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The Relationship Between Self-Reported Emotional Intelligence and Emoji Identification Accuracy in College Students

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Introduction

The current study examines the use and interpretation of emojis by neurotypical college students through emotional recognition and social understanding and the implications for their use in supportive communication inside the classroom for individuals with autism spectrum disorder (ASD). Emotional awareness and reciprocity are essential for establishing friendships and developing social skills. At this point, there is limited research on the implications of emoji use for individuals with ASD and boundaries that may be associated with emojis in social understanding and emotional awareness. The specific research questions that will be addressed in this study are as follows: (1) Is there a correlation between self-reported emotional intelligence and emoji identification accuracy? (2) Is there a correlation between degree of emoji use and emoji identification accuracy? (3) Are certain demographic characteristics (i.e., gender, age, years of smartphone use) related to emoji identification accuracy? A total of 101 undergraduate and graduate students completed a 53-item survey that included demographic questions, emoji identification tasks, and self-reported measures of emotional intelligence. Results indicated that there is not a relationship between an individual's ability to correctly identify emojis and their level of self-reported emotional intelligence ($r = .161$; $p = .131$). Participants' identification accuracy was not found to be related to degree of emoji use, gender, or age ($p > .05$). However, the relationship between identification accuracy and years of smartphone use was found to be approaching significance ($p = .051$). The results provide preliminary evidence for future researchers to investigate whether there is a relationship between emoji identification accuracy and emotional intelligence for individuals with ASD.

Significance of the study

The use of computer-mediated communication (CMC) for students with ASD has demonstrated learning benefits such as age appropriate behaviors and creative play (Herrera et al., 2008), in addition to making positive impacts on building social and emotional skills (Parson & Mitchell, 2002). Further research is necessary regarding the use of CMC for individuals with ASD, due to a lack of studies with young adults or minorities in postsecondary education. One component of CMC is the use of emojis. The purpose of this study is to explore whether emotional intelligence and emoji identification are related, primarily to inform support options for individuals with ASD. However, this relationship has not been previously explored, and this study therefore utilizes neurotypical (typically developing in intellectual and cognitive ability) college students because of the limited accessibility of individuals in the ASD population. This is the first step in our line of research on social communication. If the emotional intelligence of neurotypical individuals is associated with emoji recognition and accuracy, this relationship may offer insight into potential treatment and support options for social communication for individuals with ASD. This study also aims to draw preliminary conclusions about whether or not emoji use in CMC may help support emotional awareness and social understanding in individuals with ASD.

Literature Review

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by impairments in social-emotional reciprocity, nonverbal communication, and development of relationships as well as restricted interest or repetitive behaviors (American Psychiatric Association, 2013). Individuals with ASD have been noted to experience challenges with emotional recognition and reciprocation as well as difficulty with employment and

postsecondary education (Baron-Cohen et al., 2001). Previous research has also found that fear in social situations was more often reported by children with ASD than neurotypical children and that children with ASD had difficulty identifying their own emotions in social situations (Rieffe et al., 2007). Emotional awareness, defined as the conscious experience of emotions, is essential for establishing friendships and building pragmatic (i.e., social and body language) skills (Gu et al., 2013). Current evidence-based practices based on classical interventions do not support development of emotional expression, recognition, and awareness in self-initiated social interactions or realistic settings (Gallup & Serriani, 2017). Despite rapid growth in the use of technology for teaching and learning in the classroom, the use of technology as teachers' support for children and youth with disabilities has not been thoroughly examined (O'Malley et al., 2013). Additionally, the use of media environments to facilitate a social space for individuals with ASD to develop the skills necessary for building and maintaining friendships and face-to-face (FtF) interactions continues to be an area for exploration.

Computer-Mediated Communication

Computer-mediated communication (CMC) is defined as communication between people using computer technology through applications over the Internet (Hopperton, 2016). These communication applications include email, text messaging, online forums, social networking services, and online role-play gaming (Hopperton, 2016). The use of a mixture of technology, including smartphones, tablet and game devices, computers, and cell phones without Internet access in secondary education has been shown to increase independence, reduce anxiety, and encourage social opportunities for students with ASD (Hedges et al., 2017). Although young adults are increasingly using CMC for social interactions, previous research has primarily

studied cognitive bias through FtF interactions (Riordan & Kreuz, 2010; Kafetsios et al., 2017; Okdie et al., 2011).

