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Age variation in nonverbal cue recognition in computer-mediated communication

Nathaniel Beyerink
University of Northern Iowa

AGE VARIATION IN NONVERBAL CUE RECOGNITION IN COMPUTER-MEDIATED COMMUNICATION

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Nathaniel Beyerink

University of Northern Iowa

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Date Dr. Ardith Meier, Honors Thesis Advisor

_____ _____

Date Dr. Jessica Moon, Director, University Honors Program

When interacting with someone in a face-to-face setting you not only communicate with spoken words, but with other sorts of communicative tools, such as tone of voice or facial expressions. However, now interlocutors are frequently communicating through channels, such as email, that restrict their ability to use such tools. Therefore, one may wonder how one retains the same level of communication. The purpose of the research reported in this paper was to attempt to attain a better understanding of the ways in which people interpret text-based computer-mediated communication (e.g. texting, instant messaging, and email). More specifically, this study looks at how certain nonverbal cues, such as emoticons or non-standard punctuation, are comprehended and interpreted by individuals of various age groups. Such studies are becoming increasingly more important as the use of communication technologies becomes more frequent in both workplace communication and in people's daily lives. Identifying differences in the extent to which such nonverbal cues are comprehended by different age groups can assist in the avoidance of misunderstandings and contribute to better communication of affect among diverse interlocutors, which is a reality in today's workplace.

Literature Review

As most people can attest, emotions are a rather complex issue. Their existence is a natural part of the human condition and an integral part of everyday life; yet, there is still much about them that is not completely understood. Researchers have addressed many facets of emotion: their connection to our physiology, their function in our lives, their origin, and how we deal with them, among others (Planalp, 1999). The communication of emotion stands among the many areas of research tied to affect/emotion, and much like the aforementioned examples, there is already a plethora of existing literature on the subject, albeit less in the framework of emerging technology.

Derks, Fischer, and Bos (2008) defined the communication of emotion as "the recognition, expression and sharing of emotions or moods between two or more individuals" (p. 767). In sharing these emotions, whether implicitly or explicitly, a variety of signals are used to attain communicative goals (Planalp, 1999). These signals, which are often called cues, allow communicators to share information in a variety of ways. Examples of cues in face-to-face communication include facial, vocal, physiological, action, and verbal cues, among others (Planalp, 1999). These cues happen to be quite helpful in communicating, especially when the message includes emotional content, which is supported by the claim made by Vandergriff (2013) that "CMC cues often, though not always, have been found to communicate socio-emotional meaning (p. 2). Riordan and Kreuz (2010) argued that nonverbal cues facilitate comprehension of the message and help lower its ambiguity. Therefore, such cues can be quite useful in avoiding misunderstandings and allowing the receiver to better comprehend how the sender feels.

Although the communication of affect through nonverbal cues in face-to-face communication is an area worthy of research in its own right, the communication of emotion has evolved significantly, offering an exciting frontier in the field of communication, especially computer-mediated communication (CMC). CMC can be described as "human-to-human interaction via computer networks" (Georgakopoulou, 2003, p. 93). The majority of the communicated messages in CMC are composed of text, although they may also contain images, audio, or video (Derks et al., 2008). This current study focused specifically on text-based computer-mediated communication, in order to investigate how individuals communicate

emotional content when the nonverbal cues that are normally available in face-to-face interaction are no longer present to assist interlocutors in communicating their messages.

Although individuals interacting through computer-mediated communication may not be able to use standard nonverbal cues, such as facial expressions and tone of voice, they have developed other tools to help convey the intended message, which likely indicates that communicators find them to be important. Kalman and Gergle (2014), for example, described these tools as being capable of conveying both social and relational information across computer-mediated communication. Furthermore, these nonverbal CMC cues are extremely helpful in giving the reader a better idea of the affective state of the sender or to clarify the intent of the message. Harris and Paradice (2007) found that receivers in their study were able to understand both positive and negative messages progressively better as the number of cues increased. Overall, when these cues are used in conjunction with a verbal message in the form of written text, they help to decrease the message's ambiguity (Riordan & Kreuz, 2010).

Carey (1980) first suggested a categorical list of the different types of nonverbal cues in CMC, including such categories as vocal spelling, spatial arrays, lexical surrogates, manipulation of grammatical markers, and minus features. This first categorization of such cues was followed by proposals for other such taxonomies, all varying from one another to a certain extent. In this current study we will look specifically at the following categories: emoticons, vocal spelling, non-standard punctuation, and capitalization.

