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Busy Signal: Effects of Mobile Device Usage on Pedestrian Encounters

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Abstract Mobile communication technology plays an increasingly pervasive role in everyday life. This study examined one aspect of this role, specifically, the effects of mobile device use on the micro-interactions of pedestrians as they approached and passed a confederate. Over 400 participants were observed in a 2 (group: mobile device vs. control) × 3 [condition: look-only (L); look and smile (LS); look, smile, and greeting (LSG)] factorial design study measuring participants' looks, smiles, nods, and greetings toward the confederates. Log-linear analyses of the dependent measures provided qualified support for the predicted decreased responsiveness from mobile device users. Specifically, a group by condition interaction on smiles showed that significantly fewer mobile device users than controls smiled at the confederates in the LSG condition. In addition, a group by sex of participant interaction on greetings indicated that significantly fewer female mobile device users offered greetings than males and females in the other conditions. The processes potentially mediating these effects are discussed and the broader influence of mobile devices on the micro-interactions of pedestrians is considered.

Keywords Mobile devices · Nonverbal communication · Pedestrian behavior

Introduction

In the few decades since their introduction, mobile communication devices have become an increasingly common, and important, part of everyday life. For example, it is estimated

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that there are over 5 billion wireless service subscribers worldwide (ITU 2010), with 321 million subscribers in the United States alone (Cellular Telecommunications Industry Association 2012). A recent Pew Research Center poll across the world found that, in 18 of 21 countries polled, three-quarters of respondents reported having a cell phone (Pew Research Center 2013). The practical advantages to these mobile technologies are many. Quick and easy contact with distant others is possible without dependence on landlines. Mobile devices provide a sense of increased security in case of emergencies. Various messaging options provide a way of communicating without disturbing ongoing activities. And, of course, mobile devices can provide easy access to the power of the Internet. In spite of these considerable benefits, there are also problems related to some circumstances of mobile device use.

One problem receiving considerable research attention is the effect of cell phone use on driving safety. Specifically, cell phone use while driving increases reaction times to changing traffic conditions (Beede and Kass 2006; Strayer and Drews 2004; Strayer et al. 2003). In addition, drivers who talk on a cell phone have a threefold increase in traffic violations (Beede and Kass 2006) and a fourfold increase in accident rates (Redelmeier and Tibshirani 1997). In fact, the level of impairment caused by talking on a cell phone while driving is comparable to being intoxicated at a blood alcohol level of .08 (Strayer et al. 2006). Furthermore, it appears that these deficits are not the product of peripheral interference from simply holding a phone. Rather, these effects are the product of attentional deficits from the cognitive demands of a phone conversation (Caird et al. 2008; Strayer and Johnston 2001).

Although mobile devices now serve a variety of functions, their most frequent uses are for phone calls and texting (Pew Research Center 2013). This kind of remote contact with others creates what Gergen (2002) describes as absent–presence, that is, a continuous presence of family, friends, colleagues, and others who are physically absent. It is not surprising that such absent-engagement decreases attention to, and involvement with, in-person conversational partners (Bugeja 2005; Glaser 2007; Hills et al. 2009). But such in-person conversations, or what Goffman (1963) terms focused interactions (i.e., interactions focused around a conversation), are not the only form of face-to-face interactions. Goffman (1963) emphasized that we also interact in the absence of a conversation by making nonverbal adjustments to the close presence of others—unfocused interactions. Thus, for example, as people stand in line at a checkout counter, choose a seat in a half-filled doctor's waiting room, or enter an occupied elevator, they engage in subtle, and often brief, interactions with nearby others.

The present study examined the effects of mobile device use in one type of unfocused interaction, specifically, the encounters between pedestrian strangers passing one another on the sidewalk. Although these mundane interactions may seem trivial, they are ubiquitous occurrences that reflect social norms, signal attitudes toward in-group and out-group others, and even prime subsequent social judgments and behavior (Patterson 2008).

