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Influencing message perceptions with emoji and sarcasm

The influence of emoji and sarcasm on people's perceptions of WhatsApp messages.

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Content

Abstract

Emoji are the images of facial expressions and gestures that are nowadays widely used in computer-mediated communication. Previous research has shown that emoticons, the precursors of emoji, are the closest replacements for nonverbal cues in computer-mediated communication and that they aid in message comprehension. Rightfully interpreting a message can be difficult when it contains sarcasm. Therefore, people can indicate sarcasm. However, it has not yet been researched what type of sarcasm indicators work best and how messages with these cues are perceived. In the current study an experiment was conducted measuring participants' perceptions of WhatsApp messages with or without emoji (a smiling emoji or a 'Face with tears of joy' emoji) and sarcasm (indicated by the text "LOL" or the 'Face with tears of joy' emoji). Participants' perceived sarcasm, informality, humor, valence, and professionalism were studied. The results show that messages containing emoji were perceived as more informal, more humorous, and less professional than messages without emoji. Messages containing sarcasm were perceived as more sarcastic, informal, humorous, and negative, but as less professional than messages without sarcasm. Messages with the 'Face with tears of joy' was perceived as more sarcastic than the "LOL". This study suggests that emoji can be used to change the meaning of a message and to lighten the tone of a message. They can add an extra dimension to a text, but have been shown to be more suitable for informal messages than for formal communication.

Keywords: emoji, sarcasm, WhatsApp, perceptions, valence, informality, humor, professionalism.

Introduction

'Jack's new haircut is really great! 😂*'*

The sentence above is not meant to be taken literally. This person is actually saying that Jack's hair looks ridiculous or at least a bit funny, and most people will understand that. Here, the laughing emoji is an indicator for the sarcasm in this sentence. The sarcasm changes the meaning of the message. It can be used to say something negative in a humorous way, but it can be misinterpreted if it is not indicated clearly. Without the emoji it would be difficult to understand that the sentence above is meant sarcastically. Emoji and emoticons can be used to clarify the sentiment of messages, but they are two different concepts. Emoticons, the precursors of emoji, are the smiley faces created using symbols and punctuation marks, while emoji are visual images used in text. Emoji and emoticons are important tools for clarifying the meaning of written messages in computer-mediated communication (CMC). They aid in the rightful interpretation of digital messages (Loglia & Bowers, 2016). This study will explore the perceived sarcasm, formality, humor, valence, and professionalism of informal WhatsApp messages that contain emoji and/or sarcasm.

In face-to-face communication, part of the meaning of what is said is derived from non-verbal cues of the sender of the message. For example, sarcasm can be indicated by means of gestures, facial expressions, or tone of voice. People adopt these non-verbal cues because they add value to what is said. However, in written CMC, these non-verbal cues are missing, which can lead to misinterpretations of what is being said. Cues that can be applied are emoji and emoticons. The scholars Derks, Bos, and Von Grumbkow (2008a) studied the impact of emoticons on message interpretation. They found that emoticons are useful for interpreting text, because they can indicate ambiguity or strengthen the intensity of a textual message. They concluded that emoticons can serve the same functions as non-verbal cues in face-to-face communication. Accordingly, emoticons aid in message comprehension. Nowadays, emoticons

are mostly replaced by emoji. Emoji can display more facial expressions and gestures than emoticons, but are not as well-researched. Therefore, the current study examines the impact of the smiling emoji and the 'Face with tears of joy' emoji on message perceptions. This will shine new light on the existing research about the perceptions of emoticons.

Non-verbal cues are especially important when a message includes sarcasm, because people (and computers) generally have difficulty distinguishing sarcastic from non-sarcastic messages when there is no sarcastic cue present (Kunneman, Liebrecht, Van Mulken, & Van den Bosch, 2015; Liebrecht, Kunneman, & Van den Bosch, 2013). Emoji and emoticons help people recognize sarcasm. They are especially helpful for interpreting messages with a non-literal meaning, such as sarcastic messages, when there is little explicit context about the message available (González-Ibáñez, Muresan, & Wacholder, 2011). In the current research, a visual and a textual sarcastic cue will be examined. The perceptions of messages with the 'Face with tears of joy' emoji and with the text "LOL" will be studied to see which cue indicates sarcasm most effectively in a communication setting with little context.

Emoji have become a common form of communication on informal social media such as WhatsApp. In a study by Kannan and Shreya (2017) 94% of the WhatsApp users reported that they use emoji in their communication. Emoji are mostly used in informal communication because of their informal character. However, there is more literature about the use of emoji or emoticons in formal communication than there is about its use in informal communication. The perceptions of emoticons have often been studied in a work-related setting. When messages in a formal communication setting contain emoticons, they can be perceived as less professional (Gacey & Richard, 2013; Loglia, 2013) and their sender can be perceived as less competent (Glikson, Cheshin, & Van Kleef, 2017; Thoresen & Andersen, 2014). These findings suggest that emoticons can have a negative impact on the perception of the message and its sender. In informal communication settings however, emoji and emoticons might be more suitable.

Emoticons are a form of informal communication and can be used to make the tone of a message more human (Gretry, Horváth, Belei, & Van Riel, 2017). They are expected to be perceived differently in informal communication than in formal communication. Therefore, this paper will examine people's perceptions of messages with and without emoji and sarcasm on the informal social medium WhatsApp. Two types of emoji and two types of sarcasm indicators will be tested and compared to each other. The following research question will be studied:

> RQ1: What is the effect of the inclusion of emoji and/or sarcasm in an informal setting on people's perception of the message?

Theoretical framework

Emoji

The word emoji is a loanword from Japanese that combines 'e' (picture) and 'moji' (character). The function of emoji is to express an idea or emotion in electronic communication. They can also be used to express humor, to strengthen the sentiment of a message, or to replace certain words (Moschini, 2016). According to Moschini (2016), emoji were created explicitly as 'humor indicators'. She studied the background of the 'Face with tears of joy' emoji, because it was chosen as *Oxford Dictionaries'* "Word of the Year" of 2015 (https://oxforddictionaries.com). *Oxford Dictionaries* argues that it not only best reflected the mood and preoccupations of 2015, but that it was also the most heavily used emoji in the world in that year. In 2017 the 'Face with tears of joy' emoji was again the most frequently used emoji. Since many of our daily interactions take place via computers, and in CMC emoji are widely used, emoji have become fundamental for digital communication.

In CMC, it is common for the sender of a message to wonder if the receiver is going to misconstrue it (Loglia & Bowers, 2016). Therefore, we use emoji to clarify the tone of our messages. Derks, Bos, and Von Grumbkow (2008b) found that emoticons are used more in communication with friends than in communication with strangers. This is noticeable in

informal CMC. Emoji have become a widespread supplement to textual communication that fits in perfectly with other forms of communication on mobile devices and social media (Danesi, 2017). Emoji allow people to provide visual imagery for emotions and semantic nuances to enhance written text. They make CMC richer, by allowing people to transmit more information with less words or characters. However, on different social media platforms emoji will be perceived in different ways. The interpretation of the communicated message is dependent on the intentions of the sender of the message and on the character of the medium.

On WhatsApp, the digital images of faces, animals, party hats or other symbols that we call emoji are indispensable. Not only do 94% of WhatsApp users embrace the use of emoji (Kannan & Shreya, 2017), they are also often crucial for the rightful interpretation of a message (Loglia & Bowers, 2016). Kannan and Shreya (2017) analyzed 131 responses on a questionnaire about the usage of emoji on WhatsApp. They found that 80% of the respondents believe that the emoji enhance textual communication. Making messaging more interactive was also found to be an advantage of emoji. 73% of the respondents felt that emoji helped in building the required impressions on the receiver. Most relevant for the current research is the finding that 89% of the respondents thought that emoji can change the meaning of a communicated text. In the current study this will be examined by using the ‘Face with tears of joy’ emoji to make a sentence sarcastic. The emoji is meant to change the meaning and the valence of the textual message.

