The Functions of Emoticons and Pictograms in Instant Messengers

(Journal Article)

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Human communication has been evolving for thousands of years and technological progress is continuously expanding the range of media that people use for exchanging information and talking to friends. One medium of communication which has become more popular over the years is the Instant Messenger in its various forms. WhatsApp is one of the most popular Instant Messengers. It offers multimodal functionalities that can be used to compensate for the lack of actual human contact and even beyond, for more complex purposes.

This paper comprises three parts. Starting from a media-linguistic perspective, it provides insights into Instant Messengers as such and WhatsApp as the prominent example in this context. On the basis of this information, central assumptions on the function of emoticons in computer-mediated communication are reviewed. Afterwards, based on general observations and a corpus of WhatsApp conversations, the significance of emoticons and pictograms is discussed in order to arrive at the conclusion that WhatsApp emoticons and pictograms by far exceed the compensatory functions once ascribed to them.

(Student Paper)

1.   Introduction

Communication is a phenomenon which, although shared by practically all biological beings, has been developed most elaborately by the human species. The Oxford English Dictionary[1] defines communication as "interpersonal contact, social interaction, association, intercourse". While this broad explanation outlines the basic principle, communication between humans can be defined more precisely as the "transmission or exchange of information, knowledge, or ideas, by means of speech, writing, mechanical or electronic media" ("Communication"). There is a general consensus that it is not only significant *what* is communicated, but also *how* it is done. The manner of communication includes verbal features such as prosody, intonation, tone etc., but also nonverbal features like facial expression, body posture, breathing rhythm, outer appearance and various others. Facial expressions and other nonverbal information can only be successfully transmitted when the participants in a conversation are able to see each other. Today, however, a great deal of interaction between people does not happen face to face but via the Internet. The emergence and widespread use of smartphones and tablet PCs have contributed to this development by providing people with messaging clients of different kinds. Applications like Facebook Messenger, Blackberry Messenger, iMessage or WhatsApp belong to the category of Instant Messengers and allow users to exchange messages both fast and synchronously. Not only can people easily send text messages, they are also free to attach pictures, videos and audio files to them. Furthermore, there is another feature which is characteristic for Instant Messaging clients and sets them apart from traditional messaging services like SMS: the immense abundance of pictograms and emoticons which is available for free to every user. Scholars appear to have agreed that emoticons can be seen as substitute for facial expressions (Derks et al. 2008; Luor et al. 2010; Jibril & Abdullah 2013). But as there are many more pictograms than those simply representing different countenances, it can be claimed that the emoticons and pictograms in WhatsApp have gone well beyond the compensatory function once ascribed to them and fulfil more complex functions now.

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[1] www.oed.com.

This paper examines how emoticons have been conceptualized so far and how this conceptualization is undergoing a process of change. As a first step, in order for the respective context to be clarified, the medial basis will be elucidated. Initially, the focus will be on Instant Messaging as a medium of communication, the messaging client WhatsApp then serving as an exemplary application. Subsequently, central assumptions encountered up to now in the literature on the function of emoticons in computer-mediated communication in the linguistic context will be reviewed. Afterwards, the focus will move to the current situation of emoticons in WhatsApp. Based on general observations and a corpus of WhatsApp conversations, the significance of emoticons and pictograms will be discussed separately. Finally, the results will be merged to arrive at a more elaborate account of their functions.

2. Medial Basis

2.1 Instant Messaging

Computer-mediated communication (CMC) can be defined as "predominantly text-based human-human interaction mediated by net-worked computers or mobile telephony" (Herring 2007: 1). As mentioned in the introductory section, a considerable amount of today's communication takes place in the form of CMC, and the usage of mobile devices in this process is ever increasing. With other examples being electronic mails, chat or social networking sites, Instant Messaging is one form of CMC which is defined as "near-synchronous computer-based one-on-one communication" (Bradner et al. 2000: 80). With most IM applications, the user chooses a specific contact from their contact list and types messages into a chat window. This chat window is only visible and accessible to the participants in this exchange; however, many Instant Messengers facilitate conversations with more than one participant. As with any kind of message, the recipient decides independently whether to answer and when to answer. For IM conversations to function properly, each participant must be equipped with a working mobile internet connection and each has to install the respective application. Many current Instant Messengers do not only enable users to transmit text messages, but also provide the opportunity to send pictures, videos or other multimedia files. Mobile Instant Messengers often offer to send the GPS location as well and moreover, instead of typing it into the keyboard, users may record their message as they speak it and transmit it as an audio file.

