

# The Role of Prosocial Behaviour, Personality and General Mental Health in Predicting Emoji Use and Preference

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## Abstract

Emojis are prevalent in text-based communication, but the factors that influence our use and preference for emojis remains unclear. This study investigated how emoji use and preference could be explained by three factors; mental health, personality and prosocial behaviour. A questionnaire consisting of five measures was completed by 222 participants and both Pearson correlations and multiple regressions were conducted on the data. The results showed prosocial behaviour significantly related to frequency, attitudes and motivations towards emoji use as well as to positive emoji preference. Agreeableness related to the frequency of emoji use. Extraversion related to both positive and negative emoji preference while conscientiousness and emotional stability significantly related to negative emoji preference only. General mental health significantly related to negative emoji preference. The regressions found all of the factors identified in the correlations predicted emoji use and preference with the exception of extraversion. Further research is needed to explore how the impact of the emotions depicted by emojis on these factors and to investigate how emojis are used by people with specific mental health conditions.

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Data Availability Statement included at the end of the article

## Keywords

Emoji, mental health, personality, prosocial behaviour, communication

## Introduction

Emojis can facilitate understanding of written text by providing emotional tones that may otherwise be difficult to demonstrate verbally or in written text alone (Kaye et al., 2016). Their use has been shown to activate parts of the brain responsible for perceiving emotions that can help when interpreting the meaning of written text (Yuasa et al., 2011). Emojis, which are pictorial, are considered to be easier to use, are more expressive and more accurately represent emotions (Sampietro, 2020). They can be a method of communication that enables the individual to engage in specific behaviour online and for this behaviour to be interpreted by the recipient in a certain way, such as softening an instruction or emphasising the meaning of the text after a greeting has been used (Skovholt et al., 2014). However, our ability to interpret the meaning of emojis is influenced by many factors, such as our motivation to use them, specific attitudes towards emojis or the behaviour we want to demonstrate through the written text (Kaye et al., 2016; Prada et al., 2018). These factors may impact on both our decision to use certain emojis and which emojis we prefer to use in our text-based communication.

The use of electronic communication as a method of interacting with people became more pronounced during the pandemic, and as emojis can be used as a way of self-reporting personal emotions (Toet & van Erp, 2019), it is possible they may represent current emotional states. Communicating electronically can involve conscious decision-making as the content can be carefully considered before being sent (Kaye et al., 2017) and so people may choose to use specific emojis as a way of reflecting their current mood. In a study investigating the use of emojis as a screening tool for depressive symptoms, Marengo et al. (2019) found some negative-based emojis such as the sad face accurately identify individuals experiencing depressive symptoms, suggesting they may have been used not just to strengthen the text but also because they represent the individuals' current feelings (Donovan, 2016). People with depression have been found to relate more to depressive memes than people with no depressive symptoms (Akram et al., 2020), therefore it is possible that this may be the same for negative-based emojis. However, in an app that used emojis as a way for people to communicate their feelings to health professionals, emojis were reported to help identify their current mood but this tended to be for those with less severe mental health issues (van Dam et al., 2019). This may be due to people who have severe emotional disorders sometimes having a biased interpretation of emojis or may find it difficult to understand the emotional tone attached to the emoji (Mathews & MacLeod, 2005). However, research has shown that people, especially children, respond to emojis in the same way regardless of whether or not they are experiencing negative mood states such as anxiety (Keil et al., 2018) suggesting that other factors may be affecting the way

emojis are used. Therefore, how these mood states relate to emoji use requires further exploration.

Since emojis may be used in conjunction with written text, the purpose of the text is important to consider. Written text can be used online to demonstrate prosocial behaviour demonstrating how the physical acts of prosociality can be transferred into an online environment (Wright & Li, 2011). For example, emojis and other symbols found on instant messaging and social media platforms allow people to show their opinion on whether they like or love posts which can confirm actions and demonstrate approval (LaRochelle, 2017). Demonstrating and receiving approval from others has been considered an aspect of prosocial behaviour and so whether emojis help people demonstrate prosocial behaviour requires investigation.