Sarcasm

Ever since the existence of social media, the use of sarcasm and irony have been proven to be pervasive phenomena in messages (Sulis, Farías, Rosso, Patti, & Ruffo, 2016). Sarcasm and irony are often used as synonyms and in most literature the words are used as interchangeable (Hallmann, Kunneman, Liebrecht, Van den Bosch, & Van Mulken, 2016). In this paper, the word sarcasm is preferred for categorizing sarcastic messages. Sarcastic

messages are paradoxical in nature; they often convey a negative opinion by means of only positive words (Kunneman et al., 2015). The *Cambridge Dictionary* defines sarcasm as: "the use of remarks that clearly mean the opposite of what they say, made in order to hurt someone's feelings or to criticize something in a humorous way" (https://dictionary.cambridge.org/). For these words to 'clearly mean the opposite of what they say', there has to be an indicator of the underlying meaning of the text. Otherwise, misinterpretation of the message may occur.

Sarcasm indicators are meta-communicative cues that can take different forms in written and face-to-face communication. In face-to-face communication, we know indicators such as air quotes, facial expressions, intonation and false coughs. In written communication sarcasm indicators can for example be exclamation marks, three dots, intensifiers, and superlatives (Hallmann et al., 2016). Then there are emoticons. Emoticons can also be typographic sarcasm indicators (Burgers, Van Mulken, & Schellens, in press). Unlike emoji, they are written in text and do not contain visuals. CMC can be seen as an intermediate form between written and face-to-face communication. CMC messages can contain written, spoken, and visual communication. If they contain both written and visual communication, they are multimodal. In multimodal messages, emoji are particularly useful for indicating sarcasm in messages (Kunneman et al., 2015). They can be added to indicate the underlying meaning of a sarcastic message.

Hallmann et al. (2016) studied whether people who know each other need less cues to indicate sarcasm than people who do not know each other. They analyzed 644.000 Twitter messages for sarcasm indicators and found that the use of indicators depends on the mutual knowledge between sender and receiver. When they know each other, less sarcasm indicators are used. Senders addressing receivers rely more on their mutual knowledge. Gerrig and Goldvarg (2000) argue that people's perceptions of sarcastic utterances is dependent on their beliefs, desires and expectations. Sarcasm will not be recognized if there is no disparity between

their beliefs and what is being said. This is called situational disparity (Gerrig & Goldvarg, 2000). For example, if the receiver of the message at the beginning of this paper would belief that Jack's new haircut actually looks really great, it would be more difficult for this person to recognize the sarcasm in the utterance. The situation does then not give the grounds for sarcasm. Sarcasm indicators will be less necessary for the rightful interpretation of the message if the context is clear for both parties.

The research of Kunneman et al. (2015) shows that an indicator for sarcasm is needed for rightful interpretation of a sarcastically meant message. They analyzed tweets with and without indicators for sarcasm, such as hashtags, (intensified) evaluative words, and exclamations. They concluded that it is hard for people to distinguish sarcastic tweets from literally intended tweets, but also for computers using linguistic analysis. González-Ibáñez et al. (2011) found that accurately classifying sarcasm is a task that is as difficult for machines as it is for humans. The accuracy of both parties was low. Correspondingly, Liebrecht et al. (2013) concluded that distinguishing sarcastic tweets from literal tweets is fairly hard in an open setting. More specifically, if tweets do not contain an indicator for sarcasm, humans and machines both experience difficulty when identifying sarcastic from non-sarcastic tweets. Liebrecht et al. (2013) showed that their system detected sarcasm with only a 30% average precision when it analyzed 250 tweets of which some were sarcastic and others were not when indicators for sarcasm were removed. These studies show that sarcasm indicators are crucial for Twitter messages including a maximum of 140 characters. The main argument given for this problem is that the lack of context and the brevity of the messages creates a knowledge gap which leads to differences in understanding between the sender and the receiver of the message (González-Ibáñez et al., 2011). Nevertheless, even with more context, differences in understanding still occur. In online forums, a lack of verbal and visual cues often causes humorous, sarcastic or ironic comments to be misinterpreted badly. To avert arguments, which

can be the result of misunderstandings, emoticons are required for indicating humor or other emotions in texts (Raymond, 1996).

But why use sarcasm if it can lead to misunderstandings? Sarcasm is a form of humor and can therefore make a message humorous. It can make a critical remark come across as a humorous observation. Besides being humorous, sarcasm can help people remember certain things. Gibbs (1986) found that expressions which included sarcasm were remembered much better than their literal equivalents. The participants recalled the expressions that included sarcasm more often than expressions without sarcastic utterances.

Emoji indicating sarcasm

The word emoticon stands for 'emotion icon', which suggests that emoticons are only meant for representing emotions (Dressner & Herring, 2010). However, sarcasm is not derived from one single emotion, but can be indicated by emoticons. Dressner and Herring (2010) argue that a simple smiling face can even indicate sarcasm. Since emoticons can express ambiguity, they can indicate sarcasm. They can do this by making the valence of an emoticon and a written message contradictory. Derks et al. (2008a) found that a negative verbal message accompanied by a smile emoticon conveyed greater sarcasm than a negative pure message. The same effect was found for a positive verbal message accompanied by a frown emoticon. Besides adding emoticons with an opposed valence, it was also useful to add a wink emoticon to the message. The wink emoticon could cause both the negative and positive verbal messages to be perceived as sarcastic. In the study of Derks et al. (2008a), messages that included an emoticon with a different valence than the textual message were perceived as more sarcastic than messages with an emoticon with the same valence as the text. This shows that messages can be two-sided. The same textual message can be perceived in two different ways, by adding certain emoticons. But an emoticon in itself can also be two-sided, for example the winking face emoticon. The smile suggests that the emoticon has a positive meaning, but the wink can imply sarcasm. It leads to

an ulterior interpretation of the meaning of the message and can be used for positively and negatively worded messages (Derks et al., 2008a).

The study outline

To investigate the perception of emoji and sarcasm in a messaging context, participants' perceptions of messages containing emoji and/or sarcasm were measured using an online experiment. The messages were displayed on the social medium WhatsApp, because emoji and sarcasm are forms of informal communication (Koot, 2013). Informal communication is most suitable and mostly used on informal platforms, such as WhatsApp. By means of a survey, the participants' perceived sarcasm, informality, humor, valence, and professionalism was measured. Table 1 shows the four conditions the sentences were presented in. In the first condition, the meaning of the message is not sarcastic and it does not contain an emoji. In condition 2, the meaning of the message is again not sarcastic, but the message does contain an emoji. The emoji is smiling and is therefore congruent with the positive/not sarcastic meaning of the message. Condition 3 shows a sarcastic sentence in which the sarcasm is indicated by the textual cue: "LOL", which stands for 'Laughing Out Loud'. The fourth condition is the sarcastic emoji condition in which the sarcasm is indicated by a visual cue: the 'Face with tears of joy' emoji. This emoji is laughing very hard and thus suggests that the message is meant to be humorous. In this case it indicates that the sentence should be perceived as being meant sarcastically.

Table 1

The visualizations in the four conditions.

