Not crazy, just talking on the phone: Gestures and mobile phone conversations

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Abstract

This paper discusses why mobile phone users engage in vivid nonverbal communication behaviors that do not benefit their communication partner, e.g., gesturing, smiling, and nodding their heads. It reviews generally the literature on nonverbal aspects of mobile phone use. It then specifically focuses on the communicative functions of nonverbal behavior, such as the use of gesture in speaking when the partner is not visually present and how it can influence conversations. This literature review can help inform the design of field studies that attribute meaning to nonverbal communication associated with mobile phone use, particularly in societies where nonverbal communication is very rich. Ultimately, such studies can lead to innovative design that takes advantage of the nonverbal communication patterns of mobile phone users, and some design ideas are presented.

Keywords: *mobile phones, nonverbal communication, gesture*

Introduction

People wandering around, seemingly talking to themselves, are common sights in urban spaces. Some of them, of course, are really talking to themselves, but many are just chatting on their mobile phones. The challenge of distinguishing mobile phone users from kooks can be attributed partly to the increasingly invisible nature of the devices themselves: mobile phones are shrinking in size as hands-free accessories such as wireless earpieces are growing in popularity. Further complicating the matter, mobile users are free to chat in previously unconnected spaces like buses, elevators, cafes, or the middle of the street where one-sided conversations are not the norm. However, as members of modern, urban society become accustomed to near-invisible phones and their ubiquitous use, what continues to confound the average person on the street is how animated these mobile phone talkers can be: they act as vividly and normally as if there was someone in front of them. They smile, gesture, nod their heads, and seem completely involved in the conversation. It feels like they are talking to *you* and not someone on a phone.

The purpose of this paper is to uncover why these mobile users engage in nonverbal communication behaviors that the person on the other end of the line cannot see. It reviews generally some literature on nonverbal aspects of mobile phone use and then focuses specifically on the use of gesture in speaking and how it can influence conversations where the partner is not visually present. This inquiry is part of a broader study of mobile phone use and its transformative effects on digitally emergent societies, such as India and Uzbekistan, which have very different traditions, values, and communication habits than the West. Although mobile phones are popular in these places, their design may yet be further localized and innovative, culturally relevant mobile applications may be created. Thoughtful consideration of nonverbal communication issues can inform creative designs for the mobile phone that take advantage of the multiple modes of communication that people of all cultures use.

Mobile Phone Use as Nonverbal Communication

The deep integration of mobile phones into modern life has prompted numerous studies of their use.

These studies almost always consider verbal communication features of the mobile phone, either through its voice modality, e.g., [1], [2], or over text messaging, e.g., [3], [4]. As the mobile telephone evolved conceptually from fixed line telephones, it is not surprising that they are still considered verbal communication devices primarily. Among other functions, verbal communication over mobile phones can help cement social relationships [2], [5] and coordinate meetings [6].

The nonverbal character of mobile phone use has also been studied. The meanings that imbue mobile phones can be considered a kind of nonverbal communication. As an example of assigned meaning, in the earliest stages of technology diffusion, mobile phones are sometimes considered prestigious because of their expense and relative rarity. Ownership of a mobile phone in a digitally emergent society may signify "showing off" or suggest that the owner is an important businessperson [7]. Conspicuous display of mobile phones in social situations, either hanging around the neck, held in the hand, or placed on a table in a restaurant may similarly suggest power or prestige. Men in mixed-gender company at a bar may use their mobile phones as "lekking" devices by prominently displaying them to imply their attractiveness as a mate and vie for the attentions of prospective females amongst other men [8]. For women, mobiles may connote freedom such as for Israeli women who wish to be available to their families but do not want to be tied to the fixed line telephone at home [9] or for the mother of a disabled girl who realized she was no longer tied to a fixed line telephone in case of emergencies [1]. Finally, the seamless sharing of mobile phones within teenage cliques may signify group membership [5], [10]. These meanings of mobile phones nonverbally convey messages about the owner of a given phone and their status in society.

