

Uncertainty reduction in Facebook C2C social commerce: an uncertainty reduction theory perspective

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Abstract

Purpose – The purpose of this study is to investigate how nonverbal communication cues, specifically emoticons and product presentation pictures, reduce uncertainty and build trust in Facebook consumer-to-consumer (C2C) social commerce. Grounded in uncertainty reduction theory (URT), this study examines how these cues influence disclosure, reciprocity and verbal expressions of affection between buyers and sellers.

Design/methodology/approach – An online field experiment using a 2×2 between-subjects factorial design was conducted to test the effects of emotional emoticons (high vs low) and product presentation pictures (with vs without picture) on disclosure, reciprocity and verbal expressions of affection in Facebook C2C social commerce. A total of 120 participants from Facebook “buy and sell” groups in Taiwan engaged in controlled buyer–seller interactions via Messenger. Data is analyzed using ANOVA and logistics regression techniques.

Findings – The results of this study show that high-emotion emoticons and product presentation pictures significantly increase both disclosure and reciprocity, reducing buyer uncertainty. Information quality further strengthens these effects through interaction effects with emoticons and images. Disclosure, rather than reciprocity, emerged as the key predictor of verbal statements of affection, underscoring its central role in advancing trust and relational warmth in Facebook C2C social commerce interactions.

Originality/value – This study extends URT into the context of Facebook C2C social commerce, demonstrating that emoticons and product presentation pictures function as strategic tools of uncertainty reduction rather than mere expressions of emotion or aesthetics. This study highlights the transactional and relational importance of nonverbal cues in shaping trust, transparency and engagement in peer-to-peer digital marketplaces. These insights illustrate how thoughtful communicative strategies can enhance transaction outcomes, strengthen buyer–seller relationships and support the long-term sustainability of digital exchange environments.

Keywords Computer-mediated communication, Emoticons, Information quality, Social commerce, Uncertainty reduction theory, Verbal statement affection

Paper type Research paper



1. Introduction

The rapid proliferation of social media platforms has profoundly transformed how individuals communicate, interact and conduct commerce (Zhao *et al.*, 2024). This transformation has given rise to social commerce, broadly defined as the integration of social networking and e-commerce functionalities to facilitate buying, selling, comparing and sharing products and services within online communities (Cao *et al.*, 2021; Hajli, 2015). Social media provides companies and organizations with a wide range of valuable business opportunities and benefits (He, 2012). However, social commerce extends beyond transactional efficiency by embedding economic activities within interpersonal interactions and community engagement (Chen *et al.*, 2020). Among these platforms, Facebook buy-and-sell groups have emerged as particularly significant, offering affordability, accessibility, information seeking and opportunities for sustainable consumption through the resale of goods (Husnain *et al.*, 2025; Mokhberi, 2023; Mokhberi *et al.*, 2024; Yannopoulou *et al.*, 2019).

Facebook provides a wide range of features to facilitate these activities, including Facebook Messenger, which enables buyers and sellers to interact through texts, pictures and emoticons. Such features allow users to communicate across linguistic boundaries and personalize exchanges (Valmohammadi *et al.*, 2023). In consumer-to-consumer (C2C) commerce, these tools play a crucial role in reducing uncertainty: the quality of product information, visual presentation and the use of emoticons can enhance impression management, cultivate reciprocity and build trust between unfamiliar parties. Prior research suggests that textual and visual cues in computer-mediated communication (CMC) can serve functions similar to nonverbal signals in face-to-face interactions (Fullwood and Martino, 2007). With the rise of new communication forms on social media, organizations of all types have intensified their focus on strategies that engage consumers, reaffirming the critical role of effective communication strategies (Santos *et al.*, 2025). However, despite their widespread use, the role of emoticons and visual cues in reducing uncertainty and shaping relational outcomes in C2C commerce remains underexplored.

Beyond this CMC paradox, Facebook-based C2C commerce continues to face structural challenges. Buyers often face limited or unclear product information, as well as many competing listings. These challenges make it harder for them to judge product quality and make confident purchase decisions (Bansal and Thakur, 2025). Immersive browsing and serendipitous discoveries can stimulate impulse buying, creating a paradox where platforms designed to support sustainability also promote overconsumption (Husnain *et al.*, 2025). Weak platform monitoring, reliance on seller-generated content and minimal verification mechanisms further exacerbate information asymmetry and uncertainty about product quality, seller reliability and transaction safety (Chatterjee and Datta, 2008; Fay and Xie, 2010; Jiang *et al.*, 2017). Existing studies have used frameworks such as transfer theory, which explains how platform features and brand associations reduce uncertainty in impulse buying (Han, 2023). Other work draws on the social support perspective to highlight how emotional and instrumental peer interactions shape purchase intentions and seller performance (Chen *et al.*, 2020). Social recommendation research also shows how interpersonal cues and word-of-mouth influence consumer decisions (Cao *et al.*, 2021). However, these perspectives do not fully explain how buyers actively seek information and reduce uncertainty during buyer–seller exchanges in digital marketplaces.

In this context, the uncertainty reduction theory (URT) (Berger and Calabrese, 1975) provides a particularly suitable lens. URT posits that individuals seek to reduce ambiguity by using strategies such as disclosure (sharing information) and reciprocity (mutual exchange), which help establish trust and predictability in interactions. Applied to Facebook C2C commerce, URT offers a framework for understanding how buyers and sellers use product

pictures, textual cues and emoticons to manage uncertainty in ways comparable to nonverbal behaviors in face-to-face contexts. Accordingly, this study addresses a critical gap by investigating whether product presentation and emoticons influence uncertainty-reduction strategies, disclosure and reciprocity and how these strategies shape buyer–seller verbal statement of affection as relational outcomes in Facebook C2C social commerce.

Overall, this study offers contributions to the literature and practice of social commerce. Theoretically, this study extends the application of URT into Facebook C2C social commerce by showing how textual and visual cues, specifically product presentation and emoticons, operate as mechanisms that shape disclosure and reciprocity during buyer–seller interactions. By doing so, the study advances current understanding of how consumers actively manage uncertainty in digital peer-to-peer (P2P) marketplaces, addressing a gap left by prior frameworks such as trust transfer, social support and social presence theories. Practically, the findings provide insights for platform designers and sellers by highlighting how communication features and visual strategies can promote greater affection, reduce transaction-related risk and encourage sustainable buyer–seller engagement.