Meaning	**Modality**	
	No emoji (text)	Emoji (text + emoji)
Not sarcastic		
Sarcastic		

Overall, previous research suggests that messages are most easily recognized as being sarcastic when they contain an additional cue that exposes the underlying meaning of the message. Both humans and machines experience difficulty in distinguishing sarcastic from non-sarcastic messages without a sarcasm indicator (González-Ibáñez et al., 2011; Liebrecht et al., 2013). This is because the underlying meaning of a sarcastic message is often different from the literal meaning of the text in the message. This second layer has to be revealed in order to make people understand the message. That is where the sarcastic cue comes in. Hypothesis 1

argues that the addition of the ‘Face with tears of joy’ emoji and the “LOL” will be clear remarks for the sarcastic tone of voice of the messages.

Derks et al. (2008a) argue that emoticons are useful in strengthening the intensity of a message, but also in expressing ambiguity. This study will examine whether two different sarcasm indicators will effectively express ambiguity. The ambiguity is in the valence of the message sentence and its sarcastic cue. It can be exposed by opposing the valence of the message sentence and the valence of the sarcasm indicator (Derks et al., 2008a). In this study, the valence of the message sentences will be positive, but the sarcastic cues will indicate that the underlying meaning of the messages is negative/sarcastic. Thus, the perceived sarcasm and valence of the messages should correlate. Hypothesis 2a examines the valence of messages with and without sarcastic cues. According to Derks et al. (2008a), the intensity of a positive message can be strengthened by adding a smiling emoticon. Therefore, hypothesis 2b will study the valence of messages with and without the smiling emoji.

H1: Messages containing sarcasm (indicated by the ‘Face with tears of joy’ emoji or “LOL”) will be perceived as more sarcastic than messages without sarcasm.

H2a: Messages containing sarcasm will be perceived as negative, whereas messages without sarcasm will be perceived as positive.

H2b: When the smiling emoji (☺) is added to a positive message, it will be perceived as more positive than without that emoji.

Research by Loglia (2013) pointed out that formal CMC-messages (e-mail messages from a fake boss) containing emoticons were perceived as more feminine and less professional than messages without emoticons. Derks et al. (2008b) found that emoticons are used more in communication with friends than in communication with strangers. These results lead to the belief that emoticons are more suitable for (and more often used in) an informal setting than in

a formal setting. Gacey and Richard (2013) studied the effect of emoticons in business e-mail communication on the perceived negative affect of the e-mail message. They found that e-mail messages that included emoticons were perceived as less professional than e-mails without emoticons, but also as less negative. This suggests that emoticons can have a positive influence on the perceived valence of a message. The perception of emoticons as unprofessional may relate to them being seen as more informal. This can be positive for an organization if they want to gain their consumers' trust. Gretry et al. (2017) showed that the use of an informal communication style, for example by means of emoticons, leads to an increased trust in the brand if the costumer is familiar with the brand. The use of emoticons thus increased the perceived conversational human voice of the brand. This perceived humanity is necessary for strong bonds with and loyalty of customers (Gretry et al., 2017). Hypothesis 3a will study the perceived informality of messages with and without emoji. Besides emoticons, jokes can give messages a more informal tone of voice (Koot, 2013). Sarcasm is a form of humor and is mostly used in informal communication. Therefore, hypothesis 3b argues that the inclusion of sarcasm will increase the perceived informality of a message when compared to a non-sarcastic message. Hypothesis 3c will study if the messages in the condition with emoji and sarcasm will be perceived as the most informal from the four conditions in this study.

H3a: Messages containing emoji (the smiling emoji or the 'Face with tears of joy' emoji) will be perceived as more informal than messages without emoji.

H3b: Messages containing sarcasm will be perceived as more informal than messages without sarcasm.

H3c: Messages containing a sarcastic emoji will be perceived as more informal than messages without emoji or sarcasm.

Sarcasm can be used to criticize something. A critical remark can become humorous by making it sarcastic. The meaning of the message then becomes less severe. Because sarcastic messages often entail positive words, they can enlighten the tone of an actually negative message. For the recognition of sarcasm, emoticons have been proven to be effective (Derks et al., 2008a; Dressner & Herring, 2010). In the current study, two different emoji are used. The smiling emoji is used when a message should not be interpreted as sarcastic and the 'Face with tears of joy' emoji is used when a message should be interpreted as being meant sarcastically. Since sarcasm is a form of humor, hypothesis 4 suggests that messages containing sarcasm will be perceived as more humorous than messages without sarcasm.

H4: Messages containing sarcasm will be perceived as more humorous than messages without sarcasm.

In all studies mentioned in this paper, where messages containing emoticons were perceived as less professional, a formal setting was used to study participants' message perceptions (Gacey & Richard, 2013; Loglia, 2013; Loglia & Bowers, 2016; Thoresen & Andersen, 2014). However, emoticons are seen as a form of informal communication (Gretry et al., 2017). Studying the perceived professionalism of messages with emoticons in an informal setting has not often been done. Therefore, this study will examine the perceptions of emoji in an informal setting. Loglia (2013) studied the influence of the use of emoticons on professional respect. She stated that emoticons were considered unprofessional when used in a business setting. In her research, the participants read an email from a fake boss and graded his professionalism. The participants perceived bosses whose emails contained emoticons as less professional. In the current study, participants' perceived professionalism of messages with and without emoji will be examined in an informal setting. Loglia (2013) studied work-related email messages, whereas this study examines informal WhatsApp messages. The professionalism of messages may be perceived differently on different platforms, due to the informal

communication in a message. Koot (2013) argued that as jokes are also a form of informal communication. Thus, emoji and sarcasm might be more suitable for messages on informal platforms, such as WhatsApp. However, hypotheses 5a, 5b, and 5c argue that messages with emoji and/or sarcasm will be perceived as less professional. This is because they will be compared to messages without emoji and/or sarcasm. Then, messages with informal communication are still expected to be perceived as less professional than messages without it.

H5a: Messages containing emoji will be perceived as less professional than messages without emoji.

H5b: Messages containing sarcasm will be perceived as less professional than messages without sarcasm.

H5c: Messages containing a sarcastic emoji will be perceived as less professional than messages without emoji or sarcasm.

Method

Participants

A total of 137 participants took part in the experiment. After filtering out the incomplete responses, the data of the remaining 132 participants was analyzed. The age of the participants varied from 18-63 years old (M = 26.25, SD = 10.38). A majority (88.9%) of the participants was highly educated. 72% of the participants was female and 28% was male.

Design

The experiment had a 2x2 factorial within-subjects design. The participants were randomly assigned to one of four groups. Each group contained the same 27 base sentences, but in four different conditions. The conditions were equally represented over the four groups. One participant answered questions about six sentences per condition and three filler sentences. The independent variables were the modality (emoji or no emoji) and the meaning (sarcastic or

not sarcastic) of a message. This resulted in four different conditions: the control condition (without sarcastic cue and without emoji), the smiling emoji condition (without sarcasm, but with the smiling emoji), the sarcastic textual cue condition (with sarcasm, indicated by the text "LOL"), and the sarcastic emoji condition (with sarcasm, indicated by the "Face with tears of joy" emoji). Whereas the smiling emoji is congruent with the valence of the message sentence, the 'Face with tears of joy' emoji changes the valence of the message sentence. The dependent variables were the perceived sarcasm, informality, humor, valence, and professionalism of the content.