Probably, one of the most often used and familiar types of nonverbal cues in CMC is the emoticon. The term "emoticon," which was created by combining the words "emotion" and "icon," is used to describe graphic symbols that depict facial expressions, such as a smile (Dresner & Herring, 2010). Such visual symbols are reported to have been first used as early as

1982 (Dresner & Herring, 2010; Walther & D'Addario, 2001), but since then have flourished in everyday computer-mediated communication. Although they began as simple smiles or frowns, they have formed the basis for other symbols that have evolved to represent more complicated emotions, feelings, or intents. Despite the focus on emoticons, it has been argued that this particular variety of nonverbal cues may not be as common as other possible varieties. (Vandergriff, 2013).

Another variety of cue, vocal spelling, which has also been simply called letter repetitions (Kalman & Gergle, 2014), is purported to be a way to imbue a word with a certain tone of voice. Kalman and Gergle (2014) note that the repetition of letters often is a representation of an extension of a certain phoneme. For example, in writing the statement, "I saw Jooooooohn," the repetition of the o's would represent an elongated "o" sound, which would sound quite different than simply saying "I saw John." This cue in particular also tends to signal a change in pitch or tone (Kalman & Gergle, 2014), but it would seem that this tone might not always be interpreted in the same way.

Non-standard punctuation, which can be presented in multiple ways, may take the form as repetitive question marks (I saw John??), exclamation points (I saw John!!), or ellipsis (I saw John…). Such variations in punctuation can be interpreted in various ways, such as the ellipsis representing the insertion of an intentional pause, but their function is still debated due to their high dependency on context (Vandergriff, 2013).

Capitalization as a nonverbal cue (I saw JOHN) may not have received specific attention in the literature, but it is still referred to in almost all the studies discussing the various types of cues. Despite many cues' connections with certain vocal intonations in a face-to-face context, not all cues, like vocal spelling, non-standard punctuation, or capitalization, can be translated

back to a prosodic cue (Vandergriff, 2013). The lack of a profound understanding about such cues can be attributed to the unfortunate scarcity of research in this particular field, which could be remedied with further research.

Research Questions and Hypotheses

A review of the literature on communicating emotion, computer-mediated communication, and the various forms of cues that assist in the communicative process provides extensive coverage of the representation of affect outside of written prose; however, it leaves some questions that have not been so thoroughly addressed. Within the research that I have found, not one has examined the variable of age. To fill in these gaps in our knowledge of nonverbal cues in computer-mediated communication, this study attempted to answer the following two questions: 1) Do people of different age groups interpret nonverbal cues similarly, if so, which ones? 2) Do certain age groups have a more uniform agreement on the meaning of particular cues?

Based on personal experience and knowledge of these nonverbal cues and of individuals' apparent knowledge of their meaning and usage, it is hypothesized that the older participants in the current study will be less familiar with cues in this context, while the younger respondents will have a more uniform interpretation, in general, as well as be more familiar with the nonverbal cues in CMC.

Methods

In order to answer the questions above, I employed similar methods to those used by Walther and D'Addario (2001) in their study on emoticons. They created examples of messages that had either a positive or negative valence within the verbal message. They then included one

of three emoticons in the message to ascertain whether it would alter the valence of the message making it more or less positive or negative. In my study, instead of having an initial message that already had a positive or negative attitude attributed to it, a neutral message was used in order to ascertain how the respondents would interpret the additional information brought into a message that would normally have no underlying valence. Walther and D'Addario (2001) suggested that further research be conducted using "affectively neutral or no verbal messages" (p. 342). I believe that this method would be beneficial in testing whether or not individuals interpret cues in a similar way.

Respondents for this study were contacted via email and received a link to the survey outlined below. The survey was sent out to 75 possible participants of various ages, which were initially recruited from within and outside a medium-sized Midwestern university, as was approved by the IRB. Of those who received the survey, 66 responded. In order to investigate the interpretation of nonverbal cues, a survey was designed that was comprised of 10 different examples of nonverbal cues using the same affectively neutral statement, "I saw John." The message, on its own, does not imply whether seeing John is positive or negative, and it gives no clue to the intent of the sender. For each example, a common nonverbal cue that is used in CMC was inserted. These included the emoticons :), :(, ;), :/ , and ^^, as well as what is known as vocal spelling, capitalization, and one variety of nonstandard punctuation. With each example, participants were asked to state the attitude expressed by the message. They were given the option of saying whether it was positive, negative, that they did not know, or they could select "other" and supply an adjective to better describe the message.