Passing Encounters

According to Goffman (1963, pp. 83–88), a common pattern in these brief micro-interactions is civil inattention. Presumably, this occurs when people initiate a brief glance to recognize the presence of the approaching pedestrian, followed by looking away to respect the individual's privacy. Goffman (1963, p. 84) proposed that the transition from glancing to gaze avoidance occurs when an approaching stranger reaches an approximate eight-foot separation. Across four studies, Cary (1978) found, however, that pedestrians did not lower their heads and avert gaze as they closely approached and passed one another. To pursue this issue further, we examined these micro-interactions between pedestrians in a series of studies. In samples from an urban area in the Midwest, we found that, as confederates initiated greater involvement toward an approaching pedestrian [i.e., from avoid, to look, to look and smile (LS)], glances, smiles, nods, and greetings toward the confederates increased (Patterson and Tubbs 2005; Patterson et al. 2002).

An important qualification to this pattern was observed in a cross-cultural study comparing pedestrians in Japan and the United States. Specifically, in Japan, smiles, nods, and greetings were very rare (a range of 1–2 %) and unaffected by the confederates' behavior, compared to the US (a range of 9–25 %) where reactions were similar to those in the earlier studies (Patterson et al. 2007). Thus, for our US samples, there was a consistent pattern of increased confederate involvement precipitating greater participant involvement (i.e., reciprocity) in the form of increased glances, smiles, nods, and greetings. In addition, however, sex of participant and sex of confederate also affected response patterns. For example, in two of the studies, female confederates received more glances than male confederates (Patterson et al. 2002, 2007). In one study, this was qualified by a sex of confederate by sex of participant interaction, with more glances toward opposite-sex confederates than toward same-sex confederates (Patterson et al. 2002).

Present Study

The purpose of the present study was to examine the effects of mobile device use on the micro-interactions of pedestrians passing one another on the sidewalk. It seems clear that the absent engagement of mobile device use adversely affects involvement with in-person conversational partners (Bugeja 2005; Glaser 2007; Hills et al. 2009), but do these distracting effects extend to the brief passing encounters of pedestrians? First, we hypothesized that the earlier condition main effect (Patterson et al. 2002, 2007; Patterson and Tubbs 2005) will be replicated. That is, increased confederate involvement will precipitate more glances, smiles, nods, and greetings from participants. Our second, and more important, hypothesis was that participants using mobile devices will be less responsive than control participants. That is, there will be a group main effect, with mobile device participants displaying lower involvement than control participants, reflected in some combination of decreased glances, nods, smiles, and greetings.

We were also interested in a research question involving gender of participants and confederates. Given our earlier results of participant and confederate gender affecting patterns of glancing (Patterson et al. 2002, 2007), does the gender of either participants or confederates interact with mobile device use in affecting participants' responses?

Methods

Design and Participants

The experiment employed a 2 (group: mobile device vs. control) $\times$ 3 [condition: look-only (L); LS; look, smile, and greeting (LSG)] design.[1] The greeting component was a simple

[1] In the earlier pedestrian studies, the condition manipulations included avoid, look-only, and look and smile. We removed the avoid condition in this study because we were concerned that the base rate of responding might be too low, especially among mobile device participants. Thus, we intensified the high

"Hi" as the confederate initiated a LS. The mobile device participants had to be using their mobile devices in some fashion (talking on the phone, using the key board, or reading the screen) and not simply holding it in their hands. A total of 481 pedestrians walking alone were observed as they approached and passed a confederate. There were 56 participants dropped from the analysis due to procedural errors or observers' problems with seeing the participants clearly. This left a total of 425 participants with 206 men, 217 women, and 2 without gender identification included. Because we did not select for gender, but only for solitary pedestrians who met the requirements identified in the "Procedure" section, the gender distribution in the 6 (2 × 3) cells of the experiment was free to vary. This resulted in 120 males and 91 females in the control condition and 126 females and 86 males in mobile device condition. The sample appeared to be approximately 60 % Caucasian and/or Hispanic, 25 % African-American, 10 % Asian, and 5 % other/undetermined. Over 80 % of the pedestrians appeared to be in the 18–30 age range.