Materials

24 sentences were created and then manipulated to create the four experimental conditions (see Appendix I). Every sentence was manipulated four times (as can be seen in Table 1). So, all four conditions would have the same 24 base sentences, but with different additions. Kunneman et al. (2015) stated that sarcastic sentences are often negative remarks expressed in positive words. Therefore, these sentences are positively worded remarks on someone or something that can be turned into sarcastic utterances by means of adding a sarcastic cue. In addition, three filler sentences were created. These three sentences were negatively worded remarks to add a little diversity to the experiment. Randomly chosen cues (a heart eye emoji, an angry face emoji, and "HAHA") were added to these filler sentences to function as a distraction from the goal of the study. For the experimental sentences, half the conditions had an emoji added at the end of the sentence. The sentences all contained an exclamation mark and an adjective. When those cues are included in a sentence, sarcasm is more likely to be recognized, according to Liebrecht et al. (2013). For the sarcastic condition without emoji, the text "LOL" was included to point out the sarcastic tone of the sentence. This linguistic addition can be compared to the 'Face with tears of joy' emoji from the sarcastic emoji condition, because they both indicated sarcasm and laughter. Also, when typing 'LOL' on an iOS

keyboard, the system suggests you use the 'Face with tears of joy' emoji. The sentences were portrayed as messages in a WhatsApp conversation. The WhatsApp conversation had six different lay out options, to make the experiment feel more realistic for the participants.

Measurements

The dependent variables (the perceived sarcasm, informality, humor, valence, and professionalism) were inspired by paradigms of Walther and D'Addario (2001) and Loglia (2013). Some of the questions of Walther and D'Addario (2001) are turned into statements to make the items in the current study more coherent. In the study of Loglia (2013), the perceived positivity and professionalism of the message were both measured by means of one Likert scale statement. This method was also used in the current study. The participants rated their accordance with five different statements using a 7-point Likert scale ranging from 1 (completely disagree) to 7 (completely agree). Since the participants had no information about the WhatsApp message other than the message itself, one question per variable captured the possible impact of the presence of the emoji and/or sarcasm (Loglia, 2013). When participants clicked to go to the next screen the following statements appeared:

1. I think this message is informal.
2. I think this message is humorous.
3. I think this message is sarcastic.
4. I think this message is meant positively.
5. I think this message is professional.

Procedure

The experiment started with a screen with general information about the survey. The participants were thanked for their participation, were instructed about the duration of the survey and the possibility to end the survey at any given moment, and were told that their data would be processed anonymously and would only be used for the scientific goal of this study.

After reading these general instructions, the participants clicked to go to the next page and provided information about their gender, age and educational level. After answering these three questions, there was a short instruction about the task. It was explained to the participants that they were going to see a message and then receive questions about the message when they went to the next page. They were instructed that they could not go back to the message after going to the next page. Then, every participant was shown 27 WhatsApp messages: six from every condition and three filler sentences. After every sentence, the questions about informality, humor, sarcasm, valence, and professionalism were asked. At the end of the survey, the participants were once again thanked for their participation.

Data analysis

For every dependent variable a repeated measures analysis of variance (ANOVA) was conducted. This analysis tested the effects that were named in the hypotheses, but also other possible influences of the independent variables. The four conditions in this research were distinguished by the two independent variables with two levels: the modality and the meaning of the message. The modality of a message represents the presence of an emoji: a message either contains an emoji or does not contain an emoji. The meaning of a message is either sarcastic or not sarcastic. These factors segregate the four conditions the messages were presented in. The repeated measures ANOVA was conducted for the perceived sarcasm, informality, humor, valence, and professionalism. A midpoint analysis was conducted by means of a one-sample t-test. This test was done to test against the midpoint value of the 7-point Likert scale that was used to measure the dependent variables.

Results

Hypothesis 1 tested if sentences that were meant sarcastically were perceived as more sarcastic than sentences that were not meant sarcastically. A main effect of the meaning of messages was found. Messages with a sarcastic meaning were perceived as more sarcastic than

messages without sarcasm ($F(1,131) = 605.95$, $p < .001$). This means that the meaning of a message can be influenced by the inclusion of a sarcastic cue. Hypothesis 1 was confirmed. Besides, there was an interaction between a message's modality and meaning ($F(1,131) = 5.48$, $p < .05$). This means that the messages with the 'Face with tears of joy' emoji were perceived as more sarcastic than the messages with "LOL", but the messages with the smiling emoji were perceived as less sarcastic than messages without any emoji or sarcasm. However, we can see in Figure 1 that this difference was rather small (on a scale from 1 to 7 there was a difference of .094 between the two conditions without sarcasm and .221 between the two conditions with sarcasm). There was no main effect of message modality ($F(1,131) = .08$, $p = .778$). Messages with emoji were not perceived as more sarcastic than messages without emoji. Table 2 reports the descriptive statistics and the results of the one-sample t-test against the midpoint value of the dependent variables in all four conditions. Figure 1 shows the influence of the modality (emoji versus no emoji) and meaning (sarcastic versus not sarcastic) on the perceived sarcasm of the messages. All graphs contain error bars showing the standard error for the variables.

Table 2

The descriptive statistics for the perceived sarcasm, informality, humor, valence, and professionalism in the four conditions and the outcomes of the midpoint value t-test.

	M	*SD*	*t*-test
Sarcasm1	2.389	.818	-21.318*
Sarcasm2	2.295	.903	-20.769*
Sarcasm3	4.908	1.162	8.414*
Sarcasm4	5.129	1.147	10.638*
Informality1	5.266	1.092	12.540*
Informality2	5.690	.951	19.550*

Informality3	5.881	1.106	18.315*
Informality4	5.938	1.068	19.628*
Humor1	2.767	1.003	-13.297*
Humor2	2.856	.964	-12.992*
Humor3	4.820	1.081	8.165*
Humor4	5.058	1.052	10.877*
Valence1	4.850	.906	10.148*
Valence2	4.984	.851	12.672*
Valence3	3.590	.851	-3.883*
Valence4	3.641	1.095	-3.542**
Professionalism1	3.148	1.157	-7.966*
Professionalism2	2.690	.930	-15.422*
Professionalism3	2.090	.837	-24.591*
Professionalism4	2.120	.751	-27.091*

Note. *M* = Mean. *SD* = Standard Deviation.

* $p < .001$. ** $p < .01$.