In their review of prosocial behaviour definitions, Pfattheicher et al. (2022) suggested prosocial behaviour consists of intentions focusing on the welfare of an individual, consequences of the behaviour for the individual, and any behaviour that is approved of and valued by members of the wider society. Examples of prosocial behaviour include giving time or money to charity, offering skills to people in need, donating blood and volunteering (Aknin & Whillans, 2021). However, these examples are demonstrable in the physical environment but may not be easily shown in an online environment or in text-based communication. In their study looking at online prosocial behaviour, Bao et al. (2021) showed that behaviour such as laughter, gratitude and compliments were significantly associated with online prosocial behaviour but not with prosocial behaviour in the physical environment. This suggests that online prosocial behaviour is dependent on the content of text but given that people often use emojis to help with the interpretation of the written message, emojis may also be used to demonstrate prosocial behaviour.

Engagement with online prosocial behaviour can also be affected by our emotions. Slatery et al. (2021) investigated how prosocial behaviour (volunteering and philanthropy) was encouraged on two websites and found intention to engage in prosocial behaviour was influenced by positive and negative affect separately. This suggests emotional factors can affect our intention to demonstrate prosociality but whether this in turn may affect the emojis we prefer to use to demonstrate this behaviour is unknown. Furthermore, it has been found that using pictures alongside text can influence prosocial behaviour. Buckley et al. (2022) found online posts which also contained an image facilitated higher levels of prosocial behaviour than text alone, suggesting that including an image does affect our presentation of online prosocial behaviour. As emojis are pictorial and can be used to represent our mood, whether our preference for certain emojis as well as our use of them relate to levels of prosociality remains unknown.

While emojis might be important in demonstrating mental health and prosocial behaviour, another factor that has been investigated in relation to emojis is personality. Marengo et al. (2017) investigated whether emojis were related to the Big-Five personality traits and found agreeableness related to some of the smiling emojis, extraversion related mainly to positive emojis (e.g. a face throwing a kiss) and emotional stability related mainly to negative emojis (e.g. a disappointed face). The

authors suggest that these personality traits could be significantly associated with emojis due to their link with affective and emotional processing. This has been supported by [Volkel et al. \(2019\)](#), who found agreeableness and extraversion both predicted use of emotional-based emojis in positive scenarios but furthered Marengo and colleagues work by showing neuroticism to be positively associated with heart-based and pleasure-based emojis while being negatively associated with contentment-based and sadness-based emojis. This indicates personality may influence people's preferences for emojis, especially when the context of the text is taken into consideration. However, whether it is the context of the text or people's personality that influence their preference for and use of emojis in text-based communication is still unclear.

Given the complex nature of emoji use, the current study aims to investigate the role of personality, prosocial behaviour, and mental health in emoji use and preference. The first hypothesis is that there will be a significant correlation between mental health (depression and anxiety), personality and prosocial behaviour in relation to emoji use and emoji preference. Based on the literature, it is expected that poor levels of mental health will negatively correlate with positive emoji preference and positively correlate with negative emoji preference. In relation to personality, it is expected that agreeableness and extraversion will positively correlate with positive emoji preference whereas emotional stability will negatively correlate with negative emoji preference. The second hypothesis is that mental health, personality and prosocial behaviour will predict emoji use and emoji preference.

## Material and Methods

### *Participants*

Overall, 565 participants took part in the questionnaire but 10 had to be removed due to not answering any of the items across all five measures and 6 were removed as they stated they did not use emojis in text-based communication. A technical problem allowed people to select more than one response for the emoji use measure, therefore a further 327 participants were excluded due to missing or unusable data resulting in 222 being included in the analysis (92 recruited from the University of Chester and 130 from Prolific Academic). A minimum sample of 160 participants, calculated using G\*Power ([Faul et al., 2009](#)), was recommended for the study. Out of the 222 participants, the majority identified as female ( $n = 155$ ; 81 university students and 74 from Prolific Academic), were white ( $n = 76$ ; 27 university students and 49 from Prolific Academic) and were approximately 23 years of age (mean = 23.57, range 17–67 years of age). The most frequent age for university students was 18 years ( $n = 33$ ) and either 19 years ( $n = 14$ ) or 22 years ( $n = 14$ ) for those recruited on Prolific Academic. For a full description of the demographic statistics for the sample overall, see [Table 1](#). Full ethical approval was obtained from the School of Psychology Ethics Committee.

