

Isolation marketing: Social isolation and virtual gift donation intention

Abstract

Purpose – This study aims to examine the phenomenon of gift-giving in the context of live video streaming, which has received little attention in research studies. Specifically, the study seeks to explore the impact of social isolation on virtual gift donation intentions while considering the mediating role of self-esteem and the moderating role of self-confidence.

Design/methodology/approach – Drawing on the terror management theory, this study employs a sample of 327 participants from the United States to examine the relationship between social isolation, self-esteem, self-confidence, and virtual gift donation intention. The proposed conceptual model is tested using the statistical approach of Structural Equation Modeling-Partial Least Squares.

Findings – The results show that social isolation strongly predicts the intention to donate virtual gifts, and self-esteem mediates this association. Additionally, the study indicates that self-confidence does not directly mediate the relationship between social isolation and virtual gift donation intention but acts indirectly through self-esteem.

Originality/Value – This study explores social isolation as a new antecedent of virtual gift donation intention. It also examines the mechanisms and underlying conditions under which social isolation affects virtual gift donation intention.

Keywords- social isolation, virtual gift donation intention, self-esteem, self-confidence, terror management theory

Introduction

In recent years, the popularity of digital live-streaming applications has increased, facilitating the broadcast of video-mediated communication across various modalities within social networking communities (Chen, 2022). In 2021, the video streaming market achieved a significant valuation of \$59.14 billion on a global scale, and the projections indicate that this market will experience a compound annual growth rate of 21.3% from 2022 to 2030 (Grand View Research, 2022).

Consumers view live video content and engage with broadcasters by giving virtual gifts, a crucial component of the live video streaming platform's business model (Hsieh et al., 2022).

Livestreaming platforms allow viewers to purchase virtual gifts, a monetary incentive for live streamers (Li, Ma, & Tong, 2022). Examples of platforms that offer this feature include Facebook, TikTok, Twitch, YouTube, Instagram, and LinkedIn. Users can send virtual gifts to their friends on Facebook by clicking on their profile page's "Send Gift" button (Hebert, 2022). TikTok has a virtual gift feature that allows users to send gifts to their friends and the creators they follow (Geryser, 2022). Twitch has a virtual gifting feature called "Cheers", allowing users to send animated emotes to their favorite streamers (Witman, 2020). YouTube has a virtual gifting feature called "Super Chat", which allows users to send messages with special formatting and colours during a live stream (Picaro, 2023). Instagram has a virtual gifting feature called "Instagram Live Gifts", which allows users to send virtual gifts to creators during a live stream (Perez, 2023). This emerging phenomenon has spurred the curiosity of researchers and practitioners alike, prompting investigations into the motivation of virtual gift-giving behaviours.

Compared to physical gifting, digital gift-giving is relatively new (Reshadi et al., 2023). Recent studies such as Reshadi and Givi (2023) have revealed insights into the link between giver spending patterns and recipient affluence, highlighting motivation variations based on perceived wealth. On the other hand, Givi et al. (2023) conducted an integrative review for a deeper gift-giving landscape understanding, while Gupta et al. (2023) performed a bibliometric analysis, showing trends and themes in the gift-giving context. Givi and Das (2022) explored preferences for gift card delivery, revealing a new virtual gifting dimension. Furthermore, Givi & Mu (2022, 2023) studied gift-giver psychology, uncovering their tendency to overvalue relative gift worth and dislike attitude-inconsistent gifts. Alternatively, Givi (2021) highlighted that virtual gift recipients feel uncomfortable when failing to reciprocate a gift on several occasions.

The motivation of social media users to voluntarily spend real money and digital gift streamers was one of the key questions raised by past studies within the virtual gift-giving literature (Tang et al., 2024; Wang et al., 2024). Numerous efforts have been made to investigate the antecedents of digital gift-giving, such as emotional attachment and flow's impact (Li & Peng, 2021), para-social relationship (Chia-Shin Lin, 2021), perception and satisfaction (Chia-Shin Lin, 2021), live

streamer characteristics, and live scene characteristics (Li & Peng, 2021), viewer engagement (Yu et al., 2018), Viewer-Viewer Interaction (Zhou et al., 2019), identity-based motivation and class and relational identity (Li et al., 2021), social and technological factors (Wan et al., 2017), and value perception (Liu et al., 2022). Despite growing attention to consumer gift-giving behaviour in marketing, scholars (e.g., Chia-Shin Lin, 2021; Hsieh et al., 2022; Tang et al., 2024; Yu et al., 2018) highlight the limited research on gift-giving in live video streaming, calling for further studies to enrich our understanding of this phenomenon. This research gap presents a compelling rationale for investigating the factors that drive virtual gift donation behaviour. By addressing this gap, the present study aims to contribute to the theoretical framework of virtual gift-giving and provide actionable insights for improving platform design and enhancing user engagement. Specifically, this study examines the interaction between social isolation and the intention to donate virtual gifts, offering a novel perspective on the complex relationship between individual psychology and digital interaction.