2. Literature review

2.1 Facebook consumer-to-consumer social commerce

The rise of social commerce has redefined the way individuals engage in digital buying and selling, blending social networking and transactional exchange (Cao *et al.*, 2021). Within this ecosystem, Facebook C2C buy-and-sell groups represent a major P2P marketplace, providing accessibility, social interaction and affordability to everyday consumers (Husnain *et al.*, 2025; Mokhberi, 2023; Mokhberi *et al.*, 2024). Unlike conventional e-commerce platforms such as eBay or Shopee, these Facebook groups embed economic exchange within ongoing social interaction, enabling users to communicate directly through Facebook Messenger, share images and emoticons and negotiate prices or conditions in real time.

Research on C2C social commerce identifies its defining characteristics as trust-building through interpersonal communication, user-generated product information and limited platform governance (Chen *et al.*, 2020; Yannopoulou *et al.*, 2019). Moreover, Al-Busaidi and Al-Wahaibi (2025) demonstrate that user participation in social commerce communities is strongly shaped by perceived trust, platform interaction quality and the reduction of ambiguity in buyer–seller exchanges. These features make uncertainty reduction a critical process in transactions involving unfamiliar sellers. As Facebook users interact, visual and affective cues, such as product images and emoticons, become substitutes for the nonverbal behaviors of face-to-face (F2F) communication, helping users to evaluate trustworthiness and authenticity (Fullwood and Martino, 2007; Son and Negahban, 2023). Consequently, understanding how users use these cues in Facebook-based C2C transactions contributes to both theory and practice by revealing how emotion and information intertwine to nurture perceived safety and relational warmth in digital exchanges.

2.2 Uncertainty reduction theory

Berger and Calabrese (1975) developed URT as a post-positivist framework to explain how individuals manage ambiguity during initial interactions. At the entry stage of communication, when two strangers initiate conversation, people seek to reduce uncertainty by gathering information, forming impressions and gradually building intimacy and affection (Afifi and Metts, 1998; Douglas, 1994). In this way, URT provides a theoretical lens for understanding how individuals rationalize and process information under conditions of uncertainty (Zhou *et al.*, 2023). The theory identifies three main strategies:

- (1) passive strategies (observing others unobtrusively);
- (2) active strategies (seeking information indirectly, often from third parties); and
- (3) interactive strategies (direct engagement through questioning or dialogue) (Berger and Calabrese, 1975).

The balance of these strategies varies depending on the communicative environment, particularly when comparing F2F and CMC.

In F2F settings, where buyers and sellers interact in informal marketplaces, uncertainty reduction strategies appear in familiar forms. Passive strategies involve observing seller behavior or product cues, active strategies rely on third-party information such as word-of-mouth and interactive strategies occur through direct questioning or negotiation. Prior research shows that disclosure and reciprocity, two core mechanisms of URT, play a central role in these interactions: individuals reduce uncertainty by sharing information, while others reciprocate by revealing preferences or intentions, helping to establish trust and mutual understanding (Lin *et al.*, 2016). Nonverbal cues further support this process. Goffman (2023) argued that interaction often involves cooperative performances that preserve face, especially in early encounters where uncertainty is high. Consistent with this, Son and Negahban (2023) found that symbolic cues such as emojis reduce ambiguity in digital contexts, mirroring how affective gestures like smiling or demonstrating products reduce uncertainty in F2F exchanges.

In digital social commerce, particularly on platforms such as Facebook C2C, the absence of physical presence shifts emphasis toward interactive strategies. Prior research suggests that passive and active strategies are harder to adopt in text-based CMC, leaving interactive disclosure and reciprocity as the primary means of reducing uncertainty (Ramirez *et al.*, 2002; Walther, 1992). Emojis, product photos and textual descriptions substitute for nonverbal cues, while reciprocal feedback loops enhance predictability and trust. Shin *et al.* (2017) and Shin *et al.* (2023) demonstrated that the usefulness and richness of fan page content significantly lower uncertainty and encourage continued engagement, findings consistent with how buyers and sellers in online marketplaces use disclosure and symbolic cues to manage risk. Similarly, Gambo and Özad (2021) confirmed that users use passive, active and interactive strategies on social media to reduce uncertainty, translating into behaviors such as browsing individual profiles, information seeking and engaging directly with other social networking sites users.

Overall, URT underscores that reducing uncertainty is essentially the gathering of information to increase predictability (Venkatesh *et al.*, 2016). Whether in F2F or digital commerce, individuals rely on disclosure, reciprocity and symbolic performances to mitigate ambiguity. Importantly, when uncertainty is perceived as high, interaction tends to involve higher rates of reciprocity to equalize information exchange (Berger and Calabrese, 1975; Goffman, 2023). This theoretical foundation provides a robust framework for analyzing how buyers and sellers in Facebook C2C commerce manage transactional uncertainty through textual and visual cues that parallel nonverbal strategies in face-to-face contexts.

In essence, despite a growing body of social commerce research, empirical evidence on how nonverbal digital cues operate as uncertainty reduction mechanisms remains limited. Prior studies have focused on platform-level trust or peer influence but have overlooked the micro-interactional processes within Facebook C2C exchanges. This study fills that gap by applying URT to reveal how emoticons, pictures and information quality jointly shape disclosure, reciprocity and affection, offering both theoretical enrichment and practical insights for sustainable digital commerce.

2.3 Emoticons and disclosure in Facebook consumer-to-consumer social commerce

Emoticons convey affective and relational meaning in text-based communication by functioning as paralinguistic cues that substitute for facial expressions and emotional tone (Derks *et al.*, 2007a, 2007b; Hsieh and Tseng, 2017). Within Facebook Messenger, which is widely used for buyer–seller communication in Facebook C2C groups, emoticons help compensate for the absence of nonverbal cues that normally guide trust-building in face-to-face exchanges. Prior studies show that emoticons improve message clarity, convey relational warmth and reduce uncertainty during online interactions (Son and Negahban, 2023; Thompson and Filik, 2016). High-affect emoticons such as hearts or smiling faces communicate friendliness and openness and tend to elicit reciprocal emotional responses from receivers (Gambo and Özac, 2021; Luor *et al.*, 2010).