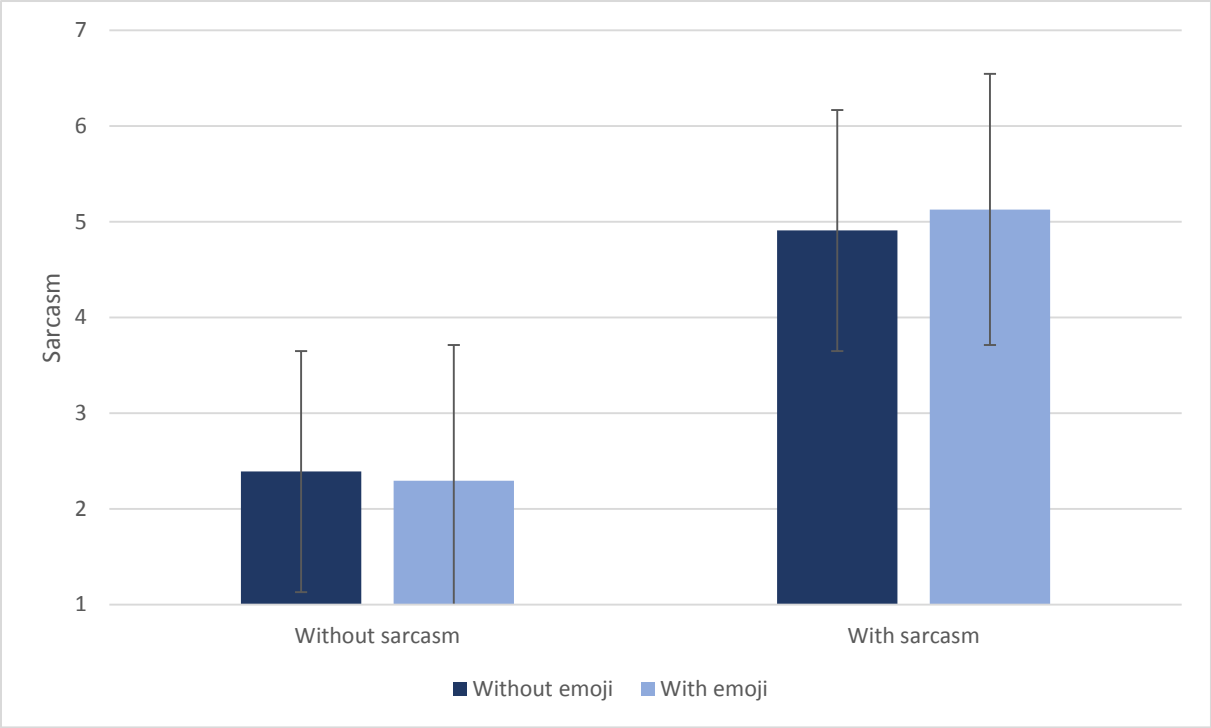

Figure 1. The influence of the presence of emoji and sarcasm on the perceived sarcasm of a message (1 = not at all sarcastic, 7 = very sarcastic).

Sarcasm was also measured by means of the perceived valence of the messages. Higher ratings of valence meant that participants perceived a message as more positive. Hypothesis 2a argued that sarcastic messages should be perceived as negative, whereas non-sarcastic messages should be perceived as positive. This hypothesis was confirmed. Figure 2 and Table 2 show that sarcastic messages scored low and non-sarcastic messages scored high on valence. This was a main effect of sarcasm ($F(1,131) = 174.55$, $p < .001$). Hypothesis 2b argued that messages with a smiling emoji would be perceived as more positive than messages without emoji. This hypothesis was not confirmed. The perceived valence was not influenced by the modality of a message ($F(1,131) = 2.79$, $p = .098$). Furthermore, there was no interaction between emoji and sarcasm on valence ($F(1,131) = .43$, $p = .515$).

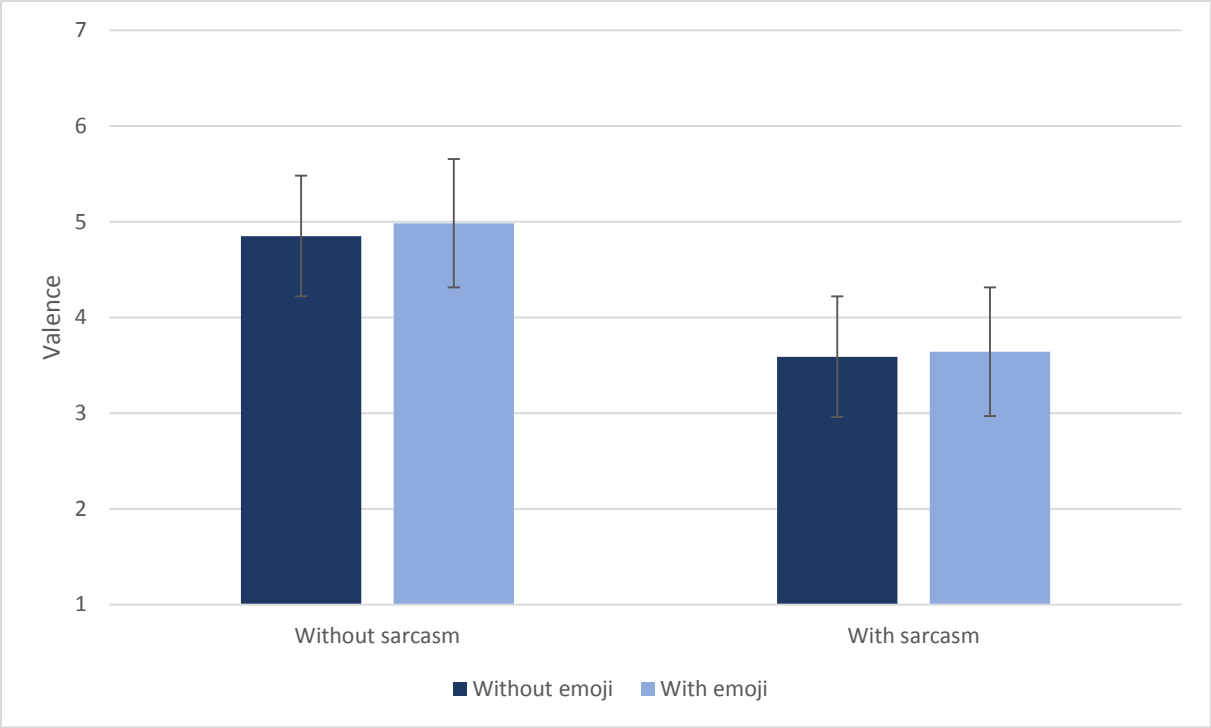

Figure 2. The influence of the presence of sarcasm on the perceived valence of a message (1 = not at all positive, 7 = very positive).

Hypothesis 3a stated that messages containing emoji would be perceived as more informal than messages without emoji. This hypothesis was confirmed. Message modality influenced the perceived informality of the message ($F(1,131) = 28.49$, $p < .001$). Hypothesis 3b argued that sarcastic messages would be perceived as more informal than non-sarcastic messages. This hypothesis was also confirmed. The meaning of a message influenced participants' perceived informality of the message ($F(1,131) = 73.75$, $p < .001$). Lastly, hypothesis 3c argued that there would be an interaction between modality and meaning. Messages containing the sarcastic emoji were perceived as more informal than the messages in the other conditions ($F(1,131) = 14.44$, $p < .001$). Thus, hypothesis 3c was confirmed. Figure 3 and Table 2 report the influence of emoji and sarcasm on the perceived informality.

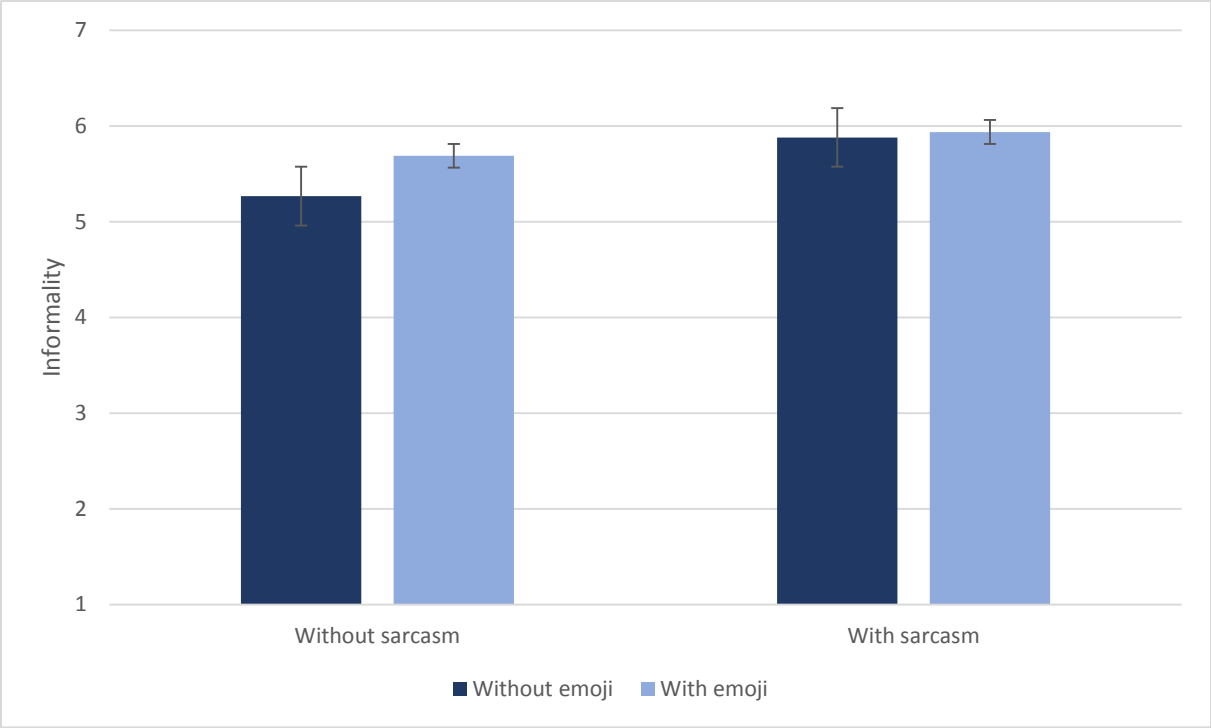

Figure 3. The influence of the presence of emoji and sarcasm on the perceived informality of a message (1= not at all informal, 7= very informal).

