An analysis of young people's use of and attitudes toward cell phones

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Abstract

Cell phones are a pervasive new communication technology, especially among college students. This paper examines college students' cell phone usage from a behavioral and psychological perspective. Utilizing both qualitative (focus groups) and quantitative (survey) approaches, the study suggests these individuals use the devices for a variety of purposes: to help them feel safe, for financial benefits, to manage time efficiently, to keep in touch with friends and family members, et al. The degree to which the individuals are dependent on the cell phones and what they view as the negatives of their utilization are also examined. The findings suggest people have various feelings and attitudes toward cell phone usage. This study serves as a foundation on which future studies will be built.
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1. Introduction

In recent years, wireless devices such as cell phones, pagers, and pocket PCs have gained popularity among a wide variety of users. For example, cell phone subscribers in the US have increased from 109 million in 2000 to 148.6 million in 2002 according to the research by eMarketer (LetsTalk cell phone survey, 2002); currently 62% of US adults own cell phones according to a study by Scarborough Research (Schackner, 2002). The usage of cell phones is also spreading among the younger generation. According to the Forrester Research and Yankee Group, in 1999 34% of 16–22-year-olds (Grimm, 2001) and about 28% of 10–19-year-olds owned a cell phone (Curry, 2001). "(T)he diffusion of the mobile phone was among the fastest of

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any technology in history . . . By 1999 there were nearly 500 million mobile telephones in use throughout the world'' (Townsend, 2002).

People use these devices in a variety of contexts. While they originated as business tools, cell phones have evolved from their original purpose and are now used largely as personal communication devices. According to the ''Cell Device Usage'' survey conducted by the Consumer Electronics Association in October 2001, 57% of cell phone users reported using phones primarily for social purposes (Wireless Phone Reliance, 2001). As cell phone usage grows, so does the reliance on the technology. The same study found half of cell phone owners carry their phones with them all the times.

Some argue the cell phone will subsume all other forms of communication—email, phone calls, and the web which will be accessible to the population by the ''universal handheld'' (Townsend, 2002). The newest generation of cell phones, third generation (3G) wireless systems, is not just for talking. Rather, this next generation increasingly provides multimedia messaging and direct Internet access in addition to traditional voice communication services. With the cell phone, users have access to phone mail, voice mail, stock prices, sports scores, restaurant reviews, movie guides, and so on. The impact cell phones have on the society is great for they create another business arena—mobile commerce or m-commerce.

We have two objectives in this research. The first is to profile cell phone users among college students in the US in terms of their intrinsic motivations toward adopting the technology. Understanding the users' intrinsic motivations helps us decipher the reason why the technology is adopted in a certain way by a certain group of people. The second is to examine various behavioral characteristics—such as length of cell phone usage, typical time of cell phone use, average number of calls received/sent, typical location of cell phone use, etc.—to determine relationships between behavioral characteristics and intrinsic motivations and feelings about usage. Understanding the relationships between intrinsic motivations and behavioral characteristics helps us understand how the motivation for adoption affects the actual use of the technology. This study in combination with others on social and behavioral aspects of cell phone use over the last couple of years addresses the new trends of cell phone use by young people in the US.

2. Previous research

Studies on social impacts of mobile phones had been scarce until a couple of years ago. Rather, past research on mobile phones examined engineering and policy aspects of the technology. In recent years, however, several researchers started to turn attention to social aspects of cell phone diffusion and the impacts cell phones had on people's daily lives and relationships.

James E. Katz, a prominent US researcher studying the social aspects of mobile communication, explored in 1997 the possible effects of wireless communication upon people's lives. In examining the topic, he identified several levels of effects of such a technology: namely ''first-order effects,'' direct effects that are immediately

perceived by users; "second-order effects," indirect effects that are "experiences or feelings that people have or may observe in others" (Katz, 1997, p. 235); and "third-order effects," the least direct effects that are observed not by users of the technology but by outside observers who study the effects of the technology upon the society in general. Katz listed uncertainty reduction, personal security, and personal efficiency, as the first-order effects of wireless communications on personal lives; tighter coupling of domestic production, information immediacy, and contactability as the second-order effects; and social interaction, social control, and innovative uses or unanticipated usage as the third-order effects.