**Table I.** Descriptive Statistics of the Participants.

		Frequency	Mean	Standard deviation
Age ( <i>n</i> = 218)	17–19	74	23.57	6.95
	20–29	115		
	30–39	22		
	40–49	5		
	50–59	1		
	60–69	1		
Gender ( <i>n</i> = 219)	Male/M	59		
	Female/F	147		
	Woman/Women	7		
	Man/Men	3		
	Feminine	1		
	Don't know	1		
	Non-binary	1		
Ethnicity ( <i>n</i> = 215)	White	76		
	White English	2		
	White British/British white	49		
	British	18		
	White Welsh	1		
	Mixed white Black African	1		
	Asia/Asian	4		
	Caucasian/Caucasic	19		
	European White/White European	4		
	Asian Indian	1		
	English	1		
	White Irish	1		
	Black British	1		
	Caucasian White/White Caucasian	5		
	Irish	1		
	Tanzanian (East African)	1		
	Lao	1		
	Eurasian	1		
	Greek	3		
	European/Europe	3		
	African	1		
	Portuguese	1		
	African American	1		
	Latino	1		
	Mixed (Black and white)	1		
	Persian	1		
	Hungarian	1		
	Middle Europe	1		
	Poland/Polish/Pole	1		
	Indo-European	1		
	White Central Europe	1		
	Mixed	1		
Ukranian	1			
Latin/Mixed	1			
Asian/White	1			
Hispanic	1			
British Asian	1			
Moldovian	1			
Slavs	1			
Mixed Asian and white	1			
None	1			

## Materials and Measures

The questionnaire used in the study comprised of five measures. The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) was used to measure levels of anxiety and depression. It consists of 14 items using a 4-point Likert scale ranging from 0 to 3, with 0 representing the low levels and 3 representing high levels of either anxiety or depression. Seven items measured anxiety, of which five were reverse scored while the remaining seven items measured depression, of which three items were reverse scored. A total score was then obtained with a high score representing high levels of anxiety or depression. An overall total score for general mental health was obtained by combining all 14 items together. Cronbach's alpha was .690 for the current study.

The Prosocialness Scale for Adults (Caprara et al., 2005) was used to measure prosocial behaviour. This was a 16-item scale that used a 5-point Likert response scale ranging from 1 (never/almost never true), to 5 (almost always/always true). A mean score is then calculated, with the higher the score, the more the individual perceives they demonstrate prosocial behaviour. Cronbach's alpha was .896 for the current study.

The Ten-item Personality Inventory (TIPI, Gosling et al., 2003) is based on the Big Five and measures the five personality dimensions agreeableness, extraversion, openness to experiences, emotional stability and conscientiousness. The ten items use a 7-point Likert response scale ranging from 1 (disagree strongly) to 7 (agree strongly). Five items (one for each of the personality dimensions) are reverse scored and a mean is calculated with a high score reflecting high levels of each dimension. Cronbach's alpha was .611 for the current study.

The Emoji Use scale by Prada et al. (2018) is a three-part scale measuring attitudes, motivation and frequency of emoji use. One item focused on how often emojis were used in text-based communication with a Likert response scale ranging from 1 (never) to 7 (always). Six items then focused on attitudes towards emojis and used a 7-point Likert response scale. The attitudes consisted of the following: useful (1 = useful, 7 = useless), interesting (1 = uninteresting, 7 = interesting), fun (1 = fun, 7 = boring), easy (1 = hard, 7 = easy), informal (1 = Informal, 7 = formal) and good (1 = good, 7 = bad). The scores for useful, fun, informal and good were reverse scored so that the higher the score, the more positive the attitude. The last part of the scale investigated motivation for using emojis to promote expressiveness of text-based communication and used nine items with a 7-point Likert response scale (1 = completely disagree, 7 = completely agree). The higher the score, the more motivated people are to use emojis to promote expressiveness in their text-based communication. Overall, Cronbach's alpha was .716 for the current study ( $\alpha = .598$  for attitudes towards emoji use and  $\alpha = .677$  for motivation to use emojis).

