

The moderating roles of self-construal and social anxiety in the association between attitude towards emojis and their frequency of usage

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Abstract: Emojis are popular features in WhatsApp messaging. However, individual differences, such as social anxiety and self-construal, may influence emoji usage patterns. This cross-sectional study examines the relationship between attitudes toward emojis and their frequency of use, and the moderating effects of self-construal and social anxiety on this relationship among Indonesian undergraduate WhatsApp users. We recruited a convenience sample of 364 participants aged 18 to 24 (M-age = 21.12, SD = 1.48). The multiple linear hierarchical regression analysis results indicated that attitude towards emojis was a unique positive predictor of usage frequency ($B = 0.16, t = 3.91, p < .001$), accounting for 4% of the variance in such frequency ($\Delta R^2 = .04$, Cohen's $f^2 = .05$). Neither self-construal orientations nor social anxiety moderated the relationship. Notably, independent self-construal emerged as a direct predictor of emoji usage frequency ($B = 0.10, p = .043, \Delta R^2 = .01$, Cohen's $f^2 = .01$). The findings may reflect independent self-construal as perceived behavioral control within the theory of planned behavior (TPB) framework. They also highlight the importance of considering individual differences in digital communication behaviors among Indonesian youth.

Keywords: digital communication; emoji usage; online behavior; self-construal; social anxiety

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Introduction

Emojis have evolved from mere decorative elements into vital components of modern online communication (Arafah & Hasyim, 2019; Boutet et al., 2021; Erle et al., 2022; Manganari, 2021; Santamaría-Bonfil & Grabiél Toledano López, 2020). As Unicode-standardized visual symbols, they can substitute for nonverbal cues we typically convey in face-to-face interactions. They help express emotions, clarify tone, and enhance the meaning of textual messages (Q. Bai et al., 2019). Today, emojis have become an efficient form of visual communication, evolving into a linguistic element that resembles a “language” in its own right, given their widespread and growing use in online communication (Suliman, 2024).

In instant messaging apps such as WhatsApp, emojis have become an important element that enriches interactions. People tend to use them to create a more enjoyable communication environment (Un Nisa, 2024), build trust and empathy (M. Zhang et al., 2021; Z. Zhang & Luo, 2025) and express emotions, feelings, and reactions that are difficult to convey through text alone (Thi Dung et al., 2024; Zahra & Cacciafoco, 2026). As a result, emojis have emerged as a mandatory para-linguistic element, particularly in peer communication (Dhaliwal & Hazarika, 2026). A recent study identified nine broad functions of emojis in online communication: emotional expression, tone reinforcement, visual quotient, regional variations, communication efficiency, creativity, word substitution, peer prompt, and playfulness (Suliman, 2024).

With the widespread use of WhatsApp in Indonesia, emojis have become part of people’s digital communication. By 2025, WhatsApp had become the main communication platform for most Indonesians. Currently, 112 million citizens use the service, making Indonesia the world’s third-largest user base (World Population Review, 2025). Beyond everyday communication, the

Reuters Institute 2025 report (Stevany, 2025) found that the app is the main news source for 43% of survey participants. Indonesia ranks highest in average time spent on WhatsApp per month, at around 29 hours. It means Indonesians spend an average of 58 minutes per day using the service, almost five times longer than Australians, emphasizing WhatsApp’s significance in the country (Gohil, 2025).

The theory of planned behavior (TPB) by Ajzen (1991, 2002) proposes that attitudes toward a behavior strongly predict behavioral intentions, which ultimately influence actual behavior. In addition to attitudes toward behavior, TPB also identifies two other components that shape behavioral intentions: subjective norms and perceived behavioral control. Subjective norms refer to social pressure or expectations from significant others that individuals perceive. In the context of emoji use, this component can take the form of social expectations individuals feel about emoji use that align with communication norms among peers or certain groups. Perceived behavioral control reflects individuals’ belief that they can control and perform certain behaviors. For example, an individual’s perceived behavioral control in using emojis can be influenced by their familiarity with different emoji forms and meanings, and by their belief that they can use them effectively in digital communication.