Media environments can also provide increased reassurance in reciprocal relationships and support greater accessibility to postsecondary education (Gallup & Serianni, 2017). Children with ASD who participate in technology-based intervention programs, such as touchscreen technology, that focus on cause-and-effect behaviors in real time may experience motivation and sense of presence during the program (Boucenna et al., 2014). Game-based therapy using serious games, with the purpose of training as opposed to entertaining, has shown higher levels of concentration and interest when compared to other therapeutic interventions. For instance, when multiple children with ASD were involved in an activity, their understanding and peer interaction improved (Sasikumar et al., 2017). However, one limitation of previous studies is that it was not necessarily ensured that the game or application used in the media environment was appropriate for the target population and correlated to the study design and focus. A review of computer-based intervention emphasizes the importance of understanding both the game player, which includes emotional and physical states and target population characteristics, and the game itself, which must be appropriate for the parameters of the study (Goh et al., 2008). Future efforts need to offer more intervention programs that cater specifically to individuals with ASD in order to explore the potential short- and long-term benefits of using these interventions in secondary and postsecondary education.

Emojis

CMC has expanded on the use and range of different emojis, which are a pictographic form of language used for representation of a facial expression (Marengo et al., 2017). Emojis are used informally to convey emotions and attitudes in CMC by replacing words or phrases in

messaging through text (Marengo et al., 2017) and clarifying communicative intent (Wagner et al., 2020). Emojis were predated by emoticons (or "emotion icons"), which used punctuation marks, letters and numbers, such as :-) and :-(, to express feelings or save time (Pardes, 2019). Emoticons were first published in 1982 but did not become widely used until the emergence of short message service (SMS) and Internet in the late 1990s, when they were incorporated into emails, text messaging, and online forums and gaming (Williams, 2007). Emojis were first introduced as a set of 176 pictograms available to users of Japanese mobile phones and have expanded to over 1,144 single emoji characters as defined by the Unicode Consortium, a non-profit international encoding system that has standardized every computer letter and character for language (Pardes, 2019).

Emojis were not universally accessible on smartphones until 2010, though they were available with separate applications (Pardes, 2019). Despite the prevalence of emoji use, research about them remains limited and mostly concerns patterns of use among different demographics, descriptive analysis, and emotional effect of accompanying media (Barbieri et al., 2016; Chen et al., 2017; Muralidhar et al., 2018). However, research has found that younger generations are more comfortable with technology, and 92% report texting with their smartphone several times a day (Grieve, 2017; Kingsbury & Coplan, 2016). Although emojis can offer a means to convey emotions through nonverbal gestures, there remains the possibility of misunderstanding and ambiguity. Teens and young adults report a strong preference for text messages over other forms of communication, including emails, voice calls, and even FtF communication (Lenhart, 2012).

Emojis represent nonverbal communication using facial expressions, which have been shown to be difficult for individuals with ASD (Eack et al., 2015). But what do we know about how emoji use is perceived? Emojis have been found to be significantly related to emotions and

affective processing (Marengo et al., 2017). A study on playfulness in mobile texting surveyed 201 adults (128 females and 73 males) and found that emojis in text messaging cohesively facilitated perceived playfulness, which strengthens social connection, increases advocacy intention among friends using cell phone instant messaging, and enhances the ability to express one's identity (Hsieh & Tseng, 2017). For individuals with ASD who struggle with social understanding, the use of emojis may establish another social and emotional boundary in communication. Kafetsios et al. (2017) examined positive and negative emotions in FtF versus CMC experiences in female college students. Results indicated that FtF interactions were found to be experienced more positively overall (Kafetsios et al., 2017). This may indicate that the use of emojis in computer-mediated communication could be perceived negatively due to the lack of in-person gestural queues. Emojis and text messaging can also be used together to build communicative connection with peers, but may pose a challenge for individuals with ASD who struggle with emotion evaluation in FtF or media environments. Rigby et al. (2018) used questionnaires to assess social skills and empathy abilities among 32 adults (16 adults with and 16 without ASD). They found that the ability of individuals with weaker (vs. stronger) social and empathy skills to match or identify static, socially engaging faces was dependent on how much time they were given (Rigby et al., 2018). If emotional IQ is associated with time for emoji recognition, it may offer implications of the struggles ASD individuals face in CMC environments.