Hypothesis 4 suggested that a message's meaning would influence the perceived humor of the message. This hypothesis was confirmed. There was a main effect of the inclusion of sarcasm on the perceived humor of the message ($F(1,131) = 394.83$, $p < .001$). Messages with the 'Face with tears of joy' emoji or the text "LOL" were perceived as more humorous than messages without sarcasm. Furthermore, there was an unexpected main effect of modality ($F(1,131) = 8.07$, $p < .05$). This was not hypothesized, but messages containing emoji were perceived as more humorous than messages without emoji. No interaction was found between emoji and sarcasm ($F(1,131) = 2.07$, $p = .153$). Figure 4 and Table 2 report the influence of emoji and sarcasm on the perceived humor.

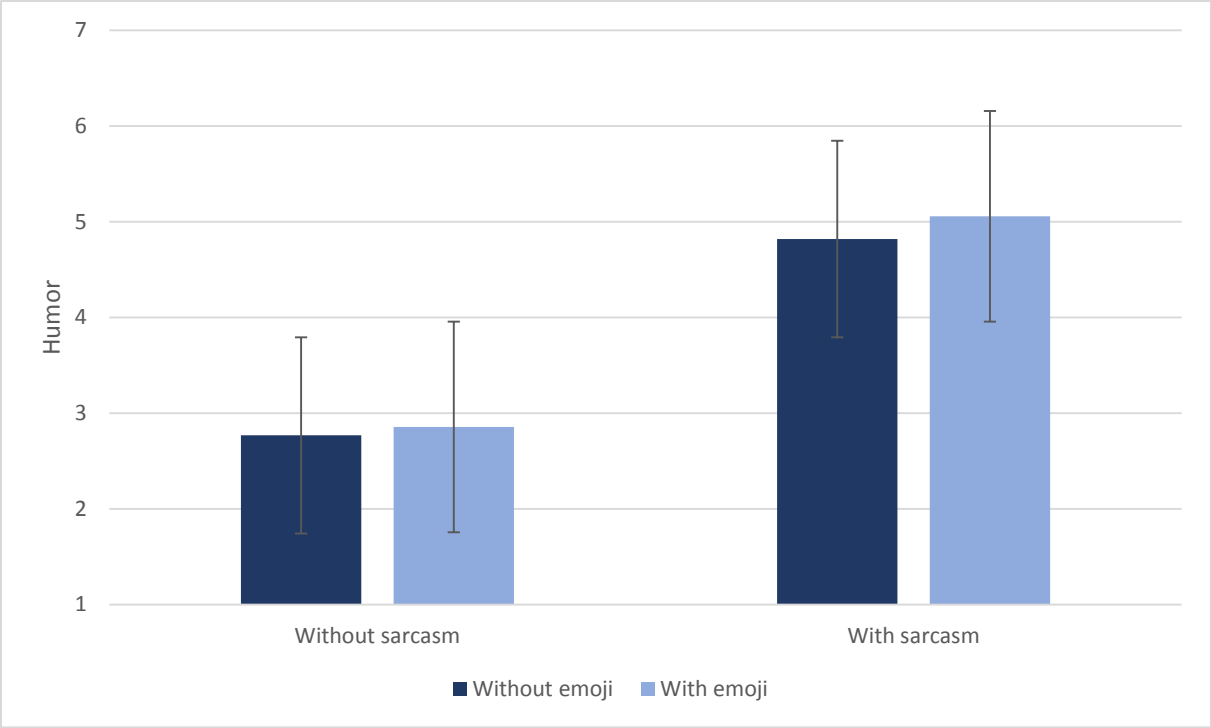

Figure 4. The influence of the presence of emoji and sarcasm on the perceived humor of a message (1 = not at all humorous, 7 = very humorous).

Hypothesis 5a stated that the perceived professionalism would be lower for messages with emoji than for messages without emoji. This hypothesis was confirmed. There was a main effect of message modality ($F(1,131) = 27.47$, $p < .001$). There also was a main effect of message meaning ($F(1,131) = 114.85$, $p < .001$). Hypothesis 5b, stating that messages containing sarcasm would be perceived as less professional than messages without sarcasm, was hereby confirmed. Lastly, an interaction between modality and meaning was found ($F(1,131) = 36.70$, $p < .001$). This occurred because the participants perceived the messages without emoji or sarcasm as more professional than the messages with the smiling emoji, but also perceived messages containing the 'Face with tears of joy' emoji as more professional than messages with "LOL". Hypothesis 5c was hereby confirmed. However, these differences were rather small (.458 between the two conditions without sarcasm and .03 between the two

conditions with sarcasm). See figure 5 and Table 2 for the influence of emoji and sarcasm on the perceived professionalism.

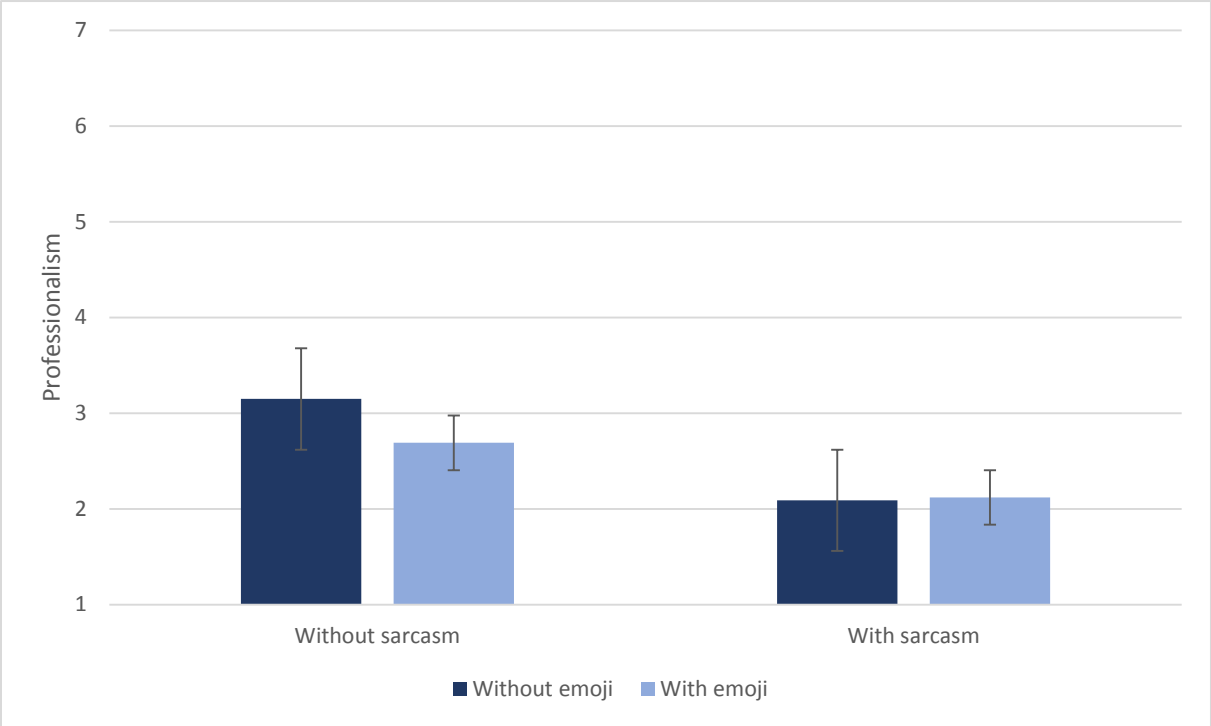

Figure 5. The influence of the presence of emoji and sarcasm on the perceived professionalism of a message.