The nonlinguistic characteristics of mobile phone use are often observed and discussed even in the popular press. "Cell yell" or the unusually loud volume of voice used by mobile phone talkers is a commonly observed phenomenon. Some explanations offered for the loud volume with which mobile phone users feel compelled to speak are the small form factor of mobile phones, which puts the mouthpiece deceptively far from the mouth, the poor aural feedback of mobile phones, and the loudness of the surrounding environment in which users sometimes find themselves [11]. Monk, Carroll, Park, and Blythe [12] conducted controlled experiments in the field to test the intrusiveness of mobile phone conversations. They staged face-to-face and mobile phone conversations at various volumes at bus stations and on trains for the benefit of unsuspecting listeners. After the conversation, the researchers approached the listener they had targeted and asked them to rate the conversation's volume, content, and annoyingness. They found that mobile phone conversations were significantly more noticeable and annoving to overhear than face-to-face conversations at comparable volumes. In a followup study, the researchers concluded that the mobile calls were annoying because they were one-sided: only half the verbal information was available to eavesdroppers [13]. To confirm this effect, the researchers found that face-to-face conversations where one communication partner was very quiet (thus making the conversation seem one-sided) were as annoying to surrounding listeners as the mobile phone conversation.

Nonverbal communication behaviors have also been observed in field studies of mobile phone users in public spaces. One study discovered a public etiquette surrounding mobile use in public transportation that is shared by both the user and the non-user [14]. This preliminary field study found that, once answering the phone, mobile users averted their eyes to a neutral space and then kept their head turned downwards apparently to create privacy. Similarly, some mobile users held their conversation between train cars to get privacy. The listeners surrounding the mobile phone user politely turned their eyes away when the owner answered the phone in the manner of Goffman's "civil inattention." They also stared in the direction of a ringing mobile phone if it was not answered quickly. The preliminary results suggest that the duration of call, time of call, subject matter, and location of call all affect the surrounding listeners' reactions and judgments of the mobile phone user and his or her chatter.

Another field study of mobile phone use in public spaces found that users try to create privacy for themselves by tucking into a corner or tilting their head in so they are speaking towards their lap or the floor [15]. The study also discovered that in colocated dyads, where one person used the mobile to talk to someone else, the excluded person seemed to feel awkward, pretended not to listen, or openly listened in on the conversation.

Together, these above studies suggest that there is a rich layer of nonverbal communication surrounding mobile phones. The phones themselves convey information about their users [1], [5], [7], [8], [9], [10], the users communicate nonverbally while on the phone [11], [12], [13], [14], [15], and the people near the mobile phone user also react nonverbally to the phone call [14], [15].

Although phone conversation has fewer cues than face-to-face communication, e.g., it lacks visual feedback about the conversation partner, it is not necessarily a communicatively poorer one. A literature review suggests that the visual presence of a communication partner seems to have little or no effect on the outcomes of information transmission, problem-solving, conflict, and person perception tasks [16]. In other words, there may be very little difference between telephone and faceto-face conversations, at least functionally. Some teenage users have expressed appreciation for the stripped nature of mobile text messages because they keep the conversation short and to the point saving time and avoiding embarrassment such as while asking someone out on a date [17]. Mobile phone exchanges (either through voice or text messaging) may be valued as "metacommunication" for arranging future interactions such as a follow-up fixed line telephone call or a face-to-face meeting [1], [16], [17] and thus enhance overall communication. Phone conversation seems different from face-to-face conversation, but it may have many of the same functions and can actually enhance communication with others.

Mobile phone use is entwined with nuanced nonverbal communication on behalf of the user and nearby listeners. Some of the communication focus is clearly on the phone itself, whether it is used to lure prospective mates at a bar or because it makes for one-sided voice conversations that annoy neighbors. But as shown by the functional similarities between phone conversation and faceto-face conversation, there may be something inherent to communication itself that encourages nonverbal behaviors to enhance the exchange. This paper now looks at one kind of nonverbal behavior—the production of gesture in speakingin order to inform our understanding of the use of gesture in mobile phone conversations.

Use of Gesture in Speech

The kind of gesture that is considered in this paper is communicative rather than random. Bavelas and Chovil [18] present a model for examining nonverbal acts and their linguistic use in face-toface dialogue that is useful for considering whether a nonverbal behavior should be analyzed as a communicative event. It helps to separate the wheat from the chaff, allowing researchers to distinguish between meaningful and inconsequential behaviors. Not all nonverbal behaviors are linguistic in function; context and the behavior itself determine whether the behavior holds meaning. Four propositions are named in this model, which focuses on conversational hand gestures and facial displays as test cases. First, nonverbal behaviors must occur synchronously with spontaneous speech. That is, the nonverbal behavior must be timed with words being spoken in an unambiguous way such as using hands spread far apart to indicate width while talking about the width of an object. Second, to be considered conversational, nonverbal behaviors should be symbolic acts: they should be encoded with a meaning. Third, the nonverbal behavior must be integrated with words, either redundantly or nonredundantly. The gestures should complement and supplement the words spoken. Finally, the nonverbal behaviors must create and convey shared meanings, as exhibited by the mutual encoding and decoding of meaning by speaker and listener. With such a framework, researchers have a tool to ensure they are studying meaningful, communicative gestures rather than a random movement. Using this framework, researchers can discern whether someone who scratches his head while speaking on the phone is indicating confusion or simply has an itch.