WhatsApp
One of the most popular mobile Instant Messengers is WhatsApp. The name of this application derives from the merge of the colloquial phrase "What's up?" and the abbreviation of the word *application*. This combination represents the launchers' intention to create a messaging application via which people can communicate about everyday matters without any further ado. The messaging application enables users with smartphones from different manufacturers to exchange text and/or multimedia messages. As is the case for most Instant Messengers, all users need to have a working mobile internet connection and the WhatsApp application needs to be downloaded and installed on the device. The messenger costs about 1€ per year, with the first year being free. Since it works only with a valid mobile phone number, the account is personalized and interaction is only possible if the participants exchanged their phone numbers beforehand. WhatsApp gives each user the opportunity to publish social information in

order to further personalize the account. They can create a username which can differ from their real-life name, upload a profile picture and add a status message. Furthermore, other users can see "when their friends are online, when they are typing and when they last accessed the application" (Church & Oliveira 2013: 353).

According to a blog post from April 2014 on the WhatsApp website, the messaging client is used on a daily basis by more than 500 million people worldwide (500,000,000). This substantial number, which could be estimated to have risen by at least another 50 million people since then, represents the current significance of WhatsApp as a means to communicate.

2.2   Emoticons in CMC

"The term 'emoticons' – short for 'emotion icons' – refers to graphic signs, such as the smiley face, that often accompany computer-mediated textual communication" (Dresner & Herring 2010: 249). As technology evolves, emoticons are no longer only composed of combinations of graphic signs such as :-), :-(or ;-). Be they e-mail programs, chat programs or Instant Messengers, most applications offer a wide range of little coloured still pictures which users can attach to their textual message. Some assumptions researchers have made to date about the function of emoticons in computer-mediated communication are reviewed in the following.

> A specific characteristic of computer-mediated communication (CMC) is that it is largely text-based, which automatically implicates that there is a lack of nonverbal cues. Besides the verbal part of a message, one way to give expression to our thoughts is by using emoticons. (Derks et al. 2008: 379)

As Derks et al. point out, CMC lacks most nonverbal information like facial expressions or other body language which serves to decode a message properly in face-to-face communication. When sending text messages via the internet, many of the original meanings can be lost or misinterpreted when visual cues are not transmitted. Researchers appear to agree that the role of nonverbal information in face-to-face communication is to provide further knowledge which serves to regulate human interaction. Emoticons thus serve as substitutes for absent facial expressions (Ekman & Friesen 1969; Lee & Wagner 2002; Derks et al. 2008; Jibril & Abdullah 2013); they are "considered to be socio-emotional suppliers in the computer-mediated communication" (Jibril & Abdullah 2013: 201). It has been argued that emoticons have the ability to emphasize the content of the textual message and they may be used to "clarify one's feelings but also to soften a negative tone and to regulate the interaction, just as smiles and frowns do in daily life" (Derks et al. 2008: 380). While in a face-to-face conversation a statement could have been marked as a joke by a big smile on the part of the sender, the recipient might not take the same statement as a joke in a text message when there is no emoticon to clarify the intended meaning.

Furthermore, emoticons have been claimed to be used "more consciously than actual nonverbal behavior, which implies that there is more control over the message a person wants to convey" (Derks et al. 2008: 380). It seems redundant to mention that facial expressions are linked to a person's inner emotions. As emotions change without the person being consciously involved in the process, the respective facial expressions may sometimes change without intention. However, in almost every form of CMC, any expression of emotion must be

placed intentionally. As the people cannot see or hear each other, they have to signalize their mood otherwise and this is achieved by purposely inserting emoticons at specific locations. Thus, since the emoticons must be chosen and placed deliberately, the sender of a message can strongly impact how the recipient will decode it.

This process is also influenced by the make-up of the human brain. Psychologist Albert Mehrabian has claimed that "human brain processes visual elements 60,000 times faster than written text." While pictorial elements are processed instantly, strings of text are decoded chronologically, "requiring extra time to process" (Jibril & Abdullah 2013: 203). Based on this observation, one could even go as far as to claim that once the recipient catches sight of the emoticon, this will set the underlying tone for the whole message. As this question is not the core focus of this paper, it should be investigated further in another research project.