In Facebook C2C transactions, these functions take on an explicitly strategic role. Sellers frequently use emoticons to soften negotiation, present themselves as approachable and reduce buyers' perceived risk when dealing with unfamiliar individuals. Emotional cues help humanize the seller, signal sincerity and enhance the perceived credibility of product-related messages (Zhang *et al.*, 2024). When buyers interpret such signals as genuine, they are more willing to engage in deeper conversation, disclose preferences and share transaction-relevant information. In other words, emoticons do not simply add emotional flavor but directly support the uncertainty reduction process that shapes information exchange in C2C commerce. Therefore, the following hypotheses are proposed:

- H1. High-emotion emoticons increase buyer–seller disclosure more than low-emotion emoticons in Facebook consumer-to-consumer social commerce.
- H2. High-emotion emoticons increase buyer–seller reciprocity more than low-emotion emoticons in Facebook consumer-to-consumer social commerce.

2.4 Product presentation pictures and uncertainty reduction in Facebook consumer-to-consumer social commerce

Visual information plays a central role in shaping consumer trust and evaluation in online marketplaces (Jiang and BenbasaXt, 2007; Zhang *et al.*, 2024). In Facebook C2C social commerce, where buyers cannot physically inspect products and often interact with unfamiliar sellers, product pictures serve as essential visual evidence that reduces ambiguity and strengthens credibility. Clear and authentic images signal transparency and effort on the part of the seller, which are important components of uncertainty reduction in peer-driven environments (Jarvenpaa and Todd, 1996).

Product presentation pictures also function as a form of disclosure in buyer–seller interactions. When sellers provide detailed and context-rich images during Facebook Messenger exchanges, they reveal product attributes, usage conditions and quality indicators that cannot be easily conveyed through text alone. This additional visual information helps buyers form more accurate judgments about product value and seller intentions, which decreases perceived risk and increases relational warmth (Ou *et al.*, 2014).

Within the Facebook C2C context, where trust is developed through interpersonal cues rather than platform-level assurances, product pictures encourage reciprocal engagement. Buyers who receive clear visual information are more likely to respond with questions, share preferences, express interest or continue the interaction. Thus, both disclosure and reciprocity are stimulated when product images are incorporated into the communication exchange. Based on the above reasoning, we propose the following hypotheses:

- H3. Posts that include product presentation pictures will generate higher buyer–seller disclosure than posts without pictures in Facebook consumer-to-consumer social commerce.
- H4. Posts that include product presentation pictures will generate higher buyer–seller reciprocity than posts without pictures in Facebook consumer-to-consumer social commerce.

2.5 Moderating role of information quality in Facebook consumer-to-consumer social commerce

Information quality is a fundamental determinant of successful online transactions and has been widely recognized as essential for reducing ambiguity and enhancing decision-making in digital environments (DeLone and McLean, 1992, 2003, 2004; Petter *et al.*, 2013). In social commerce settings, high-quality information that is accurate, reliable, timely and relevant strengthens consumer trust and improves the credibility of seller-generated content (Chen *et al.*, 2016; Forsgren *et al.*, 2016). When information quality is low, buyers may experience greater uncertainty, perceive higher risk and become hesitant to engage in further interaction (Kim, 2021).

In Facebook C2C social commerce, information quality plays an important role in shaping how buyers interpret emotional and visual cues during communication. When sellers provide clear product descriptions, transparent details and consistent responses, the credibility of emoticons and product pictures is enhanced. High-quality information reinforces buyers' confidence that affective signals and visual disclosures reflect genuine intentions rather than superficial persuasion attempts. This creates a communication environment where emoticons, product images and textual information work together to facilitate disclosure and reciprocity. Conversely, when information is incomplete, vague or inconsistent, buyers may view emotional cues or product images with suspicion. Under such conditions, emoticons may appear insincere, while pictures may be interpreted as selective or misleading. As a result, the uncertainty-reducing effect of these cues becomes weaker. Based on the above reasoning, the following moderating hypotheses are proposed for Facebook C2C social commerce:

- H5. Information quality strengthens the positive effect of emoticons on buyer–seller disclosure in Facebook consumer-to-consumer social commerce.
- H6. Information quality strengthens the positive effect of emoticons on buyer–seller reciprocity in Facebook consumer-to-consumer social commerce.
- H7. Information quality strengthens the positive effect of product presentation pictures on buyer–seller disclosure in Facebook consumer-to-consumer social commerce.
- H8. Information quality strengthens the positive effect of product presentation pictures on buyer–seller reciprocity in Facebook consumer-to-consumer social commerce.

2.6 Disclosure, reciprocity and verbal statements of affection in Facebook consumer-to-consumer social commerce

URT explains that as individuals share information and respond to one another's messages, uncertainty decreases and relational closeness increases (Berger and Calabrese, 1975). In computer-mediated environments, where traditional nonverbal cues are limited, users compensate by expressing verbal affection such as compliments, gratitude, polite

expressions or supportive remarks (Walther *et al.*, 2005). These forms of verbal warmth serve as signals of sincerity and interpersonal connection. Prior research shows that disclosure plays a central role in building trust and interpersonal attraction. When individuals reveal personal preferences, intentions or detailed information, partners often perceive them as more open and trustworthy (Antheunis *et al.*, 2007; McKenna *et al.*, 2002). Reciprocity also contributes to positive relational outcomes. When one party responds with matching or complementary information, it demonstrates engagement, mutual interest and relational commitment (Collins and Miller, 1994).

In Facebook C2C social commerce, these relational processes take on additional importance because buyers and sellers are typically strangers relying solely on digitally mediated cues. When sellers engage in meaningful disclosure, such as sharing product details or personal assurances, buyers perceive greater transparency. Similarly, when sellers reciprocate promptly and constructively, buyers interpret this as a sign of reliability and interpersonal respect. Ultimately, these behaviors cultivate positive conversational exchanges that reduce uncertainty, enhance perceived trustworthiness and increase the likelihood of warm and friendly communication. Based on the above reasoning, the following hypotheses are proposed:

H9. Disclosure positively influences verbal statements of affection in Facebook consumer-to-consumer social commerce interactions.

H10. Reciprocity positively influences verbal statements of affection in Facebook consumer-to-consumer social commerce interactions.