Past meta-analyses provide strong evidence that attitudes substantially influence behavior (Kraus, 1995). In the context of emoji use, positive attitudes are understood to correlate with the frequency of emoji use in online communication. Research adapting TPB to explore mobile technology usage has highlighted the importance of attitudes in determining the adoption and intensity of digital communication features (Warraich et al., 2024). Using TPB as a framework, attitudes towards emojis can be assumed to be shaped by beliefs about their effectiveness in conveying emotions and clarifying message

meaning. These beliefs influence consistent emoji use in WhatsApp communication. Young people who view emojis positively tend to use them more often. They enrich their messages and help create emotional resonance with their conversation partners.

An extended TPB framework can also consider individual differences, such as gender, as moderators of the relationship between attitude and behavioral intention (e.g., Teo et al., 2020). Emojis play a significant role in communication among the younger generation. Their use is closely linked to various psychosocial factors that influence how individuals engage with them (e.g., Bendl et al., 2025; Carroll, 2025; Cavaleiro et al., 2023; Dubé et al., 2024; Kennison et al., 2024). This study examines two key psychosocial factors: self-construal and social anxiety. These factors can shape the relationship between emoji use and its determinants, in this case, attitudes toward emojis.

Self-construal refers to how individuals perceive themselves in relation to others (Markus & Kitayama, 1991). It may affect the relationship between attitudes and emoji use behaviors. Individuals with interdependent self-construal focus on interconnectedness and social harmony and are more likely to use emojis to foster emotional connections. It is evident in the stronger correlations between interdependent self-construal and emoji use than between independent self-construal and emoji use (Togans et al., 2021). Emojis also help reduce potential misunderstandings in online communication, as they have been shown to decrease message ambiguity and increase readers' confidence in interpreting the sender's intended meaning (Riordan, 2017).

Previous research shows that self-construal moderates the effects of attitudes on behavior in other contexts. For example, individuals with higher levels of interdependent orientation exhibited a stronger relationship between

institutional beliefs and COVID-19 vaccination intentions (Paredes et al., 2023). In the context of emoji use, those with interdependent self-construal may feel a greater need to express their emotions and maintain social connections in online communication. This sensitivity can reinforce the relationship between positive attitudes towards emojis and their frequency of use.

Social anxiety can influence how people communicate online. In the context of face-to-face interaction, individuals with social anxiety often remained in social situations that caused them such anxiety. They tended to suppress their fear rather than avoid these situations (Dryman & Heimberg, 2018). Consequently, it is not surprising that individuals with high social anxiety often feel more comfortable using digital media than participating in face-to-face interactions (Chen et al., 2020; Hutchins et al., 2021; Rizkiyani et al., 2026; Zsido et al., 2021). They might use emojis to help manage impressions and clarify their messages, consistent with findings that socially anxious individuals perceive online communication as more controllable and manageable than face-to-face interaction, which encourages greater self-presentation online (Scott et al., 2024). This strategy may help reduce ambiguity in conversations. It also helps them avoid the social risks associated with face-to-face communication.

This study makes several contributions that differentiate it from previous research. While past studies have examined emoji use primarily from a functional and communicative perspective (e.g., Boutet et al., 2021; Erle et al., 2022; Suliman, 2024), those that have systematically integrated the TPB framework with psychosocial factors (i.e., self-construal and social anxiety) to explain emoji usage behavior remain limited. Previous applications of the TPB framework in the digital domain have focused on general technology adoption and social media use (Dhir et al., 2020; Warraich et al., 2024).

However, the studies did not specifically target emoji usage as a behavioral outcome. Furthermore, while self-construal has been linked to online communication patterns (Chinchanchokchai & Pusaksrikit, 2021; Nan et al., 2024), and social anxiety has been associated with digital communication preferences (Hsieh et al., 2024; Hutchins et al., 2021; Shaughnessy et al., 2017; Yin et al., 2022), neither variable has been tested as a moderator within a TPB model of emoji use. Most importantly, no previous study has examined these dynamics within an Indonesian context, despite the country being among the nations with the highest number of WhatsApp users (World Population Review, 2025).