Social Understanding

Individuals with ASD typically display poor social awareness and understanding, which can result in difficulty establishing and maintaining relationships and issues integrating into mainstream classroom and employment environments (Bernard-Opitz et al., 2001). Multiple

studies have found that when given a verbal task, even high-functioning individuals with ASD exhibit weak or absent pragmatic skills (Lönnqvist et al., 2015). Parson et al. (2004) explored the possibility of virtual environments to teach social skills and awareness to individuals with ASD. The results of the study indicated that individuals with ASD were able to effectively use virtual technology to understand simulated people and environments through representations of real-world scenarios (Parson et al., 2004). Virtual environments (VE) provide 3D situations that can be explored in real time, with some VEs allowing the viewer to experience a "through-the-eyes" view as opposed to a "birds–eye-view" (Parson et al., 2004). VEs consist of a three-dimensional computer-based task that depicts an environment resembling the real-world or abstract data and objects (Blade & Padgett, 2015). In another study, Mitchell et al. (2007) found that the use of VEs resulted in significant gains in social awareness and understanding. It was concluded that the participants were able to experience first-hand the consequences of living out a scenario rather than simply hearing an abstract social rule presented by a teacher (Mitchell et al., 2007). Fabri et al. (2007) showed that the facilitation of VEs provides adults with ASD the opportunity to practice their skills associated with theory of mind—the ability to think about mental states, both one’s own and those of others, such as emotions, beliefs, opinions, or knowledge. These environments can offer new rehabilitative and therapeutic ways to support social skill growth for individuals with ASD.

Emotional Awareness

Emotional awareness involves the monitoring and differentiation of emotions, without recognition of the portion of the emotional experience regarding physical arousal (Rieffe et al., 2011). Individuals with ASD have been known to struggle with the ability to regulate, perceive, and understand their own emotions and the emotions of others (Uljarevic & Hamilton, 2012).

Media technologies have demonstrated benefits in emotional learning that may be important to consider for people with ASD. Gallup and Serianni (2017) found that VEs can provide an environment that helps individuals with ASD participate in more meaningful interactions with peers, supported by complex communication. Their results showed that emoticons in VEs supported emotional awareness and served two purposes in the game: (1) expression of the participants' own emotions and (2) understanding the emotions of others (Gallup & Serianni, 2017). Additionally, VEs provide an exploratory setting for learning emotional self-awareness, particularly in massively multiplayer online role-playing games (MMORPG), which allow the user unlimited interactions so that they are able to practice their social and emotional awareness skills (Gallup & Serianni, 2017). In the study, Gallup and Serianni (2017) allowed participants to explore learning emotional reciprocity in an environment without consequences or judgement. The use of a MMORPG with young adults improved the ability of individuals with ASD to self-reflect and relate activities within the virtual game to comparable situations in a face-to-face setting (Gallup & Serianni, 2017). The results of a study using "Jestimule," an educational game, displayed improved recognition of facial emotions, emotional gestures, and emotional situations in children with ASD (ages 5-14) after they played the game for one hour daily for three months ($p < .05$; Khaoula & Touhami, 2018). In a comparative trial using an application known as the "Emotion Trainer," a multimedia computer program, the VE had significant positive effects on the performance of children with ASD on assessment tasks involving cartoon expression recognition ($p = 0.041$) and interpretation of strange stories ($p = 0.016$) (Silver & Oakes, 2001). With the increased use of emojis in virtual environments, it is important for individuals with ASD to recognize these expressions in order to develop relationships, social skills, and emotional reciprocity.