The difference between the initial intention and the actual nature of cell phone use was also noted by Palen et al. (2000). Their study found people initially adopted cell phones for safety/security and "business" or job-related reasons instead of social reasons. However, nearly all subjects in their study reported the use of their cell phones for sociable interactions had grown to become very important. Ling and Yttri (1999), studying particularly teenage cell phone users through a series of focus group interviews, indicated the adoption of cell phones resulted in new forms of interaction called "micro-coordination and hyper-coordination." Micro-coordination refers to the use of cell phones by social groups to coordinate their meeting time and/or place as the need arises. Hyper-coordination goes beyond the simple time/place coordination and includes emotional and social communication among group members and development of group norms for appropriate self-presentation.

In Europe and Asia where cell phones are much more prevalent than in the US, young people have been the driving force in adopting the new communication device. In Finland where the cell phone penetration rate is highest in the world, over 90% of the people under 30 own such a device (Puro, 2002). Taylor and Harper (2001) noted that young people use cell phones, especially their text-messaging feature, as forms of gifts that are "exchanged in performances that have specific meanings in young people's daily lives and are played out with the intent to cement social relationships" (p. 5).

In regard to the use of cell phones for business and job-related issues, Laurier (2002) describes "nomadic workers" who use mobile phones in their car, throughout the day, for conducting business from the road—storing messages, briefing themselves with Post-it Notes stuck to the middle of the steering wheel, and preparing themselves for business meetings. Sherry and Salvador (2002) describe the frustrations business travelers, in their attempt to telecommute, face with a "sense of isolation" and a "lack of (technical) support for difficult-to-manage technology" (p. 111). Kopomaa (2000) and Gant and Kiesler (2001) noted cell phones are blurring the boundary between work and private life.

As cell phones are often used in public spaces, social artifacts of their use have also been examined. Cooper (2002) states, "The use of the mobile in certain public spaces makes the relation of private and public slightly different" (p. 22). With cell phones certain kinds of public space have been intruded. As a result, the distinction between private and public has been blurred. People in public space are now unexpectedly exposed to one side of a two-party private interaction, which can be frustrating with

speculations about the missing side of the interaction (Cooper, 2002; Plant, 2001). Fortunati (2002) also notes that the mobile phone "favors the progressive encroachment of intimacy in the public sphere and of extraneousness in the private sphere" (p. 49). Cooper (2002) further states that the blurring distinction does not occur only between private and public spaces, but also between remote and distant, and between work and leisure. He suggests we think of cell phones as an indiscrete technology, a technology which has "the capacity to blur distinctions between ostensibly discrete domains and categories" (p. 24).

Wei and Leung (1999) examined the issues of social use of cell phones in public spaces. They conducted a telephone survey using a probability sample drawn in Hong Kong. They found significant differences between users and non-users of cell phones; cell phone users were younger, wealthier, and better educated than non-users. As for the popular usage of cell phones, they found that social uses, such as calling family members, friends, and co-workers, were much more common than non-social uses such as business calls. Another interesting finding of their study is that users and non-users differ in their opinions toward cell phone usage in public spaces. Users tend to dislike the use of cell phones at restaurants, in classes, and at the airport; on the other hand, non-users dislike the use of cell phones at theaters, meetings, shopping malls, and in public transportation.

Cell phones also make it possible for anybody to be reached at any time, in any place. This feature seems to pose ambivalent feelings. On the one hand, the devices facilitate communication among close circles of friends, family, and businesses. On the other hand, they can be considered as technologies of "surveillance," allowing people to be monitored (Green, 2002). Green suggests "the practices of mutual monitoring via information and communication technologies are shifting in ways unaccounted for in many contemporary theories of 'surveillance'" (p. 42).