3. Methodology

3.1 Experimental design

This study used an online field experiment to systematically examine the effects of emoticons and product presentation pictures on communication dynamics in Facebook C2C (“buy and sell”) social commerce groups. The experimental design followed a 2×2 full factorial between-subjects structure, incorporating two independent variables – emoticon type (high vs low emotional expression) and picture of product presentation (with picture vs without picture).

This design allowed for the analysis of both main effects and interaction effects, as well as the moderating role of information quality. The research model is illustrated in Figure 1, and the experimental structure is summarized in Table 1.

3.2 Experimental design

Following Wang and Zhang (2012), social commerce represents a rapidly growing yet underexplored context within the information systems (IS) field. To ensure ecological validity, this experiment was conducted in an authentic C2C Facebook “buy and sell” environment, focusing on the “Tainan Market: Buy and Sell” group – one of the largest and most active local trading groups in Taiwan.

We analyzed 18 such groups and identified that second-hand laptops (especially Apple MacBook) were among the most frequently traded products. Consequently, a second-hand MacBook Pro was selected as the standardized item for all experimental treatments. This choice reflects a high-involvement product category where trust, uncertainty reduction and visual presentation play a pivotal role in influencing buyer decisions.

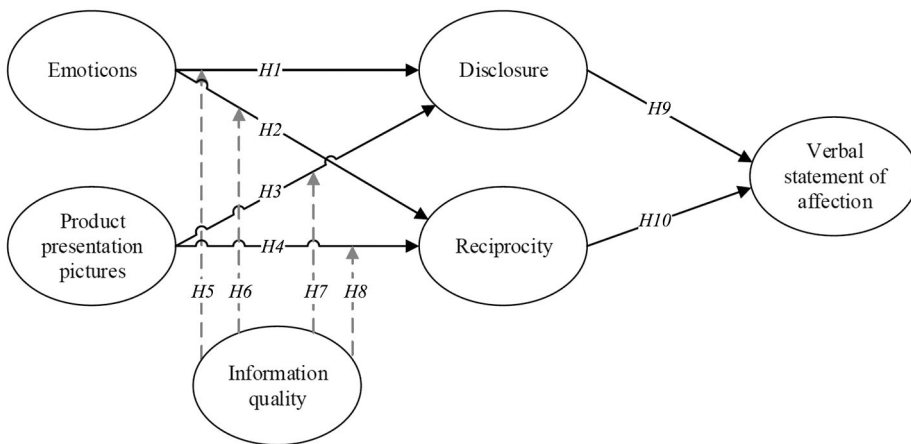


Figure 1. Research model
Source: Authors' own work

Table 1. Experimental design

Product presentation pictures	Emoticons	
	High emoticons	Low emoticons
With picture	A-01	A-02
Without picture	B-01	B-02

Source(s): Authors' own work

3.3 Manipulation checks

Emoticons: Given the central role of emotional expression and uncertainty reduction in this study, Facebook emoticons were systematically classified into high and low emotional expression categories through a rigorous multi-stage procedure. The process began with the compilation of 68 frequently used emoticons sourced from Facebook Messenger and other widely adopted CMC platforms. Two graduate students independently reviewed this initial pool and shortlisted six emoticons deemed representative of varying emotional intensities. A pilot study was then conducted with 20 IMBA students, who were asked to evaluate and classify each emoticon as either “high” or “low” in emotional expression. Their classifications were aggregated to determine consensus, resulting in the identification of two emoticons as low in emotional expression and four as high in emotional expression. These emoticons were embedded in both the Facebook post descriptions and messenger chat conversations to represent the two treatment levels. To ensure manipulation validity, respondents were asked:

Q1. What type of emoticon did you see from the post description?

Q2. What type of emoticon did you receive from the chatting conversation?

Picture of product presentation: The second manipulated variable was the presence or absence of a product picture in the post. Participants were asked:

Q3. Did the seller send you the picture of the MacBook during the chatting conversation?

3.4 Construct measurement

To ensure theoretical rigor and empirical validity, all constructs in this study were operationalized using established scales and adapted to the context of Facebook-based C2C social commerce. The primary constructs measured include disclosure, reciprocity, information quality and verbal statements of affection, supplemented by two control variables: self-presentation and effective use of instant messaging to account for individual differences in communication behavior.

Disclosure was conceptualized as the extent to which sellers are willing to share relevant, accurate and complete information during buyer–seller interactions. Although rooted in URC (Berger and Calabrese, 1975; Rubin and Shenker, 1978), disclosure remains challenging to measure directly within computer-mediated environments. Therefore, this study used a qualitative pre-phase, conducting in-depth interviews with 14 active members of Facebook “buy and sell” groups to identify salient indicators of disclosure in social commerce contexts. The transcribed interviews were thematically coded by the researcher and two independent coders, and the final scale items were developed based on the frequency and relevance of recurring disclosure-related expressions. The resulting eight-item self-developed scale was measured using a seven-point Likert scale ranging from strongly disagree (1) to strongly agree (7). Items captured perceptions of information completeness, accuracy, transparency and credibility of the seller’s communication, including details such as product condition, price, authenticity and contact information.

Reciprocity was defined as the degree to which sellers engage in two-way communication that enables mutual responsiveness and information exchange. Following prior studies on interactive communication in online commerce (Liu, 2003; Ou et al., 2014), reciprocity was measured through two dimensions: interpersonal interactivity and synchronicity. The four-item scale assessed how promptly and attentively sellers responded to inquiries and whether the interaction reflected balanced conversational dynamics. All items were evaluated using a seven-point Likert scale anchored from strongly disagree (1) to strongly agree (7).

Information quality represents the perceived usefulness, relevance and reliability of product-related information shared during C2C interactions. Drawing on prior IS research (Chen et al., 2016; DeLone and McLean, 1992, 2003, 2004; Petter et al., 2013; Wang, 2008), this construct encompassed four dimensions: accuracy, availability, reliability and relevance. Each dimension was measured through both expected and experienced information quality, yielding a total of eight items. Respondents rated each item on a seven-point scale, thereby capturing their evaluation of whether the information provided met or exceeded their expectations during the transaction.