There has been a growing interest in studying the relationship between social isolation, defined as a state of being alone, with little or no social participation (Cloutier-Fisher et al., 2011), and customer prosocial behaviours (Lyngdoh et al., 2023) such as gift donations. Virtual gift-giving in live video streaming can be considered a prosocial behaviour because it is an entirely voluntary action (Tang et al., 2024) where viewers provide support to streamers without any obligation, often receiving gratitude as a non-monetary reward in return (Yu et al., 2018). This act reflects an intention to benefit others and fosters social connections, aligning with the core principles of prosocial behaviour. Although virtual donations differ from physical ones in their form and effort perception, they remain voluntary and intentional acts that benefit others (Reshadi et al., 2023), emphasising their prosocial nature.

Previous research has found that high levels of social isolation are associated with increased intention to purchase luxury brands (Thapa et al., 2022), internet addiction (Ang et al., 2017), willingness to share personal information online (Lyngdoh et al., 2023), and a tendency to spend money on products that signal group membership (Mead et al., 2011). Social isolation can lead to a decline in self-esteem, as it may cause individuals to feel that their lives lack meaning and that others do not value them (Holt-Lunstad et al., 2010; Lyngdoh et al., 2023). However, the question of how social isolation affects the intention to donate virtual gifts to live streamers remains a gap

in the literature. This study aims to explore and provide new insights into the underlying mechanism that links social isolation to virtual gift donation intention.

This study aims to answer two main questions: First, do isolated individuals have a stronger inclination to donate virtual gifts on social media platforms? Second, what are the motivations and factors that influence this behaviour? To address these questions, this study adopts the theoretical lens of terror management theory (Greenberg et al., 1986), suggesting that people have a psychological need to feel that their lives have meaning and purpose and belong to something larger than themselves. People may engage in behaviours that give them meaning and purpose, such as prosocial behaviours, coping with their thoughts of mortality and feelings of isolation and anxiety (Lyngdoh et al., 2023). Further, this study aims to advance previous research by investigating the potential mediational influence of self-esteem on the complex relationship between social isolation and consumer behaviour, which is known to be influenced by various external factors (Lyngdoh et al., 2023). According to the terror management theory, people may attempt to boost their self-esteem to cope with the fear of death. It is a defence mechanism against existential terror and the potential threat to their cultural beliefs and values (Greenberg et al., 1997; Solomon et al., 1991). Additionally, research suggests that self-esteem can serve as a buffer against anxiety, including death anxiety, which may stem from early developmental experiences (Smith et al., 2022). In light of these theories and findings, this study explores whether self-esteem mediates the relationship between social isolation and virtual gift donation intention, potentially driven by the need to manage feelings of terror. Additionally, self-confidence is a vital aspect that strongly impacts human psychology and individual decision-making (Chuang et al., 2013); the influence of this concept on the connection between social isolation, self-esteem, and virtual gift donation intention remains unexplored. This study also investigates how self-confidence moderates the direct link between social isolation and virtual gift donation intention and the indirect relationship mediated by self-esteem.

This study contributes to the existing virtual gift donation literature (e.g., Lin, 2021; Kneisel & Sternadori, 2022; Yang et al., 2022) in several ways. First, it is one of the pioneering research that examines social isolation as a potential predictor of intentions to donate virtual gifts. This novel investigation responds to the growing need to explore additional factors that serve as antecedents of the virtual gift-giving phenomenon (Tang et al., 2024). Second, this study extends the

application of terror management theory by exploring its relevance in digital interactions, particularly virtual gift-giving. Third, this study sheds light on the relationship between social isolation, self-esteem, and the intention to donate virtual gifts. It contributes significantly to the gift-giving literature by offering a deeper understanding of how social isolation influences consumer psychology and motivates contributions within virtual environments from the self-esteem perspective. In doing so, this study responds to recent calls (e.g., Jia et al., 2023) to investigate the underlying mechanisms of the gift-giving antecedents. Fourth, this study underscores the pivotal role of self-confidence within this interplay. Finally, the practical contribution of this study lies in guiding live-streaming platforms to engage more effectively socially isolated users. By understanding the psychological drivers of virtual gift-giving, platforms can design features that encourage prosocial behaviour and strengthen user engagement, contributing to sustainable monetisation strategies. Given the centrality of virtual gift-giving as a revenue-generating mechanism (Wan et al., 2017) and a tool for fostering deeper connections between streamers and audiences (Reshadi et al., 2023), this study has significant implications for both platform profitability and community-building initiatives.

Literature review and hypotheses development

Social isolation

Social isolation can be defined as the absence or disruption of interpersonal connections and relationships (Trout, 1980). According to Cacioppo et al. (2009), isolation pertains to the psychological disconnection of oneself from others. This can result in solitude that impacts an individual's perspective of life (Campagne, 2019). Social isolation is negatively linked with mental well-being and life satisfaction (de et al., 2024). Similarly, it significantly predicted the quality of life among Generation Z (Annamalai et al., 2025). The negative consequences of social isolation on mental and physical health have been well-documented in past studies (e.g., Wang et al., 2023). High levels of social isolation can lead individuals to have a greater desire to affiliate with groups, leading to a stronger preference for brands associated with groups (Mazodier et al., 2018). Consumer behaviour research has also posited that challenges in maintaining interpersonal connections can lead to internet addiction or persistent engagement in online activities (Ang et al.,

2017). This behaviour can even prompt individuals to share their personal information online (Lyngdoh et al., 2023).