In summary, the researchers in the past have studied the effects of cell phone use and found that: (1) there are intended and unintended uses of the technology; (2) cell phones are forming particular subcultures among youths in many different countries; (3) the use of cell phone is blurring the boundary between work and private life as well as the boundary between public and private space; and (4) the cell phone can make the user susceptible to social control by friends, family and businesses. Most of the past studies were conducted in Scandinavian countries, European countries, and Asian countries. In order to add the US perspective to the worldwide body of the literature, this study will examine why college students in the US use the cell phone, what they think of the technology, and how they use it.

3. Methods

A combination of qualitative and quantitative techniques was used to collect data. In October 2001 four focus group interview sessions were conducted with 32 college students who regularly use cell phones. These sessions took place in a professional focus group facility with researchers observing the sessions through a one-way mirror. All interviews were videotaped in their entirety and later transcribed for data

analysis. The sessions were designed to capture a variety of subjective and spontaneous statements about participants' cell phone usage.

Based on the focus group interviews, motivational and attitudinal statements were developed and a questionnaire was constructed. The questionnaire contained a total of 40 seven-point Likert-type scale items ranging from "strongly disagree" to "strongly agree." The questionnaire also contained behavioral questions, examining topics such as the frequency of calls sent and received, and the length of cell phone usage.

The questionnaire was administered to undergraduate students in an introductory communication course in a large Northeast university in December 2001 and January 2002. A total of 137 students completed the questionnaire. The participants in the sample were made up primarily of second or third year college students from middle to upper class families. Almost half had a cell phone for about two years; the others had acquired the cell phone more recently.

4. Results

The focus group interviews were transcribed and analyzed. As for quantitative data analyses, a two-phase approach was taken in this study. In the fist phase, the data were analyzed utilizing an exploratory factor analysis. In the second phase, the data were analyzed using a *Q* factor analysis.

4.1. Results of focus group interviews

The purpose of conducting the focus groups was to engage the respondents in a loosely structured interchange of discussion in order to gain a preliminary understanding of their beliefs and motivations: in essence, we wanted these individuals to "tell their cell phone stories."

Nine motivational themes emerged from the focus group. They provided rich insights into the feelings, personal experiences, emotions, intuitions, and subjective judgments (Firestone, 1987) held by these respondents. These themes were: personal safety; financial incentive; information access; social interaction; parental contacts; time management/coordination; dependency; image; and privacy management.

4.1.1. Personal safety
As discussed by Katz (1997), personal safety was the initial motivation for many to obtain a cell phone. About one-third of the participants indicated they got their cell phones when they started driving. The participants described reasons to have obtained cell phones as a communication device in the case of emergency in their cars.

Jessica: I drive a 1986 Volvo, and we really aren't sure about it . . . I live in a city and my parents are kind of worried, (about) me driving home at night.

Interviewer: Ok, so what type of situation do you envision you would use your phone?

Jessica: Like if I broke down and I needed someone to pick me up. A lot of places where I drive . . . you don't want to be walking up the street.

Respondents indicated cell phones also give them psychological security when they are out on the street at night.

Siobhan: My friend actually lives away from the middle of the campus and one night it was really late and she was . . . walking home. Basically we just talked to her the whole time.

Jana: I've done the same thing, like if I'm in a scary place I'll talk to people (on the phone) . . . I feel better knowing that someone is there listening to what's going on.

The appearance the use of a cell phone gives to bystanders seems to be a two-edged sword. On one hand, the use of a cell phone on the street gives the appearance of being busy, which one participant, Jessica, believed made her less susceptible to an attack. "If you are on a cell phone, you are less of a target," she said. With a cell phone, she continued, you "look busy and look like you're headed somewhere and that you're not lost even if you are." On the other hand another participant, Anna, said "I have mixed emotions about (using a cell phone) when I'm walking home by myself at night . . . I feel vulnerable because . . . people are going to think I have money or something like that because I have this cell phone—which isn't necessarily true. They might try to hurt me or take it away from me . . .".