Setting

The experiment was conducted on two sidewalks and an enclosed walkway on an urban university campus in St. Louis. The chosen sidewalks were on level terrain and straight. This allowed unobstructed vision to identify approaching participants. Trials were run on the sidewalks during daylight hours when the weather was not too cold and there was no precipitation. Some of the trials on the enclosed walkway were run when the weather did not permit the outside trials. Times immediately around class changes were avoided because pedestrian traffic levels were too high.

Procedure

Eleven college-age students (six males and five females) served as both confederates and observers in the experiment. The students were trained in the confederate role and practiced the conditions on one another before data were collected. The second author also monitored several early trials for each confederate/observer. The basic format required the confederates to initiate a look, LS, or LSG to the oncoming pedestrian at the start of an approximate twelve-foot passing zone.

In order to make sure that each participant had a comparable opportunity to notice and react to the confederate, a number of restrictions were placed on the potential participants. These restrictions included the following circumstances: (a) the sidewalk had to be uncrowded with no more than a few people in the oncoming traffic; (b) the participant had to be walking alone on the right side of the sidewalk; (c) there had to be a gap of at least 30–40 ft between the participant and the person walking in front of him/her (i.e., in order for the participant to have a clear view of the approaching confederate); (d) the participant could not have just turned the corner on to the sidewalk; (e) participants could not be involved in other activities while walking (wearing headphones, smoking, reading, eating, carrying heavy or awkward objects); (f) participants could not be running or obviously disabled; and (g) participants could not be wearing sunglasses because it was too difficult to monitor their gaze direction. In addition, participants could not be someone the confederate knew or someone who had been observed previously.

Footnote 1 continued
confederate–involvement condition by adding a greeting in order to promote greater participant responsiveness.

Each confederate ran the six conditions in a block randomized order. The observers could obviously identify mobile device versus control participants, but they were blind to the condition manipulations. Confederates and observers were dressed casually, typical of their age group. The confederate positioned him/herself at one end of a sidewalk, in a location to identify a potential participant. The observer was stationed to the side of, and physically separated from, the confederate. No attempt was made to select participants by gender or age. That is, the first person meeting the requirements described in the previous paragraph was approached. When the confederate started to move down the sidewalk, the observer followed at approximately 30–40 ft behind the confederate. After the confederate and observer passed the participant and reached the end of the sidewalk, they stopped in separate locations and recorded their observations. Then they got ready for the next trial. Confederates and observers were kept blind regarding the hypotheses.

Response Measures

The observer's data sheet contained items on the time of day, location, temperature, weather, race and sex of participant, and approximate age of participant (18–30, 31–40, 41–50, 51–60, and over 61). The participant's reactions toward the confederate in the passing zone (12–0 ft) were recorded on the following dimensions: (a) glance, (b) nod, (c) smile, and (d) a verbal greeting. In operational terms, a glance was defined as visually focusing on the confederate in the passing zone. This was usually very brief and typically involved a slight, but noticeable, head turn in the direction of the confederate. A head nod was defined as down and up vertical head movement while glancing at the confederate. A smile was defined as a noticeable upward turn of the corners of the mouth while glancing at the confederate. A verbal greeting was defined as a verbalization directed toward the confederate. On each of the measures, reactions were scored as present, absent, or uncertain. The confederate and the observer scored each behavior on every trial.

In earlier studies, inter-rater reliabilities, based on Kappa (Cohen 1960) and computed on the judgments of the confederates and observers, ranged from approximately .60–.95 (Patterson et al. 2002, 2007; Patterson and Tubbs 2005). In general, the Kappas were lower in the present study: glances = .56, nods = .39, smiles = .58, and greetings = .72. Because the Kappa for nods was too low, nods were dropped from the analyses.[2]

Results

Log-Linear Analyses

Because the effects of multiple categorical variables were examined, log-linear analyses were employed for analyzing effects on the separate response dimensions. Specifically, a simultaneous entry procedure was conducted on SPSS, with the relevant variables entered in a single step (see Howell 2010, pp. 629–659). Partial χ^2 in the log-linear analysis tests the significance of the relationships between predictor variables and the dependent