Verbal statements of affection were measured using a content analysis approach to identify the linguistic cues expressing warmth, appreciation and positive affect within buyer–seller conversations. Following the operational definition by Scherwitz and Helmreich (1973), this variable captures direct or indirect expressions of encouragement, gratitude and respect in the chat exchanges. Three coders, including the primary researcher and two independent raters, coded the transcripts to ensure inter-coder reliability. Disagreements were resolved through discussion until consensus was achieved. To validate

the coding consistency, Cohen's Kappa values and Cronbach's alpha were computed, confirming satisfactory reliability levels for subsequent analysis.

Finally, to control for individual variations that might influence communication patterns, we incorporated self-presentation (Lee *et al.*, 2008) and effective use of instant messaging (Daft and Lengel, 1986; Ou *et al.*, 2014) as control variables. Demographic factors, including age, gender, education level and time spent on Facebook, were also collected to ensure robustness in the statistical models. Overall, these measurements provide a theoretically grounded and methodologically consistent operationalization of all variables, ensuring internal validity and alignment with this study's experimental objectives.

3.5 Experimental procedure

The experimental procedure was carefully designed to simulate authentic buyer–seller interactions in a Facebook C2C “buy and sell” environment. In this experiment, the researcher acted as the seller, posting fictitious advertisements for a second-hand MacBook Pro – a commonly traded and high-interest item across Taiwanese C2C Facebook groups. Four distinct product post descriptions were created to represent the different treatment combinations under the experimental design:

- (1) high emotional emoticons with picture;
- (2) high emotional emoticons without picture;
- (3) low emotional emoticons with picture; and
- (4) low emotional emoticons without picture.

These posts were randomly distributed across the group to avoid potential selection bias. All advertisements contained standardized information regarding product condition, specifications and price to ensure that the only manipulated elements were emoticon intensity and the presence or absence of a product image.

When potential buyers responded to a post, a private conversation was initiated via Facebook Messenger. During the chat, the seller (researcher) engaged participants following the assigned experimental condition. For example, in the high emoticon conditions, expressive emoticons (e.g. 😊💕👍) were frequently integrated into text-based communication to convey positive emotion, whereas in the low emoticon conditions, neutral emoticons (e.g. 😐😐) were used sparingly. Similarly, in the with-picture conditions, a clear product image of the advertised MacBook was sent during the interaction, whereas in the without-picture conditions, the conversation contained only text. The dialogue was designed to emulate typical C2C interactions involving product inquiries, clarifications and basic negotiation, ensuring realism while maintaining experimental control.

Each participant interacted with the researcher only once to avoid familiarity effects and prevent cross-treatment contamination. When the conversation ended, whether the buyer indicated continued interest or decided to stop the inquiry, the seller informed the participant that the interaction was part of an academic study and invited them to complete a brief online survey. The survey captured participants' perceptions of disclosure, reciprocity and information quality during the exchange, along with demographic information and relevant control variables. A JavaScript-based randomization algorithm embedded in the survey link ensured that participants were automatically and independently assigned to one of the four treatment conditions.

In total, 120 valid participants completed the experimental process, with approximately 30 participants per treatment condition. The participant pool primarily consisted of active users of Facebook “buy and sell” groups residing in Taiwan, representing diverse age and

professional backgrounds. While most participants were local to Taiwan, a number of students and expatriate users residing in Taiwan also engaged in the experiment; however, all interactions were conducted in English, ensuring cultural consistency in communication.

All conversations were recorded and transcribed for subsequent content analysis, particularly to code for verbal statements of affection. However, in adherence to ethical research protocols and data privacy standards, individual chat excerpts were anonymized, and no identifying information was retained. Direct textual excerpts from buyer–seller exchanges are not reproduced in this manuscript to respect participant privacy and comply with ethical approval conditions. Instead, anonymized illustrative summaries of the interaction types are presented in Section 3.6, which demonstrate how emoticons, product images and text-based communication contributed to disclosure, reciprocity and trust-building in the C2C context.

3.6 Illustrative interaction between buyer–seller

To provide deeper insight into how meaning, trust and relational cues emerged in actual exchanges, the following anonymized examples illustrate the interaction dynamics under each treatment condition. These are representative reconstructions rather than *verbatim* transcripts to preserve participant confidentiality. Table 2 provides illustrative examples of anonymized excerpts from representative buyer–seller exchanges.

These examples illustrate how emoticon expressiveness and visual presence shape perceived warmth, trust and willingness to disclose information – core constructs under URT.

3.7 Data analysis

Data were analyzed using factor analysis, ANOVA and logistic regression. Factor analysis reduced measurement items to core constructs, while ANOVA tested the main and interaction effects of emoticons and product pictures on disclosure and reciprocity. Logistic regression was subsequently applied to examine the influence of disclosure and reciprocity on verbal statements of affection.

Table 2. Anonymized excerpts from representative buyer–seller exchanges

Picture	Emoticons	
	High emoticons	Low emoticons
With picture	Seller: “hi 😊 thanks for your interest! the MacBook is still available. It’s in excellent condition 📺🔧 would you like to see more photos?” Buyer: “sure! it looks great 😊 can you show the keyboard area?” Seller: “of course! here’s a close-up 📺👍 it’s well maintained and works perfectly”	Seller: “hello. The MacBook is available. Attached is the photo of the item” Buyer: “thanks. How old is it?” Seller: “about three years”
Without picture	Seller: “hi 😊 the MacBook is still in great shape! 📺🔧 No scratches at all!” Buyer: “can I see a picture?” Seller: “sorry, can’t send one right now 🙏 but it looks new!”	Seller: “hi. The MacBook is available.” Buyer: “can you show me how it looks?” Seller: “No picture available at the moment”

Source(s): Authors’ own work

Control variables were included in ANCOVA tests, confirming that self-presentation and effective use of instant messaging significantly influenced both disclosure and reciprocity, consistent with prior CMC literature (Daft and Lengel, 1986; Lee *et al.*, 2008).