4.1.2. Financial incentive

Another reason why participants obtained their cell phones is the perception that using cell phones for long-distance communications is more economical than landline phones. This may be particular to this group of college students, as long-distance telephone charges tend to be higher in dormitories on campus. The majority of the participants have landline phones at home, but they use cell phones for long-distance calls since cell phones are considered to be cheaper than landlines. We see this in the following comments:

Pia: I actually only live about 20 miles away from the campus, and for me to call any family or friends is long distance from the campus line but it's free on my cell phone.

Gina: I got my cell phone because I think it is really convenient. I use it all the time. Also, I'm from California; I have friends and family across the country. It was cheaper for me to have a cell phone with a long distance plan rather than . . . pay . . . to get long distance. So I use it for everything. I'm very pro cell phone.

4.1.3. Information access

Cell phones are not only communication devices, but are also used to keep important information such as phone numbers. Mark, for example, indicated his dependence

on his cell phone as a vehicle to store phone numbers. He said, ''When I lost my phone I had like 100 numbers in there and I didn't know what to do. It took me like a while to put them all back in. Then I had to get a palm pilot just to store the numbers in, so now I have like a backup system.'' The use of cell phones to access information not stored in the phones themselves was not discussed at all among these participants. Unlike in some European countries and Japan, the use of cell phone to access the Internet for information does not seem to have caught up among college students in the US.

4.1.4. Social interaction

Though many participants acknowledged that they did not get their cell phones initially for the purpose of social interaction, as their devices become part of their lives, the cell phones started to be used for staying in touch with their friends. This is reflected in the following comments:

Lynn: . . . the original reason I got a phone was for (use) in the car . . . If I got into an accident or something it was there. And now it is more like, I'm bored, and I'm walking home (and) I want to call someone. Or, I all (of a) sudden realized that I need my mom to send me something . . . (so I) call her wherever I am.

Michelle: I really like the fact that with a cell phone you can put it on silent mode or something and still get all your phone calls . . . but not necessarily respond to them right away.

Though a cell phone is a great tool to stay in touch with friends, several participants also noted the negative aspect of staying in touch all the time. As one said, ''you feel like it (the cell phone) is a leash.''

Mark: Yeah, someone is like you're gonna have your phone on you right, so you should call me. Even if I am going away or something, and I really just don't want to be bothered.

Anna: Yeah, it's a pain in the butt. Because before (you had the cell phone) you could have excuses to get away from people. You could say, ''Oh, I wasn't home'' or whatever. And now, they know that you're ignoring them because you have that voice-mail. And if they get forwarded straight to voice-mail, they know that you are denying their call and they're not happy. There's no way you can get away from it (cell phone) and just have quiet time.

4.1.5. Parental contacts

Being college students, most participants mentioned keeping in touch with their parents was a motive for their parents to give them a cell phone.

Michelle: This is kind of a funny story: When I was in high school, one time my mother . . . was out past midnight, and she didn't have her cell phone on her. So the next day she realized this wasn't good . . . (since) we couldn't get in touch

with each other because I (had been) out all day . . . So she got me a cell phone so the two of us could then locate each other all the time.

Angeli: I just got mine because when I came to college, the second semester freshman year my dad was like "Get a cell phone, get a cell phone," because then he could get in touch with me any time. But I didn't really want to. I still don't carry it around with me everywhere. I just leave it at home.

4.1.6. Time management/coordination

As mentioned in Ling and Yttri (1999), micro-coordination is a common theme of cell phone usage among these young participants as described by Lauren and Michelle.

Interviewer: What types of situations do you find yourself in when you might use your cell phone for local call(s)?

Lauren: Like when I am supposed to meet somebody, I can call them and say "Where are you, why aren't you here?" I use it in dumb places too . . . like if I am in a store and I am lost, I call my friends and ask "Where are you guys?"