Emoji preference was measured using the scale devised by Marengo et al. (2017). It consisted of 36 items, with items 1–18 representing positive emojis and items 19–36 representing negative emojis. A 5-point Likert response scale was used with 1 representing 'not at all like me' and 5 representing 'very much like me'. A mean score was calculated separately for positive and negative emoji preference; the higher the

score, the more participants preferred those emojis. Overall, Cronbach's alpha was .863 for the current study ( $\alpha = .830$  for positive emoji preference and  $\alpha = .862$  for negative emoji preference).

## *Procedure*

The study was conducted between October 2020 and March 2021. Participants were recruited for the study using three different methods; the University of Chester internal research participation scheme (RPS) which is open to all students studying on an undergraduate and postgraduate psychology course, Prolific Academic which is a worldwide, online participant recruitment site where people can sign up and be paid money to take part in research studies, and during a first year undergraduate psychology research methods module. Participants were given a link to the questionnaire which, upon clicking, took them directly to the participant information sheet. After reading this, participants indicated whether or not they consented to be included in the study; those that did not wish to go further were taken to the debrief sheet which thanked them for their time. If participants wished to continue, they clicked next and began completing the questionnaire as well as answering some demographic questions. Upon completion, participants submitted their responses and were directed to a debrief sheet which signalled the end of the study. All participants were compensated for their time; participants completing the study via RPS or during the research methods module were awarded two credits while those completing it via Prolific Academic were awarded £3.13.

## *Design and Analysis*

This cross-sectional study used Pearson correlations and linear multiple regression to analyse the data. All variables were correlated together and based on the results of these multiple linear regressions were conducted with emoji use and preference being the outcome variables while mental health, personality and prosociality were the predictor variables. The significance level used was  $p < .05$ .

## **Results**

A Shapiro-Wilk test of normality was conducted with all variables showing to be statistically significant with the exception of the mean score for positive emoji preference ( $p = .078$ ), depression ( $p = .099$ ), anxiety ( $p = .112$ ) and general mental health (both depression and anxiety combined,  $p = .664$ ). However, as the sample consisted of over 100 observations, it is argued that the distribution of data can be ignored (Altman & Bland, 1995) therefore parametric tests were conducted. Before conducting the inferential statistics, a maximum likelihood confirmatory factor analysis was conducted on the HADS to evaluate whether it could be used to assess anxiety and depression separately. The 14 items were assigned to their respective factor (either depression or

anxiety) however the  $\chi^2$  statistic indicated the model may not be a good fit with the data given that the sample was large ( $\chi^2 = 259$ ). To determine whether the fit was satisfactory, the following statistics and their thresholds were tested; Comparative Fit Index (CFI)  $>.9$ , Tucker Lewis Index (TLI)  $>.9$  and the Root Mean Square Error of Approximation (RMSEA) between  $.05$  and  $.08$ . The results showed that the model was not a good fit with the data (CFI =  $.775$ , TLI =  $.730$  and RMSEA =  $.104$ ) and so it was decided not to conduct separate analyses on depression and anxiety. The factor loadings and covariance estimates do indicate that the items together contribute to the overall model which reflects how anxiety and depression can be co-morbid conditions. Research supports this and has suggested there are underlying genetic similarities between depression and anxiety which can help explain their co-morbidity (Zavos et al., 2010). Consequently, given the results of the CFA and the shared correlation that exists between anxiety and depression, it was decided to generate an overall score across all 14 items to determine general levels of anxiety and depression together. Tables 2 and 3 show the factor loadings and their covariances.

Overall, participants demonstrated high levels of openness to experiences ( $M = 5.12$ ,  $SD = 1.10$ ) followed by conscientiousness ( $M = 4.97$ ,  $SD = 1.30$ ), agreeableness ( $M = 4.79$ ,  $SD = 1.13$ ), emotional stability ( $M = 4.04$ ,  $SD = 1.44$ ) and extraversion ( $M = 3.85$ ,  $SD = 1.61$ ). They reported it was 'sometimes' to 'nearly often true' that they engaged in prosocial behaviour ( $M = 3.88$ ,  $SD = .63$ ) and overall had good levels of mental health ( $M = 15.53$ ,  $SD = 7.03$ ). In relation to emoji use, participants reported using emojis fairly frequently ( $M = 5.26$ ,  $SD = 1.41$ ; 7 did not provide an answer for this item only), agreed they were motivated to use emojis as a way to express themselves in text-based communication ( $M = 4.87$ ,  $SD = .92$ ) and generally had a neutral to positive attitude towards emoji use ( $M = 4.99$ ,  $SD = 1.15$ ). Participants tended to prefer positive emojis ( $M = 2.99$ ,  $SD = .65$ ) more than negative emojis ( $M = 2.13$ ,  $SD = .62$ ).

