandemic context, and the mechanisms by which different dimensions of social presence affect donation may be different.

Despite the extensive exploration of the antecedents and outcomes of social presence in various fields, there is a research gap in understanding its specific manifestations and effects in the context of online donations during a pandemic crisis. Additionally, the impact of social clues on individual donation participation behavior remains understudied. In this study, Social Presence Theory is employed as the theoretical lens to explore the factors that influence public online donation intentions on social media. To fully capture its impact on online donation behavior, a multi-dimensional conceptualization of social presence is proposed based on previous studies (Lu et al., 2016; Nadeem et al., 2020). Specifically, we investigated the impact of social presence, perceived threat, perceived trust, and empathic concern related to the pandemic on people's donation intentions on social media platforms. By conducting a survey of Chinese social media users, we collected and analyzed data to test our research model and hypotheses. Our study aims to make a contribution to the existing literature and provide practical implications for crisis management on social media platforms and the development of the public charity.

The remaining paper is structured as follows: Section 2 presents a literature review of the existing research, followed by the description of our research model and hypotheses in Section 3. Section 4 provides an overview of our research methodology, including data collection and measurement of variables. The results of the data analysis are presented in Section 5. Section 6 discusses our research findings and implications. Finally, in Section 7, we discuss the limitations of our study and propose directions for future research.

Literature review

The Use of Social Media in Emergencies

Social media, based on the Internet Web 2.0, is user-centered, user-generated content, and provides and maintains platform services for users (Obar & Wildman, 2015). Its use is crucial, not only in providing information and crisis communication to alleviate public perception conflicts but also in assisting crisis management to alleviate internal social conflicts. The efficient dissemination of information through social media platforms strongly influenced public behavior and government responses in emergencies (Cinelli et al., 2020). For the public, social media is an important channel for information dissemination and access (Vieweg et al., 2010), crisis communication (Pourebrahim et al., 2019), social support (Liu et al., 2015), and emotional support (Oh et al., 2013). For managers, social media is a useful crisis management tool (Alexander, 2014). During the COVID-19 pandemic, officials increasingly used social media platforms to communicate important public health messages (Basch et al., 2022). Social media has also become an important tool for promoting charitable giving and public scientific participation in outbreak prevention and control, and online donation fundraising, with a large number of donors prioritizing the use of various social media to communicate with charitable organizations (Shier & Handy, 2012). Despite the potential crisis management function of social media in promoting social cohesion through encouraging donations, most studies have only explored from the perspectives of psychology and crisis management.

Study on willingness to donate online based on social media

Through social media platforms, donors can not only contribute money or goods but also time (e.g., retweeting), material resources (in-kind donations), or services (Michaelidou et al., 2015). Current research on willingness to give in social media has focused on the motivations and factors influencing willingness to give (Salido-Andres et al., 2021). Bekkers et al classified motivations for giving participation as awareness of need, response to the request, altruism, values, effectiveness, psychological benefits, cost-benefit, and reputation (Bekkers & Wiepking, 2011). Intrinsic factors influencing willingness to give such as gender, education level, income, moral obligation (Knowles et al., 2012), empathy (Shier & Handy, 2012), and perceived trust (Liang et al., 2019), and external factors comprise awareness of the urgency, collective participation, and external support (Zhao et al., 2021), the legal and social environment (Kshetri, 2015), characteristics of charity projects and organizations (Reddick & Ponomariov, 2013).

Focusing on the social environment of emergencies, the dissemination of social information, especially information about others' donations, can significantly affect the individual willingness to participate in donations (Lobb et al., 2012; Van Teunenbroek & Bekkers, 2020). Social emotional moods such as tension, panic, and anxiety under unexpected events can also have an impact on willingness to donate (Han et al., 2021). Strong social ties lead to a significant increase in charitable giving (Saleh et al., 2021), while social detachment leads to a lower willingness to give to charity (Lee et al., 2021). Although the social environment, social content, social emotions, and social relationships all have a significant effect on donation participation, these factors are always exogenous, and different people do not respond to the same behaviors under the influence of the same social factors. Therefore, this study argues that the direct driver of giving behavior comes from a sense of social presence stimulated by social cues rather than from other extrinsic social factors alone.