Michelle: I've done that too. I was in Target once and we couldn't find each other so we called each other on the cell phone. I was at one end of the store and he was at the other.

This concept of micro-coordination can extend to include getting someone in a store to receive service from store personnel.

Lauren: . . . I use it for the dumbest reasons . . . Like I'm in the supermarket and I need to find someone (a store employee), and they are in the produce section. I don't know why, because like two months ago, I wouldn't have done that. So like it's just the fact that you have it there that you can use it.

Participants agreed it all comes to the efficient use of time. The cell phone allows individuals to utilize time otherwise wasted.

Gina: For me, it also saves a lot of time for me because I'm . . .(often) running around doing different things. I can . . . return calls while I'm walking . . . There are like a million different things I do with my cell phone so it saves me a lot of time. I don't have to wait till I get home to make those phone calls; I can just do it from the (student union) or whatever.

Christina: If I'm in a traffic jam and I'm bored, I call someone. If I'm walking, the only way I have time to keep up with my friends at home is if I have a long walk. Last year, I used to live (in one dorm) and to make it all the way to (the other dorm) . . . I would walk and I would call someone and that's may be 20 minutes.

4.1.7. Dependency

As participants start using a cell phone regularly, it becomes part of their lives and they feel lost without it.

Nicole: I definitely am attached. I bring my cell phone everywhere; I've had it for a while. It's engrained in my family tree . . .. I have lost a couple of cell phones, which is no fun . . . (since) life just comes to a halt . . .. I have everyone's number in my cell phone so if you lose it, you're gone because I didn't write them down on paper. And it's just like security. Like you know, checking messages, and when I'm on my way home from work at like 11:30 at night, I always call someone, I just feel better talking to someone.

Veronica: I feel out of touch with the world because all of my friends, all of my businesses, my job, my everything is in that cell phone . . . That's my contact with the world and I hardly ever have time between work and school to see anyone so it's the only way I keep in touch with everyone.

Audrey: I remember the first time I got disconnected last year . . . I felt like I lost my right arm. So I decided not to pay (for the cell phone service). I didn't like being a slave by a little machine. It just drove me crazy. So I decided, I'm not going to take it . . . I'm just going to see how it works. And actually I just grew out of it. And, as people around me got used to the idea, you know, Audrey hasn't got a cell phone anymore, I think it added to it. But obviously, you have needs and so I needed a cell phone and so I got it back. And it was like having a first love for it again. But I really need like a month, like three weeks adaptation. Like, my God, I have no cell phone.

4.1.8. Image

Peer pressure to maintain a good image was a theme that several of the participants brought up in acquiring their cell phones.

Interviewer: Why did you really want a cell phone?

Kate: Because . . . I was the only person out of like nine friends who didn't have a . . . cell phone and I felt like the biggest geek in the whole world. So I went home and said, "Mom, for graduation I want a cell phone," and she said "fine." And it just kind of happened.

Interestingly the same person mentioned the negative image of carrying a cell phone after she moved on to college life and started to hang out with a different group of friends.

Kate: {T}he thing about cell phones is that you feel like you are living in such an image. You are walking down the street and talking . . . A lot of my friends are like laid back surfers, so they are like cell phones are for yuppies. So I always feel like the biggest geek because I have a cell phone.

Cell phone usage in a public place also has a negative image.

Siobhan: All my friends say ''You are so loud when you talk on your cell phone!'' It's like ridiculous. It's obnoxious. Like if I'm in a line waiting to order something, I'll always tell the person to hang on . . . because I know I hate it when I'm working and someone comes in and asks me for something, and is like blah blah blah. Just like put the phone down for like two seconds! . . . I try to make sure that I do that too.

Michelle: (Sometimes) you feel like you are invading on someone's personal conversation. There was a girl brushing her teeth in the bathroom and talking on her cell phone!

4.1.9. Privacy management

Several participants described the use of cell phones to maintain or manage privacy. They cleverly use the landline numbers for certain business transactions and keep the cell phone numbers to those who are their in-group members.