To conclude, researchers so far seem to have agreed that users of computer-mediated communication employ emoticons as substitutes for nonverbal cues such as facial expressions. The use of emoticons may enhance specific aspects of the message and can clarify the meaning or add another tone

to it. Since the selection and placement of emoticons happens entirely consciously and intentionally, the sender could be said to have more control over the interpretation of the message than in face-to-face communication, even though nonverbal cues are absent. What is left to discuss is the function of those pictograms which clearly do not resemble anything close to facial expressions, but are instead things like animals, national flags or food. To what extent the usage of these pictures goes beyond that of face-like emoticons will be investigated subsequently.

3. Emoticons and Pictograms in WhatsApp

3.1 Overview

One characteristic aspect of WhatsApp is the abundance of little colored, still pictures which are freely available to every user and which represent various things. From this point onwards in this paper, a distinction will be made between *pictograms* and *emoticons* with regard to WhatsApp, each referring respectively to a particular range of pictures. *Pictograms*, which the Oxford English Dictionary defines as "pictorial symbol[s] or

sign[s]" ("Pictogram"), will denote those pictures which are by definition excluded from the other category. The Oxford English Dictionary defines emoticons as "a representation of a facial expression formed by a short sequence of keyboard characters (usually to be viewed sideways) and used in electronic mail, etc., to convey the sender's feelings or intended tone" ("Emoticon"). As stated before, emoticons are no longer only composed of keyboard characters but have developed into little pictures that more closely resemble human faces. In this paper, the term "emoticon" will thus denote those pictograms which are intended to represent faces.

In total, WhatsApp provides 889 pictograms, which are divided into five categories. As the categories are not titled by words but only by pictures, the researcher will use made-up titles for the sake of clarity. The first category, *Face and Body*, includes 189 emoticons and pictograms, 58 of which are actually intended to resemble a human face with several facial expressions. The remaining 131 pictograms show related images, such as for instance faces of different age groups, cat faces showing expressions, hand signals, items of clothing and different variations of a heart. The second and largest category, *Various*, contains 230 highly diverse

pictograms. While there are some for different festive events or kinds of food, the category also contains pictorial signs resembling forms of sports, other leisure activities, things which can be found in an office or diverse items somehow related to daily life. Within the third category, *Nature*, there are 116 pictograms depicting animals, plants, moon constellations and weather conditions. The fourth category will be referred to as *Traffic and Flags* and contains 147 pictograms which resemble different kinds of houses or institutions, various forms of public transport and the flags of 56 countries. In the fifth category, *Symbols*, there are 207 pictograms. Some of them resemble simple icons like numbers or directional arrows, but there are also Asian characters, public icons, star sign symbols and clocks showing different times of the day.

It should now be evident that the messaging client WhatsApp's users can choose from an immensely wide range of diverse pictograms and emoticons. The functions which these pictograms fulfil will be investigated in the following sections.

3.2   Emoticons

Initially, it should be noted that when analyzing the usage of emoticons with the messaging client WhatsApp, one has to differentiate between the use of emoticons and the use of all other pictograms. The former will be considered first.

As mentioned before, WhatsApp provides each user with 889 pictograms, only a fifteenth of this number, namely 58, actually being pictures designed to resemble the facial expressions of human faces. A longitudinal study conducted in 2011 investigated the usage of emoticons in text messages from iPhone users and found that emoticons were only employed in 4% of the messages (Tossell et al. 2011). However, these data only relate to iPhone users, and not the users of other smartphones and furthermore, only the emoticons in text messages were investigated, where not as many emoticons are offered as in WhatsApp. In order to gain an insight into how the usage of emoticons and pictograms could be seen to have changed with regard to one-to-one conversations in WhatsApp, the researcher created the corpus *HWAC* in September 2014, using messages which had been stored on the Win-