4. Results

4.1 Demographic results

A total of 120 valid participants took part in the experiment, all of whom were active users of Facebook “buy and sell” groups. Table 3 summarizes the participants’ demographic characteristics. The respondents represented 26 nationalities, with the largest proportions from Vietnam (27.5%), Taiwan (16.7%) and Indonesia (14.2%), reflecting the multicultural composition of social commerce users in Asia. Approximately 50.8% were female, and 49.2% were male. A majority (47.5%) were aged between 18 and 25 years, and most reported using Facebook for 1–3 h daily. Nearly 37% of participants made at least one to three purchases per month on C2C Facebook groups. Although approximately half of the respondents reported purchasing less than once per month, all were verified as active C2C users who regularly browse and interact within Facebook “buy and sell” groups. This reflects typical engagement patterns in social commerce communities, where social interaction and information exchange often outweigh purchase frequency. This demographic distribution confirms that the participant pool represents an active, digitally engaged consumer segment typical of Facebook C2C social commerce contexts.

4.2 Factor analysis and reliability tests

Exploratory factor analysis was performed to validate construct dimensionality for disclosure, reciprocity and information quality. All items loaded strongly on their intended constructs with factor loadings above 0.70, eigenvalues greater than 1.0 and cumulative variance explained exceeding 60% (Hair *et al.*, 2010). The Cronbach’s alpha values were all above 0.90, indicating excellent internal consistency and construct reliability (Gerbing and Anderson, 1988). These findings affirm that the measurement instruments were both statistically robust and theoretically consistent with prior research in online trust and uncertainty reduction (Berger and Calabrese, 1975; Petter *et al.*, 2013). Table 4 presents the results of the factor analysis and reliability tests.

4.3 Manipulation checks

Manipulation checks confirmed that participants accurately perceived the experimental conditions. A one-way ANOVA revealed significant differences between high- and low-emotion emoticons ($F = 42.200$ and $p < 0.001$) and between conditions with and without product pictures ($F = 7.429$ and $p < 0.01$). Levene’s tests for homogeneity of variances were nonsignificant ($p > 0.05$), indicating that the manipulations were successful. These results validate that the emotional and visual cues were salient and distinguishable to participants, ensuring the reliability of subsequent hypothesis testing.

4.4 ANOVA results

Main effects: The results indicate that emoticons significantly influenced disclosure ($F = 210.933$ and $p < 0.001$), with high-emotion emoticons ($M = 5.877$) generating higher disclosure than low-emotion emoticons ($M = 3.811$). As a result, $H1$ was supported. Similarly, emoticons significantly influenced reciprocity ($F = 40.092$ and $p < 0.001$), where high-emotion emoticons ($M = 5.877$) led to stronger reciprocal communication ($M = 3.811$); thereby, $H2$ was supported. These findings support the notion that affective expressiveness in

Table 3. Demographics summary

Demographics	Category	Frequency (n = 120)	%
Country	Taiwan	20	16.7
	Austria	1	0.8
	Mongolia	3	2.5
	Vietnam	33	27.5
	Indonesia	17	14.2
	Japan	2	1.7
	Spain	1	0.8
	Australia	1	0.8
	Burkina Faso	1	0.8
	China	2	1.7
	Philippines	5	4.2
	France	5	4.2
	Germany	5	4.2
	Haiti	3	2.5
	Honduras	1	0.8
	Hungary	1	0.8
	India	3	2.5
	Italy	1	0.8
	Malaysia	1	0.8
	Nepal	1	0.8
	Nicaragua	1	0.8
	Northern Ireland	1	0.8
	South Korea	1	0.8
	St. Kitts and Nevis	2	1.7
	Thailand	4	3.3
	The USA	4	3.3
Gender	Female	61	50.8
	Male	59	49.2
Age	18–25 years old	57	47.5
	26–32 years old	55	45.8
	33–39 years old	5	4.2
	More than 40 years old	3	2.5
Education	Unemployed	50	41.7
	Part-time employed	32	26.7
	Full-time employed	29	24.2
	Self-employed	9	7.5
Monthly income (USD)	Less than 200	28	23.3
	200–400	28	23.3
	400–600	30	25
	600–800	8	6.7
	800–1000	4	3.3
	More than 1000	22	18.3
Monthly spending (USD)	Less than 200	25	20.8
	200–400	52	43.3
	400–600	20	16.7
	600–800	7	5.8
	800–1000	7	5.8
	More than 1000	9	7.5
Total time spent on Facebook per day	Less than 1 h	17	14.2
	1–2 h	27	22.5
	2–3 h	30	25

(continued)

Table 3. Continued

Demographics	Category	Frequency (<i>n</i> = 120)	%
Total time on purchasing product(s) from Facebook “buy and sell” group per month.	3–4 h	12	10
	4–5 h	8	6.7
	5–6 h	8	6.7
	More than 6 h	18	15
	Less than 1 time	62	51.7
	Between 1–3 times	44	36.7
	Between 3–4 times	11	9.2
	Between 5–7 times	2	1.7
	More than 7 times	1	0.8

Source(s): Authors’ own work

CMC enhances relational warmth and openness, consistent with the premise of URT that self-disclosure and emotional signaling reduce ambiguity in interpersonal exchanges (Berger and Calabrese, 1975; Walther and D’Addario, 2001). Product presentation also had significant effects on both disclosure ($F = 34.957$ and $p < 0.001$) and reciprocity ($F = 96.479$ and $p < 0.001$). Interactions that included a product picture ($M = 5.514$) generated greater perceived openness and willingness to exchange information than those without pictures ($M = 4.270$); therefore, both $H3$ and $H4$ are supported. This finding aligns with earlier studies emphasizing that visual information serves as a credibility cue, reducing perceived transaction risk in online exchanges (Jiang and Benbasat, 2007; Kim *et al.*, 2008).

Interaction effects: Significant interaction effects emerged between emoticons $\times$ information quality ($F = 85.052$ and $p < 0.001$) and picture $\times$ information quality ($F = 32.970$ and $p < 0.001$) on disclosure; therefore, both $H5$ and $H7$ were supported. Likewise, significant interaction effects were observed between emoticons $\times$ information quality ($F = 20.694$ and $p < 0.001$) and picture $\times$ information quality ($F = 37.946$ and $p < 0.001$) on reciprocity. As a result, $H6$ and $H8$ were supported. These findings suggest that high-quality information amplifies the uncertainty-reducing power of emotional and visual cues. This supports the argument that information quality acts as a reinforcing mechanism in the uncertainty reduction process by strengthening message credibility and trustworthiness (Cao *et al.*, 2021; Chen *et al.*, 2020). Table 5 summarizes the ANOVA results for both main and interaction effects.