The use of media environments for students with ASD has been shown to increase age appropriate behaviors and creative play, in addition to improving social and emotional skills (Gallup & Serianni, 2017). The use of emojis in media environments may help to communicate nonverbal gestures and facial expressions through text that do not translate typically in CMC (Gallup et al., 2016). CMC, such as texting, provides a setting with the opportunity to enhance social skills in verbal and nonverbal communication and emotional awareness (Hedges et al., 2017). Further research is necessary on the use of emojis in CMC for individuals with ASD as support for social communication skills, due to lack of studies on young adults and/or minorities in postsecondary education and the potential of media environments to benefit students further in and out of the classroom. This study aims to provide preliminary evidence for whether or not emoji use in CMC may help establish emotional awareness and social understanding in neurotypical college students. It is essential to understand the nature of the relationship between emotional intelligence levels and emoji use in neurotypical individuals in order to determine if emojis may be a support for social communication for individuals with lower levels of emotional intelligence, including those in the ASD population.

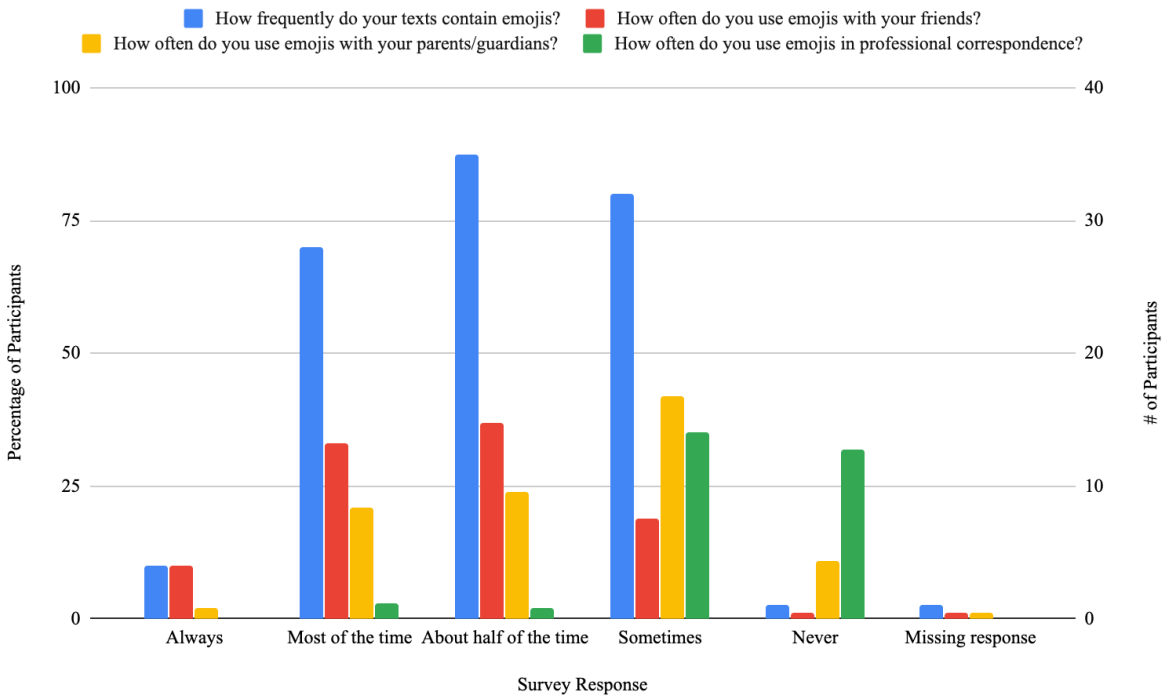
The purpose of the present study is to measure the relationship between emoji identification accuracy and self-reported emotional intelligence in neurotypical college students as an intial step in exploring the possibility of using them to build and support skills in emotional awareness and social understanding for individuals with ASD. In addition, the relationship between successful emoji identification and degree of emoji use was investigated. Lastly, demographic characteristics were obtained from participants in order to evaluate the relationship between degree of emoji use and gender, age, and years of smartphone use.

Methodology

Participants

All procedures involved in this study were approved by the Institutional Review Board (IRB) of the University of Northern Colorado prior to beginning data collection. A convenience sample of 101 participants was used for this study. Participants included both graduate and undergraduate students (8 males, 93 females; average years of smartphone use = 6.45 years) at the University of Northern Colorado who were 18 to 32 years old, in order to investigate age diversity in relation to emoji use. Figure 1 outlines the characteristics of the participants who completed the survey.