### ***Hypothesis 1: There will be a Relationship Between Personality, Prosocial Behaviour, Mental Health, Emoji use and Emoji Preference***

The results of the correlations are shown in Table 4. When considering the frequency of emoji use, only prosocial behaviour and agreeableness were significantly related to this showing positive, weak to moderate relationships ( $r(222) = .319$ ,  $p < .001$  and  $r(222) = .411$ ,  $p < .001$  respectively). People's motivations and attitudes to use emojis only significantly correlated with prosocial behaviour ( $r(222) = .393$ ,  $p < .001$  for motivation and  $r(222) = .193$ ,  $p = .004$  for attitudes).

The results showed different relationships when it came to emoji preference. Positive emoji preference was related to extraversion ( $r(222) = .305$ ,  $p < .001$ ), agreeableness ( $r(222) = .227$ ,  $p < .001$ ) and prosocial behaviour ( $r(222) = .357$ ,  $p < .001$ ). Negative emoji preference however was related to extraversion ( $r(222) = -.201$ ,  $p = .003$ ), conscientiousness ( $r(222) = -.254$ ,  $p < .001$ ), emotional stability ( $r(222) = -.391$ ,  $p < .001$ ) and general mental health ( $r(222) = .416$ ,  $p < .001$ ).



**Table 2.** Summary of the Confirmatory Factor Analysis for the Depression and Anxiety Subscale Items of the HADS Measure.

Factor	Indicator	Estimate	SE	Z	p	Stand. Estimate
Anxiety	HADS_Qu_1r	.446	.0625	7.14	<.001	.495
	HADS_Qu_3r	.622	.0720	8.64	<.001	.583
	HADS_Qu_5r	.840	.0650	12.92	<.001	.791
	HADS_Qu_7	.543	.0526	10.32	<.001	.670
	HADS_Qu_9	.385	.0683	5.63	<.001	.397
	HADS_Qu_11r	.392	.0617	6.35	<.001	.444
	HADS_Qu_13r	.697	.0662	10.52	<.001	.679
Depression	HADS_Qu_2	.457	.0674	6.78	<.001	.489
	HADS_Qu_4	.236	.0611	3.86	<.001	.291
	HADS_Qu_6r	.556	.0540	10.29	<.001	.688
	HADS_Qu_8r	.399	.0631	6.33	<.001	.454
	HADS_Qu_10r	.378	.0734	5.16	<.001	.377
	HADS_Qu_12	.685	.0618	11.08	<.001	.729
	HADS_Qu_14	.419	.0540	7.76	<.001	.542

**Table 3.** Summary of Factor Covariances for the Depression and Anxiety Subscales of the HADS Measure.

Factor covariances		Estimate	SE	Z	p	Stand. Estimate
Anxiety	Anxiety	1.000 <sup>a</sup>	.0599	10.7	<.001	.641
	Depression	.641				
Depression	Depression	1.000 <sup>a</sup>				

<sup>a</sup>fixed parameter.

### *Hypothesis 2: Personality, Prosocial Behaviour and General Mental Health will Predict Emoji use And Emoji Preference*

Given that not all of the variables relate to all aspects of emoji use and preference, two linear and three multiple regressions were conducted. Two linear regressions will use the same predictor variable of prosocial behaviour but have two outcome variables, one being motivation to use emojis and the other being attitudes towards emojis. One hierarchical multiple regression will have prosocial behaviour and agreeableness as the predictors with the frequency of emoji use being the outcome variable. The remaining two hierarchical multiple regressions will consider positive and negative emoji preference separately. When the outcome variable is positive emoji preference, the predictor variables will be extraversion, agreeableness and prosocial behaviour. When the outcome variable is negative emoji preference, the predictor variables will be extraversion, conscientiousness, emotional stability and general mental health. The predictor variables for both models were entered according to their r value with the strongest being entered first.