Control variables: ANCOVA analyses revealed that self-presentation ($F = 15.978$ and $p < 0.001$) and effective use of instant messaging ($F = 10.437$ and $p < 0.01$) significantly affected disclosure, while both also influenced reciprocity ($F = 17.473$ and $p < 0.001$; $F = 24.779$ and $p < 0.01$). These findings indicate that users’ self-monitoring ability and technological competence enhance their communicative engagement and impression management in C2C contexts (Daft and Lengel, 1986; Lee *et al.*, 2008).

4.5 Logistic regression analysis

The final stage of analysis focused on verbal statements of affection, operationalized as the presence (1) or absence (0) of positive verbal expressions in buyer–seller chats, such as appreciation, respect and friendliness. Coding was conducted by three independent coders, achieving satisfactory inter-coder reliability (Cohen’s $\kappa = 0.60$ and 0.65 ; Cronbach’s $\alpha = 0.862$). According to the interpretive thresholds of Landis and Koch (1977), this represents moderate to good reliability. While the inter-coder reliability values indicate moderate-to-

Table 4. Results of factor analysis and reliability tests

Constructs	Research items	Factor loading	Eigenvalue	Cumulative explained (%)	Item-to-total correlation	Cronbach's alpha (α)
Disclosure	The price of the product that the seller discloses is real	0.718	5.014	62.679	0.635	0.914
	The condition of the product that the seller discloses is fair	0.835			0.771	
	The picture of the product that the seller discloses is genuine	0.807			0.731	
	The problems of the product that the seller discloses are real	0.810			0.739	
	All the information that the seller discloses convince me	0.870			0.817	
	The personal profile of the seller discloses convinces me	0.735			0.654	
	The contact information that the seller provides satisfies me	0.784			0.713	
	The location to meet with the seller to make a transaction satisfies me	0.763			0.689	
Reciprocity	This seller facilitates two-way communication between himself/herself and myself	0.848	3.134	78.354	0.736	0.907
	This seller gives me the opportunity to talk to him/her	0.917			0.843	
Information quality	This seller responded to my questions very quickly	0.866	5.734	71.679	0.757	0.944
	I was able to get information from this seller very rapidly	0.907			0.826	
	The quality of information accuracy I originally expected was	0.844			0.788	
	The quality of information accuracy I experienced was	0.858			0.816	
	The quality of information availability I originally expected was	0.839			0.779	
	The quality of information availability I experienced was	0.853			0.810	
	The quality of information reliability I originally expected was	0.844			0.784	
	The quality of information reliability I experienced was	0.868			0.830	
Source(s): Authors' own work	The quality of information relevance I originally expected was	0.831			0.771	
	The quality of information relevance I experienced was	0.835			0.787	

Table 5. ANOVA results

Source	Dependent variable	Sum of squares	df	Mean square	F-value	p-value
<i>Main effect</i>						
Emoticons	Disclosure	127.992	1	127.992	210.933	0.000
Picture		45.616	1	45.616	34.957	0.000
Emoticons	Reciprocity	42.174	1	42.174	40.092	0.000
Picture		74.807	1	74.807	96.479	0.000
<i>Interaction effect</i>						
Emoticons × information quality	Disclosure	137.212	3	45.737	85.052	0.000
Picture × information quality		91.860	3	30.620	32.970	0.000
Emoticons × information quality	Reciprocity	57.974	3	19.325	20.694	0.000
Picture × information quality		82.368	3	27.456	37.946	0.000

Source(s): Authors' own work

good agreement, they remain slightly below ideal thresholds typically recommended for confirmatory research. This reflects the inherent subjectivity of manual content analysis, as coders' interpretations of verbal nuances and affective tones may vary. Although all discrepancies were resolved through consensus discussions to ensure consistency, some degree of interpretive bias cannot be entirely eliminated. Future undertaking should consider using automated sentiment or linguistic analysis tools to supplement manual coding and enhance the precision and replicability of results.

Logistic regression analysis revealed that disclosure significantly predicted verbal statements of affection ($B = 0.480$ and $p < 0.01$), while reciprocity was nonsignificant ($B = 0.253$ and $p > 0.05$). This indicates that openness and transparency are stronger predictors of relational warmth than reciprocation alone. The finding is consistent with URT, which posits that initial information disclosure functions as a foundational mechanism for reducing ambiguity and enabling trust, particularly in first-time online interactions (Berger and Calabrese, 1975; Gibbs *et al.*, 2010).

In other words, when sellers provide clear, emotionally expressive and information-rich messages, buyers are more likely to respond with affective language and trust-laden communication. Conversely, reciprocity appears to play a more supportive, rather than causal, role in these early-stage digital interactions.

5. Discussion

This study examined how emoticons and product presentation images shape uncertainty reduction strategies, specifically disclosure and reciprocity, within Facebook C2C social commerce. Grounded in URT (Berger and Calabrese, 1975), the findings reveal how digital cues function as relational mechanisms in computer-mediated buyer–seller interactions. Several key insights emerge. First is emoticons as important relational cues. The results show that high-emotion emoticons significantly increase both disclosure and reciprocity compared to low-emotion emoticons. To a certain extent, emotion-based features are essential inputs for accurately predicting the persuasive impact of textual content (Braca and Dondio, 2023). From a URT perspective, emoticons act as paralinguistic signals that substitute for nonverbal expressions in face-to-face contexts (Derks *et al.*, 2007a, 2007b; Hsieh and Tseng, 2017). They enhance impression formation, reduce ambiguity and facilitate interpersonal predictability, enabling buyers and sellers to build rapport more quickly. These findings extend prior research by demonstrating that emoticons are not merely expressive but also strategic tools of uncertainty reduction in digital P2P marketplaces.

Second, product presentation functions as a form of visual disclosure. The findings show that product images significantly enhance both disclosure and reciprocity, supporting prior research that emphasizes the role of visual cues in reducing uncertainty and facilitating relational communication in online environments (Ramirez *et al.*, 2002; Walther, 1992). Visual presentation provides buyers with clearer information about product quality and condition, thereby reducing ambiguity and enhancing relational openness. In line with URT, images serve as a form of disclosure that signals transparency and credibility, allowing buyers to interpret the seller's intentions more positively (Gambo and Özad, 2021). This underscores the importance of visual disclosure in enabling smoother, trust-based interactions in social commerce.