Therefore, this study examines the association between attitude toward emojis and the frequency of emoji use among Indonesian undergraduate students when messaging friends on WhatsApp. This study also analyzes the moderating effects of self-construal and social anxiety in the relationship. The following hypotheses are proposed:

- H₁: Attitude towards emojis is associated with frequency of emoji usage.
- H₂: Self-construal moderates the relationship between attitude towards emojis and frequency of emoji usage.
- H₃: Social anxiety moderates the relationship between attitude towards emojis and frequency of emoji usage.

Methods

This study uses a quantitative, cross-sectional design. The following section on research methods outlines the participants and procedure, research instruments, and data analysis methods.

Participants and Procedure

Undergraduate students from a private university in Bandung, Indonesia, were invited to participate in the study. Inclusion criteria required participants to be active students aged 18-24 and

WhatsApp users. A total sample of 364 individuals (M-age = 21.12; SD = 1.48) participated, comprising 275 women (75.55%) and 89 men (24.45%).

The authors sent participation invitations via WhatsApp to students who met the inclusion criteria. Participants completed an online survey and provided informed consent. The consent form contained important information about the study, including the research objectives, methodology, data confidentiality, and the withdrawal procedure. Participants indicated consent by selecting "I am willing to participate" in response to the question "Are you willing to participate in this study?" and then clicking "Next" to begin the online questionnaire. Konsorsium Psikologi Ilmiah Nusantara approved the research protocol (License No. 115/2023 Ethics/KPIN), and the study followed the ethical principles outlined in the Declaration of Helsinki.

Measures

Participants completed demographic questions (age and gender), a single-item measure of emoji usage frequency, and the following instruments: the Indonesian version of the Liebowitz Social Anxiety Scale (LSAS) (Liebowitz, 1987; Srisayekti et al., 2023); the Indonesian version of the Self-Construal Scale (SCS) (Singelis, 1994; Srisayekti et al., 2019); and the Attitude Index (Prada et al., 2018).

Social Anxiety

The study used the Indonesian version of the LSAS to assess social anxiety (Liebowitz, 1987; Srisayekti et al., 2023). The scale consists of 24 items, each describing a social situation, e.g., "Expressing a disagreement or disapproval to people you don't know very well." Participants rated how scared they were in the situation (0 = "absolutely not" to 3 = "very") and how often they avoided the situation in the past week (0 = "never" to 3 = "almost always"). The fear subscale score

was obtained by totaling the fear ratings. The avoidance subscale score was obtained by adding together the avoidance ratings. The global LSAS score is obtained by totaling the two subscales. The Indonesian version of the LSAS shows good internal consistency, with α coefficients of .84, .88, and .92 for the avoidance scale, fear scale, and global LSAS scores, respectively (Srisayekti et al., 2023).

Srisayekti et al. (2023) also report evidence of convergent validity, internal structure, and content validity in the Indonesian version of LSAS. In the present study's sample, the Indonesian version of LSAS also showed satisfactory internal consistency, with $\alpha = .94, .93$, and $.97$ for the fear subscale, avoidance subscale, and global LSAS, respectively. The item-rest correlation for each item was reasonable ($r \geq .30$), consistent with psychometric guidelines for item-rest correlations (Zijlmans et al., 2018).

Self-construal

The instrument used to measure self-construal was the Indonesian version of the SCS (Singelis, 1994; Srisayekti et al., 2019). It consists of two scales: the independent self-construal scale (12 items) and the interdependent self-construal scale (12 items). A sample item from the independent self-construal scale is "I enjoy being unique and different from others in many respects," while an item from the interdependent self-construal scale is "I will sacrifice my self-interest for the benefit of the group I am in." Respondents indicated how well each statement applied to them on a 7-point Likert scale, ranging from 1 ("Strongly Disagree") to 7 ("Strongly Agree"). We calculated each scale score by averaging the 12 items. Higher scores on either scale indicate stronger or more dominant self-construal (Singelis, 1994). The Indonesian version of SCS has acceptable internal consistency, with Cronbach's alpha values of .69 for the independent self-construal scale and .72 for the interdependent self-construal scale (Srisayekti et al., 2019). In the

present study's sample, both subscales also showed good internal consistency, with $\alpha = .85$ and $.89$, respectively. The item-rest correlations of the subscales were also satisfactory ($r \geq .40$).