Impact of Social Presence on Donor Engagement

Social presence theory posits that individuals perceive a sense of "being there" in mediated communication. It encompasses both established and changing properties of media and social interactions (Cole, 2001; Labaree, 2004). It was initially proposed to describe the salience of the other in a mediated communication and the consequent salience of their interpersonal interactions (Short et al., 1976). As Internet expanded and social interactions diversified, additional social cues, such as human behavior, social relationships, and communication contexts, were incorporated into the concept (Çakmak et al., 2014; Sung & Mayer, 2012). With the application of multidimensional social presence measurement models in research, several key elements of social presence have been identified. These elements include awareness (perceiving the coexistence and influence among participants), cognition (building and confirming relationships with others, understanding the immediacy and urgency of the situation),

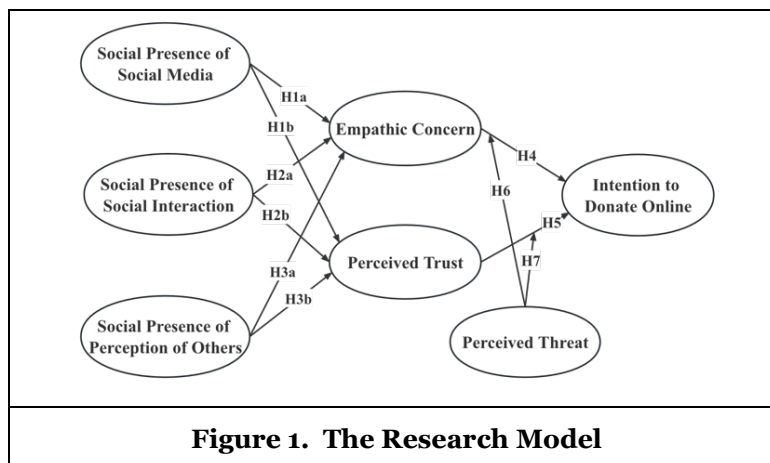
emotion (emotional connections and cohesion), and behavior (interaction, assistance, and reliance) (Biocca et al., 2001; Chang & Hsu, 2016; Kim, 2011; Ning Shen & Khalifa, 2008).

Previous research has demonstrated that social factors, such as social interactions (Chow & Chan, 2008), and social connections (Sargeant & Woodliffe, 2007), are associated with increased user engagement and performance in public fundraising campaigns. These social connections and interactions are prerequisites for creating a sense of social presence. Social presence, in turn, generates a sense of psychological proximity and affection, eliciting positive cognitive, emotional, and behavioral responses (Algharabat et al., 2018). During the pandemic, social presence generated by social media communication plays an important role in coordinating social and creative motivation (Yasir et al., 2020). Existing research suggests that social presence, generated based on platform characteristics, user interactions, and content interactions, can significantly facilitate philanthropic giving (Raab et al., 2017), influencing user intentions, group decisions, and behaviors (Mao & Yuan, 2018) by increasing perceptions of the personal, warm, intimate, social, or sensitive nature of social interactions in virtual environments (Choi, 2016). However, the impact of social presence on donation participation is limited to medical and commercial crowdfunding studies, and few studies have used social presence theory to investigate public welfare donations under unexpected events.

Research Model and Hypotheses

Social Presence

Given the characteristics of online donations on social media and the similarities between the contexts of e-commerce and online donations, which both involve online activities with associated costs or investments, this study adopts the similar classification and categorizes social presence into Social Presence of Social Media (SPSM), Social Presence of Social Interaction (SPSI), and Social Presence of Perception of Others (SPPO)(Lu et al., 2016; Nadeem et al., 2020). We investigate the effects of these three dimensions on online donation intention, while also examining the variables of a perceived threat of the new coronavirus pandemic, perceived trust, and empathic concern (EC) as potential reasons for the surge in online donations. The research model and hypotheses are depicted in Figure 1.



Social Presence of Social Media (SPSM) refers to the ability of media platforms to convey a sense of human warmth and sociability, which corresponds to the media form characteristics of social presence (Gefen & Straub, 2004; Lombard & Ditton, 1997). Existing research has demonstrated that the interactivity of a website can enhance the social influence of advertisements on the site, thereby increasing customer engagement (Fortin & Dholakia, 2005). The interactivity of the media affects users' perceptions and attitudes (Johnson et al., 2006) and also influences the formation of social presence (Fortin & Dholakia, 2005). The unique social properties of social media platforms, such as immediacy and intimacy, facilitate users' sense of presence and connectedness, influencing their perceptions and attitudes (Han et al., 2015).