[2] One factor that may have contributed to the lower Kappas was that the reaction times of mobile device participants might have been a little slower than those in the control condition. As a result, the observers may have noticed late reactions that the confederates did not see as the participant was passing. Because this was not a problem with greetings, as confederates could still hear the comment even if they did not see it, the Kappa for greetings was higher.

measures. Specific comparison tests in log-linear analyses are typically made in terms of odds ratios, that is, the ratios of two conditional probabilities, or odds, for a dichotomous outcome. Odds ratios can assume any value between 0 and ∞ and are not affected by marginal frequencies. Consequently, odds ratios are useful measures of effect sizes (Howell 2010, pp. 629–659). It should also be noted that a significant partial χ^2 indicates that the odds ratio is significantly different from 1.0.[3]

Although we were also interested in the potential higher-level interactions involving condition, group, sex of participant, and sex of confederate, the expected cell frequencies for smiles and greetings in the three-way and four-way combinations were too small to meet the minimal requirements for log-linear analyses. The higher base rate for participants' glances did permit analyses of three-way interactions. Overall, 45 % of all participants glanced at the confederates, but only 13 % smiled and 12 % offered a greeting. Consequently, the main and interaction effects of condition and group (mobile device vs. control) are reported first and, later, the separate main and interaction effects involving sex of participant and sex of confederate are reported.

Condition Effects

There were significant condition main effects on participants' (1) glances, $\chi^2(2, N = 425) = 50.69$, $p < .0001$; (2) smiles, $\chi^2(2, N = 423) = 21.72$, $p < .0001$; (3) greetings, $\chi^2(2, N = 423) = 57.51$, $p < .0001$. These effects are clearly seen in Fig. 1 where the percentages of responses on each of the dependent measures are displayed as a function of condition. In general, participants in the L and LS conditions did not differ in their responses. But participants in the LSG condition had much higher levels of glances (odds ratio = 2.23/.51 = 4.37), smiles (odds ratio = .32/.08 = 4.00), and greetings (odds ratio = .42/.04 = 10.50) than in the other two conditions. Thus, there was clear support for the first hypothesis that increased involvement from the confederate would increase participants' responsiveness.

Mobile Device Effects

Although there were no significant main effects of group (mobile device vs. control) on any of the response measures, there was a marginally significant group effect on greetings, ($\chi^2(1, N = 425) = 3.31$, $p < .07$). That is, a higher percentage of control participants (15 %) than mobile device participants (9 %) greeted the confederates (odds ratio = .17/.10 = 1.70), consistent with the second hypothesis. There were also three interaction effects indicating conditional group effects. First, a significant group $\times$ sex of participant interaction effect on greetings ($\chi^2(1, N = 423) = 4.82$, $p < .03$) qualified the marginal group main effect on greetings. Specifically, males and females in the control condition and males in the mobile device condition initiated more greetings (15 %) than did females in the mobile device condition (6 %) (odds ratio = .17/.06 = 2.83). Thus, the marginal group difference in greeting was mainly a product of fewer greetings from females using mobile devices.

[3] For example, if six out of ten participants glanced at the confederate in condition A, the odds of glancing would be 3/2 (six glancing/four not glancing). If two out of ten participants in condition B glanced at the confederate, the odds of glancing would be 1/4 (two glancing/eight not glancing). The odds ratio of glancing in condition A versus B would 1.5/.25 = 6. That is, the odds of participants in condition A glancing would be 6 times the odds of participants in condition B glancing.