Discussion

The goal of this paper was to examine the relation between sarcasm and emoji in CMC, by looking at people's perceptions of WhatsApp messages with and without emoji and sarcasm. Four message conditions were constructed. Messages either had no emoji and no sarcasm, no emoji but sarcasm indicated by "LOL", a smiling emoji and no sarcasm, or the sarcastic 'Face with tears of joy' emoji. The participants' perceptions of the messages were measured using ratings of sarcasm, informality, humor, valence, and professionalism. The discussion of these variables will be discussed in three parts, because literature showed that sarcasm and valence are related, as well as professionalism and informality. The valence of a message changes when

it becomes sarcastic and messages that contain informal communication are perceived as less professional. Finally, humor will be discussed.

Sarcasm and valence

Messages that were meant sarcastically were interpreted as being sarcastic and having a negative valence. As the literature suggested, the sarcastic sentences were positively worded evaluations conveying a negative opinion (Kunneman et al., 2015). Messages with the 'Face with tears of joy' emoji were perceived as slightly more sarcastic than messages with "LOL". The valence however, was not perceived differently in the two sarcastic conditions. The presence of the non-sarcastic smiling emoji did not influence the perceived valence of the messages. These results showed that the 'Face with tears of joy' emoji and the "LOL" were effective indicators for sarcasm. However, messages with the sarcastic emoji were perceived as being slightly more sarcastic than messages with "LOL". Now, these findings will be connected to the previous literature regarding sarcasm and valence.

The perceived sarcasm and valence of the messages were expected to be related. Messages that were perceived as being sarcastic were also perceived as being meant negatively. This is in line with previous research about sarcastic messages. Derks et al. (2008a) argue that messages that are meant to be sarcastic are perceived as sarcastic more easily if there is a contradiction in the valence of the text and the valence of the sarcasm indicator. The messages were created with positive wording, because Kunneman et al. (2015) state that sarcasm is characterized by a negative opinion being expressed in positive words. The findings show that the sarcastic cues reversed the valence of the messages from positive to negative. In this case, the valence of the text and the valence of the sarcasm indicator are not opposed, but the 'Face with tears of joy' emoji and the "LOL" were responsible for changing the meaning of the message. Without a cue the message was a positive remark, but the valence is flipped by the addition of the cue.

Although the literature shows a relation between sarcasm and valence, this relation was not consistent over the two sarcastic conditions. Participants perceived messages with the 'Face with tears of joy' emoji as more sarcastic than messages with "LOL", but they did not perceive them as more negative. This raises the question why the perception of sarcasm and valence are not aligned. A possible explanation is that the positive effect of emoji impacted the valence of the message. Gacey and Richard (2013) showed that emoticons can make the valence of a message less negative. Derks et al. (2008a) found that emoticons are able to strengthen the intensity of a message. Therefore, the message with the sarcastic emoji might be slightly less negative than the message with "LOL". Concluding, emoji can only strengthen the intensity of a message if the valence of the emoji is congruent with the valence of the message sentence.

Burgers, Van Mulken, and Schellens (2012) argue that sarcasm indicators "increase comprehension, reduce perceived complexity and make attitudes towards the utterance more positive" (p. 231). This means that attitudes towards sarcastic jokes are more positive when there is a clear indicator. To gain knowledge about how people perceive the valence of sarcastic messages, it can be interesting to study the perception process more qualitatively. Future research could focus on people's underlying reasoning for rating valence and qualitative questions could give more insight into why these messages are perceived in this manner. To elaborate this, studying negatively worded sarcastic messages could demonstrate how different types of sarcastic messages are perceived.

Besides messages with a sarcastic emoji, messages with a non-sarcastic smiling emoji were examined in the current study. A contradictory result was shown. While Gacey and Richard (2013) showed that emails containing emoticons were found to be perceived as less negative than those without emoticons, the current study shows that the WhatsApp messages with the non-sarcastic smiling emoji were not perceived as less negative than messages without an emoji. This can be explained by looking at the content of the messages. Gacey and Richard

(2013) studied work-related email communications with a neutral valence while the WhatsApp messages in the current study were positively worded evaluations. This leads to a more positive perception of the WhatsApp messages to begin with (when no emoji was included). This might explain why the addition of the smiling emoji does not have the same effect on the perceived valence of the messages in the current study as in the study of Gacey and Richard (2013).

Professionalism and informality

Furthermore, the results showed that the usage of emoji and sarcasm was perceived as informal. Sentences containing both emoji and sarcasm were perceived as the most informal, whereas sentences without those factors were perceived as only slightly informal. All sentences were expected to be perceived as informal, since the platform on which they were presented (WhatsApp) has an informal character. This was in line with the perceived professionalism of the messages. While all messages were perceived as being slightly unprofessional, the messages with emoji or sarcasm were perceived as very unprofessional. Similarly, the messages containing both emoji and sarcasm were perceived as the least professional messages. Sarcasm had a greater impact on the perceived professionalism than an emoji. When sarcasm was included, the messages were perceived as even less professional than when only an emoji was included. Possible explanations for the findings regarding the professionalism and informality of messages will now be discussed.

Previous research showed that emoticons give a message, or its sender, an unprofessional character (Gacey & Richard, 2013; Loglia & Bowers, 2016; Loglia, 2013), but the new insights showed us that emoji influenced this character less than sarcasm does. But why does sarcasm have more impact on the perceived professionalism of a message than emoji? To gain more insight into this matter, the perceived humor and informality should be taken into account, because humorous informal messages might be perceived as less professional. Sarcasm and emoji both give messages a more informal tone of voice (Koot 2013). However,

sarcasm is also a form of humor and therefore it can influence the meaning and purpose of a message. A sarcastic message is not only meant to be informative, but also to be entertaining. This might explain why sarcastic messages were perceived as less professional than messages with emoji.

Another possible explanation can be found if we look at the communication setting. Previous studies researching the effect of emoticons on professionalism (Gacey & Richard, 2013; Loglia & Bowers, 2016; Loglia, 2013) were constructed with a more formal communication setting. The messages in these studies were business emails, while the messages in the current study were informal WhatsApp messages. The biggest difference between these two types of settings is that people have different expectations regarding the type of communication. Emoji are mostly used in communication with friends (Derks et al., 2008b). In WhatsApp messages, almost everyone uses emoji (Kannan & Shreya, 2017). Therefore, people expect there to be emoji in WhatsApp conversations. This can explain why emoji do not have great impact on the perceived professionalism of a message. In formal business emails people do not expect there to be emoticons. The emoticons are then a surprising factor. People's expectations can therefore be the mediating variable for their perception of messages. This would be interesting to further investigate, since such a mediating variable was not studied in the current study. The perceptions of messages with and without emoji should be examined in combination with people's expectations. Studying this could elaborate on the finding of Kannan and Shreya (2017) that almost every WhatsApp user embraces the use of emoji. One could argue that this lead to the belief that the use of emoji is expected on WhatsApp.