Social Presence of Social Interaction (SPSI) refers to social presence experienced during media-based interactions, which corresponds to the user characteristics of social presence. Media-based interactions is

a crucial part in social presence and can have a positive impact on various domains, such as online education and product purchases (Caspi & Blau, 2008; Jiang et al., 2019). The increased frequency of online interactions facilitated by social media platforms, particularly during a pandemic, stimulates discussions about the current situation and donation projects. These interactions, such as reposts, comments, likes, private messages, and other forms of engagement, can evoke users' empathic concern and enhance their perceived trust, thereby facilitating donation behavior.

Social Presence of Perception of Others (SPPO) refers to the extent to which other social actors appear to exist and react to the users in online communities, which corresponds to the media content characteristics of social presence (Shen & Khalifa, 2009). It involves individuals' perception of others through social media content messages and how these perceptions influence their emotions and perceptions (Tu, 2002). In the context of social media, it is related to the observability of others' behaviors, facilitated by the transparency and interactivity of social media platforms. Previous research has demonstrated that recommendations, user comments, emotionally rich user-generated content (UGC) can make users aware of the presence of others, thereby evoking a sense of social presence (Hassanein & Head, 2005; Kumar & Benbasat, 2006). Donation-related content, such as images, text, and videos, can also make potential donors more aware of the presence of others.

Biocca et al. (Biocca et al., 2001) proposed that social presence can be considered a measure of empathic concern, which is a form of psychological involvement that requires the ability to feel the emotions or states of others. Lebowitz et al. (Lebowitz & Dovidio, 2015) argue that social relationships and social attitudes are prerequisites for empathy. Pimentel's experimental studies (Pimentel et al., 2021) demonstrate that social presence significantly enhances empathy and promotes pro-social behaviors such as donations. Kort et al. (De Kort et al., 2007) also found that empathic concern increased with social presence based on game experiments. Furthermore, it has been demonstrated that donors' social presence can stimulate higher empathic concern and willingness to donate (Kandaurova & Lee, 2019). Thus, this study posits that social presence in the context of the pandemic can enhance empathic concern and facilitate giving. Therefore, the following hypotheses are proposed:

H1a: Social presence of social media is positively related to empathic concern.

H2a: Social presence of social interaction is positively related to empathic concern.

H3a: Social presence of perception of others is positively related to empathic concern.

Social presence plays a crucial role in transmitting social cues and eliciting cognitive and emotional responses, including the awareness of coexistence, influence by others' emotions, and a sense of intimacy. One notable consequence is its impact on trust (Kaushik et al., 2018). Studies have demonstrated that social presence significantly affects consumers' perceived trust and purchase intention in social and e-commerce contexts (Jiang et al., 2019; Ye et al., 2019). Additionally, being aware of the donation participation of others, particularly when endorsed by influential figures such as celebrities, companies, and organizations, can enhance perceived trust. Specifically, we propose the following hypothesis:

H1b: Social presence of social media is positively correlated with perceived trust.

H2b: Social presence of social interaction is positively correlated with perceived trust.

H3b: Social presence of perception of others is positively correlated with perceived trust.

Empathic concern

Empathic concern (EC) and perceived trust are considered prerequisites for online donation in social media. When individuals witness someone in need, it evokes a sense of closeness and empathy, which encompasses the ability to perceive, understand, and share the emotions and feelings of another person by putting oneself in their place (Eisenberg & Miller, 1987). Empathic concern plays a significant role in promoting prosocial behaviors, such as solidarity, friendliness, mutual help, and altruistic actions like donating or volunteering (Liu et al., 2018). It is widely accepted in philanthropic research that empathic concern is a prerequisite for charitable giving. Previous research has shown that the absence of empathic concern, whether due to a lack of information or social interaction, can decrease potential donors' willingness to participate in online donation. Researchers also found that individuals with higher levels of

empathic concern are more inclined to contribute time and money to assist others (Farrelly & Bennett, 2018). Based on these findings, we propose the following hypothesis for this study:

H4: Empathic concern is positively related to the intention to donate online.

Perceived trust

Trust serves as a form of social capital and plays a crucial role in various online activities such as online shopping and paid transactions (Kim et al., 2012; Li et al., 2012). The act of online donation also involves the investment of money, goods, and services, making perceived trust a crucial factor in online donation activities (Liang et al., 2019). In the context of charitable giving, it reflects the degree to which potential donors believe in the integrity and reliability of information about donation items on social media platforms. Lack of trust in charitable giving programs can deter potential donors from participating in such activities. Therefore, this study proposes the following hypothesis:

H5: Perceived trust is positively related to the intention to donate online.