**Table 4.** Correlation Results for Personality, Prosocial Behaviour, General Mental Health, Emoji Use and Emoji Preference.

	Extraversion	Agreeableness	Conscientiousness	Emotional stability	Openness to experiences	Prosocial behaviour	General mental health	Frequency of emoji use	Motivation to use emojis	Attitude toward emojis	Positive emoji preference
Extraversion											
Agreeableness	-.132*										
Conscientiousness	.104	.103									
Emotional stability	.282**	.145*	.219**								
Openness to experiences	.261**	.261**	.153**	.207**							
Prosocial behaviour	.067	.411**	.114	.014	.093						
General mental health	-2.70**	-.147*	-.229**	-.479**	-.156*	-.051					
Frequency of emoji use	.009	.180*	.067	-.102	-.083	.319**	.033				
Motivation to use emojis	.017	.091	.091	-.009	.033	.393**	-.030	.473**			
Attitude towards emojis	.095	.024	.024	-.035	-.077	.193**	.013	.252**	.236**		
Positive emoji preference	.305**	.227**	.000	.084	.065	.357**	-.097	.375**	.414**	.236**	
Negative emoji preference	-.201**	-.013	-.254**	-.391**	-.110	.070	.416**	.203**	.221**	.009	.281**

NB: \*\*Correlation is significant at the .01 level (two-tailed for all variables).

For the first linear regression, prosocial behaviour was a significant predictor of people's motivations to use emojis ( $\beta = .393$ ,  $t(220) = 6.340$ ,  $p < .001$ ) and explained 15.4% of the variance ( $R^2 = 15.4$ ,  $F(1, 220) = 40.197$ ,  $p < .001$ ). In the second linear regression, prosocial behaviour again significantly predicted people's attitudes towards emojis ( $\beta = .193$ ,  $t(220) = 2.923$ ,  $p = .004$ ) but only explained 3.7% of the variance ( $F(1, 220) = 8.541$ ,  $p = .004$ ). Therefore, prosocial behaviour is a better predictor of motivations to use emojis in electronic communication than people's attitudes towards them. In the multiple regression for frequency of emoji use, model 1 which included prosocial behaviour only significantly predicted frequency of emoji use ( $\beta = .319$ ,  $t(213) = 4.908$ ,  $p < .001$ ) and accounted for 10.2% of the variance ( $F(1, 213) = 24.092$ ,  $p < .001$ ). When agreeableness was entered into model 2, the amount of variance accounted for increased marginally to 10.5% ( $R^2$  change = .003,  $F(2, 213) = 12.415$ ,  $p < .001$ ) but agreeableness was not a significant predictor ( $\beta = .062$ ,  $t(212) = .875$ ,  $p = .383$ ) therefore it was decided that this model was not a good fit and so model 1 was accepted.

When considering what factors predicted positive emoji preference, a hierarchical multiple regression was performed with the predictor variables being entered in the following order; prosocial behaviour, extraversion and agreeableness. In model 1, prosocial behaviour alone explained 12.8% of the variance ( $F(1, 220) = 32.162$ ,  $p < .001$ ). The explained variance increased to 20.7% in model 2 when extraversion was included ( $R^2$  change = .079,  $F(2, 219) = 28.549$ ,  $p < .001$ ) and increased again in model 3–22.6% when agreeableness was included ( $R^2$  change = .020,  $F(3, 218) = 21.261$ ,  $p < .001$ ). Investigation of the coefficients shows all three variables were significant predictors of positive emoji preference in model 3 ( $\beta = .272$ ,  $t(218) = 4.131$ ,  $p < .001$  for prosocial behaviour,  $\beta = .307$ ,  $t(218) = 5.04$ ,  $p < .001$  for extraversion, and  $\beta = .156$ ,  $t(218) = 2.347$ ,  $p = .020$  for agreeableness).