Figure 1. Characteristics of Participant Emoji Use



Data Collection

Students were recruited through flyers, internet postings, and face-to-face invitation over three weeks during the end of the Fall 2018 semester. A 53-item survey was created in Qualtrics (see Appendix A, Tables A1, A2, and A3) and submitted electronically to students to examine

interpretation of the use of different emojis in social communication. The participants used a QR code to access the survey on their computer or mobile device in any location with Internet access. The survey included an introductory message explaining the significance of the study and emphasized that participation was voluntary. Multiple-choice survey questions gathered participant characteristics information (n = 8) and assessed emoji identification (n = 17), and a four-point Likert-type scale asked for a self-reported rating of emotional intelligence (n = 28; see Appendix A, Table A1). The emojis used in emoji identification questions were presented in translation of emoji sentences (see Appendix A, Table A2) and individual emojis (see Appendix A, Table A3). The emojis in this study were chosen from the Unicode Emoji List based on common inappropriately used or interpreted emojis according to Emojipedia.org. To evaluate the individual's emotional intelligence, questions were used from the Rotterdam Emotional Intelligence Scale (Pekaar et al., 2018). The questions were formulated for both self- and other-focused regulation dimensions as follows:

1. "Self-focused emotion appraisal: The extent to which individuals perceive and understand their own emotions." (Pekaar et al., 2018)
2. "Other-focused emotion appraisal: The extent to which individuals perceive and understand other individuals' emotions." (Pekaar et al., 2018)
3. "Self-focused emotion regulation: The extent to which individuals regulate their own emotions to reach a goal." (Pekaar et al., 2018)
4. "Other-focused emotion regulation: The extent to which individuals regulate other individuals' emotions to reach a goal." (Pekaar et al., 2018)

Data Analysis

Descriptive analysis was used to obtain participant characteristics for the sample and provide the frequency of response for emoji identification and self-reported emotional intelligence questions. All 101 of the participants responded to the demographic questions. Researchers entered the data into Qualtrics Research Suite to prepare for analysis. Descriptive analyses were completed using SPSS data analysis and statistical software. A Pearson Product Moment Correlation test was used to measure the strength and direction of association between the two variables (emoji identification accuracy and self-reported emotional intelligence) on an interval scale. The test was also used to measure the relationship between the variables for demographic information and emoji identification accuracy. A Spearman Rank Order Correlation procedure was used to measure the strength and direction of association between degree of emoji use and emoji identification accuracy on an ordinal scale. Frequency tables were generated for all questions. The number of respondents varied for some questions due to response rate. In all, 94 students completed the full survey version (53 questions), with 101 participants completing the participant characteristics questions (see Figure 1), 98 completing the self-reported emotional intelligence questions (see Appendix A, Table A1) and individual emoji questions (see Appendix A, Table A2), and 94 participants completing the emoji sentence questions (see Appendix A, Table A3).

Results

The results suggest that the majority of the participants were familiar with and used emojis in computer-mediated communication. The following section will describe the results as they relate to each research question.

Our first research question asked, "Is there a relationship between self-reported emotional intelligence and emoji identification accuracy?" A Pearson Product Moment Correlation test was used to answer this question. Because participants were not required to answer each survey question, only 89 out of the 101 participants answered all of the questions related to emoji accuracy (17 questions) and emotional intelligence (26 questions). Thus, these 89 participants' responses were used to answer research questions 1-3. A total percentage accuracy score was calculated through SPSS analysis based on participants' responses to both the individual emoji items and the emoji sentence items. Similarly, an average rating was calculated from participants' responses to the Rotterdam Emotional Intelligence Scale items. Results indicated there was not a relationship between an individual's ability to correctly identify emojis and their level of self-reported emotional intelligence (r = .16; p = .13). Appendix A, Tables A2 and A3 provide the results of the emoji identification items, and Appendix A, Table A1 shows the results of the Rotterdam Emotional Intelligence Scale questions.