Perceived threat of COVID-19

The most direct effect of perceived threat in public health events is to produce negative emotions such as stress, anxiety, and sadness in the public (Song et al., 2021). As the perceived threat increases, individuals may experience heightened emotional empathy and a stronger desire to alleviate the suffering of others. This heightened empathy often leads to increased engagement in altruistic and pro-social behaviors, including donation and volunteering (Jin & Ryu, 2022; Vieira et al., 2020). Trust also serves as a coping mechanism in times of crisis. When individuals perceive a high level of threat, the importance of trust in organizations becomes even more significant (Berens et al., 2005). During such periods, individuals actively seek reliable entities to provide support and guidance (Shreedhar & Mourato, 2020). Therefore, the following hypotheses are proposed:

H6: Perceived threat of COVID-19 positively moderates the effect of empathic concern on intention to donate online.

H7: Perceived threat of COVID-19 positively moderates the effect of perceived trust on intention to donate online.

Methodology

Measures

This study developed measures by drawing on established scales from relevant literature while taking into consideration the context of the pandemic and the public donations, as well as the specific features of social media, as described in Appendix A. The questionnaire was divided into three parts: the pandemic donation survey, a social media online donation participation survey during the pandemic, and essential information collection. The first part of the questionnaire is comprised of two short questions that aim to screen potential participants by inquiring about their involvement in online social media donations, as well as the specific channels through which they made such donations. The second part consisted of 30 questions that measured seven variables: social presence of social media (SPSM), social presence of social interaction (SPSI), social presence of perception of others (SPPO), empathic concern (EC), perceived trust (PT), perceived threat (PTH), intention to donate online (IDO). The third part was used to obtain the demographic characteristics of the study participants, including gender, age, education, disposable monthly income, and hours of social media pandemic information per day.

The questionnaire was administered in Chinese. To ensure a desirable degree of discrimination, a seven-level Likert scale was used in all measures. Respondents were asked to rate their level of agreement with the question statements based on their actual situation, ranging from "1" to "7", where "1" represented "totally disagree" and "7" represented "totally agree". To ensure the questionnaire's validity, reverse measures were included in the questionnaire and a pre-test was conducted on 140 respondents on social media. The measurement items were also modified based on the results of the reliability and validity tests, and the final questionnaire was formed and distributed to a large sample of users to collect research data.

Data collection

Our study distributed questionnaires through personal social media platforms such as Weibo, WeChat, and QQ, as well as online survey tools like Wenjuanxing (<http://www.wjx.cn/>) and Wenjuanwang (<https://www.wenjuan.com/>). In total, 553 questionnaires were collected. We excluded questionnaires that had too short a response time, exhibited identical or obvious patterns in all items (e.g., ABABAB), or provided inconsistent answers to at least one of the original and reversed items. Finally, we obtained 385 valid questionnaires for empirical analysis, and the demographic information is summarized in Table 1.

Demographic variables		Frequency	Percentage
Gender	Male	174	45.2%
	Female	211	54.8%
Age	18-25	168	43.6%
	26-30	108	28.1%
	31-40	56	14.5%
	41-50	41	10.6%
	>50	12	3.2%
Education	Below undergraduate	64	17.7%
	Undergraduate	221	57.4%
	Graduate and higher	96	24.9%
Disposable monthly income (in RMB)	<1000	30	7.8%
	1000-2000	127	33.0%
	2000-3000	99	25.7%
	3000-5000	75	19.5%
	>5001	54	14.0%
Hours of using social media to follow pandemic information (hours/single day)	<1	77	20.0%
	1-3	158	41.03%
	3-5	114	29.61%
	5-7	24	6.23%
	>7	12	3.11%
Table 1. Demographic distribution			

As is shown in Table 1, among the 385 responders, 45.2% were male and 54.8% were female. People under 30 years old accounted for 71.7% of the sample, which is similar to 78% of Weibo users. Notably, in 2020, 17.86 million Weibo users donated over 141 million yuan through the micro public welfare platform, of which people under 30 years old accounted for 80%, which proves that the age proportion of the sample is representative. In terms of the sample's occupation, 80% are students and company employees. From the viewpoint of the education level of the sample, people with a bachelor's degree or above are the main force of donation. Overall, the sample group is representative and can reflect the basic characteristics of social media users. In addition, 80% of the online donation participants reported spending more than one hour per day focusing on pandemic information on social media platforms.