When considering what factors predicted negative emoji preference, a hierarchical multiple regression was performed with the predictor variables being entered in the following order; general mental health, emotional stability, conscientiousness and extraversion. In model 1, general mental health predicted negative emoji preference ( $\beta = .416$ ,  $t(220) = 6.778$ ,  $p < .001$ ) and explained 17.3% of the variance ( $F(1, 220) = 45.941$ ,  $p < .001$ ). In model 2, emotional stability was also a significant predictor ( $\beta = -.249$ ,  $t(219) = -3.657$ ,  $p < .001$ ) and the explained variance increased to 22% ( $R^2$  change = .048,  $F(2, 219) = 30.950$ ,  $p < .001$ ). When conscientiousness was included in model 3, this also significantly predicted negative emoji preference ( $\beta = -.142$ ,  $t(218) = -2.316$ ,  $p = .021$ ) and again, the variance increased to 23.9% ( $R^2$  change = .019,  $F(3, 218) = 22.832$ ,  $p < .001$ ). In model 4 when all four variables were included (general mental health, emotional stability, conscientiousness and extraversion), 24.2% of the variance was explained ( $R^2$  change = .003,  $F(4, 217) = 17.286$ ,  $p < .001$ ). However, not all of the variables are predictive of negative emoji preference in model 4. General mental health ( $\beta = .264$ ,  $t(217) = 3.836$ ,  $p < .001$ ), emotional stability ( $\beta = -.218$ ,  $t(217) = -3.162$ ,  $p = .002$ ) and conscientiousness ( $\beta = -.141$ ,  $t(217) = -2.295$ ,  $p = .023$ ) significantly predicted negative emoji preference but extraversion did not ( $\beta = -.053$ ,  $t(217) = -.856$ ,  $p = .393$ ). Since extraversion was not a

significant predictor, model 3 may be the best fit for explaining the factors that predict our preference for negative emojis.

## Discussion

The results indicated a number of interesting findings. In relation to emoji use, prosocial behaviour was positively associated with all aspects of emoji use (frequency, motivation and attitudes towards emojis). Agreeableness was the only personality trait that significantly related to frequency of emoji use but did not relate to either motivation or attitudes towards emojis. The regressions indicated that prosocial behaviour was a significant predictor but accounted for more variance when focusing on people's motivations to use emojis rather than their attitudes towards emojis. Furthermore, prosocial behaviour did predict the frequency of emoji use but agreeableness did not. Positive emojis were preferred more when people perceived themselves to be extravert, agreeable and were more prosocial in their behaviour. For negative emojis, these were preferred less the more people felt they were extravert, conscientious and emotionally stable but were preferred more when people perceived their general mental health to be poor. This supported the expected directional correlations for extraversion, agreeableness and emotional stability but for general mental health, the expected correlation was found only for negative emoji preference. The regressions indicated that overall, prosocial behaviour, extraversion and agreeableness all significantly predicted positive emoji preference but the amount of variance accounted for by this model was low. Negative emoji preference was only significantly predicted by general mental health, emotional stability, and conscientiousness but again, only a small amount of variance was accounted for by this model. It must be noted that general mental health in this study and subsequent discussion relates only to the combination of anxiety and depression as measured by the HADS.

Prosocial behaviour significantly predicted emoji use frequency, attitudes and motivation. Expressing emotion, strengthening text and expressing humour are common motivators for using emoticons (Derks et al., 2008) but the current study suggest that levels of prosociality might also explain emoji use. Santhanam et al. (2018) studied emoji use during natural disasters and found on social media, emojis were used to express solidarity with positive-based emojis being more prevalent and sustained than negative emojis. Solidarity can be a prosocial behaviour therefore in an online context emojis provide a way of expressing this behaviour as events occur in real-time. This can also be applied to text-based communication that occurs in messaging services such as WhatsApp and Facebook messenger as these allow conversations to be conducted in real-time. Furthermore, Zhang et al. (2021) found positive emojis were used to show trust in relationships online supporting the idea that prosocialness may underpin our use of emojis. The current study supports how prosocial behaviour may motivate our use of emojis however despite it also predicting our attitudes towards emojis, this relationship was not as strong. One explanation for this might be that our motivation to use emojis is to help demonstrate our levels of prosocialness (e.g. by

being able to communicate feelings that can be shared and enhance solidarity) rather than emojis being used to reflect an internal state. As such, prosocial behaviour can predict our attitudes towards emojis but it is a stronger predictor of our motivation to use them, possibly because it allows us to demonstrate the behaviour we perceive is more reflective of how we would like to act.

