

Conditioned To Be On Call

The relationship between teens and text-messaging

Conditioned To Be On Call

Introduction

Digital technologies allow us to be “on-call” at all times of the day. From instant messaging to mobile phones and texting we are conditioning ourselves to be available for work and play anytime, anywhere. Take a walk through a restaurant and you’re guaranteed to see someone texting or talking in the middle of dinner. Visit a high school or university classroom and you’ll see one or more students sneaking in an instant message or text to a friend. Driving on the highway, you’ll likely see someone sneaking in a call or text even though Ontario laws prohibit the action. Communication technologies are colliding with instant gratification and impulse control.

No other demographic is more affected than youth. The [Kaiser Family Foundation](#) released its Generation M2 report in January 2010 showing that 66% of Americans between the ages of 8 and 18 have their own mobile phone; up from 39% in 2004 and 85% of teens from 15-18 have their own mobile phones. This demographic has become an area of interest not only because of its quick adoption of mobile technologies, but also because of the fascinating way ties have formed between teens and the technology. [Research in Motion](#)’s mobile technology, the Blackberry was created with texting capabilities allowing managers to keep track of whether or not employees have read their messages, what time the messages are read, and what time a response is made. Teens have taken the

Blackberry and re-purposed it for their social lives. They judge where they rank on their friends' "favorites" lists based on when messages are responded to, and how often they are responded to. An anytime, anyplace conditioning is taking place. This conditioning extends to their use of media for entertainment and work and is changing their leisure time, relationships, and work habits. Helping teen users find a balance in self control over using the technology may be an area of opportunity.

Previous studies have focused on the relationship adults have between work and interruptions. Researchers have found that interruptions cause a decrease in efficiency, while others have found "task-switching" to be effective up to a certain point (Harris, 21). Other research also studies the emotional effects of interruptions, noting them to cause anxiety in workers. While there are many studies on the causes of task switching and systems to improve efficiency in an increasingly interrupted world, there are few studies conducted on the effects interruptions have on teens specifically. Our study examines teens' perspectives on their sense of control over use of mobile technologies, the impact the technologies have on their work habits and relationships with others, as well as the development of identity through use of the technology. Through analysis of 33 Q-sorts, 3 factors of teens emerged based on their perceptive use of mobile technologies: Factor A - Social Users; Factor B - Utilitarian Users; and Factor C - Nonchalant Users.

Literature Review

Teens are spending a lot of their leisure time with media and text-messaging. The Kaiser Family Foundation released its Generation M2 report in January 2010, giving insight into 8-18 year olds and their media-use over a ten year period. The report found that American teens spend 7 hours and 58 minutes a day with media; 29% of that time is spent multi-tasking. As reported in the introduction, the report did reveal that 66% of Americans between the ages of 8 and 18 have their own mobile phone and 85% of teens from 15-18 have their own mobile phones. Where the report fell short, by no fault of its authors, was in observing the time spent on texting. This particular was only added in 2009, due to its recent increase in relevance. The Kaiser Family Foundation report explains that teens' texting has largely evolved just within the last five years, but it is growing in practice (18). In 2009, 7th to 12th graders were reported to text for one hour and 51 minutes a day. Interestingly, most of the people studied said they did not have established rules about how much time they spend on the phone (Victoria et al, 18).

The realization that teens spend so much time on the phone creates a large concern for youth development in a digital age. A review of educational sources gives some insight into how kids connect with digital devices. Marilee Sprenger author of the article Focusing the Digital Brain writes about students as participants in the interactive digital world. Sprenger writes, "They do homework while listening to iPods, sending instant messages, or watching movies on their computers," (34). The article explains the whole idea of being

hyper-connected is not for productivity, but for the purpose of feeling connected to others that leads to a state of partial attention. “Digital natives are motivated by a desire to be busy and in demand. They don’t want to miss anything, but the main goal behind their multitasking is not so much to be productive as to be connected to someone. Being physically present has become less important; responding instantly is highly prized” (36). The literature not only gives valuable insight into how teens connect with their mobile phones, but also explains the product attachment they have developed with these devices. Where the article falls short is in confusing multi-tasking with task-switching. Further research provides a clear differentiation.