In order to ascertain whether there is a difference between age groups, the results were compared between the three groups, which were chosen following Dresner and Herring (2010),

who note that emoticons were first reported being used around 1982. The first group is the youngest generation, which includes individuals from 18 to 30. This group differentiates itself from the others because it is the first generation after the creation of the emoticon who grew up with the use of CMC being relatively more integrated into their daily lives. The second age group consists of informants between the ages of 31 and 50. These individuals were the first ones to start working with CMC because they were most likely at a working age by the time email and other CMC technologies became more popular. The final group consists of individuals 51 years old and older. By the time they were exposed to CMC, it would have been after they had been communicating with others for many years solely in a face-to-face context. Therefore, they may have had less experience with CMC and thus, may have adapted more slowly to changing the way in which they communicate through this new channel.

Findings

After disseminating the survey to individuals in the various age groups, a total of 66 responses were received, which allowed for at least 20 participants in each of the age groups, being the minimal goal for this study. The actual numbers were 20 respondents for Group 1, 20 for Group 2, and 26 for Group 3. Their responses can be seen in the following figures.

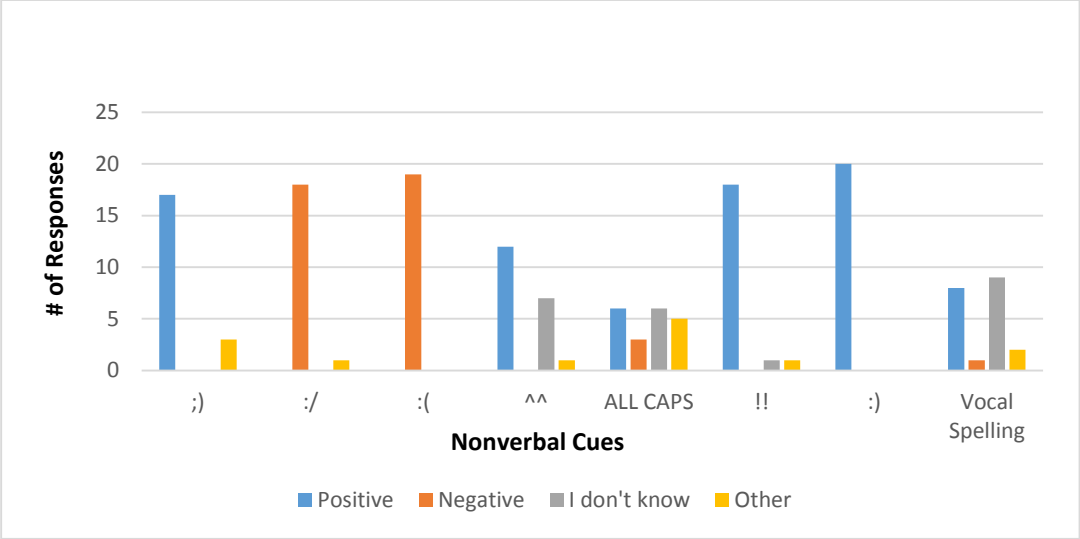

Figure 1. Results for Group 1. This figure illustrates the responses given by participants who identified as being 18-30 years old, and distinguishes between the four possible answers for each nonverbal cue.