Mark: . . . I like to have a landline because I want a number where I can give it out to people. Where if you need to fill out a form for something and a store needs your number, I don't want to give out my cell phone number.

Michelle: You give some people your landline because you know that in a year that number is going to be gone and they won't ever be able to call you again.

Siobhan: I actually share a landline with my roommate and we both have cell phones . . . The people programmed into my phone have me programmed into their phone. I had to give . . .(a phone number) out to my work so they could get in touch with me and as soon as I got it (the landline) hooked up, I took the cell phone number off their list because I . . . don't like people who I don't know calling me on my cell phone. If a number shows up (and) that I don't know what it is, I'm kind of like what's going on?

4.2. Results of the exploratory factor analysis

Built from the focus group results, a questionnaire containing 40 statements was developed. Responses to the 40 seven-point Likert-type scale items were subject to a principal component factor analysis with Varimax rotation. The analysis produced a solution with eight factors, among which two were dropped due to low reliability. The six factors accounted for 56.3% of the total explained variance.

As shown in Table 1, six attitudinal factors emerged as the result of factor analysis. Factor 1: ''Necessity in modern times'' accounts for 19.9% of the total explained variance and, as the label implies, consists of variables relating to efficient time management and positive image. Factor 2: ''Cost efficiency,'' accounts for 12.2% of total explained variance and is linked to characteristics pertaining to financial ben-

Table 1
Results of exploratory factor analysis

Factor and item description (α)	Factor loadings
Factor 1: necessity in modern times (0.79)	
A cell phone allows me to use my time efficiently	0.77
I use my cell phone to make use of time that otherwise would be wasted	0.67
We need a cell phone to be successful in the world today	0.64
A cell phone allows me to do two things at once	0.59
Those people who don't have a cell phone are out of touch with modern times	0.55
The brand of a cell phone is important to me	0.46
I often use my cell phone to schedule or reschedule an appointment at the last minute	0.39
Factor 2: cost efficiency (0.88)	
It is financially beneficial to use a cell phone as opposed to a landline	0.89
A cell phone is more affordable than a landline phone service	0.87
If I had to choose, I would use a cell phone instead of a landline because a cell phone is cheaper	0.86
A cell phone is a cheaper alternative for long distance calls than a landline	0.76
I don't use landlines because having a cell phone is cheaper	0.73
Factor 3: safety/security (0.77)	
Having a cell phone makes me feel safe while I am walking alone at night	0.70
My parent wanted me to have a cell phone so I can get in touch with her/him if necessary	0.67
I use my cell phone to keep my parent from worrying about me	0.67
Having a cell phone makes me feel safe while I am driving	0.65
I got my cell phone to use in case of emergency	0.57
My parent worries about me less because I have a cell phone	0.57
With a cell phone I can keep in touch with my family members	0.52
Factor 4: dependency (0.74)	
When I don't have my cell phone with me, I feel disconnected	0.71
I feel lost when I leave my cell phone at home	0.69
I always leave my cell phone on	0.66
I feel upset when I miss a call to my cell phone	0.48
Factor 5: negatives (0.51)	
A cell phone distracts me from being aware of my surroundings	0.71
I feel embarrassed by my cell phone ringing at inappropriate times	0.55
I am often distracted by my cell phone when driving	0.46
I am tired of being accessible all the time	0.46
A cell phone is addictive	0.42
Factor 6: functionality (0.78)	
I don't care to learn how to use non-calling functions on my cell phone	0.78
I seldom use non-calling functions of my cell phone	0.76

efits. Factor 3: "Safety/Security" accounts for 7.7% of total explained variance and includes variables which relate to the feelings of being safe and secure. Factor 4: "Dependency" accounts for 6.6% of total explained variance and includes variables that are closely tied to the feelings of disconnection and being lost without a cell phone. Factor 5: "Negatives" accounts for 5.1% of total explained variance and

consists of variables relating to the negative characteristics of cell phone use such as distraction and embarrassment. Factor 6: "Functionality" accounts for 4.8% of total explained variance and is linked to the use of non-calling functions of cell phones.