Data analysis and results

Measurement model

The pilot test described before provided a necessary check for content validity. The test of the measurement model involves examining reliability, convergent validity, and discriminant validity. The Cronbach's alpha values and composite reliability (CR) values of all constructs were greater than 0.7,

indicating good reliability (Fornell & Larcker, 1981; Nunnally, 1967). The average variance extracted (AVE) values of the models were above 0.5, and their AVE values' square roots are higher than the correlation coefficients with other variables, indicating good convergent validity. All factor loadings were above the recommended value of 0.7, indicating sufficient levels of convergent validity. Additionally, the internal similarity of all constructs was greater than the external similarity, indicating that the model has good discriminant validity among the constructs (Chin, 1998). To confirm the possibility of common method variance (CMV) in this cross-sectional survey, Harman's single-factor using an exploratory factor analysis was tested (Podsakoff & Organ, 1986). The results showed that seven factors were extracted and the variance of the first extracted factor was around 39% (40%), thus providing evidence that CMV is not an issue for this study. The reliability and discriminant validity are presented in Appendix A and Table 2.

	α	C.R.	AVE	SPSI	SPPO	SPSM	PT	EC	IDO	PTH
SPSI	0.884	0.880	0.649	0.805						
SPPO	0.873	0.874	0.635	0.399	0.797					
SPSM	0.816	0.801	0.503	0.391	0.368	0.709				
PT	0.897	0.906	0.565	0.401	0.487	0.492	0.812			
EC	0.859	0.837	0.659	0.381	0.352	0.116	0.204	0.752		
IDO	0.910	0.911	0.718	0.437	0.454	0.403	0.589	0.382	0.847	
PTH	0.820	0.851	0.588	0.695	0.662	0.628	0.451	0.334	0.377	0.767

Table 2. Discriminant Validity

Structural model

This study employed the covariance-based structural equation model in AMOS to analyze the data. Principal component analysis was used to extract the factors, and the Kaiser normalized maximum variance method was used to rotate the factors. The KMO value was 0.88, and the approximate chi-square was 4193.9, with a significance level of less than 0.005, indicating that the data were suitable for factor analysis. The overall structural validity met the requirements, with a $\chi^2/df=2.3$ (<3), RMSEA=0.065 (<0.08), GFI=0.853 (>0.8), AGFI=0.824 (>0.8), CFI=0.915 (>0.9), IFI=0.915 (>0.9), and TLI=0.904 (>0.9), demonstrating good model fitness and structural validity. The result is presented in Table3, indicating that H1b, H2a, H2b, H3a, H4, H5, H6 hypothesizes are supported.

Paths	Estimate	S.E.	C.R.	P	Significance
H1a: SPSM→EC	-0.082	0.058	-1.398	0.162	H1a not supported
H1b: SPSM→PT	0.366	0.08	4.559	0.000***	H1b supported
H2a: SPSI→EC	0.285	0.081	3.52	0.000***	H2a supported
H2b: SPSI→PT	0.204	0.106	1.921	0.055	H2b not supported
H3a: SPPO→EC	0.194	0.058	3.335	0.000***	H3a supported
H3b: SPPO→PT	0.337	0.077	4.344	0.000***	H3b supported
H4: EC→IDO	0.348	0.06	4.277	0.000***	H4 supported
H5: PT→IDO	0.439	0.045	7.522	0.000***	H5 supported
H6: EC*PTH→IDO	0.122	0.041	2.965	0.003**	H6 supported
H7: PT*PTH→IDO	-0.164	0.027	6.172	0.000***	H7 not supported

Table 3. Hypothesis Testing Results

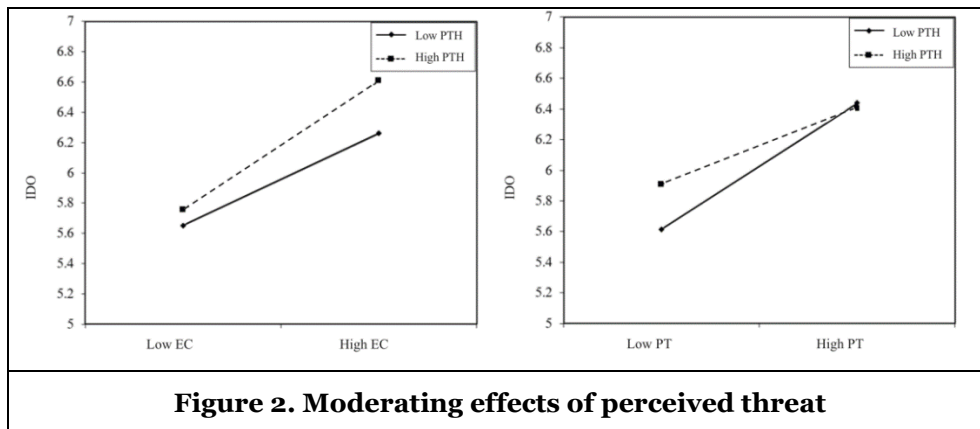
Then, a linear regression analysis was conducted by SPSS to obtain the moderating effect of perceived threat on empathy concern and perceived trust on intention to donate online. The mean of the moderating variable and the dependent variable was first obtained, and then the z-score was calculated based on the