dows Phone of the researcher herself. *HWAC* is subdivided into two sub-corpora, one of which will be examined now whilst the other will be used later. The first corpus consists of 500 messages from five conversations, 100 messages from each conversation. Three of the conversations were carried out between different close friends, two female and one male, and two were recorded between different colleagues, one female and one male. All subjects were between 21 and 26 years old and can thus be seen as representing the generation who use WhatsApp most of all. As this corpus has been designed to gain some general insight, pictograms and emoticons were added up to arrive at more representative results. It was expected that the colleague-to-colleague conversations would not contain as many emoticons and/or pictograms as the friend-to-friend conversations, merely in view of the lower degree of social closeness between the participants. In total, 189 of the 500 messages contained one pictogram and 62 contained two or more different ones, arriving at around 50% of all messages which contain at least one emoticon and/or pictogram. While the rate is slightly higher in the three female-to-female conversations when compared to the female-to-male conversations, the expected

contrast cannot be observed. The conversation with the male colleague contains almost twice as many emoticons and/or pictograms as the one with the close male friend. The conversation with the female colleague does not significantly differ from the chat with two female close friends. On average, female-to-female conversations contained one emoticon and/or pictogram in 43% of the messages and more than one in 14% of all messages while female-to-male conversations contained one in 29% of all messages and more than one in 11% of the messages. Although the corpus is rather small and might not be representative due to the absence of male-to-male conversations, the percentages do provide a more current insight into the usage of emoticons and pictograms in WhatsApp. Furthermore, these results clearly demonstrate the significance of emoticons in WhatsApp conversations. As noted before, emoticons are thought to supplant facial expressions, which are absent in computer-mediated communication. It is likely that most face-to-face conversations between close friends or colleagues exhibit quite a lot of different facial expressions. This can also be observed in the WhatsApp conversations, where the emoticons fulfil the function of the absent facial expressions.

Figure 1: Selected WhatsApp emoticons.

It is also often the case that facial displays change in the course of a conversation, which could serve to explain the number of messages containing more than one emoticon.

However, it is to be noted that many of the emoticons offered by WhatsApp cannot really be used to visualize the sender's actual facial expression at the moment of sending the message. Instead, most emoticons are placed to clarify the intended tone of the textual part of the message or the sender's mood. Some of these supposedly unrealistic emoticons can be seen in Figure 1.

The emoticons above have been called "unrealistic" due to the fact that they cannot be produced by sender or recipient in the very short time period of sending or reading the message. Neither can a human being change the form of their eyes into red hearts or into arrow-like shapes, nor can we rapidly produce a drop[2] on our temples due to exer-

tion or worry, nor erase nose and mouth from our face so only the eyes are left. Some of these unrealistic facial expressions shown by the emoticons in WhatsApp might be possible biologically, but their production would require more time than the few seconds during which a message is composed and/or read. Thus, these emoticons can be regarded as being merely figurative substitutes for emotional states but not as replacements for real-life facial expressions which are only absent due to the conversation being computer-mediated.

Of the 58 emoticons offered by the application, only some realistically visualize facial expressions normally exhibited by participants in WhatsApp conversations. However, most of the features exhibited by the emoticons could not be reproduced on a real face, or they would require more time than that available. Still, users of WhatsApp seem to make frequent use of the emoticons offered, regardless of their biological feasibility.

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[2] It could be argued, though, that these drops are visual tropes from comics.

3.3   Pictograms

There are several arguments which can be regarded as refuting the claim made by researchers so far, stating that emoticons and pictograms merely serve to supplant absent facial expressions. The extent to which the pictograms offered by the messaging client WhatsApp serve to disprove this claim is investigated in the following.

Initially, one has to note that out of the 889 pictograms and emoticons in WhatsApp, there are 831 that illustrate other things than those purported to be facial expressions. There are five categories to classify and organise these pictures. This number alone serves to show that the pictures that WhatsApp offers no longer serve merely to replace absent facial expressions. Even if all 889 pictures represented human faces, it is impossible for a single person to exhibit that many different facial displays. The fact that WhatsApp provides this number of different emoticons and pictograms clearly reveals that the application's developers assume and expect the users to utilize the pictures for various purposes besides visualising their current facial displays. Thus, the users do not only have the opportunity to do so but the

usage of the pictograms for other functions than merely representing a facial expression even seems to be anticipated.

These other functions have been revealed and investigated by the German researchers Christa Dürscheid and Karina Frick (2014). They have identified several functions which pictograms can fulfil in a WhatsApp message. These functions will be analysed and verified with the help of examples taken from *HWAC*.