Prosocial behaviour also predicted positive emoji preference but when it came to preference, personality was also a predictive factor. Extraversion and agreeableness alongside prosocial behaviour all predicted our preference for positive emojis, with high levels of these factors relating to more preference for positive emojis. Previous research has shown that agreeableness and extraversion relate directly to prosocial behaviour (Abdullah et al., 2020; Carlo et al., 2005) and given their characteristics such as enjoyment of social interaction, warm-heartedness and altruism, this link is perhaps unsurprising. Positive emojis often consist of smiling faces, hearts and other positive actions therefore they may represent specific aspects of extraversion, agreeableness and prosocial behaviour making them preferred by people high in these attributes.

The idea that emojis may not always reflect internal states may be applicable when considering emoji preference. Positive emojis may be preferred by people with a disposition towards agreeableness, extraversion and prosocial behaviour because they reflect emotions which focus on others rather than on themselves. Habashi et al. (2016) found empathic concern, a prosocial emotion, was related to agreeableness and prosocial behaviour therefore it is possible that the positive emojis may represent and facilitate prosocial emotions. However, whether this is the case requires further investigation.

When considering negative emoji preference, the story was different, with general mental health, emotional stability and conscientiousness all being significant predictors. The correlations suggest that negative emojis were preferred when people's general mental health and emotional stability were poor. Emojis can be used to represent negative mood states such as anxiety (Davis et al., 2022) therefore when people are struggling with depression and anxiety or feel emotionally unstable they appear to prefer emojis which reflect their state of mood. This supports the use of emojis as a response scale in measures relating to wellbeing. However, when it came to personality, only conscientiousness significantly predicted negative emoji preference. Conscientiousness can be defined as being a consistent cognition or behaviour in various situations (Roberts et al., 2009) and can involve planning, setting goals, and achievement. Consequently, when negative emojis are preferred, people lack this consistency in their thoughts and behaviour which when combined with emotional instability and experience of mood-related disorders may explain why it helps predict negative emoji preference. The negative emojis themselves can often reflect unstable emotions (e.g. fearfulness, worry, crying and disappointment) therefore low conscientiousness may exacerbate people's preference for these types of emojis.

The findings from the current study show how perceptions of prosocial behaviour, mental health and personality contribute to our use of and preference towards emojis. This expands our knowledge by showing how our preference for certain types of emojis may be based on individual differences which explains why the same emojis are not

always used in the same way. The current study also indicates that while individual differences such as personality can predict our preference for emojis, our perceptions of prosocial behaviour predict our motivation to use them. This shows how our perceptions of our behaviour can predict emoji use in addition to using them as a communicative function (Derks et al., 2008). Furthermore, while our use of emojis is not simply due to them representing our current mood as previously indicated (e.g. Donovan, 2016), our mental health does underlie our preference for negative emojis, suggesting there may be a link between preferring negative emojis when our mental health is low but that this is not translated into our use of negative emojis in text-based communication. Therefore, preferring certain emojis does not necessarily mean we use them in our communication and that both preference and use appear to be linked to individual differences.

There are some limitations of the study which need to be acknowledged. Due to technical errors, not all of the participants' data could be used for the emoji use measure therefore a high proportion had to be removed. While this did not affect the power, it is something that could have been avoided when setting up the questionnaire online. Secondly, the poor factor structure of the HADS resulted in depression and anxiety being considered together rather than separately. Consequently, it is not clear whether emoji use and preference differs in these two groups and so future research would be good to investigate this with a view of using emojis as a possible indicator of depressive or anxious mood.

To conclude, emoji use and preference is predicted by our personality, mental health and prosocial behaviour. Prosociality is predictive of use, motivations to use and attitudes towards emojis as well as our preference towards positive emojis. Preference towards emojis however seems to relate to different personality traits and mental health, suggesting that negative emoji preference might be related to mood-based traits and emotions whereas positive emoji preference is related to traits and behaviour that focus on social interaction. Further investigation is needed to understand the use and preference of emojis in our text-based communication.

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## Data Availability Statement

The data that support the findings of this study are openly available in Open Science Framework at <https://doi.org/10.17605/OSF.IO/FTW8J>, Janine (2023).

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