mean, and after obtaining the z-score, a three-step linear regression was conducted to obtain the moderating effect significance and unstandardized coefficients. The results showed that the results of linear regression of the moderating effect of perceived threat on empathic concern on intention to donate online were significant, with significance $p=0.003$, and the results of linear regression of the moderating effect of perceived threat on empathic concern on intention to donate online were significant, with significance $p=0.000$, as shown in Tables 4.

	Model	Estimate	S.E.	T	P
H6	EC	0.304	0.046	6.650	0.000***
	PTH	0.226	0.044	5.101	0.000***
	EC*PTH	0.122	0.041	2.965	0.003**
H7	PT	0.412	0.040	10.396	0.000***
	PTH	0.130	0.040	3.248	0.001***
	PT*PTH	-0.164	0.027	-6.172	0.000***

Table 4. Hypothesis Testing Results for Moderating Effect

As shown in figure 2, the higher the perceived threat, the more likely the public with empathic concerns about the outbreak donation program is to participate in the outbreak online donation, and the moderating effect of perceived threat are stronger for the high empathic concern group. However, perceived threat negatively moderates the effect of perceived trust on the intention to donate online. When the perceived threat of COVID-19 was high, perceived trust had a weaker positive effect on intention to donate.



Discussion and implications

Major findings

Our study applies social presence theory to analyze the impact of social interactions, socio-emotional involvement, and awareness of social relationships on online donation during the pandemic. The results show that social presence significantly influences the public's empathic concern and perceived trust, which in turn positively impacts the intention to donate online. Social media platforms were perceived to have a sense of personalness, human sensitivity, and warmth, and interactions related to pandemic donations were perceived to have a sense of human touch, as well as solidarity. The perceived trust and empathetic attention resulting from the perception that others were following, discussing, and sharing information about the pandemic and actively participating in pandemic donations when making online donations, led to mass public engagement in the online donation program. However, the mechanisms by which different dimensions of social presence affect the willingness to participate in online donation differ. The social presence of social interaction and the perception of others significantly influence empathic concern, whereas the social presence of social media does not have a significant effect on empathic

concern due to the absence of the personal element. Moreover, the social presence of social media and the perception of others have significant effects on perceived trust, whereas the social presence of social interaction does not have a significant effect on perceived trust. This suggests that interactions and functions of the platform, as well as the perception of others' donation participation from platform content, can significantly increase perceived trust. On the other hand, communication interactions with others generally occur in non-urgent social issues such as economic issues, social issues, and educational issues. Therefore, the effect of communication interactions with others on perceived trust in online donation was not significant.

In terms of the effect of social presence on empathic concern and perceived trust, Eisenberg defined empathic concern as the perception, grasp, and understanding of others' emotions and feelings in a situated and empathetic manner (Eisenberg & Miller, 1987). The interpersonal closeness or warmth generated by perceiving and interacting with others is more likely to lead to empathic concern toward them. However, platform social presence, as an inherent property of social media platforms, does not embody the element of people or others, and therefore does not lead to a high level of empathy among potential donors. In addition, public health emergencies can lead to herding attitudes and behaviors (Murray & Schaller, 2012). When the public is aware of the active participation of others in donating to the pandemic and the urgency of donating to the pandemic through platform functions and information, they are more likely to choose to trust the donation program and participate in the donation based on group consciousness or group norms. In previous research, various factors such as characteristics of the fundraiser, donee, charity project, and organization have been identified as key determinants of perceived trust in donation campaigns (Zhao et al., 2021). The authority of social media platforms, along with the display, tracking, and interactive features of the donation program, also provides more clues to verify the authenticity of pandemic donation information, the legality and ethical operations of the charity, and the wise use of pandemic donation funds. All of these factors significantly influence the perceived trust of potential donors, which is consistent with previous research conducted in the field of e-commerce (Lu et al., 2016).