Virtual gift donation intention

Gift-giving is a common practice in human society that involves the transfer of resources to strengthen social relationships and demonstrate themes of love, caring, connection, and social interaction (Wang et al., 2022). In live video streaming, virtual gift-giving has emerged as a business model (Yu et al., 2018) and is considered a brand-new, innovative e-business model that has developed and rapidly grown within social live-streaming services (Tang et al., 2024). However, in contrast to other social media platforms, gift-giving is a relatively recent feature on live-streaming platforms (Li et al., 2022). A live streaming platform provides the necessary infrastructure for connecting content creators and viewers, enabling real-time interaction and facilitating support through virtual gifts (Yang et al., 2022). Additionally, gift-giving on live-streaming platforms is viewed as a way of sharing a part of oneself, and receiving a gift is a way of taking in a part of someone else (Wang et al., 2022). Much like digital gift cards, virtual donations may challenge traditional social norms by being less effort-intensive than physical donations but are nonetheless meaningful acts of support (Reshadi et al., 2023).

Virtual gift-giving could incorporate prosocial and consumptive elements, as donors may perceive their contributions as supporting content creators while enjoying the entertainment or services provided. This dual nature aligns with Wan et al. (2017), who argued that donations in live-streaming contexts can have a consumptive attribute, as donors often pay for access to goods or services, such as content or performances, provided by creators. Empirical research has investigated various factors influencing viewer behaviour in virtual gift-giving on live-streaming platforms. For instance, Yu et al. (2018) demonstrated a positive correlation between viewer engagement and gift-giving decisions; however, its influence on the quantity of gifts purchased differs based on the measurement employed to assess engagement. Zhou et al. (2019) argued that the presence of viewer-viewer interaction could stimulate paid gifting by influencing the arousal level of viewers through the extraction of stimuli from *danmaku*, a real-time scrolling comment displayed on the screen. The study revealed that factors such as the presence of others, social

competition, emotional stimuli, and the quantity of excitement-related words positively impact paid gifting.

Other studies have investigated the motivations of individuals to engage in virtual gift-giving, indicating that factors such as parasocial relationships and social presence play a moderating role in the associations between constructs like enjoyment, loyalty, and trust (Chia-Shin Lin, 2021). Moreover, the gifting behaviour of viewers is influenced by class and relational identities, whereby social density serves as a contextual cue that moderates these effects (Li et al., 2021). In their research, Liu et al. (2022) utilised empirical data on viewers' actual behaviour to investigate the impact of viewer value perception on gifting behaviour. They discovered that satisfaction fully mediates the relationship between value perception and the number of gifts given. It also partially mediates the relationship between value perception and the number of gifts given.

A comprehensive review of the literature on the antecedents influencing virtual gift donation intention (Table 1) reveals that research has primarily focused on factors such as streamer characteristics (Y. Li & Peng, 2021), streamer type (X. Wang & Zhang, 2025), viewer engagement (Yu et al., 2018), and identity-based motivations (Li et al., 2021). However, despite the increasing digitalisation of social interactions, no prior study has examined the impact of social isolation on virtual gift donation intention. This represents a significant gap in the literature, as social isolation is a growing phenomenon in the digital age, particularly in online interactions. Moreover, while prior studies have primarily drawn from engagement theories (Yu et al., 2018), arousal mechanisms (Zhou et al., 2019), and attention perspectives (X. Wang & Zhang, 2025), this study takes a novel approach by examining virtual gift donation intention through the lens of psychological coping mechanisms. By incorporating insights from Terror Management Theory (Greenberg et al., 1986), this research explores how individuals experiencing social isolation may use virtual gift-giving to reaffirm their self-esteem. This perspective extends the understanding of psychological drivers in live-streaming environments and offers a fresh theoretical contribution to the literature on virtual gift-giving behaviour.