In Mastering Multitasking, an article co-written by Urs Gasser and John Palfrey explain that multi-tasking is parallel processing or paying attention to a number of activities at once, like reading while listening to music. Alternately, task-switching is rapidly changing from one task to another. Teens tend to engage their mobile phones in task switching behaviours by taking their focus off another activity for a moment to engage with the act of texting. Gasser and Palfrey concluded that while multi-tasking can increase efficiency in many cases, task-switching can decrease efficiency (17). Other researchers have added value to this area of study through their research in differentiating task-switching and multi-tasking, (Oulasvirta and Saariluoma 942, Tugend, 2008). One of the skills students learn by default in high school is how to divide time among multiple tasks. In an ideal world, these tasks would be limited to homework in several subjects. The life of the student however, is complicated by the interruption of their tasks by other tasks requiring immediate attention

and a resulting task-switch. These interruptions often come in the form of mediated communication on devices such as iPods, mobile phones and computers. In a hypermediated world, these interruptions are affecting the way students learn, process information and accomplish their education goals.

The impact of interruptions on adult workers has been well-documented through studies and papers examining everything from improvements in user interface to the emotion of the user after an interruption has transpired. Much of the literature on interruptions is clear – interruptions are an annoyance, cause anxiety in the user and diminish the effectiveness and performance of the user conducting a primary task. In Disruption and Recovery of Computing Tasks: Field Study, Analysis, and Directions by Shamsi T. Iqbal and Eric Horvitz, studies focused on external interruptions and the time it takes to get back on task while working on computers. The findings are closely related to the issues around texting and teens, especially, as teens tend to work on computers to do school work while answering and responding to text messages. Recovery time from interruptions is inhibiting concentration and productivity. (9) The information from the study was accumulated from interviews with participants as well as through observation of participants in action. The writers explained their interest in future research is “the pursuit of an understanding of the influence of face-to-face and phone-based interruptions on task disruption and recovery and to investigate differences in the disruption, recovery, and resumption of tasks for these interruptions versus computer- based alerts” (9). In researching the impact of task interruption, it became clear that very little research has been conducted on the impact of

task interruption on students who are now interacting with computing devices in greater numbers, especially by way of mobile phones.

A review of previously conducted studies on task switching, multi-tasking and fragmented attention gives insight into qualitative and quantitative research that can be used to relate brain function and productivity issues to new media communication devices. In No Task Left Behind: Examining the Nature of Fragmented Work, by Gloria Mark, Victor M.

Gonzalez and Justin Harris, work fragmentation factors relating to the effect of collocation, type of interruption, and resumption of work were examined. The researchers found that people whose work was collocated (arranging work side by side) worked longer before switching to other tasks but were interrupted more by disruptions occurring “internally” and “externally”. Internal interruptions are more personally related and come from the user self-prompting to task-switch, while external interruptions come from the environment the user is in. “Task switching may be beneficial. It could serve to refresh one and provide new ideas” (321). In Surviving Task Interruptions: Investigating the Implications of Long-Term Working Memory Theory, Oulasvirta and Saariluoma also point out that not all interruptions are negative. Their research points to evidence that supports the idea that skillful attention to a primary task generated through practice and memorization, is negligibly affected by interruptions. In other words, the better a user is at their primary task, the less of an interruption affects their performance. Whether students are skilled enough to avoid the effects of interruptions from mediated communication is another consideration for our

study. If so, youth may be better equipped to deal with the low post-interruption start-up times found in study participants (Oulasvirta and Saariluoma, 321).