Regarding the influence of empathic concern and perceived trust, this study confirms that empathic concern and perceived trust positively influence online donate intention in the context of public health emergencies. The key difference with previous studies is that empathic concern and perceived trust in the online environment cannot be established without the element of social presence. Regarding empathic concern, prior research has suggested that donors with high empathic concern focus on alleviating the suffering of others in need (Verhaert & Van den Poel, 2011). In the initial phase of the outbreak, a substantial amount of information shared on social media highlighted the dire situation in the pandemic-affected regions, leading to a surge in donations of medical and social supplies. As for perceived trust, it mainly depends on the donor's experience and repeated interactions with the platform. Previous studies have shown that sufficient information provided to potential donors can significantly contribute to building perceived trust. The quality of information, platform quality, and social norms can all impact this level of trust. Therefore, the initial task in promoting public participation in emergency online donation activities is to stimulate empathic concern and perceived trust by crafting appropriate materials.

Furthermore, the findings indicate that the perceived threat plays a significant role in influencing online donation behaviors. Specifically, the higher perceived threat, the more likely the public with empathic concern for the outbreak donation program is to participate in online donations to the outbreak. This supports the idea that perceived threat and anxiety during a pandemic promote altruistic, pro-social behavior (Vieira et al., 2020). However, contrary to our initial hypothesis, an excessive perceived threat may impose a cognitive or psychological burden on potential donors who otherwise have high perceived trust, thereby influencing donation behavior. This finding aligns with previous research suggesting that the effect of trust may become less salient under certain conditions (Gefen & Pavlou, 2012). This suggests a boundary effect of perceived trust in the current research context. We argue that perceived threat affects group behavior, which is fundamentally motivated by self-preservation and can manifest as either positive solidarity, cohesion, and altruistic attention, or group emotional panic and social blindness, depending on the level of threat and perceived self-efficacy. Thus, moderate perceived threat contributes to rational, group solidarity-like positive behaviors and plays an important role in the pandemic online donation and crisis management.

Implications for research

The research contributions of this study can be summarized as follows. Firstly, it contributes to the literature on social presence theory by demonstrating its applicability in the context of online donation behavior during a public health crisis. The findings provide empirical evidence that social presence is a critical determinant of online donation behavior during the pandemic. The dynamics of social media platforms and the unique characteristics of crisis situations may influence the perception of social presence and its impact on individuals' donation intentions. By redefining social presence in the context of online public donation during the pandemic, this study contributes to the understanding of how social presence operates and its implications for fostering public engagement and support.

Secondly, this study extends the literature on the role of perceived threat in donation behavior by examining the impact of the perceived threat of the pandemic on online donation intentions. Our results suggest that the perceived threat of the pandemic positively influences online donation intentions, highlighting the importance of considering the perceived threat in the context of social crises when investigating donation behavior. It also complements the study of social media crisis management and online donation behavior in public health emergencies.

Furthermore, this study employs a multi-dimensional measurement approach borrowed from the fields of online education and e-commerce (Jiang et al., 2019) and finds that different dimensions of social presence have varying effects on behavioral mechanisms. These findings not only expand the research scope and application scenarios of social presence theory but also validate the research outlook of existing studies on social presence and trust (Zhao et al., 2021).

Implications for practice

This study contributes to practical applications in two main areas: crisis management and public charity on social media platforms. In terms of crisis management, our research highlights the impact of social cognition (perceived threat) and social presence on social behavior (online donation) in the social context of public health emergencies. Social presence plays a critical role in social protection and requires active public participation (Yasir et al., 2020). Therefore, during a public health emergency, managers need to communicate with the public through social media to avoid excessive anxiety and blind optimism (Bavel et al., 2020; Mobbs et al., 2015). Addressing the public collectively and calling on them to act for the common good can effectively enhance social presence and build social cohesion (Carter et al., 2015).

Moreover, our study has practical implications for public charity on social media platforms. Charities and nonprofits can use social media to enhance their social presence and engage the public in charitable activities by building a sense of community, increasing public awareness of charitable causes, and providing clear information about how donations will be used. Additionally, they can provide clear and specific information about how donations will be used and create opportunities for public involvement in the decision-making process.

In the context of the development of public charity in social media, our finding indicates that illegal or unethical practices in charitable donations can affect the public's intention to donate. We believe that the development of social media philanthropy should be encouraged and regulated. This includes promoting the presence of traditional public charity organizations or implementing other policy measures to encourage philanthropy. Another important aspect is the need to improve laws and regulations related to platform governance and protection to ensure ethical and transparent practices in online charitable giving. Additionally, pro-social behavioral norms are more effective when combined with socially acceptable expectations. We found that pro-social behavior, such as pandemic donation, has a scale effect when it is spread centrally on social media platforms. The social network, personal influence, interaction ability, or personal reputation of the donor or fundraiser can affect its impact. Thus, mobilizing opinion leaders on social media platforms can significantly impact the success of philanthropic giving programs.