Our second research question asked, "Is there a relationship between degree of emoji use and emoji identification accuracy?" To answer this question, each participant's emoji percentage accuracy score was compared to their response to the question, "How frequently do your texts contain emojis?" Results of the Spearman Rank Order Correlation procedure indicated that there was not a relationship between degree of emoji use and emoji identification accuracy (ρ = -.013, p = .91). Figure 1 shows results of the participant characteristics, and Appendix A, Table A2 and A3 provide the results of the emoji identification items.

Our third research question asked, "Are certain demographic characteristics (i.e., gender, age, years of smartphone use) related to emoji identification accuracy?" Again, to answer this question, each participant's emoji percentage accuracy score was compared to certain

demographic information. Results of the Pearson Correlation procedure showed that gender and age were not related to emoji identification accuracy (gender $r = .22$, $p = 0.07$; age $r = -.11$, $p = .30$). However, years of smartphone use was negatively related to emoji identification accuracy ($r = -.21$, $p = .05$), so individuals who had used smartphones longer tended to perform poorer on the emoji identification task. Since smartphones were only widely available beginning in 2007 (Chowdhury et al., 2014), the older study participants likely had less experience with smartphones. Additionally, there was a significant relationship between years of smartphone use and age ($r = .50$, $p = .00$).

Discussion

The purpose of this study was to measure the relationship between an individual's level of self-reported emotional intelligence and their ability to accurately identify emojis in media environments. Due to the limited accessibility of college-students with ASD and lack of evidence regarding this relationship for neurotypical college students, this study provides exploratory evidence for the use of emojis to reinforce social communication for neurotypical individuals and initial steps in investigating the potential benefits of emoji use to support deficits in pragmatics in populations with lower levels of emotional intelligence, including individuals with ASD. The results provided preliminary support for the idea that emoji identification accuracy is not related to self-reported emotional intelligence. Additionally, results suggested that the ability to correctly identify emojis is not related to age, gender, or degree of emoji use in media environments. Data showed there was a negative relationship between years of smartphone use and emoji identification accuracy. Therefore, the assumption cannot be made that the longer someone owns a smartphone, the more adept they are at identifying emojis. Individuals who have owned and used a smartphone prior to the addition of emojis may not use them in

communication to the extent of an individual who has always had the option of emojis. Due to these findings, years of smartphone use and age were investigated, and a significant positive relationship was found.

Emoji Accuracy and Emotional Intelligence

The lack of a relationship between emoji identification accuracy and emotional intelligence suggests that the benefits of emojis to facilitate communication may not be to limited to the understanding and use of neurotypical individuals. Individuals with ASD typically display lower levels of emotional intelligence and cognitive impairments in social processing, which has been thought to hinder their ability to interpret facial expressions of emotion (Eack et al., 2014). If emoji identification accuracy is not related to emotional intelligence level, it may not present communication barriers for individuals with ASD. Emojis may allow facial and gestural expressions to be more concise and accessible for users of variable emotional intelligence through online formats. Additionally, 85.1% of the participants in the study reported that they felt emojis helped them to better communicate their emotions via text. This supports previous research that the visual representation of emojis add context and meaning through a variety of semantic information that is not available in text alone (Cappallo et al., 2019). Emojis may serve as a beneficial resource for neurotypical individuals and individuals with emotional intelligence deficits like ASD for social communication support or as compensatory strategies for building skills in social understanding and emotional awareness in CMC.

Emojis and Smartphone Use

The results of the study indicated that there was not a relationship between degree of emoji use and the ability to identify emojis successfully. This suggests that the frequency that an individual uses emojis across various platforms is not indicative of emoji identification success.

The study found that there was a significant relationship between age and years of smartphone use. This indicates that the older the participant is in age, the longer they have used a smartphone. However, individuals in the present study who had used a smartphone for a longer period of time tended to perform poorer on emoji identification tasks. We hypothesize that this could be due to experience with smartphones, as participants who have used smartphones longer may have learned to use them without emojis. The majority of the participants had used a smartphone for four to eight years, which means they have only been exposed to smartphones with encoded emoji accessibility (Pardes, 2019). This supports previous research that shows that individuals from GenZ or iGen (individuals born in 2001 to 2013) (Raphelson, 2014) are more comfortable with technology and have a stronger preference for online social interaction (Grieve, 2017).