Firstly, the pictograms can serve as accompanying commentary (Dürscheid & Frick 2014: 11). This role can be performed by emoticons and pictograms in a similar way, as illustrated in Figure 2 and Figure 3. Although the emoticons used in the examples do not necessarily show the actual facial displays at the moment of sending or receiving the message, as mentioned in the previous chapter, they do fulfil a particular role as commentary. While the first emoticon portrays a moment of shock in an unexpected situation, the second face sticks out its tongue to signal the humorous tone of the content. In the third and fourth example, the emoticons are not only inserted once, but several times, which serves to strengthen the additional meaning that is appended to the textual part of the message. While the

eight emoticons after "Oahhhhh nicht dein ernst" (translation: "Oh, you can't be serious") visualize annoyance and anger, the repetition of the emoticon in the last example shows the high degree of admiration which was intended to be transmitted by the sender.

Figure 2: Emoticons as commentary (HWAC).

Figure 3: Pictograms as commentary (HWAC).

The pictograms in the examples in Figure 3 are used for a similar purpose, namely to comment on the content of the textual message in a visual way. The sender expresses disapproval by adding a pictogram that resembles a "thumbs-down". The two messages in the second example are titled by the sender's names, which shows that these are taken from a group chat. For reasons of data protection, only the initial letters of the first names are shown here. Sender *F* strengthens the assertion that it was worth it to ascend 366 stairs by adding a "thumbs-up"-icon and this statement is answered by *M* with a compliment and a pictogram that resembles applause, both accompanied by a laughing emoticon that clarifies the humorous tone (author's note: this message is preceded by a photo showing the view over the German city Stralsund from the tower of St. Nikolai Church). Three red hearts accompany the textual message "Jaa das ist einer meiner Lieblingsfilme" (translation: "Yes that's one of my favorite movies") in the last example. By adding these pictograms, the sender emphasizes their high degree of admiration for the movie which is being talked about. It is to be noted that when emoticons serve as commentary, they fulfil a very similar function to that which has previously been described by researchers. As stated in 2.2, they are chosen and placed intentionally in these cases in order to emphasize the intended tone of the message or to add a particular meaning to the textual part.

Dürscheid and Frick maintain secondly that pictograms often fulfil illustrating functions (2014: 12). Depending on the content of the textual message and on the aspect of it which is to be illustrated, this role might also be performed by emoticons, though pictograms appear to be used much more often here. The illustrating function differs from the commentary function, as in case of illustrations, additional meaning is not subjoined to the text. Illustrating pictograms do not necessarily fulfil an essential function since they mostly only visualize the same content as the text message, as can be seen in the examples in Figure 4. The sender in the first example suggests making cocktails, and adds two pictograms of cocktail glasses and an icon which shows a hand symbol saying "Everything's okay", probably illustrating that the cocktails taste good. In the second example, the sender firstly illustrates the message with pictograms of different fish, as the recipients are on holiday at a fishing lake and secondly adds an icon resembling a sun while complimenting the good weather. The pictograms in the last example also show the text message's content in form of pictures; two of the icons resemble dancing people and one shows a confetti bag symbolizing the party.

Figure 4: Pictograms as illustrations (HWAC).

All pictograms have in common that they do not add anything to the message which is not said in the textual part already. They transfer the content of the text message into a different form and represent the same in a visual way. While the commentary and the illustrating function can be fulfilled by emoticons and pictograms likewise, the function of rep-

resentation is most often performed by pictograms alone (Dürscheid & Frick 2014: 13-17). Dürscheid and Frick categorize this function further by claiming that pictograms can represent and replace word elements, whole words such as nouns or verbs and even whole phrases, e.g. noun phrases or prepositional phrases. As the researcher has not come across instances of this function, representative examples will be taken from Dürscheid and Frick, as seen in Figures 5, 6 and 7.
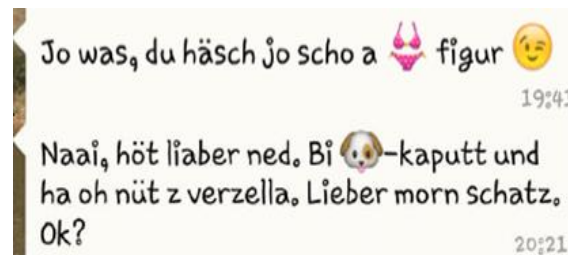

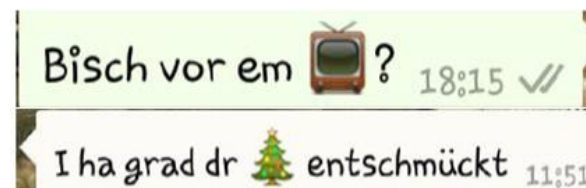**Figure 5:** Pictograms as word elements (Dürscheid & Frick 2014: 14).