Limitations and future work

Although the questionnaire respondents were carefully screened in this study, and we restricted the sample to individuals who had participated in online donations on social media platforms to ensure

the accuracy and representativeness of the study data, the data fell short of the ideal state. This is due to two main reasons. First, the potential variable of social presence is challenging to measure because of its timeliness. Public attention and donations are concentrated during outbreaks and decrease significantly during recessions. Ideally, the study population should be experiencing the threat of a new pandemic when the public's perception of the pandemic threat and social presence related to the pandemic on social media is highest and most easily reflected in the questionnaire data. Second, there is the possibility of sampling bias since we approached participants online. When comparing survey respondents from different channels, we also found that the quality of data from users of social media platforms was much higher than that of the questionnaire community. Future studies should consider selecting more accurate survey respondents or accounting for the effect of timeliness on the measurement items to obtain more ideal and scientific research results. Lastly, this study only explored online donation participation behavior in the context of public health emergencies from the perspective of social presence theory. Future studies can further examine and analyze the antecedents, consequences, purposes, and emotions of online donation behavior.

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Appendix A

Constructs	Measurement items		FL	Reference
Social presence of social media	SPSM1	There is a sense of human contact in social media.	0.746	(Gefen & Straub, 2004; Ye et al., 2020)
	SPSM2	There is a sense of personalness in social media.	0.716	
	SPSM3	There is a sense of sociality in social media.	0.715	
	SPSM4	There is a sense of human warmth in social media.	0.710	
	SPSM5	There is a sense of human sensitivity in social media.	0.736	
Social presence of social interaction	SPSI1	There is a sense of human touch when I participate in the interaction on the topic of anti-pandemic aid.	0.816	(Caspi & Blau, 2008; Jiang et al., 2019; Zhang et al., 2021)
	SPSI2	There is a sense of warmth when I participate in the interaction on the topic of anti-pandemic aid.	0.835	
	SPSI3	There is a sense of solidarity when I participate in the interaction on the topic of anti-pandemic aid.	0.857	
	SPSI4	I can make sense of the attitude of others by interacting on the topic of anti-pandemic aid.	0.705	
Social presence of perception of others	SPPO1	There are many others who feel interested with the information about the pandemic donation.	0.736	(Lu et al., 2016; Nadeem et al., 2020)
	SPPO2	There are many others who have shared information regarding the pandemic.	0.792	
	SPPO3	There are many others who have discussed pandemic donation.	0.829	
	SPPO4	There are many others who have made donations to the pandemic.	0.827	
Perceived threat	PTH1	COVID-19 could put my health at risk.	0.716	(Lin & Bautista, 2016; Song et al., 2021)
	PTH2	I am vulnerable to health problems due to COVID-19.	0.821	
	PTH3	COVID-19 would be a very serious threat to my quality of life.	0.713	
	PTH4	The pandemic would be harmful to my well-being.	0.836	
Empathic concern (reverse scored)	EC1	I don't have concerned feelings for the unfortunate people in the pandemic crisis.	0.798	(Kamas & Preston, 2021; Liu et al., 2018)
	EC2	I don't feel very sympathetic for the unfortunate people in the pandemic crisis.	0.812	
	EC3	Other people's misfortunes of pandemic crisis do not usually disturb me a great deal.	0.804	
	EC4	I don't feel very sorry for other people when they encounter difficulties.	0.866	
	EC5	I am not moved by the pandemic relief information that I see.	0.775	
perceived trust	PT1	I believe that pandemic donation information on social media platforms can be trusted.	0.736	(McCroskey & Teven,

	PT2	I believe that pandemic donation projects can be trusted.	0.773	1999)
	PT3	I believe that pandemic donations will be used appropriately.	0.822	
	PT4	I believe that charitable organizations will operate in an ethical manner.	0.856	
Intention to donate online	IDO1	I am willing to donate to the pandemic.	0.836	(Sura et al., 2017)
	IDO2	I have an intention to donate to the pandemic.	0.832	
	IDO3	I will very likely donate to the pandemic.	0.889	
	IDO4	I will consider making a donation to the pandemic.	0.831	

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