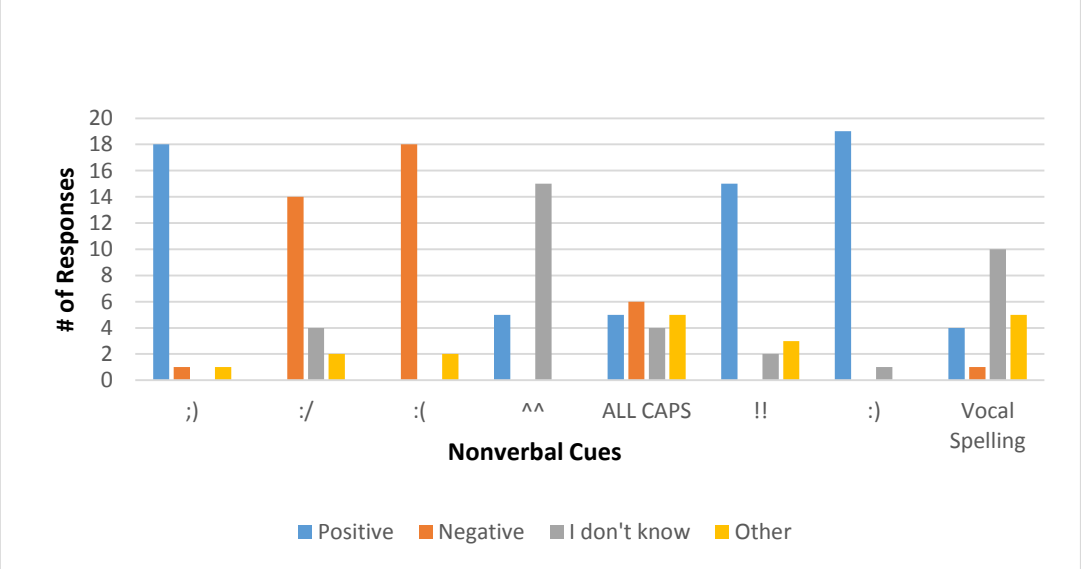

Figure 2. Results for Group 2. This figure illustrates the responses given by participants who identified as being 31-50 years old, and distinguishes between the four possible answers for each nonverbal cue.

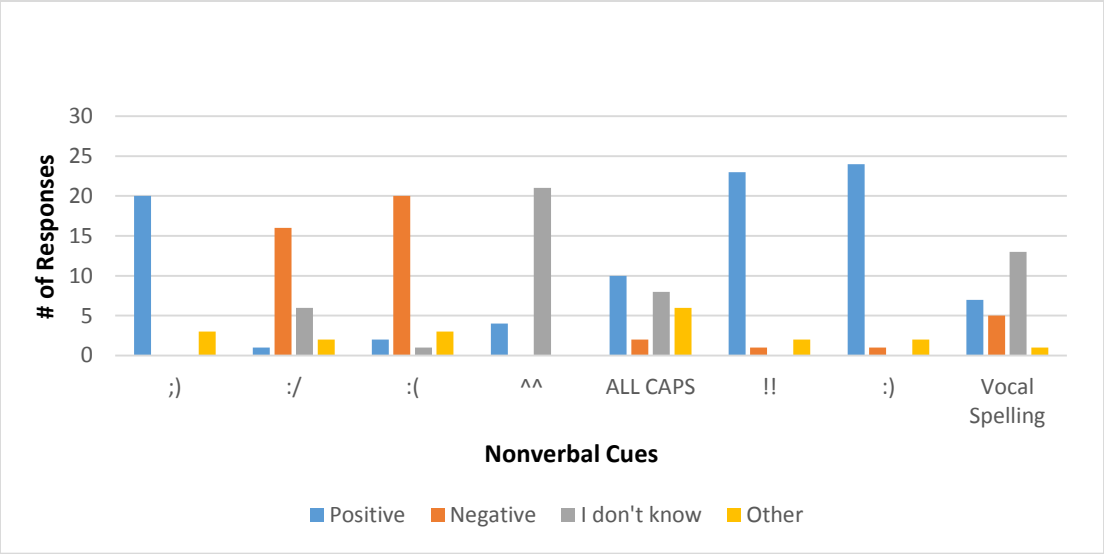

Figure 3. Results for Group 3. This figure illustrates the responses given by participants who identified as being 51 years old or older, and distinguishes between the four possible answers for each nonverbal cue.

As a quick glance at the graphs reveals, there is a large percentage of respondents selecting just one of the four possible answers for each cue. There are also a few examples of cues that do not have as many responses agreeing on one of the options. As one can see by comparing Figures 1,2, and 3, the examples for capitalization and vocal spelling both received a large variety of responses. When comparing the "other" responses for vocal spelling and capitalization, in which respondents could insert a word or short phrase that they found more applicable to the cue, they elicited such responses as "Context dependent: unsure," "multiple meanings," "Depends." This agrees with a claim made by Vandergriff (2013), saying that these types of cues are more variable and highly context-dependent. As for examining the responses for other cues in this study, an interesting interpretation was given by the youngest age group, Group 1, to the winking emoticon, ;). This particular cue elicited multiple responses saying

"sexual" as well as one saying "playful; mischievous," but similar responses were not found in Group 2 or Group 3.