**Figure 6:** Pictograms as words (Dürscheid & Frick 2014: 13 & 16).

Figure 7: Pictograms as phrases (Dürscheid & Frick 2014: 13 & 15).

For the sake of clarity, the examples will be referred to in the translated English form from this point onwards. Figure 5 shows instances of pictograms being used as word elements. Firstly, the bikini icon was inserted to represent the first part of the word "bikini figure". The second example shows a dog face being incorporated to represent the German word "hundskaputt", which refers to a feeling of exhaustion. The examples shown in Figure 6 each incorporate a pictogram which represents and replaces a word, in the first case the TV icon is inserted instead of the noun television and in the second message, a pictogram representing a Christmas tree is used instead of the word. Figure 7 shows the most far-reaching replacements, where pictograms are employed as substitutes for whole phrases. The umbrella icon represents the finite verb form of the verb phrase "to rain" in the first example and the

pictogram resembling a phone replaces the noun phrase "the phone". Although the representational function is probably not how most people use pictograms in WhatsApp, the fact that there are instances of this process is clearly significant in this discussion. The various functions analyzed in the previous section represent the increasing variety of roles that are assigned to pictograms and further represent their ever growing versatility.

There is a unique setting in WhatsApp when it works with the Windows operating system on Windows Phones which corroborates the functions analyzed by Dürscheid and Frick. As smartphones of other manufacturers also do in messaging programs, Windows Phones provide textual alternatives when the intended word was not typed in correctly and the user can also choose from a selection of suggested words to follow what has been typed in before. But besides offering other words, Windows Phones offer the appropriate pictogram, as shown in Figure 8.

The screenshots from *HWAC* in Figure 8 show the exemplary words being typed in and which suggestions are made by the application. As the words are typed correctly, Windows Phone offers words to follow the first one, for example the respective verb or

Figure 8: Suggested pictograms in WhatsApp on Windows Phone (HWAC).
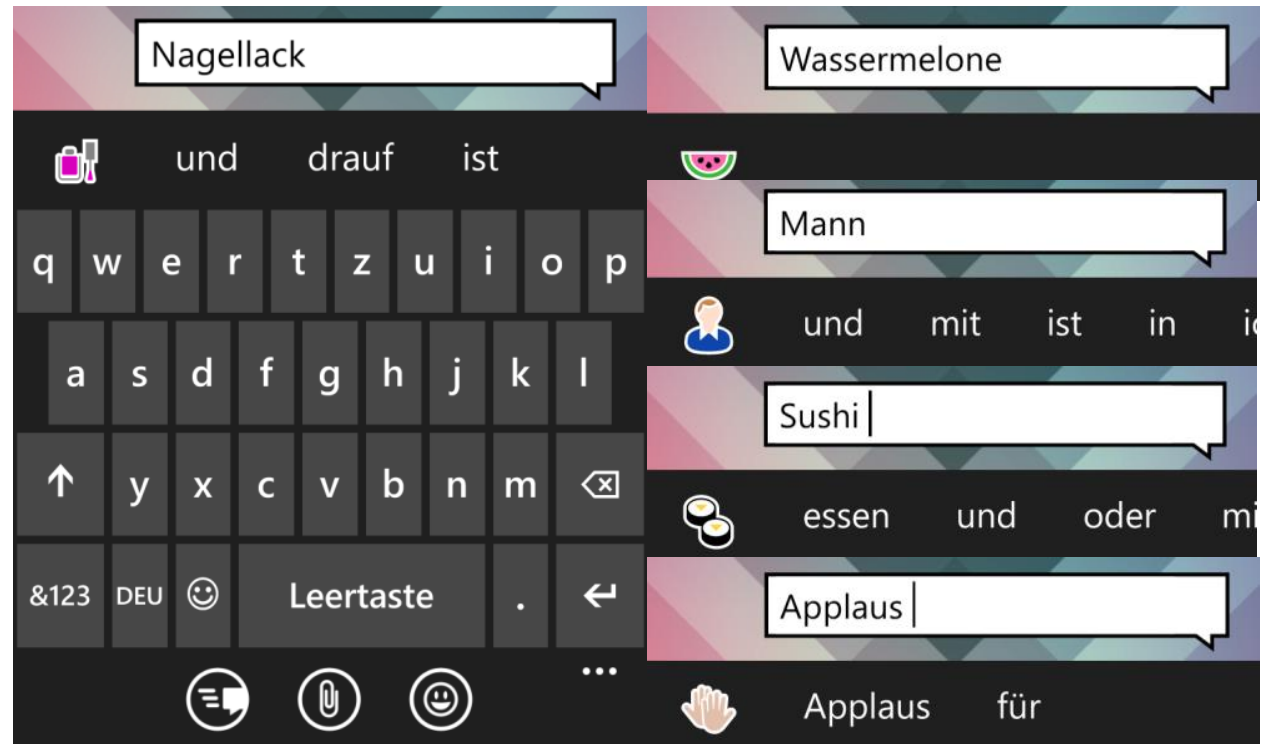
conjunction. The first position in the list of suggestions is repeatedly taken by the pictogram that represents the content of the word which has just been typed in. Once the user clicks on the pictogram, it will appear next to the word in the message. Another option which is offered in the WhatsApp settings is to replace the word with the pictogram when the pictogram is selected. These two functions are not offered for each