Attitude Index

The attitude index instrument consisted of six bipolar items (useful-useless, uninteresting-interesting, fun-boring, hard-easy, informal-formal, and good-bad) (Prada et al., 2018). The participants reported their attitudes toward emoji use on WhatsApp using a 7-point Likert scale for each bipolar item. For example, for the useful-useless item, 1 indicated useful, and 7 indicated useless. Higher ratings indicated a more positive attitude. Items related to useful, fun, informal, and good were reverse-coded. The attitude index was calculated as the average score of the six items.

Frequency of Emoji Usage

The participants reported the frequency of their emoji use when messaging friends on WhatsApp over the previous week. They rated this on a scale of 1 to 5, with the following options: 1 "Never"; 2 "Rarely (3 or fewer messages out of every 10 contain emojis)"; 3 "Occasionally (4 to 6 messages out of every 10 contain emojis)"; 4 "Frequently (7 to 9 messages out of every 10 contain emojis)"; and 5 "Always". This scale allowed participants to reflect their emoji-use frequency accurately.

Data Analysis

JASP software version 0.19.3 (JASP Team, 2024) was employed for all the statistical analyses. Descriptive statistics included calculating the mean, standard deviation, skewness, and kurtosis for each variable examined. Skewness and kurtosis were utilized to assess the assumption of normality. The findings indicated that all variables exhibited a normal distribution, allowing for the use of parametric test statistics in subsequent analyses. The relationships between variables were evaluated using Pearson's correlation

coefficient (Pearson r), and a t-test was used to test differences by gender. Additionally, we analyzed moderation using hierarchical multiple linear regression.

Results

Descriptive Statistics and Demographic Analysis

Table 1 presents descriptive statistics for social anxiety, self-construal, and emoji usage motives. Based on the LSAS-FS score, individuals can be categorized into two groups: High Social Anxiety and Low Social Anxiety. A cut-off score of more than 27 on the LSAS-FS indicates high social anxiety, while a score of less than 13 indicates a low level. These scores represent the highest and lowest 10% of the social anxiety distribution (Heuer et al., 2010).

Table 2 shows the number of participants classified into the High and Low Social Anxiety groups, along with those not belonging to either group (scores from 13 to 27). Table 2 also shows the number of participants in each self-construal group: interdependent, independent, and non-self-construal.

Age is negatively correlated with emoji usage frequency (see Table 3). In addition, we ran Welch's t-test to examine gender differences in emoji usage frequency. We used this test because variance differed between gender groups. The results of this analysis showed that women ($M = 3.40$, $SD = 0.91$) used emojis significantly more often than men ($M = 2.92$, $SD = 0.82$), $t(165.18) = 4.71$, $p < .001$, with a medium effect size ($d = .56$).

Table 1

Descriptive Statistics (N = 364)

Variable	Mean	SD	Min-Max	Skewness	Kurtosis
Social Anxiety					
Global Score	73.74	26.51	0-144	-0.13	0.33
Fear Scale	36.96	13.71	0-72	-0.16	0.21
Avoidance Scale	36.78	13.45	0-72	-0.11	0.21
Self-construal					
Interdependent Self-construal	5.16	1.05	1.33-7	-0.55	0.12
Independent Self-construal	4.90	0.97	2-7	-0.13	0.17
Attitude Index	5.22	1.16	1.33-7	-0.52	-0.04
Frequency of Emoji Usage	3.29	0.91	2-5	0.28	-0.71

Notes. SD, standard deviation

Table 2

Social Anxiety and Self-construal Grouping (N = 364)

	n	(%)
Social Anxiety		
High	278	76.37
Low	20	5.50
Neither	66	18.13
Self-Construal		
Interdependent Self-Construal	213	58.52
Independent Self-Construal	114	31.32
Neither	37	10.16

Relationships between Variables

Table 3 presents the *r* coefficients for the relationships among the study variables: self-construal (SC), social anxiety (SA), attitude towards emojis, and frequency of emoji usage. Based on the correlations, both self-construals (interdependent and independent) and attitude towards emojis were positively and significantly correlated with emoji usage frequency. The authors found no relationship between social anxiety and emoji usage frequency.