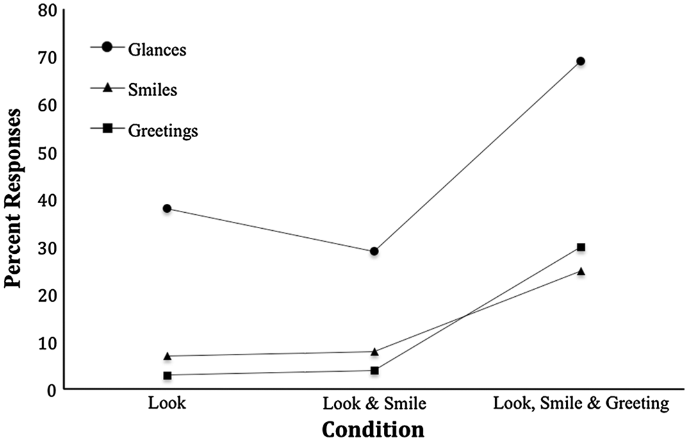

Fig. 1 Percent of responses on the dependent measures as a function of condition

Second, there was a group × condition interaction effect on smiles (χ^2(2, $N = 425$) = 13.23, $p < .002$). Figure 2 shows that the proportion of smiles from mobile device participants remained low and constant across conditions, whereas the proportion of smiles from control participants increased dramatically from the L and LS conditions to the LSG condition. Specifically, in the LSG condition, control participants smiled much more at the confederates (34 %) than did mobile device participants (14 %) (odds ratio = .53/.17 = 3.12) Although there was a higher percentage of control participants (77 %) than mobile device participants (62 %) who glanced at the confederates in the LSG condition (χ^2(1, $N = 139$) = 3.85, $p = .05$) (odds ratio = 3.31/1.59 = 2.08), it is unlikely that this difference alone could explain the much larger difference in smiles. To determine if the higher percentage of smiles from control participants was merely a product of their glancing more frequently and, consequently, having more opportunity to smile at the confederates, a separate comparison was made on only those participants who glanced at the confederates in the LSG condition. The group effect remained, with a significantly higher proportion of smiles (χ^2(1, $N = 96$) = 5.04, $p < .03$) from control participants (45 %) than from mobile device participants (23 %) (odds ratio = .83/.30 = 2.77). Thus, the condition × group interaction effect on smiles was not simply the product of fewer mobile device participants than control participants glancing at the confederates.

Finally, there was a significant group × sex of participant × sex of confederate interaction effect on glances (χ^2(1, $N = 423$) = 4.98, $p < .03$). One way of describing the three-way interaction is that the largest difference in participants' patterns of glancing at same-sex or opposite-sex confederates occurred in the mobile device condition, with a much higher percentage of male participants (69 %) glancing at female confederates than at male confederates (34 %) (odds ratio = 2.21/.52 = 4.25). In contrast, males in the control condition glanced at comparable rates at both female (52 %) and male confederates (51 %) (odds ratio = 1.09/1.04 = 1.05). The glance percentages across the group × sex of participant × sex of confederate cells are shown in Table 1.

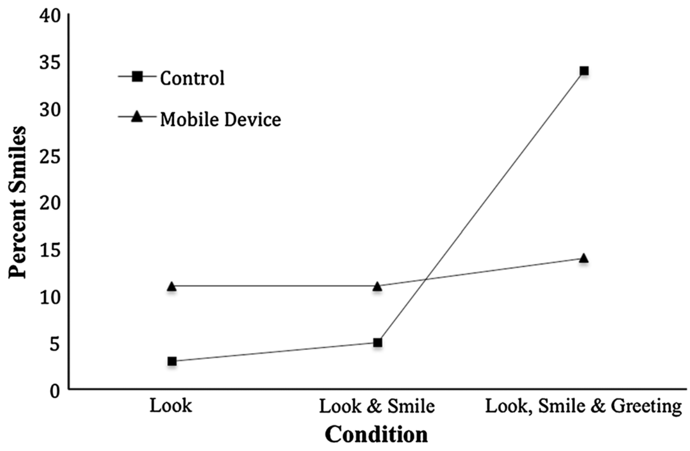

Fig. 2 Percentage of smiles as a function of condition and group (control vs. mobile device)

Table 1 Percent of glances as a function of condition, sex of participant, and sex of confederate

	Male participants		Female participants		Mean
	Control	Mobile device	Control	Mobile device	
Male confederates	51	34	30	34	39
Female confederates	52	69	47	39	50
Mean	52		38		45