pictogram in WhatsApp but mostly for those that clearly resemble a specific object or action. So far, this function has not been observed in a smartphone of any other manufacturer besides Windows Phone. The mere existence of this function however reveals the significance that is ascribed to pictograms in the process of composing a message

sage. Users are clearly expected to include pictograms in their messages and Windows Phone already provides them with the most appropriate one to make sure the user does not forget. It is to be noted that this function does not work for the emoticons in WhatsApp, but only for a number of pictograms.

In summary, the numerous pictograms included in WhatsApp serve a variety of functions beyond compensating for absent facial expressions. There are 831 diverse images which provide each user with a wide range of possible options for using them, some of these functions having been analyzed above.

4. Conclusion

This paper is designed to demonstrate that the numerous emoticons and pictograms in the international messaging client WhatsApp have functions that go far beyond the merely compensatory function of emoticons proposed by researchers so far. It has been explained how emoticons have been conceptualized by researchers and scholars so far but it has also been shown that users employ pictograms for various other pur-

poses and these functions have been analyzed on a linguistic level. To make these functions more apprehensible and to put them into a current and direct context in relation to WhatsApp as it is used nowadays, examples taken from *HWAC* were employed. As the examples from this corpus offer insights which contribute new facets to this discussion than the earlier data of researchers so far, it can be claimed that they have served to demonstrate the extent to which the theoretical approach to emoticons in computer-mediated communication can be regarded as being in a process of change. In line with the technological progress in various fields all over the globe, the little images which are incorporated in almost every messaging program have arrived at a point where they fulfil functions which were not imaginable by researchers in the field of computer-mediated communication before. As this paper only provides insights from a particular angle and as technological progress will not come to a halt in the foreseeable future, there is more research to be done in this field. A possible domain of investigation could be the analysis of Facebook Messenger with regard to emoticons, as the user can even insert animated pictures. Furthermore, it could be of interest to explore the

usage of different emoticons and pictograms in different age groups, as the deployment of pictograms as a replacement for words appears to be rather rare in the younger generation. It would be interesting to explore reasons for this distribution, possibly with the help of a longitudinal study.

As Joseph Walther already noted 20 years ago, different instances of the medium should be analyzed differently, in order not to fail at exploring divergences in usage. He also states that

> the study of CMC is very young, and new systems with new qualities emerge almost constantly. In such a rapidly developing field, it is not surprising that any interesting discovery should be reported, especially as it might apply to fundamental communication processes. (Walther 1992: 80)

Thus, finally it should be noted that this paper presents an analysis located at one point in time. In relation to a medium progressing as rapidly as Instant Messaging, the results should be re-evaluated continuously to sustain a slanting view which is in compliance with the state-of-the-art.

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