Table 1. Summary of literature on the antecedents of virtual gift donation intention

Articles	Antecedents	Moderator/ Mediator	Notable findings	Theoretical framework
(X. Wang & Zhang, 2025)	Streamer type (informer vs. entertainer)	Mediator: Hedonic value Moderator: Language style	The study finds that entertainers elicit stronger gift-giving intentions than informers, with hedonic value mediating this effect. Additionally, using sensory language amplifies entertainers' impact on gift-giving intentions.	Attention theory
(Chia-Shin Lin, 2021)	Parasocial relationship	Moderator: Social presence Mediator: Enjoyment, loyalty, trust, and satisfaction	The parasocial relationship predicts virtual gift donation intention; social presence moderates the relationships between parasocial relationships and enjoyment, loyalty, trust, and satisfaction; enjoyment, loyalty, and trust positively impact virtual gift donation intention.	Social presence theory
(Y. Li & Peng, 2021)	Live streamer characteristics and live scene characteristics	Moderator: None Mediator: Emotional attachment and flow experience	Live streamer trustworthiness and attractiveness boost users' emotional attachment and gift-giving intention; telepresence and entertainment enhance the flow experience, impacting emotional attachment.	Attachment and flow theories
(Yu et al., 2018)	Viewer Engagement	Moderator: Engagement measurement Mediator: None	Viewers' engagement affects gift-giving decisions; spending varies based on engagement measurement.	-
(Zhou et al., 2019)	Viewer-Viewer Interaction	Moderator: None Mediator: None	The presence of others, social competition, and emotional stimuli positively influenced paid gifting	Arousal theory

	<i>(Presence of others, social competition, and emotional stimuli)</i>			behaviour within a Chinese live-streaming platform.	
(R. Li et al., 2021)	Identity-based motivation <i>(Class and Relational Identity)</i>	Moderator: Social density Mediator: None		Viewers' class and relational identities impact paid and gift-giving. Class identity negatively affects gift-giving. Relational and class identities interact, with more potent effects, if the giver has a high relational identity with the streamer. Social density also influences viewers' class identity and gifting behaviour.	-
(Wan et al., 2017)	Social and technological factors	Moderator: None Mediator: Emotional attachment to content creator and Functional dependence on social media		Donation intention is influenced by creator and functional dependence on social media, which are affected by social factors (identification, interaction, and information value) and technical factors (sociability and personalisation).	Socio-emotional attachment to the content technical systems framework and attachment theory
(Liu et al., 2022)	Value perception	Moderator: None Mediator: Satisfaction		The findings indicate that satisfaction fully mediates the effects of viewer value perception on the gifting amount and partially mediates the effects of value perception on the gifting number.	
This study	Social Isolation	Moderator: Self-confidence Mediator: Self-esteem	Self-	The first study on how social isolation predicts virtual gift donation intention considers self-esteem mediation and self-confidence moderation.	Terror management theory

Source: Authors

Social isolation, self-esteem, and virtual gift donation intention

Humans naturally tend to socialise, and social relationships are considered a necessity rather than a mere desire (Thapa et al., 2022). Terror management theory posits that people have a psychological need to feel that their lives have meaning and are valued members of a social group (Greenberg et al., 1986). Social isolation can lead to feelings of meaninglessness and lack of value to others (Holt-Lunstad et al., 2010), ultimately resulting in low self-esteem (Lyngdoh et al., 2023). Self-esteem, which refers to an individual's evaluation of their worth or value (Bearden et al., 2001; Leary & Baumeister, 2000), is a vital aspect of a person's overall sense of self and provides a fundamental sense of security (Blascovich & Tomaka, 1991). The awareness of one's mortality evokes deep-seated anxiety and existential fear, driving individuals to adopt cognitive and behavioural strategies that symbolically protect their sense of self (Rahimah et al., 2024). Individuals seek to maintain their self-esteem, as it helps them to avoid the paralysing terror that would otherwise be experienced (Leary & Baumeister, 2000), as proposed by terror management theory and employed by social psychologists (Smith et al., 2022).

People may address these feelings of social isolation and low self-esteem by seeking social connection and validation by engaging in prosocial behaviour through social media platforms. According to terror management theory, individuals may engage in the act of donating virtual gifts as a means of seeking validation. Belk and Coon (1993) suggest that symbolic value can be attached to these gifts, indicating a strong connection between the giver and recipient. Donating virtual gifts may give individuals a sense of meaning and purpose in their lives, allowing them to show support for others and be recognised as a valued social group member. From this perspective, it may be hypothesised that there is a relationship between social isolation, self-esteem, and the intention to donate virtual gifts, such that social isolation may increase an individual's intention to donate virtual gifts on the platform, with this positive relationship being mediated by self-esteem. Therefore, we propose.

H1. Individuals with higher levels of social isolation will exhibit higher intentions to donate virtual gifts.

H2. The relationship between social isolation and virtual gift donation intention is mediated by self-esteem.

Self-confidence as a moderator

Human psychology is greatly influenced by self-confidence, a crucial component that plays a significant role in decision-making (Chuang et al., 2013). Self-confidence is distinct from self-esteem, though the two concepts are related (Bearden et al., 2001). While self-esteem reflects an individual's general sense of self-worth (Coudevylle et al., 2011), self-confidence pertains to one's belief in their abilities and skills (Bearden et al., 2001). Apter (1984) proposed the confidence frame as a protective source of self-confidence, which relates to experiences and skills that aid in developing a sense of mastery and the necessary self-assurance to confront and overcome fear (Du et al., 2019).