Gesture has been found to have communicative functions as part of a larger social and material context of conversation [19] and in studies of nonverbal dominance [20]. However, it is not clear from these example studies why gestures are used or how they benefit the speaker or the listener. To understand the origin of gesturing while speaking, researchers tested whether speakers gesture because they see gestures modeled and whether speakers gesture to convey information to their listener [21], [22]. In an experimental design that analyzed conversations between two sighted people, two blind people, and a blind and sighted pair, researchers found no significant differences in either gesture rate or in type of gesture between the different conditions. Specifically, the congenitally blind people used gestures as often as the sighted people even though they could not have modeled this behavior. This study was followed by one of blind speakers paired with either blind or sighted listeners. The researchers found that regardless of who the listener was, the blind speaker would still use gestures in their communication even though the blind listeners could not perceive whatever information was conveyed through the gestures. These studies suggest that gesture in talk is robust and may be integral to the speaking process itself. The use of gesture is not the result of modeling the behavior, and it is done even when the listener cannot benefit from it. That is to say, people may be "wired" to use gesture in their speech at least for their own benefit.

Gesture Benefits the Speaker

Much of the literature about gesture in conversation suggests that it has cognitive benefits for the speaker. Wesp et al. [23] asked subjects to describe a seascape watercolor painting in such a detailed manner that it could be distinguished from a similar looking painting. In one condition the painting was to be described from memory, and in the other, the painting was to be described directly. Participants explained either to an observer with her eyes closed and head tilted or with the observer facing the subject. The researchers learned that participants gestured significantly more frequently when describing from memory than from the picture directly, suggesting the cognitive burden of describing a picture from the imagination necessitated the extra gesturing. There was no significant difference for eye contact nor was there an interaction effect. These results suggest that gestures can be a cognitive aid for the speaker, especially when completing a challenging task.

The cognitive assistance offered by gesturing has been observed in other cultures as well. A study of Lao speakers revealed that they will use hand gestures to help them explain kinship structure [24]. Laotians will gesture in air—as if they were drawing out their relationships with pen and paper and making notes—helping to ease the cognitive load required to explain complex family relations. Besides cognitive assistance, gesturing can supplement vocabulary when the speaker is describing difficult material. A between-subjects study by Bavelas, Kenwood, Johnson, and Philips [25] revealed that a lack of vocabulary about a picture increased non-redundant gesturing. Participants were asked to describe an abstract picture of a maze and a picture of a lady wearing an ornate 18th century dress, either for an audioonly recording or a video recording. Participants were told that the recordings were to be done as if for a game where a partner had to guess what they were describing based on the audio or the video. Participants were not expected to have the specialized vocabulary to describe the features of the dress. The researchers discovered that there was no significant difference in the rate of gesturing for these two pictures, but there were significantly more non-redundant gestures while describing the dress. This finding suggests that speakers supplement missing vocabulary with gestures, and the gesture itself may trigger verbal memory, as in the case for one participant who used a gesture to suggest a feather shape in the process of talking about the cap with a feather the lady in the picture was wearing.

The above three studies show how speakers gesture to aid themselves in the communicative process. The gestures can help speakers think through a complicated task [23], explain complex relationships [24], and find substitutes for missing vocabulary [25]. Gesture has a definite purpose in communication and is not performed merely for color. It is easy to see why mobile phone users engage in these nonverbal behaviors to aid themselves as they speak even without an audience in sight – it is instinctual and probably spontaneous.

Gesture is Intended to Benefit the Listener Besides benefiting speakers themselves, gestures seem also to be intended by the speaker to benefit the listener. Bavelas et al. [25] found in their study of descriptions of the ornate dress and maze for audio or video, participants used gestures at a significantly higher rate in the video condition than in the audio condition. Participants produced more gestures when they thought someone would see them.