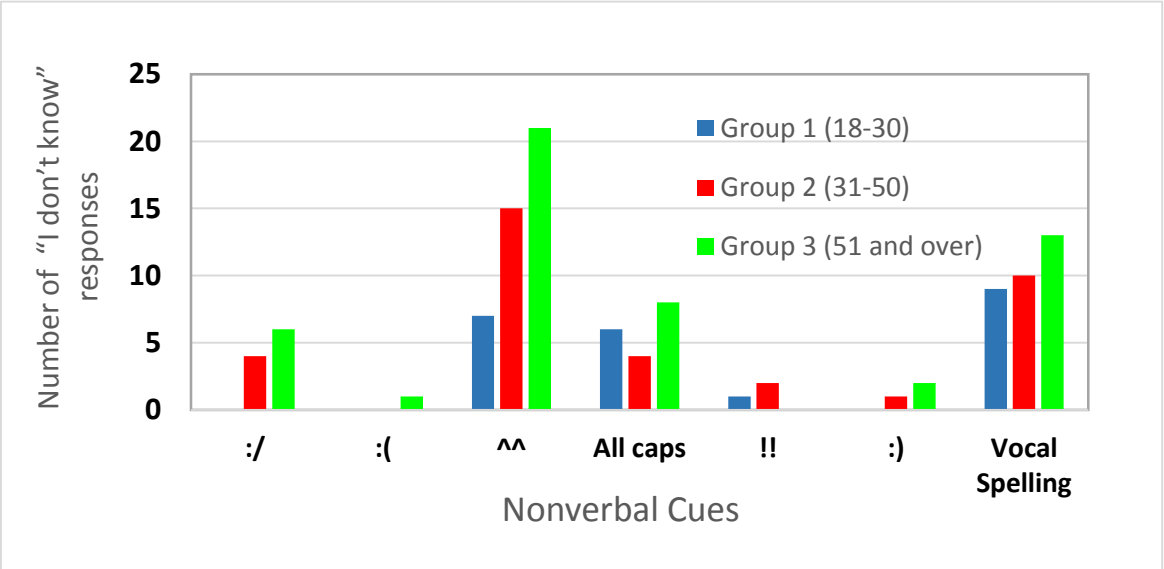

Figure 4. Lack of Recognition in Nonverbal Cues. This graph illustrates the unfamiliarity of nonverbal cues by showing the number of "I don't know responses" for each cue and age group.

Examining Figure 4, one may note that the greatest number of "I don't know" responses came from respondents in the oldest age group, Group 3, and that the second largest number of these responses came from the second oldest age group, Group 2, and the least amount of such responses came from the youngest age group, Group 1. Interestingly, the emoticon, ^^, happened to be the least understood of all the cues with 66% of participants being unfamiliar with it, but the rate of unfamiliarity was still relatively lower in the youngest age group. Despite

the high degree of unfamiliarity, there were still 32% of respondents that felt that ^^ conveyed positive feelings, whereas no participant felt that it was negative.

In an attempt to ascertain whether certain age groups had a more uniform interpretation of these nonverbal cues, the percentage of participants agreeing on a single meaning within age groups was examined. On average, 75.6% of participants in Group 1 agreed on a particular meaning for the given cue. In comparison, Group 2 and Group 3 agreed 71.9% and 71.8% of the time, respectively. Although there is an almost 4% difference between the youngest group and the older two groups, it is only a slight difference and may indicate that all age groups have a relatively uniform interpretation.

Discussion

Given the results, one may draw some conclusions about cues and their interpretation. As mentioned in the results, the majority of the cues had one of the answer options receiving the majority of responses. Having a large percentage of respondents agreeing on a single option for so many of the cues, means that most all had some form of shared meaning for those particular cues. On the other hand, one can also note that other cues, such as vocal spelling and capitalization, did not have such a decisive meaning. It would appear that, in such cases, not everyone could agree. When examining the "other" responses, one may better comprehend why that is. As noted earlier, these cues elicited responses that claimed that positivity of the message was dependent on context. This indicates that, for some, these cues do not convey a positive or negative meaning on their own. Also mentioned in the results was the tendency of the youngest age group to attribute a "sexual" meaning to the use of ;) in a message. Although this is only reported in the current study for individuals age 18-30, this trend was also noted in Walther and

D'Addario's (2001) study on emoticons. When presented with "seductive" as a descriptor for the winking emoticon, 85.4% of participants in their study agreed that it was an accurate descriptor for the emoticon. Other descriptors that were also chosen by participants in their study included "joking," "secretive," and "sarcastic," some of which appeared in similar variations in the responses of the study reported in this paper.