According to Apter (2001), the confidence frame is linked to the danger zone and represents the level of confidence a person has in coping with present danger or risk. This frame provides feelings of safety in risky situations by instilling confidence in one's abilities, those of others, and equipment reliability. Conversely, despite the danger, experiencing the world as ultimately safe puts one in a protective frame associated with the paratelic state. Drawing on the above, it can be argued that self-confidence may moderate the relationship between social isolation and the intention to donate virtual gifts. Individuals with higher self-confidence may not feel the need to seek validation through virtual gift donation as much as those with lower self-confidence, even if they have experienced social isolation. This is consistent with findings from social prescribing research, which indicate that improved self-confidence can alleviate feelings of social isolation and foster a greater sense of self-worth and belonging (Liebmann et al., 2022). Therefore, it may be hypothesised that the positive relationship between social isolation and the intention to donate virtual gifts is moderated by self-confidence. Specifically, the higher an individual's self-confidence, the weaker the positive relationship between social isolation and intention to donate virtual gifts.

H3. Self-confidence moderates the relationship between social isolation and virtual gift donation. This effect is weaker for the individual with higher self-confidence.

Additionally, it can be hypothesised that the moderation effect of self-confidence on the relationship between social isolation and virtual gift donation intention is also present in the mediation effect of self-esteem. The association between social isolation and self-esteem may exhibit reduced strength among individuals with higher levels of self-confidence, resulting in a diminished mediation effect of self-esteem on the connection between social isolation and virtual gift donation intention. Thus, it is plausible to hypothesise that self-confidence moderates the mediation effect of self-esteem on the relationship between social isolation and virtual gift donation intention, whereby stronger self-confidence corresponds to a weaker mediation effect of self-esteem;

H4. The mediation effect of self-esteem on the relationship between social isolation and virtual gift donation intention is moderated by self-confidence.

The research conceptual model is illustrated in Figure 1.

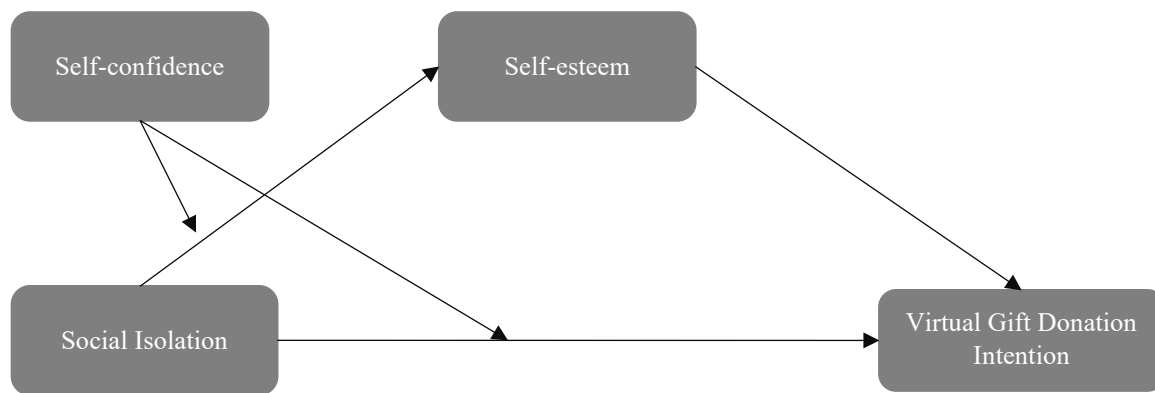


Figure 1. Model of the study

Source: Authors

Methodology

Measurements

Measurement items were rated on a five-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (5). The Friendship Scale (Hawthorne, 2006) assesses social isolation. The Friendship Scale consists of six items, three of which measure feelings of loneliness (e.g. "I felt isolated from others") and three of which gauge the significance of actual social interactions (e.g., "It has been easy to relate to others") (Hawthorne, 2008). The Friendship Scale categorises participants into five levels of perceived social isolation with scores ranging from 0-24 (0-11 = very socially isolated, 12-15 = isolated, 16 – 18 = some social support, 19-21 = socially connected, and 22-24 = very socially connected) (Hawthorne, 2008). The scale requires participants to rate their emotional experiences over four weeks on a 5-point scale (0=never, 4=almost always) (Haslam et al., 2016; Smith et al., 2020). A 4-item scale was adopted by Li and Peng (2021) to measure virtual gift donation intention (e.g., "I intend to give virtual gifts to the live streamer"). Self-esteem is measured by adopting a 10-item scale from Rosenberg (1965), such as "I feel that I have several good qualities.". A 10-item scale adopted from (Chelminski & Coulter, 2007) is used to measure self-confidence (e.g., "Owing to my capabilities, I have much potential"). The validity and reliability of these scales have been established in prior research, ensuring their appropriateness for the current study.