Scale reliabilities in terms of the internal consistency measures were examined. Cronbach's coefficient alpha for the overall scale was 0.81 whereas subscale reliability measures for Factors 1, 2, 3, 4, 5, and 6 were 0.79, 0.88, 0.77, 0.74, 0.51, and 0.78 respectively. This shows that the scale is reliable as compared with the recommended threshold of 0.70. After reliabilities were examined, composite scores were made for each factor by adding the scores for all the statements that belong to the same factor.

4.3. Behavioral characteristics

On average, subjects have been using their cell phone for two years and two months (SD = 18.3 months). As the majority of them are the second or third year college students, it seems that most of them got the cell phone when they entered the college. The majority (62.8%) of them make five or fewer calls per day and 72.4% receive five or fewer calls per day. In terms of the places they make calls most often, 36.6% said "on the street," 34.1% "at home," 16.7% "at school," 9.2% "in cars," 2.3% "at shopping malls/stores," and 0.8% "in public transportation." It is interesting to note that about one third of them use their cell phones at home in place of landline phones.

As for the people to whom subjects most often talk using cell phones, 41.0% said "friends and relatives," 32.4% "boyfriends or girlfriends," 32.1% "immediate family members," and 6.8% "co-workers or classmates." About half (51.1%) of the subjects reported they stayed connected on average 5–15 min per call.

In terms of the time of day they use their cell phones most often, the majority (68.9%) of them use their phones most often after 6 p.m.; 34.8% saying "late evening, between 9 p.m. and midnight" and 34.1% saying "early evening, between 6 p.m. and 9 p.m." This is understandable considering the fact that those college students have to take classes during the day. As for the bill payment, 62.2% said their parents were paying the bills and 34.1% said they were paying the bills themselves.

4.4. Results of the Q factor analysis

Q methodology, invented in 1935 by British physicist–psychologist Stephenson (1953) allows investigators to quantify subjectivity. *Q* factor analysis was performed by conducting a principal component factor analysis with the inversed table having subjects in columns and statements in rows.

Five factors (or groups) evolved from the analysis to represent the views of the five cell phone user groups. All five factors (or groups) were highly correlated and accounted for 66% of the variance in the outcome. The attitudinal characteristics based on the six attitudinal factors are presented in Table 2 and are summarized in the following.

Group 1 (N = 35): This group is the largest and termed as "cost conscious." They believe by having a cell phone, they save money. Some even opt not to have a

landline because a cell phone is cheaper for them. They spend the longest time on the phone per call, but do not make the most calls. They just believe a cell phone is a cheaper way to make calls. They make the calls primarily from home and the street, between 9 p.m. and midnight, to talk to family and friends. One focus group respondent said, "I'm trying to avoid long distance (charges) . . . so if I remember, I use my cell phone."

Group 2 (N = 23): This group is labeled as "security/safety conscious." They are very aware of their own safety, and having a cell phone makes them feel safer. They most likely got the phone for safety reasons while driving, but also use it to talk with friends, often while walking down the street. They also view the cell phone as giving them a sense of security, and feel lost without it. They do not feel lost in the sense of being dependent on the cell phone to keep in touch with people, but rather in the sense that if they do not have it with them, they are less safe and secure in their surroundings. One focus group respondent said she used the cell phone "for emergencies and stuff," another because her parents "were afraid I was going to kill myself with the car," and a third indicated she felt safer walking at night if she had her cell phone with her. They are most likely to talk to family and friends from the street. They make the fewest calls and talk for the least amount of time.