Sex of Participant and Sex of Confederate Effects

First, male participants (52 %) glanced significantly more at confederates ($\chi^2(1, N = 423) = 4.89$, $p < .03$) than female participants (38 %) (odds ratio = 1.08/.64 = 1.69) did. In addition, participants glanced significantly more ($\chi^2(1, N = 423) = 5.70$, $p < .02$) at female confederates (50 %) than at male confederates (39 %) (odds ratio = .99/.63 = 1.57). These two main effects were qualified, however, by the group × sex of participant × sex of confederate described in the last section and shown in Table 1. In other words, the sex of participant and sex of confederate main effects on glancing were disproportionately a product of male mobile device users' high percentage of glancing at female confederates. In addition, participants also smiled significantly more ($\chi^2(1, N = 425) = 18.62$, $p < .0001$) at female confederates (19 %) than at male confederates (5 %) (odds ratio = .23/.10 = 2.30).

Discussion

The results of this experiment indicated that greater confederate involvement increased participants' glances, smiles, and greetings toward the confederates, replicating the general pattern from the earlier pedestrian studies (Patterson et al. 2002, 2007; Patterson and Tubbs 2005) and supporting the first hypothesis. The condition effect, as seen in Fig. 1, was solely the product of participants' greater responsiveness in the LSG condition, compared to the L and LS conditions. The primary purpose of the study, however, was to examine how mobile devices affect these brief occasions of pedestrians passing one another on the sidewalk.

Mobile Device Use

First, the marginally-significant trend for mobile device users making fewer greetings than did control participants was qualified by a group × sex of participant interaction, with females on mobile devices having the smallest percentage of greetings. There are, at least, two possible reasons for this effect. Perhaps, females are more dependent on their mobile devices (Jenaro et al. 2007) and, consequently, are less sensitive to their social environments when using them than males are. In turn, this distraction might decrease the probability of noticing the greeting and reciprocating it. Of course, even if one's attention is directed toward a mobile device, a verbal greeting might still be heard, whereas a smile might not be noticed.

An alternative explanation is that females might be more cautious around strangers than males are. And for those females who are particularly concerned about these settings, a mobile device might be used as a tactic or "prop" for avoiding contact. For example, Geser (2004) suggests that, when a person is alone in a public setting, a mobile device serves as a kind of symbolic bodyguard to signal that there is still virtual contact with another person. This suggestion is consistent with Gergen's (2002) notion of mobile devices allowing an absent–presence of family, friends, and acquaintances who are not physically present. In contrast, for control participants, without such a prop, there may be more social pressure to reciprocate a greeting. As a result, females in the control condition reciprocated greetings at a level comparable to males.

Next, the group × condition interaction on smiles, seen in Fig. 2, shows that the percentages of smiles from mobile device participants were low and level across condition. In contrast, smiles from control participants increased dramatically from the LS condition to the LSG condition. Thus, smiling, the most common sign of friendliness and openness to others (Fridlund 1994), was much lower among mobile device participants than among control participants in the LSG condition. So, what might account for these differences? In another area where mobile devices are a distraction—driving performance—it appears that the increased cognitive demand from a cell phone conversation affects attention to the environment (Caird et al. 2008; Strayer and Johnston 2001). Thus, the interference occurs in processing the information relevant for making driving adjustments. That is, objects that would normally be appreciated while driving go unnoticed during a cell phone conversation (Maples et al. 2008). Recollection of hazards (Charlton 2009), traffic signals (Strayer and Johnston 2001) and billboards (Strayer et al. 2003) was significantly lower among drivers using both handheld and hands-free cell phones—even when subjects look directly at such items—suggesting an effect on a cognitive level above the visual-sensory system.

In the present study, the lower proportion of smiles from mobile device users than from controls was evident even among those who glanced at the confederates. Thus, like the drivers using cell phones who looked directly at potential dangers, but failed to react, mobile device users who glanced at the smiling and greeting confederate reciprocated smiles much less frequently than did control participants. Normally, the simple and rapid perception of others' behavior is sufficient to trigger reciprocity, or behavioral mimicry, without conscious awareness (Lakin 2006, 2013), especially with a behavior as simple as a smile. Presumably, this "perception–behavior expressway" was selected over the course of evolution because it was adaptive for our species (Dijksterhuis and Bargh 2001). Thus, the cognitive demand from mobile device use seems to be disrupting the otherwise automatic perception–behavior link, leading to fewer smiles.