Participants and data collection

The survey was created with SurveyMonkey and distributed via the Amazon Mechanical Turk (MTurk) website. MTurk is a cost-effective and high-quality data source for social science research (Goodman et al., 2013). This platform was specifically chosen due to its ability to provide access to a diverse and tech-savvy participant pool, which aligns well with the study's focus on live streaming and virtual gift behaviours. The survey began with a general overview of the study and its objectives, followed by a participant qualification question. To qualify for the study, individuals had to have viewed live video streams within the past month and purchased virtual gifts on these platforms within six months. A screening question was used to exclude participants who did not meet these criteria following previous research on live video streaming (Hsieh et al., 2022). After the screening questions, participants are asked, "Please answer the following

questions about yourself. During the past four weeks, [...]” as in Anderson, Kaplan, & Vega(2015), followed by social isolation items. Then, the items of virtual gift donation intention, self-esteem, and self-confidence have been asked following this statement: “Using the scale below, please rate each item in terms of how well it describes you”. An attention-check question (e.g., "Please select 'strongly agree' for this item") was included to ensure data quality, and responses failing this check were excluded from the analysis. The survey concluded by requesting demographic information from the participants. After collecting 420 responses and removing missing data and responses that failed the attention check, 327 usable surveys remained for further analysis.

Results

Respondents’ Demographic Profiles

Most respondents are 25-34, followed by the 35-44 age group. The smallest percentage is the 55+ age group. 61.2% of the participants were male, and 38.5% were female. Most participants possess an undergraduate degree, with a prevalence of 73.1%, while a smaller proportion, comprising 16.2%, hold a postgraduate degree. Among the surveyed population, 19.0% are single, and 42.8% are married. 37.6% have a bachelor's degree, 16.2% have a master's degree. 12.8% have a high school diploma/GED, 9.5% have some college but no degree, 11.6% have an associate degree, and 1.5% have a doctoral degree. 0.6% have a professional degree, such as JD or MD, and 4.6% have less than a high school degree (See Table 2).

Table 2. Demographic Profile

Items	N	%	Items	N	%
Gender			Marital Status		
<i>Male</i>	200	61.2	<i>Single</i>	62	19.0
<i>Female</i>	126	38.5	<i>Married</i>	140	42.8
<i>Non-binary</i>	1	.3	<i>Others</i>	125	38.2

Education level	15	4.6	Age		
<i>Less than a high school degree</i>	33	10.1	<i>18-24 years old</i>	31	9.5
<i>High school graduate</i>	42	12.8	<i>25-34 years old</i>	150	45.9
<i>Some college but no degree</i>	31	9.5	<i>35-44 years old</i>	105	32.1
<i>Associate degree in college (2-year)</i>	38	11.6	<i>45-54 years old</i>	26	8
<i>Bachelor's degree in college (4-year)</i>	123	37.6	<i>55 and above</i>	15	4.6
<i>Master's degree</i>	53	16.2			
<i>Doctoral Degree</i>	5	1.5			
<i>Professional degree (JD, MD)</i>	2	.6			

Source: Authors

Reliability and Validity Analysis

The Partial Least Squares Structural Equation Modeling (PLS-SEM) approach was used to examine the research proposed hypotheses. This approach efficiently analyses complex models involving mediation, moderation, and small sample sizes (Sarstedt & Ringle, 2017). Using the recommended two-step approach outlined in previous scholarly work (Anderson & Gerbing, 1988), our study initially assessed the measurement model's quality by conducting analyses for convergent validity, discriminant validity, and reliability. Subsequently, SEM analysis was employed to examine and evaluate the research hypotheses. Our results, presented in Table 2, demonstrated acceptable values for all variables, Cronbach's alpha (α), confirming the reliability and internal consistency of the survey items (Nunnally, 1978). We assessed convergent validity using item loading, which ranged between 0.69 and 0.93, indicating adequate convergent validity (Fornell & Larcker, 1981). Composite reliability, which was reported to be above the threshold

value of 0.7, further supported our findings. Discriminant validity was evaluated by applying Fornell & Larcker's (1981) recommendation, which involves comparing the correlation coefficients between constructs with the square root of the average variance extracted (AVE) values. The findings from our study, as illustrated in Table 4, demonstrated that the square root of the AVE exhibited a higher magnitude compared to the correlation coefficients between the constructs. This observation serves as evidence supporting the presence of discriminant validity.

Table 3. Measurement model

	α	rho_a	rho_c	AVE	λ
Virtual Gift Donation Intention (Li & Peng, 2021)	0.857	0.877	0.903	0.701	
"I intend to give virtual gifts to the live streamer."					0.8
"I will give virtual gifts next time."					0.789
"I will likely give virtual gifts to the live streamer in the future."					0.82
"If I have some money at my disposal, I am willing to give virtual gifts to the live streamer."					0.932
Social Isolation (Hawthorne, 2006)	0.886	0.89	0.914	0.639	
"When with others, I felt separate from them."					0.806
"I felt isolated from other people."					0.853
"I felt alone and friendless."					0.819
"I found it easy to get in touch with others when needed to." (R)					0.696
"I had someone to share my feelings with." (R)					0.824
"It has been easy to relate to others." (R)					0.788
Self-esteem (Rosenberg, 1965)	0.931	0.937	0.942	0.62	
"On the whole, I am satisfied with myself".					0.801
"At times, I think I am no good at all." (R)					0.713
"I feel that I do not have much to be proud of." (R)					0.824
"I certainly feel useless at times." (R)					0.8
"I feel that I have several good qualities."					0.82
"I can do things as well as most other people."					0.816