On top of that, future research can give more insight into whether emoji are perceived differently (professional versus unprofessional) on different types of platforms. The perceptions of messages with emoji on informal and formal platforms can be compared in order to study the differences in communication style in different settings. Hence, we can compare the

findings of the current study and the findings of the literature about perceptions of messages with emoji (Gacey & Richard, 2013; Loglia & Bowers, 2016; Loglia, 2013). Additionally, it may be interesting to study how the formality of a platform affects platforms with different purposes, because the findings can then be generalizable over multiple social media platforms. After all, emoji are used on many different social media platforms with different purposes (Kannan & Shreya, 2017).

Humor

Lastly, the perceived humor of messages was influenced by emoji and sarcasm. When messages contained either emoji or sarcasm, they were perceived as more humorous than messages without emoji and sarcasm. However, there was no interaction between emoji and sarcasm, meaning that messages with a sarcastic emoji were not perceived as more humorous than messages with only one of the two factors. Previous literature explained that emoji give a message a more informal character because emoji are seen as a form of informal communication (Gretry et al., 2017; Koot, 2013). Besides a more informal character, the emoji also gave the messages a more humorous character. The messages were made more humorous by means of the positive emoji. This is in line with the reasoning of Moschini (2016), who stated that emoji were created to function as humor indicators. Sarcasm on the other hand, is a form of humor and caused the messages to be perceived as more humorous when they contained sarcasm indicators. Messages were not found to be more humorous with the ‘Face with tears of joy’ emoji than with the “LOL”, because they both seem to indicate humor well.

Since sarcasm is a form of humor (Hallmann, 2016), the findings regarding the perceived sarcasm and humor could have been aligned. However, they were not completely aligned. Both variables were influenced by sarcastic cues, but participants’ perceived sarcasm was not influenced by emoji whereas their perceived humor was. So, participants found messages containing emoji to be more humorous than messages without emoji. This is in line

with the findings of Derks et al. (2008b) that emoticons can be used to express humor and sarcasm. When looking at the type of emoji, it becomes clear that the non-sarcastic emoji could make a message more humorous (because it is smiling), but not more sarcastic. This is because the smiling emoji complemented the positive sentiment of the sentences and led to a non-sarcastic interpretation of the message. The smiling emoji strengthened the positive sentiment of the message just like the smiling emoticon did in the study of Moschini (2016). This shows that this emoji served the same functions as the emoticon it can be compared with.

Besides the smiling emoji, the 'Face with tears of joy' emoji made messages more humorous. It also made the messages slightly more sarcastic than the textual sarcastic cue "LOL". So, why does the 'Face with tears of joy' emoji seem to be a more effective indicator for sarcasm than the "LOL"? A possible explanation is that an emoji can demonstrate more than a linguistic term. Derks et al. (2008a) and Loglia and Bowers (2016) argue that emoji can serve the same functions as non-verbal cues in face-to-face communication. An emoji can depict an emotion by means of showing a facial expression or gesture. Words can only describe that emotion. Emotions can be complicated to describe, because they are concepts of feelings, described differently by different people. Emoji, on the other hand, can show an expression, affected by both emotional and social factors (Derks et al., 2008a). Therefore, an emoji can represent more than a word while using only one character. This leads to the conclusion that the 'Face with tears of joy' emoji is the cue that is the most efficient for a message that is meant to be interpreted as sarcastic.

Although they were perceived as more sarcastic, the messages in the condition with the 'Face with tears of joy' emoji were not perceived as more negative or more humorous than the messages with "LOL". Although the sarcastic messages are meant to be humorous, they still had a negative sentiment, because the sarcasm indicator flipped the sentiment of the textual message. This was different in the study of Derks et al. (2008a), where they varied the valence

of the emoticon and the valence of the message to create ambiguity and express sarcasm. We see that both of these studies have found a way to indicate sarcasm. Using either emoticons with a different valence than the message text or emoji that fit the valence of the text. We can conclude that the 'Face with tears of joy' emoji can indicate sarcasm effectively because of its extreme laugh. It shows that there is humor in the message. It could be interesting to further research perceptions of sarcastic messages with this emoji. For instance, messages that are negatively worded or neutral can be studied to examine if the emoji is still effective for indicating sarcasm.

Conclusion

Overall, the current study examined the relation between emoji and sarcasm in informal CMC and studied people's perceptions of messages containing emoji and/or sarcasm. First, this study found different results than Gacey and Richard (2013). Here, smiling emoji did not increase the perceived positivity of messages, because the non-sarcastic message was initially positive. However, emoji did increase the perceived humor and can therefore be used to lighten the tone of a message. Furthermore, they can lead to a less professional perception of a message than when no emoji are included, but sarcasm led to an even less professional perception of messages. Since sarcasm can be seen as a form of humor and emoji made messages more humorous, it can be advised to avoid using sarcasm or emoji if you do not want your message to be perceived as humorous or unprofessional. On the other hand, if you want to make a joke, both factors can be helpful.

Secondly, the perceived informality of a message was related to the perceived professionalism of a message. When emoji or sarcasm were included in a message, it was perceived as less professional and more informal than when they were not included. This shows that emoji and sarcasm are perceived as informal cues. Like previous literature suggested, conversations can be made more informal by adding emoji to text (Gretry et al., 2017; Koot,

2013). The current research shows that the use of sarcasm can have a similar effect. This is why emoji and sarcasm are especially suitable for conversations on informal platforms such as WhatsApp.

Lastly, this study showed that emoji helped people to rightfully interpret messages. The 'Face with tears of joy' emoji indicated sarcasm more effectively than the textual sarcastic cue "LOL". This shows that emoji were more effective than text in changing the meaning of messages. Thus, they are useful for indicating sarcasm in CMC messages and for preventing ambiguous messages from being misinterpreted. Emoji can aid in message comprehension on social platforms like WhatsApp and Twitter to ensure that short informal texts will not be misinterpreted. They can serve the same functions as non-verbal cues, such as facial expressions, in face-to-face communication and they can express emotions by means of only one character. So, emoji can add value to CMC by representing non-verbal cues or by indicating a message's underlying meaning.

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Appendix I

The sentences that were used. Sentences 1 to 24 were used in all four conditions.

Making fun of others' skills or looks:

1. Jack's new haircut is really great!
2. I truly love guys in tank tops!
3. Jane's new head band is truly adorable!
4. Adam's striped blouse is adorable!
5. I really love Elly's heart shaped sunglasses!
6. Sara always wears those beautiful flip flops!
7. He always cleans up so well!
8. John is extremely good at math!
9. Rosie is the best at biology!
10. Patrick never forgets to do the dishes after dinner!
11. My dad is a super great cook!
12. You are a fantastic chauffeur!
13. You make wonderful Christmas cards!
14. Thomas loves fishing with his uncle!
15. She must love science class!

Making fun of other things

16. I really really like green olives!
17. Ripped jeans are so cool!
18. My cat loves to walk in the rain!
19. I just love snowy weather!
20. This booze is like super strong!

21. You can’t do wrong by choosing extra spice!
22. I am really looking forward to receiving the grades!
23. This science test was super easy!
24. Tim adores Elly’s Chihuahua!

Negatively formulated filler sentences

25. I hate being the last one chosen!
26. I disgust the smell of goat cheese!
27. Trudy really dislikes cotton candy!
28. Henk makes the worst pancakes!
29. You don’t want Richard driving!
30. William hates leading the group!