Group 3 (N = 25): This group is termed "dependent." They are reliant on their phone. They use it frequently, and feel lost without it because it connects them to the outside world. They use the phone primarily on the street and from home. They use the phone second most frequently and for the second longest amount of time per call among the five groups. This group feels disconnected if they do not have their cell phone with them and tend to leave it on all the time. One focus group respondent told the story of how he "freaked out" when, in the previous summer, he lost his cell phone (and, in turn, lost contact with his world). Another focus group respondent summarized his dependency when he told the story of how he was getting a new phone and switching companies and wanted to be "sure there was no down time." He said, "I kept both phones working for like two weeks because I wanted to make sure there wasn't a day when I didn't have a phone."

Group 4 (N = 25): This group is labeled "sophisticated." They have had their cell phone the longest, and feel as though a cell phone is absolutely necessary to function in the world today. They are more conscious of the style of their cell phone, and feel disconnected when they do not have it. One focus group participant summarized how, when she was a pre-teen, she used a beeper to keep in touch with her family and, when she started driving, she "upgraded" to a cell phone. She said that "by the time everyone went to college it was like everyone who didn't have cell phones yet were getting them too. Everyone I know got one in like a two-year period." They are most likely to talk with friends, and they do not tend to call from any one location. They tend to make the most calls of all the groups.

Group 5 (N = 26): We labeled this group the "practical users." These users simply use the phone because it makes sense. They see some of the cost saving and safety benefits of it and find it helpful for maximizing their time. They do not care about the style of their cell phone and do not believe it is necessary in the world today. They often call from the street or from home, but they also call from the car or public

transportation. They fall in the middle as far as how frequently they use the phone, and the length of each call is lower compared with the other groups. They tend to call both family and friends from their phone, but again, they use their cell phone very practically to meet their needs as they arise. Typical of this group were those focus group respondents who commented on how, fundamentally, life was made easier with a cell phone. They indicated it could be used as a walky-talky to maintain contact with friends.

4.5. Results of correlation analysis

Correlation analyses were conducted to examine the relationship between attitudinal factors and behavioral variables. It was found that the longer the ownership of a cell phone, the more calls the person receives ($r = 0.20$, $p < 0.05$); the stronger the person feels that a cell phone is a necessity in today's world ($r = 0.27$, $p < 0.01$); and the more dependent the person becomes upon the phone ($r = 0.21$, $p < 0.05$). In terms of the relationship between the overall usage of a cell phone and a person's attitude toward it, the heavier usage is highly correlated with the feeling that a cell phone is a necessity in today's world ($r = 0.29$, $p < 0.01$) and dependency on a cell phone ($r = 0.25$, $p < 0.01$).

Interestingly, the length of ownership of a cell phone is not significantly associated with the usage. In terms of usage levels, the "security/safety conscious" group uses their cell phones the least; the "practical users" group uses the second least; the "sophisticated" group uses the most; and the "dependent" group uses the second most. The "cost conscious group" falls in the middle.

5. Conclusion

Even within such an ostensibly homogeneous group of cell phone users—i.e., college students who are studying communication—there are five distinct groups in terms of their attitudes toward their cell phone usage and in terms of the levels of integrating cell phones into their lives. For the "safety/security conscious" users, cell phones are least integrated into their lives and are something they carry in case of emergencies and for safety reasons. For the "sophisticated" users, cell phones have become part of their lives and they actively use the phones to keep in touch with people and manage their time efficiently. Though this study is limited in sampling and cannot be generalized to any larger population, it is interesting to discover that such distinct attitudinal differences exist among the cell phone users.

Mobile communication technologies are advancing rapidly. For example, cell phones with Internet access and multimedia capabilities are becoming common in parts of the world such as Europe and Asia. With advances in technology come changes in users' attitudes toward those technologies. These generate new social and cultural phenomena. These social and cultural phenomena may change the way technology evolves. This represents social construction of technology. This social construction of technology is seen in the symbiotic relationship between the users of

the technology and the technology itself. Users (such as young people) respond to the technological advancement (such as cell phones); in return, the technology evolves based on users' demands. To fully understand the social and cultural changes brought about by the technology, it is important to continue investigating individuals' current attitudes and uses toward the technology.

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