Moderating Effect Analyses

The authors conducted assumption checks before running the linear hierarchical regression analyses. The authors checked the predictors (i.e., social anxiety, independent and interdependent self-construal) and the outcome (i.e., emoji usage frequency) for normality. Skewness and kurtosis values were within the normal range, as confirmed by histogram inspections. Scatter plots visualized the relationships between variables and showed linear relationships with no heteroscedasticity issues. The residual plots also showed a relatively normal distribution.

The moderation analyses included three hierarchical multiple linear regressions, each examining the moderating effects of inter-

dependent and independent self-construal and social anxiety on the relationship between attitude toward emojis and frequency of emoji use. The authors included gender as a factor and age as a covariate in the three models to rule out these variables' effects on the moderation analysis results. The authors did this by considering the gender effect based on the results of Welch's *t*-test, as well as the correlation between age and emoji usage frequency.

The variance inflation factor (VIF) values in the three models tested were all less than 5, and all tolerance statistics were above .2. These indicate no concern about multicollinearity. All three models also had acceptable independence of errors (Durbin-Watson in the range of 1.5–2.5).

Table 4 summarizes the statistics for the final model of each moderation analysis. The results indicate that age (Cohen's $f^2 = .01$) and gender (Cohen's $f^2 = .06$) predict emoji usage frequency, accounting for 1% and 5% of the variance, respectively. Attitudes towards emojis also predict how frequently individuals use them, contributing 4% of the variance (Cohen's $f^2 = .05$). The results of each moderation analysis are detailed below.

Table 3

Correlation Analysis between Variables (N = 364)

Variable	Correlation Coefficients							
	1	2	3	4	5	6	7	8
1 SA Global Score	-							
2 SA Fear Scale	.98***	-						
3 SA Avoidance Scale	.98***	.91***	-					
4 Interdependent SC	.12*	.12*	.11*	-				
5 Independent SC	-.09	-.08	-.09	.66***	-			
6 Attitude	-.03	-.01	-.04	.25***	.21***	-		
7 Frequency of emoji usage	.00	.03	-.03	.13*	.15**	.24***	-	
8 Age	.05	.02	.08	-.02	-.03	-.08	-.11*	-

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 4
Moderating Effect Analysis (N = 364)

	B	SE	t	R ²	F	ΔR ²
Frequency of emoji usage						
Constant	3.45	1.30				
Gender	-0.39	.11	-3.64***	.05	8.81	.11
Age	-0.05	.03	-1.45	.01		
Attitude	0.07	.20	0.34	.04		
Independent SC	0.04	.21	0.17	.01		
Attitude Index*Independent SC	0.01	.04	0.35	.00		
Frequency of emoji usage						
Constant	3.81	1.28				
Gender	-0.38	.11	-3.45***	.05	8.07	.10
Age	-0.05	.03	-1.50	.01		
Attitude	0.05	.20	0.26	.04		
Interdependent SC	-0.04	.20	-0.19	.00		
Attitude Index*Interdependent SC	0.02	.04	0.47	.00		
Frequency of emoji usage						
Constant	3.34	.88				
Gender	-0.40	.11	-3.53***	.05	7.84	.10
Age	-0.04	.03	-1.42	.01		
Attitude	0.20	.11	1.86	.04		
Social Anxiety	0.00	.01	0.30	.00		
Attitude Index*Soci	0.00	.00	-0.46	.00		

Notes. *p < .05, **p < .01, ***p < .001

Each multiple linear hierarchical regression included five models, with emoji usage frequency as the dependent variable. The first model included age as the predictor, and the second model added gender as a predictor. The authors added attitudes toward emojis as the predictor in the third model. The first, second, and third models of each regression were the same. In the fourth model, we added a variable hypothesized as a moderator (i.e., independent self-construal, interdependent self-construal, and social anxiety). In the last model, we added the interaction between attitude toward emojis and the respective moderator variable.