Third, this study identifies the important moderating role of information quality. The interaction effects show that information quality amplifies the influence of both emoticons and product presentation on disclosure and reciprocity. When buyers perceive the information provided as accurate, reliable and relevant, the persuasive and relational impact of emotional and visual cues becomes stronger, leading to deeper engagement and more meaningful buyer–seller exchanges. Conversely, although emoticons are powerful cues, their effectiveness is contingent on the substantive quality of the accompanying product information (Chen *et al.*, 2016). Sellers who provide clear, detailed and accurate information alongside visual or emotional cues are more likely to reduce uncertainty and elicit positive buyer responses (Ahearne *et al.*, 2022). Thus, information quality emerges as an instrumental factor that amplifies the impact of uncertainty reduction.

Fourth, disclosure emerges as a key driver of relational outcomes. Logistic regression results show that disclosure significantly predicts verbal statements of affection, which serve as indicators of relational warmth and trust in buyer–seller exchanges. This finding reinforces the central role of disclosure in uncertainty reduction and demonstrates how transparent communication encourages more positive and trusting interactions within Facebook C2C social commerce. Consistent with URT, disclosure facilitates predictability and transparency, creating conditions where buyers are more willing to signal trust and engage positively with sellers (Ko, 2023). This finding emphasizes disclosure as the central mechanism through which uncertainty reduction translates into relational outcomes in C2C exchanges.

Fifth is reciprocity's limited role. Interestingly, reciprocity did not significantly predict verbal statements of affection. One plausible explanation is that in the Facebook C2C context, reciprocity often takes the form of functional exchanges, such as clarifying product details, and confirming availability, which may be perceived as transactional rather than relational (Teubner and Camacho, 2023). Unlike disclosure, which involves personal or product-relevant openness, reciprocity in this context may not carry enough relational depth to trigger affective responses. This finding refines URT by suggesting that reciprocity, while important in traditional interpersonal settings, may play a weaker role in computer-mediated buyer–seller interactions where conversations are primarily utilitarian.

Overall, these findings confirm the utility of URT as a framework for interpreting buyer–seller interactions (Chatterjee and Datta, 2008) in Facebook C2C social commerce, while also extending its application in meaningful ways. By showing that emoticons and product images act as deliberate communicative strategies that enhance disclosure and, to a lesser extent, reciprocity, this study highlights how digital cues substitute for traditional nonverbal signals in online contexts. At the same time, the results refine URT by demonstrating the differential effectiveness of its core strategies: disclosure emerges as the more decisive pathway for building relational trust, while reciprocity appears less influential in transaction-driven exchanges. These insights not only integrate the theory more explicitly with the empirical results but also lay the groundwork for the theoretical contributions outlined in the following section.

6. Conclusion

6.1 Theoretical implications

This study advances the theoretical understanding of uncertainty reduction in Facebook C2C social commerce. By applying URT to a contemporary P2P digital marketplace, the findings show that emotional emoticons and product images function as intentional mechanisms for reducing ambiguity in buyer–seller exchanges. These cues encourage greater disclosure and reciprocity, illustrating how visual and emotional signals actively support trust formation in online C2C transactions (Mokhberi, 2023; Mokhberi *et al.*, 2024). This study also clarifies the distinct roles of disclosure and reciprocity, demonstrating that only disclosure significantly predicts verbal statements of affection (Berger and Calabrese, 1975), which serve as indicators of relational trust. In addition, the results contribute to research in computer-mediated communication by showing that emoticons operate as both expressive and strategic elements in impression management (Derks *et al.*, 2007a, 2007b; Walther and D’Addario, 2001). Finally, by situating the analysis in Taiwanese Facebook groups, this study emphasizes the cultural relevance of symbolic and visual communication, thereby expanding the applicability of URT in non-Western digital commerce contexts. Overall, these contributions reinforce the theoretical insight that visual and emotional cues are central instruments of uncertainty reduction in social commerce.

6.2 Practical implications

The findings offer clear and actionable guidance for practitioners in Facebook C2C social commerce. Sellers can strengthen buyer confidence by combining expressive emoticons, product images and detailed information when responding to inquiries. These practices increase perceived transparency, enhance credibility and raise the likelihood of successful transactions. For buyers, disclosure serves as a reliable indicator of a trustworthy seller, helping them differentiate genuine sellers from opportunistic actors. Managers and platform designers can also enhance user trust by incorporating features that facilitate visual disclosure and expressive communication, such as improved image-sharing tools or recommended message prompts that encourage sellers to provide essential product information.

The results further demonstrate broader applicability across P2P marketplaces such as Carousell, Shopee, Facebook Marketplace and Vinted, where trust similarly depends on nonverbal cues. Emotional expression, visual clarity and structured uncertainty-reduction practices can, therefore, support better decision-making for users across these platforms. Beyond social commerce, the insights extend to other digitally mediated interactions, including gig-work platforms and online customer service settings, where uncertainty and trust frequently influence engagement. These practical implications show how communicative strategies can enhance transaction outcomes, strengthen user relationships and contribute to the long-term sustainability of digital exchange environments.

6.3 Limitation and future research

This study has some limitations. First, this study was conducted in Taiwan with a predominantly Asian sample, which may influence how users interpret and respond to emoticons, disclosure and reciprocity. As communication norms differ across cultures, future work should adopt cross-cultural or comparative designs to explore how uncertainty reduction unfolds in diverse Facebook C2C markets. Second, although this study focused on high-emotion and low-emotion emoticons, users use a wide variety of emotional and symbolic icons in digital communication. Future research should examine a broader range of emoticons and visual cues to better understand their nuanced effects on disclosure, reciprocity and trust formation across different

CMC platforms. Third, self-presentation and the perceived effectiveness of Facebook Messenger significantly influenced both disclosure and reciprocity, suggesting that platform usability and individual communication styles play an important role. Future studies should consider naturalistic field experiments or longitudinal methods to better account for these contextual factors and strengthen causal inferences. These limitations highlight the need for further investigation into cultural, communicative and platform-based contingencies of uncertainty reduction, thereby extending the robustness of URT and enhancing its applicability across digital social commerce environments.

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