Finally, the group × sex of participant × sex of confederate interaction on glances qualified the main effects of (1) male participants glancing more at confederates than female participants did and (2) female confederates receiving more glances than male confederates did. The latter effect is consistent with results of earlier studies showing more glances at female confederates than at male confederates (Patterson et al. 2002, 2007). The three-way interaction in the present study was primarily the result of the contrast between male mobile device participants glancing much more frequently at female confederates ($M = 69$ %) than at male confederates ($M = 34$ %), compared to the other contrasts across mobile device and control participants. Like the possibility that female mobile device participants may have used their mobile devices strategically to limit the reciprocation of greetings, male mobile device participants may have used their mobile devices to cover for increased glancing at female confederates. Alternatively, perhaps the increased cognitive demand from attention to their mobile devices reduced the normal inhibition to avoid being too obvious in glancing at a passing female.

Finally, some mention should be made of the higher incidence of females among mobile device users in this study, and their corresponding lower incidence among controls, compared to males. This was not a random sample of all pedestrians on campus, but only solitary pedestrians on the sidewalks during low traffic periods who also met the requirements for potential participants. Nevertheless, in this sample of solitary pedestrians, females were more frequent users of mobile devices. This is consistent with a study of university students in Spain that found almost twice as many females as males identified as heavy cell phone users (Jenaro et al. 2007). If our results are representative of a more general pattern of greater mobile device use among females than males, then more research is needed to determine the reasons for this difference. And how might such a difference affect patterns of nonverbal interaction in other kinds of unfocused interactions?

Overview and Limitations

The present study was an attempt to examine how the use of mobile devices affects routine contacts with others in unfocused interactions, specifically, in the brief micro-interactions of pedestrians approaching and passing one another on the sidewalk. Although the hypothesis that mobile device use would adversely affect participants' responsiveness across levels of confederate involvement was not directly supported, interaction effects pointed to more nuanced impacts of mobile devices on social behavior. For example, the reciprocity common in smiling to a confederate's LSG seems to be disrupted by mobile device use, even among those who glance back at the confederates. In addition, the interaction effects involving mobile device, sex of participant, and sex of confederate suggest that mobile devices may be conditionally used in a strategic fashion to manage these very brief exchanges with strangers. Thus, mobile devices may not simply be distractions in unfocused interactions, but also props for managing these brief contacts with others.

Although the present study examined the effects of mobile device use in only one kind of brief unfocused interaction, there is a growing recognition that mobile device use negatively affects the quality of a wide range of face-to-face interactions (Bugeja 2005). In spite of the extensive and powerful benefits of mobile technology, more research is needed on how mobile devices affect our face-to-face contacts with others. For example, does increased time spent on mobile devices decrease interpersonal sensitivity in face-to-face contacts and adversely affect the quality of and satisfaction with interactions?

There are, of course, important limitations to the present study that deserve mention. First, the study was run on a Midwestern urban university campus and the majority of participants were students. It should be noted, however, that, in an earlier experiment, conducted both on campus and on downtown sidewalks, we did not find significant differences between the reactions of students and downtown pedestrians (Patterson et al. 2007). Nevertheless, it is likely that there are regional differences in reactions across the US and across culture. For example, in our study comparing US and Japanese patterns, there were so few Japanese pedestrians greeting or smiling and nodding at strangers (Patterson et al. 2007) that any mobile device effect would be difficult to detect.

Although there were more than 400 participants in the present study, the categorical nature of the data and the relatively low base rates of smiling and greeting prevented a more complete analysis of higher-level interactions involving sex of participants and sex of confederates. And there were too few minority participants across conditions to permit an analysis of race or ethnicity. Given these circumstances, a much larger sample is desirable and different settings and regions should also be studied. Conducting a field study like this one, however, is very time consuming, with assistants spending most of their time waiting for the appropriate conditions and eligible participants. Nevertheless, because mobile communication technology is such a pervasive part of everyday life, we should learn more about how these devices affect our face-to-face contacts with others.

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