Another study found that speakers who gesture will omit more spatial information from their verbal descriptions than speakers who do not gesture, suggesting that the gestures are intended to convey extra information beyond words [26]. The researchers asked participants to describe abstract pictures of colored dots and lines arranged as a path to a co-located individual who could see the speaker but not the picture. One picture showed a unidirectional path; another picture displayed a multidirectional path. Participants were judged to be gesturers or non-gesturers after they described the picture's colors and directions. The researchers found that the gesturers were more likely to omit verbal directional information as their gestures supplemented their verbal description. They found a similar effect among people who offered an overview of the picture that they saw (e.g., "looks like a staircase"), where those participants would have a significantly higher rate of omission of directional information in their verbal description. Gestures in this experiment clearly supplemented and complemented the verbal description and were intended to be meaningful to the listener.

Other researchers confirm that speakers gesture for the benefit of their listeners, and will use significantly more "representational gestures" with semantic encoding in a face-to-face condition than in a blind condition where a screen blocked the view between the speaker and the listener [27]. Participants were asked to describe the narrative within a Sylvester and Tweety Bird cartoon clip. Participants used "beat gestures" or rhythmic gestures that do not convey semantic meaning at the same rate across the face-to-face and screened conditions. They also produced representational gestures in the screened condition, even though no one could observe them, suggesting that gestures have complex purposes: they are never solely for the benefit of the listener; they also have a cognitive purpose for the speaker.

A speaker's gestures can be customized to the spatial relationship of listeners and to the speaker. Özyürek [28] studied how participants described the same Sylvester and Tweety Bird cartoon used in the previous study [27] to either one or two colocated listeners, with particular emphasis of gesture that made use of the speaker and listener's shared space, an imaginary circular area that joined them. Using a within-subjects design, he found that speakers tended to gesture concepts such as "into" and "out" which made use of the bounded shared space. Subjects changed the direction of their gesturing to accommodate different seating arrangements (on the left, right, or with two people at both left and right). The results were similarly confirmed in a second experiment that tested configurations with only one co-located listener. These customizations of gestures relative to the listener rather than to the speaker suggest that the gesture is intended to help listeners understand the narrative.

As a whole, the studies suggest that speakers intend gestures to help their listeners better understand communication. They use gesture in concert with words [26] and to convey semantic meaning [27]. Further, they tailor gestures relative to the listeners [28]. Gestures are purposefully designed for the listener – with fewer and different gestures used with people who are not face-to-face. Thus, the gestures employed by mobile phone users are probably more muted than they would normally be in face-to-face conversation.

Gesture May Not Actually Help the Listener Despite all these studies that suggest speakers gesture to help themselves think and to help their listeners, there seems to be inconclusive evidence about whether the gestures actually help listeners. Driskell and Radtke [29] asked pairs of participants to play a word guessing game, where speakers had to give clues to their listener about a given word, without using the word itself. One condition asked the participants to gesture or use verbal cues freely; another condition specifically asked participants not to use their hands and to keep them in their laps. The words that were given to participants were a mix of spatial location, spatial property, manipulation/movement, and nonspatial terms. The dependent measures were listener comprehension (based on the number of guesses required before the listener guessed correctly) and speech production (based on the associative strength of the clues that speakers give with the word to be guessed). The study found that the gesturing condition yielded significantly higher listener comprehension and speech production across all word types. However, the study offered limited support for the mediating effects of gesture on speech production. The speaker became more articulate with the use of gestures, and it was this improved coherence, rather than the gesture itself, may have helped listeners comprehend more. Hence, gesture may have only an indirect benefit to listener comprehension.

Other studies have been far more negative about the semantic information in a speaker's gestures that is actually decoded by listeners. Krauss, Dushay, Chen, and Rauscher [30] conducted a series of three experiments that asked participants to describe an abstract picture, an abstract sound, or a tea face-to-face with a co-located partner or over an intercom to someone in another room. The descriptions were videotaped and then either played back normally or with only the audio to an experimentally naïve subject who would then guess what was being described. There was no difference across conditions, that is, the participants who saw complete video tapes were no better at guessing what was being described than the listeners who only heard the audio. Consequently, these gestures did not aid the listeners on this measure. The authors concluded that gestures may serve much more to help speakers come up with words. Further, the gestures may not hold much decodable semantic information, but they may have other kinds of interpersonal meanings for listeners.