“I feel that I am a person of worth, at least on an equal plane with others.”	0.719
“I wish I could have more respect for myself.” (R)	0.707
“All in all, I am inclined to feel that I am a failure.” (R)	0.852
“I take a positive attitude towards myself.”	0.805
Self-confidence (Chelminski & Coulter, 2007)	0.919 0.923 0.932 0.58
“Owing to my capabilities, I have much potential.”	0.708
“I do not succeed at much.”	0.816
“I have done well in life so far.”	0.822
“I perform very well at several things.”	0.806
“I am a capable person.”	0.756
“I do not have much to be proud of.”	0.741
“I am talented.”	0.728
“I am not very competent.”	0.783
“I deal poorly with life challenges.”	0.694
“I perform inadequately in many important situations.”	0.749

Source: Authors

Table 4. Discriminant validity

	Self- confidence	Self- esteem	Social Isolation	Virtual Donation Intention	Gift
Self-confidence	0.76				
Self-esteem	0.633	0.78			
Social Isolation	0.61	0.52	0.79		
Virtual Gift Donation Intention				0.83	
	0.586	0.584	0.689		

Source: Authors

Hypotheses testing

Using the SEM approach with SmartPLS (version 4), the proposed hypotheses of the study were evaluated. The study model explained 42.1% and 44.7% of the variance in self-esteem and virtual gift donation intention, respectively. Results from Table 5 indicated that social isolation strongly predicted virtual gift donation intention ($\beta = 0.58$, $p < 0.05$), which supported H1. To examine the mediation effect of self-esteem on the relationship between social isolation and virtual gift donation intention, the researchers estimated a bias-corrected bootstrapped confidence interval ($N = 5000$) using Preacher et al.'s (2007) method. The results showed a significant mediation effect of self-esteem on the relationship between social isolation and virtual gift donation intention ($\beta = -0.10$, $p < 0.05$), supporting H2. Interestingly, the interaction effect of self-confidence on the relationship between social isolation and virtual gift donation intention was reported as a nonsignificant effect ($\beta = -0.04$, $p > 0.05$), rejecting H3. The study also explored the moderated mediation effect of self-confidence on the relationship between social isolation and virtual gift donation intention through self-esteem using the Process model in SmartPLS4, and the results demonstrated a significant moderated mediation effect ($\beta = 0.05$, $p < 0.05$), which supported H4.

Table 5. Hypotheses results (direct and interaction effects).

H	Regression path	β	SD	t Value	p-value
Direct relations					
H1	Social Isolation \rightarrow Virtual Gift Donation Intention	0.588	0.219	2.68	0.007
Indirect relations					
H2	Social Isolation \rightarrow Self-esteem \rightarrow Virtual Gift Donation Intention	-0.107	0.051	2.104	0.035
Moderation effect					
H3	Self-confidence * Social Isolation \rightarrow Virtual Gift Donation Intention	-0.043	0.043	0.999	0.318
Moderated mediation effect					

H4	Self-confidence * Social Isolation	Self-Esteem			
	Virtual Gift Donation Intention	0.053	0.017	3.125	0.002
R-square (R²)					
	Self Esteem	42.1 %			
	Virtual Gift Donation Intention	44.7 %			
Source: Authors					

Discussion

Theoretical contribution

This study makes several theoretical contributions. In contrast to previous research (e.g., Lee & Park, 2019), our findings suggest a positive relationship between social isolation and individuals' intention to engage in prosocial behaviour. Specifically, this study reveals that a higher level of social isolation significantly predicts an individual's intention to donate virtual gifts. These results align with the studies conducted by Lyngdoh et al. (2023) and Thapa et al.(2022), who also found similar results regarding increased sharing of personal information on social media and purchase intention, respectively. However, this study is the first to contribute to past research by extending the effect of social isolation on the intention to donate virtual gifts.

Moreover, this study examines the underlying mechanism of this effect, incorporating self-esteem as a mediator. More precisely, the study found that the positive effect of social isolation on the intention to donate virtual gifts is more substantial when self-esteem is low. These findings support the paper's theoretical framework and the terror management theory, suggesting that socially isolated individuals may feel a lack of purpose and feel undervalued by others, leading to lower self-esteem. Therefore, they may try to find a sense of belonging by donating virtual gifts to live streamers. Hence, this study makes two significant contributions: first, it provides empirical evidence for the mechanism underlying the relationship between social isolation, self-esteem, and virtual gift donation intention; second, it demonstrates the validity of Terror Management Theory

as a framework applicable to the digital environment. Unlike traditional applications of this theory in offline contexts (e.g., Rahmawati et al., 2025), our findings provide novel insights into how users engage in compensatory behaviours in digital spaces. By highlighting these psychological mechanisms, this study extends the theoretical scope of Terror Management Theory and provides a deeper understanding of digital consumer behaviour.