The results showed that the first model was significant, with $F(1, 362) = 4.40$, $p = .04$, $R^2 = .01$. In addition, age was significantly associated with frequency of emoji usage ($B = -0.07$, $t = -2.10$, $p = .03$). According to these results, emoji usage was higher in younger individuals. The second model was also significant [$F(2, 361) = 11.32$, $p < .001$, $R^2 = .06$], indicating that gender affects emoji usage

frequency ($B = -0.46$, $t = -4.25$, $p < .001$), with women tending to use them more than men. The second model showed improvements over the first [$\Delta F(1, 361) = 18.05$, $p < .001$, $\Delta R^2 = .05$]. The third model was also significant [$F(3, 360) = 12.94$, $p < .001$, $R^2 = .10$]. Attitudes toward emojis predicted usage frequency ($B = 0.16$, $t = 3.91$, $p < .001$). The third model also showed improvement [$\Delta F(1, 360) = 15.27$, $p < .001$, $\Delta R^2 = .04$]. The first three models in each of the three multiple linear hierarchical regressions produced the same results.

In the first regression analysis, we added independent self-construal to the predictors in the fourth model to test its moderating role. The fourth and fifth regression models included independent self-construal and the interaction between independent self-construal and attitude toward emojis, respectively. Both models were significant: with the fourth model [$F(4, 359) = 11.01$, $p < .001$, $R^2 = .06$], and the fifth [$F(5, 358) = 11.32$, $p < .001$, $R^2 = .11$]. While the fourth model demonstrated

some improvement, with $\Delta F(1, 359) = 4.81, p = .03, \Delta R^2 = .01$, no improvements were observed in the fifth model [$\Delta F(1, 358) = 0.12, p = .73, \Delta R^2 = .00$]. These findings showed that independent self-construal predicts emoji usage behavior, contributing 1% of the variance (Cohen's $f^2 = .01$). Figure 1 presents the conceptual form of this moderation model to clarify the tested interaction between attitude toward emojis and independent self-construal. However, independent self-construal did not moderate the relationship between attitudes towards emojis and emoji usage behavior.

In the second regression analysis, we added interdependent self-construal and the interaction between interdependent self-construal and attitudes toward emojis sequentially in the fourth

and fifth models. No improvement was observed in either the fourth [$\Delta F(1, 359) = 1.34, p = .25, \Delta R^2 = .00$] or fifth model [$\Delta F(1, 358) = 0.22, p = .64, \Delta R^2 = .00$]. Figure 2 summarizes the regression model used to test the moderating effect of interdependent self-construal.

In the third regression analysis, social anxiety and the interaction between social anxiety and attitudes towards emojis were included as predictors in the fourth and fifth models, respectively. Neither the fourth [$\Delta F(1, 359) = 0.34, p = .56, \Delta R^2 = .00$] nor fifth model [$\Delta F(1, 358) = 0.21, p = .65, \Delta R^2 = .00$] revealed any improvement over the previous models. Figure 3 presents a visual summary of the regression model used to examine the moderating effect of social anxiety.