Although some studies have shown that speakers complement their speech with gesture as well as customize the gestures for their co-located audience, it is not clear if or how these nonverbal behaviors assist listeners. The benefit may derive from the speaker's increased articulateness from their gesturing [29], or the gesture may not really convey any additional meaning to a listener [30]. If gesturing does not directly communicate information to the listener, it is possible that a telephone user's conversation partner is not missing out on extra information that might have been conveyed through gesturing.

Discussion

Gesture is an essential part of speech production. It is not a meaningless behavior like some kind of tic, nor is it a behavior that has merely been learned and modeled from previous generations. Speakers have cognitive purposes for using gestures, and they seem to adjust their gestures for their listeners. It is unclear if gesture directly conveys additional information to the listener or if it simply helps the speaker produce meaning and become more fluent, and thus indirectly benefiting the listener.

Further research is needed to determine what interpersonal meanings can be interpreted from these gestures. The value that listeners may derive from gestures may not be as tangible as outright semantic information transmission; benefits may be more intangible such as the perception of immediacy or involvement on the part of the speaker. As such, nonverbal communication will likely remain a component of all mobile communications.

Future studies of mobile phone use should be sensitive to nonverbal communication and its relevance and meaning to the speaker and the two kinds of audience: the communication partner at the other end of the line and the people in the vicinity of the user. Researchers should consider the use of nonverbal behaviors that occur naturally in speech and test how their meanings and purposes transfer over to the mobile environment between conversation partners. Researchers should also consider the communicative experience of the people outside the immediate conversational dyad. Even though the mobile phone is intended to afford one-on-one conversation, surrounding people are often obligated to experience the conversation as well. Besides being potentially annoyed by the conversation or unintentionally eavesdropping, these surrounding people may misunderstand a mobile phone conversation and see it is an attempt to communicate with them-embarrassing and confusing.

Mobile phone design can be sensitive to nonverbal communication behaviors. The Human Dynamics research group at MIT has developed a number of prototype applications that take advantage of paralinguistic social cues such as tone of voice, pitch, and volume [31]. An example project from this lab is the "Jerk-O-Meter" which can monitor husbands as they talk to their wives over the phone. The phone displays messages for the husband evaluating his performance throughout the conversation and warns him if the tone of his voice or his speech rate might make him sound disinterested or like a jerk to his wife. The phone can also be used in reverse, to give the user warnings about whether the person on the line is sounding rude [32].

Gesture could be taken advantage of in a similar way to create innovations in mobile phone design, especially to improve the "user experience" for surrounding people. A simple design could be a phone that alerts nearby listeners that the user is speaking on a mobile phone, perhaps by turning on a signal whenever the phone is engaged. One example of this might be a phone that is linked to a wristband, and the wristband visibly glows whenever the phone is in use. This design acknowledges that communication is a social activity that occurs in a context, and it honors the fact that mobile phone users inevitably will gesture and appear to act strangely to others. The phone would automatically alert others that the person is actually engaged in a purposeful activity. Much as drivers signal their intent to make a turn to smooth the flow of traffic, mobile phone users might also signal their activities for the benefit of the people in their vicinity who are not an active party to the conversation and yet are witnessing it. A signal would alert surrounding people that the person is speaking on a mobile phone and not to them or to themselves, saving on embarrassment and discomfort for all.

Mobile phone design can also respect existing research that suggests gestures are more meaningful to the speaker than the listener, and thus focus on innovations that aid the speaker. An example of this kind of design would be a mobile phone that senses gestures or other nonverbal behaviors and compares them with the words being spoken. If the words being spoken match the amount and nature of gesturing, then the phone might alert the user that she is performing well. Light could be used in such an interface: if the user is gesturing and speaking very animatedly, then a light on the phone might hold steady to indicate appropriate activity. If there seems to be a disconnect, for example, where the user is not saying anything but still gesturing, then the phone could alert the user with a pulsing light that she might appear odd to others. Similar feedback could be offered with paralinguistic features such as volume to notify speakers that they may be speaking overly loudly.

Future research can focus on other designs that capture and express gesture. Considering the context that mobile phone use occurs in, including the nonverbal aspects, will help researchers make design recommendations that consider gesture, gaze, spatial orientation, and vocalics. These designs can benefit the user as well as their surrounding listeners, making the mobile phone experience better for all.

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