Clinical Implications

This evidence is of particular relevance for clinicians in determining therapy for individuals with ASD who demonstrate issues in pragmatics. The results demonstrating a lack of a relationship between emotional intelligence and emoji identification accuracy may imply that individuals with ASD who typically display lower levels of emotional intelligence (American Psychiatric Association, 2013) may benefit from emoji use in computer-mediated communication. This may support social understanding and emotional awareness more than what they may encounter in face-to-face interactions. Emojis in CMC provide static representations of facial expressions, as opposed to the fleeting facial expression associated with FtF situations (Wagner et al., 2020). This may give individuals with ASD more processing time to interpret the meaning of the emotion expressed in emojis than they would have for in-person facial expressions.

Previous studies have shown that emoji users are primarily women, which is similarly representative of the demographic of speech-language pathologists (EMOGI, 2015; ASHA, 2016). Additionally, a 2014 report by the Centers for Disease Control and Prevention found that males are four times more likely to be diagnosed with ASD than females. Males with ASD may not use emojis as frequently across various media platforms as females. Therefore, speech-language pathologists must be aware of how emojis are used, the populations they are used with, and the purpose of the treatment. Interpretation bias in CMC through text messages and electronic media could be used as targets for cognitive therapies in order to reduce negative interpretations in FtF situations (Kingsbury & Coplan, 2016). The ability to create natural emoji and communication settings that resemble FtF interactions could help to alleviate discomfort, minimize the potential of misunderstandings, and improve the role of emojis in media environments (Tandyonomanu & Tsuroyya, 2018).

Limitations

The present study contains several methodological limitations. First of all, the sample size (n = 101) is likely not a representation of the majority of college students. Although the participants consisted of undergraduate and graduate students, 45.5% of the students were under the age of 20 (age 18, n = 26; age 19 n = 20). Secondly, 92 of the 101 participants were female and under the age of 30, and this demographic represents 92% of the population of most frequent emoji users (EMOGI, 2015). Additionally, the longest a participant of these ages had a smartphone was ten years, which dates back to 2009, one year before emojis were accepted by Unicode and made accessible everywhere (Pardes, 2019). This could be due to the technology-driven habits associated with Gen Z or iGen more than with Millennials (individuals born in 1980-2000) or older generations (Raphelson, 2014).

Based on the results of this survey, another issue that may be contributing to emoji identification accuracy is social or cultural discrepancy for the emojis chosen. The emoji questions formulated for this survey may not have been an appropriate measurement of an individual's knowledge of nonverbal communication. Finally, it is important to note that participants' emotional intelligence was evaluated through self-report data, which may contain response biases due to social desirability (Rosenman, Tennekoon & Hill, 2011). Despite these limitations, the study does appear to provide preliminary evidence about the relationship between levels of emotional intelligence and emoji identification ability for neurotypical college students and may provide implications for using emojis to support social communication for individuals with ASD.

Recommendations

The goal of this study was to provide preliminary evidence as to whether there is a relationship between an individual's emoji identification accuracy and their level of emotional intelligence. It should be noted that other computer-mediated communication exists outside of texting and email correspondence. These environments require communication and participation in social activities, which support friendships and help to develop pragmatic skills (Gallup et al., 2016). It remains unclear as to the prevalence of emoji use across various media environments by individuals with ASD, and this should be explored by future researchers. It will also be important to include other Emotional Intelligence Measures (i.e. other report or ability measures) when evaluating an individual's emotional intelligence because of the reliability issues associated with self-report data. Future studies should examine which emojis best represent an individual's social and emotional understanding of nonverbal communication. The present study used Apple version emojis relative to texting and email correspondence. However, different media emojis vary in

their specific features and should be examined by future researchers. Additionally, it will be essential to replicate this study with a larger sample size and greater age range of neurotypical participants. This study should also be replicated with individuals with ASD to determine if a relationship exists in this population.