Figure 1

Independent Self-construal as a Moderator

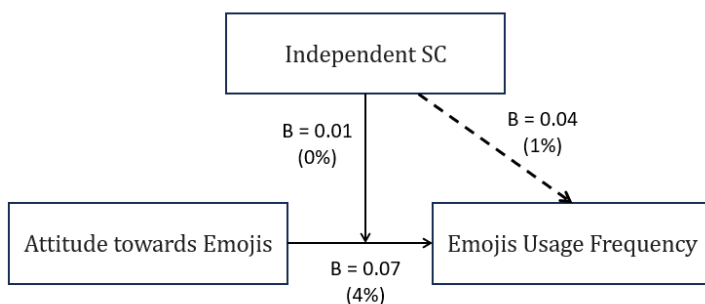


Figure 2

Interdependent Self-construal as a Moderator

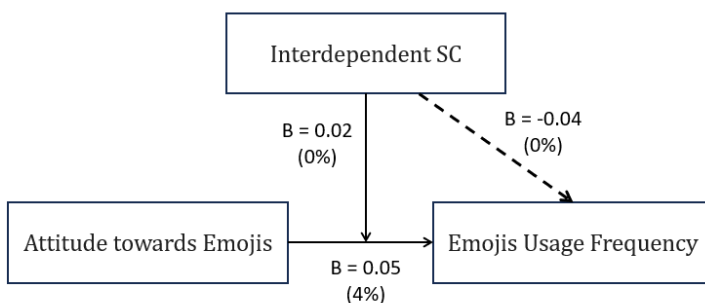
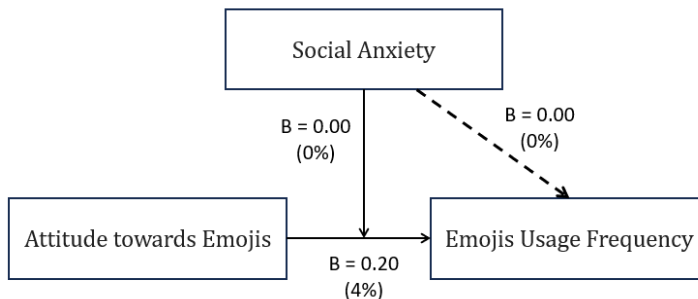


Figure 3*Social Anxiety as a Moderator*

Overall, independent self-construal emerged as a significant predictor of frequency of emoji usage ($B = 0.10, p = .043$), accounting for 1% of the variance, with a small effect size (Cohen's $f^2 = .01$). However, independent self-construal, interdependent self-construal and social anxiety did not moderate the relationship between attitudes towards emojis and the frequency of their usage.

Discussion

The study examines the relationship between young people's attitudes towards emojis and the frequency of their usage when messaging friends on WhatsApp. Additionally, the study has explored the moderating effects of self-construal and social anxiety on the relationship.

The findings confirm that attitudes toward emojis predicted the frequency of emoji use among young people when interacting with friends on WhatsApp. These results align with the Theory of Planned Behavior (TPB) (Ajzen, 1991), which proposes that an individual's attitude toward a behavior predicts their intentions and actions. Attitude in this study describes how individuals perceive emojis as useful, interesting, fun, easy to use, informal and good – a conceptualization consistent with prior work showing that positive attitudes on these dimensions are correlated with frequency of emoji use (Prada et al., 2018). In interactions with

friends, individuals with positive attitudes tend to view emojis in WhatsApp communication as an effective tool for enriching conversations, conveying emotions, and strengthening social relations (Sabri et al., 2021). This pattern has also been replicated in more recent research, where attitudes toward and frequency of emoji use remained linked even when accounting for personality and prosocial dispositions (Carroll, 2025). Previous qualitative analysis suggests that emojis are often used to create warmth in everyday conversations (Li & Yang, 2018), which may explain why positive attitudes toward emojis are directly related to how often they are used.

However, attitude towards emojis accounts for only 4% of emoji-use frequency, suggesting that other factors also play a role. Communication between friends has a unique level of familiarity and social norms. The characteristics of this context may affect how individuals use emojis (X. Bai et al., 2024), and, in turn, attitude as a key determinant. For example, individuals may use emojis to reply to friends' messages because they feel it is expected, even if their feelings toward them are neutral. This example highlights the potential role of subjective norms in TPB, which, although not measured in this study, may interact with attitudes to influence behavior.

In this context, subjective norms may reflect peer pressure to use emojis based on the prevailing

communication style among friends. These subjective norms are highly relevant in collectivist cultures. Previous studies have also highlighted the importance of cultural context in examining individuals' digital-related behavior (e.g., Alzara & Mellor, 2025; Chinchanchokchai & Pusaksrikit, 2021; Lee et al., 2016; Safaria et al., 2024).

The findings indicate that self-construal does not moderate the relationship between attitudes toward emojis and their usage frequency. Instead, independent self-construal, in particular, predicts emoji use frequency. These results suggest reinterpreting self-construal within the TPB framework. Independent self-construal can be positioned as a cognitive component that contributes to perceived behavioral control (PBC). It aligns with Ajzen's (2002) conceptualization, which distinguishes PBC into self-efficacy (belief in one's ability) and controllability (perception of external control). Independent self-construal emphasizes autonomy and self-expression as a psychological orientation (Lee et al., 2016). It can theoretically strengthen an individual's self-efficacy in using emojis, especially in informal communication between friends, consistent with evidence that independent self-construal is associated with stronger self-efficacy (e.g., McLaren et al., 2024). Therefore, independent self-construal may be considered a cognitive antecedent of PBC. Its influence on behavior is direct and operates through the self-efficacy mechanisms embedded in PBC.