When one examines the data from all three groups, one may notice that the majority can agree that :), ;), and !! all convey positive feelings, while :(and :/ are more representative of negative attitudes or intents. Based on these findings, one may claim that non-standard punctuation as well as most emoticons have shared meaning among members of all age groups. Additionally, since the majority of the "I don't know" responses can be found in the older two age groups, one may conclude that the majority of people within those age groups tend to be less familiar with nonverbal cues in CMC.

As mentioned earlier, the ^^ emoticon was the least recognized of all the cues in the survey. The amount of unfamiliarity was not particularly surprising, given that this particular emoticon (based on personal observation) is mostly encountered when conversing with individuals originally from outside the United States. Due to the fact that it was mostly recognized by the youngest group, this particular case raises the question of how individuals initially learn to interpret these cues. Have the youngest participants had more exposure to it? If so, how did they first learn what it meant? For emoticons, the answer may simply be that they are understood due to their relationship with facial expressions in face-to-face conversations, but for others it may be due to different factors. It is possible that their understanding of their cues may have developed solely due to previous exposure. This question would be worthy of further research in the future.

Conclusion

As discussed in the literature, the use of nonverbal cues is important for the sake of clear and effective communication. As demonstrated by the study reported here, older generations have a slight tendency to be less familiar with these cues in general, but are clearly capable of interpreting them. Due to their lack of familiarity and the potential for miscommunication, it may prove wise to decrease the frequency of nonverbal cue use in favor of clearer prose, or possibly raise awareness by increasing the exposure of these cues to individuals of all ages. On the other hand, Group 2 and Group 3 were not incapable of interpreting these cues, despite the higher frequency of "I don't know" responses. In fact, the members of Group 2 and Group 3 who did answer "positive" or "negative," often agreed with the responses from the youngest generation, and therefore understood these cues on a similar level.

Unfortunately, this particular study was limited by the lack of a larger sample size, which could have provided more solid evidence of the various interpretations of nonverbal cues in CMC, and therefore cannot claim to provide results representative of all U.S. Americans. This study would have also benefited from a more extensive variety of cues being examined in order to investigate the interpretation of all emoticons as well as all forms of non-standard punctuation.

In any case, these cues have already made their way into everyday life and are integrated in computer-mediated communication. The emergence and increased use of these forms of communication has opened up a new and exciting area for linguistics, and further research on the use of language in the digital age is most definitely required. There are still many questions that can be addressed and research to be done.

First, continued research on the interpretation of these cues across age groups with a larger sample size would be needed to verify the information discussed in the current study. It

would also be beneficial for future studies to examine how one acquires the knowledge to use these nonverbal cues. Is this similar to the acquisition of spoken language?

Along with the study of the acquisition of cue usage, one may investigate other factors that might influence one's understanding and interpretation of nonverbal cues. One such factor may be the frequency that one receives and uses forms of computer-mediated communication. Does more frequent exposure to such cues alter the receiver's interpretation of such cues?

A cross-cultural examination of cue usage would also be useful to better understand cues like ^^. This was also a suggested area of research mentioned by Vandergriff (2013). In that particular study, the researcher examined U.S. American learners of German, and noted their transfer of cue use into German, and questioned whether there are cross-cultural universal similarities. With such studies, one may ask: How do individuals interpret unfamiliar cues, and what differences exist between international communicators? Do certain cultures use cues that are not used in U.S. American culture? Do certain cues used in the United States have a different meaning in other cultures? What factors may influence these interpretations across various cultures?

Finally, it would be worthwhile to conduct continuing studies on the evolution of these nonverbal cues and compare their frequency of use and interpretation to that of future generations. How will nonverbal cue usage in CMC evolve throughout the years? Will future generations have newer forms of cues that will not carry shared meaning among members of all age groups? Will cues that are currently used in communication have modified meanings in the future, which will create issues for their mutual intelligibility across age groups?

Although one may not be able to predict future trends in computer-mediated communication, research can be conducted to keep pace with the constant developments in technology. Since the area of computer-mediated communication is a relatively recent development in the field of communication research, further studies can be conducted to help elucidate the function and possible interpretations of nonverbal cues in present day CMC use as well as in years to come.

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