Conclusion

The purpose of this study was to measure the relationship between an individual's level of self-reported emotional intelligence and emoji identification accuracy in computer-mediated communication to suggest whether emojis present a barrier in communication for individuals with ASD. If lower levels of emotional intelligence present no barriers to emoji identification accuracy, it is likely that nonverbal communication through media environments can supply individuals with ASD new formats to engage in building emotional awareness and social understanding.

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Appendix A

Table A1

Results of Questions Regarding Self-Reported Emotional Intelligence (4-point Likert Scale)

Survey Question	Overall *M*	SD	*n*
I always know how I feel.	(2.16)	.896	100
I can distinguish my own emotions well.	(1.89)	.799	101
I am aware of my own emotions.	(1.64)	.729	101
I understand why I feel the way I feel.	(2.13)	.913	101
I know which emotions I experience.	(1.68)	.706	101
Mostly, I am able to explain how I feel.	(2.30)	1.015	101
I can judge well if events touch me emotionally.	(1.67)	.723	101
I am aware of the emotions of the people around me.	(1.89)	.827	100
I know which feelings others experience.	(2.09)	.827	100
When I look at other people, I can see how they feel.	(2.11)	.933	100
I can empathize with the people around me.	(1.55)	.777	100
I understand why other people feel the way they feel.	(1.92)	.680	99
I can distinguish well between other people's emotions.	(1.94)	.740	99
I can judge well if events touch others emotionally.	(1.93)	.739	99
I am in control of my own emotions.	(1.99)	.909	99
I can suppress my emotions easily.	(2.29)	1.163	99
I do not let my emotions take over.	(2.60)	1.106	99
I only show my emotions when it is appropriate.	(2.19)	.986	99
Even when I am angry, I can stay calm.	(2.22)	1.041	98
If I want to, I put on my poker face.	(1.91)	1.094	98
I adjust my emotions when necessary.	(1.92)	.846	98
I can make someone else feel differently.	(2.03)	.867	98
I can alter another person's emotional state.	(2.21)	.987	98
I can boost or temper the emotions of others.	(2.00)	.849	98
I have great influence on how others feel.	(2.36)	.853	98
I know what to do to improve people's mood.	(2.00)	.812	98
I know how to influence people.	(2.16)	.905	98
I am able to calm others down.	(1.85)	.632	98

Note. From the "Rotterdam Emotional Intelligence Scale" (Peekar et al., 2018).

Table A2

Results of Individual Emoji Identification

Survey Question (What does this emoji mean?)	Participants' Response	SD	*n*
	Correct: *n* = 57 Incorrect: *n* = 41	.759	98
	Correct: *n* = 26 Incorrect: *n* = 72	.659	98
	Correct: *n* = 68 Incorrect: *n* = 30	.508	98
	Correct: *n* = 28 Incorrect: *n* = 47	.755	98
	Correct: *n* = 28 Incorrect: *n* = 60	.888	98
	Correct: *n* = 1 Incorrect: *n* = 97	.423	98
	Correct: *n* = 57 Incorrect: *n* = 41	.759	98

Note. From the New York Times' "Are You Fluent in Emoji?" quiz (Oliver, 2014).

Table A3

Results of Emoji Sentence Identification

Survey Question (translate this emoji sentence)	Participants' Response	SD	*n*
	Correct: *n* = 86 Incorrect: *n* = 9	.646	95
	Correct: *n* = 68 Incorrect: *n* = 27	.890	95
	Correct: *n* = 94 Incorrect: *n* = 1	.308	95
	Correct: *n* = 72 Incorrect: *n* = 23	1.277	95
	Correct: *n* = 92 Incorrect: *n* = 3	.249	95
	Correct: *n* = 16 Incorrect: *n* = 78	1.067	94
	Correct: *n* = 29 Incorrect: *n* = 65	.653	94
	Correct: *n* = 82 Incorrect: *n* = 12	.432	94
	Correct: *n* = 93 Incorrect: *n* = 1	.309	94
	Correct: *n* = 68 Incorrect: *n* = 26	1.127	94

Note. From the New York Times' "Are You Fluent in Emoji?" quiz (Oliver, 2014).