Moreover, this study also contributed to the literature by examining the impact of self-confidence on the research constructs. In contrast to our theoretical argument, the study found that self-confidence does not moderate the relationship between social isolation and virtual gift donation intention when excluding self-esteem from the relationship. This implies that, regardless of an individual's level of self-confidence, a high level of social isolation is a critical factor in stimulating the donation intention of virtual gifts to live streamers. This finding somehow contradicts the concept of the "confidence frame" proposed by Apter (2001), which suggests that self-confidence can act as a protective resource for managing fear, overcoming obstacles, and dealing with present risks or threats. This may happen because the "confidence frame" proposed by Apter (2001) may not fully apply to virtual gift donation intentions in social isolation.

Nevertheless, self-confidence plays a vital role in this relation when examining the moderating effect of self-confidence on the indirect relationship between social isolation and virtual gift donation intention through self-esteem. Consistent with earlier research (e.g., Campbell, 1990; Coudevylle et al., 2011), which has established a strong connection between self-esteem and self-confidence, this study sheds new light on the dynamic interplay between these two factors in the context of social isolation and virtual gift donation intention. It is the first study to explicitly incorporate the interaction between self-esteem and self-confidence in this relationship. The findings indicate that the indirect effect of self-esteem on the relationship between social isolation and virtual gift donation intention varies depending on an individual's level of self-confidence. Specifically, individuals with low self-confidence show a stronger predictive relationship between social isolation and virtual gift donation intention. Hence, two more theoretical contributions were achieved: providing empirical evidence that regardless of the level of user's self-confidence, social isolation will always produce the same effect on virtual gift donation intention; second, the role of self-esteem as an explanatory variable of why social isolation affects virtual gift donation intention varies depending on the level of users' self-confidence.

Managerial implications

The results of this study provide several critical managerial implications for social media companies, particularly those offering virtual gift options. First, our findings offer valuable guidance for social media platforms and streamers seeking to maximise virtual gift donation revenue. Specifically, platforms and streamers aiming to boost their income should prioritise targeting socially isolated users, as our study shows these individuals are significantly more likely to donate virtual gifts. Companies can strategically increase engagement and revenue through targeted campaigns catering to socially isolated users' unique needs by focusing on this high-potential user group. For example, social media platforms could leverage advanced sentiment analysis tools to identify users displaying signs of social isolation, such as infrequent interactions, negative post sentiment, or a lack of social connections. Once identified, platforms could create personalised outreach campaigns that offer special incentives, such as exclusive virtual gifts or recognition for donations, explicitly aimed at these users.

Second, people with low self-esteem are more inclined to engage in virtual gift donations on social media platforms because it can boost their self-worth and improve their social status. Virtual gift-giving can make individuals feel valued, appreciated, and connected to others, contributing to their self-esteem. Therefore, organisations can leverage this insight by targeting social media marketing campaigns for users with low self-esteem. Organisations can encourage participation in these activities by creating messaging emphasising how donating virtual gifts can make individuals feel good about themselves and their contributions. This helps individuals build their self-esteem, improve their social connections, and increase revenue for broadcasters and the platform, as more donations lead to higher earnings.

Third, the finding explaining that self-confidence does not directly moderate the relationship between social isolation and virtual gift donation intention but indirectly through self-esteem suggests that building self-esteem may be a more effective way to increase virtual gift donation intention among socially isolated individuals than simply improving self-confidence. In terms of managerial implications, companies that rely on virtual gift donations could benefit from this finding by incorporating strategies that focus on building self-esteem in their marketing or outreach campaigns. For example, a company could develop a messaging campaign highlighting virtual gift

donations' positive impact on self-esteem and use targeted advertising to reach socially isolated individuals. Additionally, companies could partner with organisations that provide services or resources that build self-esteem, such as mental health clinics or community centres, to support their marketing efforts.

Limitations and suggestions for future studies

This study presents future research opportunities due to its limitations. It does not consider the specific social media platforms used for virtual gift donations, each with distinct characteristics (Aljarah et al., 2022; Heng Wei et al., 2022). Future studies could explore the proposed model across different platforms. While this study examines the moderating effect of self-confidence on social isolation's outcomes, other factors impacting isolation's consequences, like the fear of missing out, have been identified (Lyngdoh et al., 2023). Investigating how these factors influence the studied constructs would be valuable. With a US-focused sample emphasising individualism, it is unclear if social isolation's impact on virtual gift donation intention applies universally across cultures. To address this gap, future research should explore how culture moderates these variables. Recent analysis shows that gift-giving research concentrates on developed countries (Gupta et al., 2023), including this study. Exploring this topic in developing countries and comparing findings could yield valuable insights for future research. In this study, social isolation was measured using the friendship scale. However, future research could explore alternative approaches to measure social isolation. For example, an experimental design method such as the cyberball game could generate instances of isolation and subsequently measure participants' intention to donate virtual gifts.

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