The finding that attitudes towards emojis contributed only a small share to emoji use also suggests that future research should explicitly measure other TPB components, particularly subjective norms and behavioral intention, in addition to attitude and perceived behavioral control. Including behavioral intention would allow future studies to examine whether intention mediates the relationship between attitudes towards emojis and usage behavior. This mediation mechanism may help explain why

attitude contributed only 4% of the variance in emoji usage frequency in this study.

The finding that social anxiety does not moderate the relationship between attitudes towards emojis and emoji use frequency offers important insights into social anxiety in online communication. This result challenges earlier studies that have identified social anxiety as a major factor in online communication preferences (Biglbauer, 2024; Hutchins et al., 2021). Previous research has also shown that shy individuals and those high in neuroticism are more likely to use emojis to avoid awkwardness in online conversations (Liu & Sun, 2020). However, this need for emojis may diminish when communicating with friends, as this study's findings suggest. These findings align with evidence that graphic icons such as emojis serve a more compensatory function in weak ties or unfamiliar relationships, where they help establish shared understanding, while their relational benefit is comparatively reduced in strong ties like friendships (Peng & Chen, 2025). In conversations with friends, individuals feel more at ease expressing themselves without fear of judgment. These findings underscore that the impact of social anxiety on online behavior varies significantly by relational context and platform type (Hsieh et al., 2024; Liu & Sun, 2020; Yin et al., 2022).

Our study contributes theoretically by extending the TPB to emoji use behavior, showing that self-construal may function as a cognitive antecedent of PBC. The findings also refine assumptions about social anxiety's role in digital communication. In intimate, peer-to-peer contexts such as WhatsApp, its influence in shaping behavior may diminish. In practical terms, educators and parents who want to connect more meaningfully with young people can benefit from understanding what drives Generation Z's digital communication choices. For businesses, knowing how and why Gen Z uses emojis could open up

more effective ways to reach them. Finally, for young WhatsApp users, these findings shed light on how their peers navigate emotion and expression in everyday digital communication.

The study does have several limitations. First, the reliance on a self-report scale introduced the risk of response bias. Second, the sample was limited to undergraduate students from a single private university in a single geographic area, so caution is needed when generalizing the findings to other populations. Third, the small sample size may have limited the ability to detect a statistically significant effect. Fourth, the study did not measure subjective norms and perceived behavioral control, both key components of the TPB. Despite these limitations, the study provides a valuable empirical foundation for understanding the complex psychological factors that influence young people's online communication practices. Given these limitations, future studies could combine self-report data with corpus-based or digital trace data; use longitudinal designs; and thoroughly test TPB mechanisms by measuring subjective norms, perceived behavioral control, and behavioral intentions.

Conclusion

The study confirms that attitudes towards emojis play a significant role in predicting their usage frequency in WhatsApp communication

among undergraduate students when interacting with friends. Self-construal and social anxiety do not moderate the relationship between attitudes towards emojis and emoji use behaviors. However, key findings suggest that independent self-construal directly predicts emoji usage frequency, reflecting perceived behavioral control within the TPB framework. In other words, individuals with independent self-construal tend to feel more confident controlling and expressing themselves through emojis, increasing their use. The findings enrich understanding of how individual differences shape digital communication, particularly in informal interactions between friends. The practical implications of the study include the importance of considering users' psychological characteristics when developing more personalized and adaptive online communication features. Further research should explicitly measure perceived behavioral control, subjective norms, and behavioral intention. Measurement of behavioral intention would add a mediation mechanism between attitude and emoji usage behavior. It could explain why attitude contributed only 4% to emoji usage. Future studies should also explore other moderator variables that may influence the relationship between attitudes and emoji use behavior in a broader context.[]

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Fanny Rizkiyani: Conceptualization; Data Curation; Formal Analysis; Funding Acquisition; Investigation; Methodology; Project Administration; Resources; Validation; Visualization; Writing Original Draft; Writing Review & Editing. **Wilis Srisayekti:** Conceptualization; Investigation; Methodology; Resources; Validation; Writing Original Draft; Writing Review & Editing; Supervision. **Efi Fitriana:** Conceptualization; Methodology; Resources; Validation; Writing Review & Editing;

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