In their study they also found that task interruption causes the disruption in the process of encoding and transfer of information between short term working memory (STWM) and long term working memory (LTWM), (54). STWM was most vulnerable when interruptions and tasks were similar and when the number of interruptions exceeded the capacity of STWM (53-4). This can become a problem in a student's life, especially when the interruption is a text message from a friend with conflicting information about homework, or a barrage of text messages from many people asking about relevant and irrelevant material from the perspective of the student's primary task. This study adds to a body of research conducted by Oulasvirta and others. The gap between the catalyst interruption and getting back on task may create an opportunity for designing products and services to help minimize that gap; something that may be able to fight the ill-effects of conditioning to be "on-call".

Beyond the research observing the task-implications of interruptions, other studies have focused on the emotional impact that interruptions have on the interrupted. Adamczyk and Bailey measured task performance as well as the "emotional state and social attribution," in their study If Not Now, When? The Effects of Interruption at Different Moments Within Task Execution (271). In their study they gave two sets of participants interruptions during a set of tasks, but issued the interruptions to one set in the middle of tasks and for the other set in between tasks. They observed that users interrupted in the middle of a task

demonstrated more, “annoyance, frustration, and time pressure,” (271). Additionally, Bailey, Konstand, and Carlis found that the degree to which a user would feel these pressures is directly related to, “the user’s mental load at the point of interruption,” (593). They explain this partially with the conclusion that, “a user perceives an interrupted task to be more difficult to complete than a non-interrupted task,” (594). An interview with Dr. David Meyer of Michigan State University revealed that teens do not necessarily feel stress the same way as adults do when being interrupted since youth have been conditioned to accept interruptions as natural since they are inherent in their use of digital technologies. (Meyer, 2010) While perceptions of stress are important, the issue of examining self-control became much more prevalent in our study.

While the frequency of sending and receiving text messages between 7th to 12th graders has been on the rise, it has not resulted, necessarily, in increased productivity. Rather, youth are simply saturating themselves with media simply to feel connected (Sprenger, 34). Urs Gasser and John Palfrey found that this type of “task-switching” can be counter-productive because it is a complete change in focus. Alternatively, they found that multi-tasking can be very productive, (17). Thus, it seems as though teens indulge in the feeling of a need to be connected at the risk of productivity. This is less a condition of technology than a condition of society or some other influence. Indeed, many studies concluded that multi-tasking, if done properly and with self-control, can increase efficiency, (Oulaswirta and Saariluoma, 321). In fact, some even found that non-related interruptions can also be useful, (Mark, Gonzalez and Harris, 118). However, others have found that if an interruption

comes at the wrong moment it can create anxiety and an emotional disturbance (Adamczyk and Bailey, 272). So, as teens face a constant ability to use multi-task and reality of interruptions, there is a cross-roads between a reality of efficiency and relative happiness, and one of increasing inefficiency and emotional unrest.

Towards a product aesthetic

Adamczyk and Bailey determined that to ensure the best emotional and efficient performances, interruptions should occur between two pieces of work that are easy to recall (272). As a result, they recommend the implementation of a task manager, “attempts to identify opportune moments in a user’s task sequence,” (277). Bailey, Konstand, and Carlis also argue for the building of such a system (601). Paul P. Maglio and Christopher S. Campbell actually build and measure several of these systems in their report Tradeoffs in Displaying Peripheral Information. Their study, and the design of their systems, was founded on two premises: that users like to be informed immediately about certain things and; that such a system would offer, “a user the opportunity...to do a better job,” (241). After taking three systems (one that constantly scrolls, one that scrolls and stops, and one that is just stopped), they figured out a few key factors to consider when designing a system that informs users peripherally. While some guidelines could only be useful for onscreen systems (i.e “motion or animation should be kept to a minimum), other findings from Maglio and Campbell are useful even in mobile technology - “visual feedback is better than auditory,” (248). Regardless, there is a demand and need for a system that manages the inevitable interruptions people face. Already people like Paul P. Maglio and Christopher

S. Campbell have studied the design of systems to help in these situations. By discussing teens' past experiences with text-messaging and their opinion on its daily use, responses can be used to more effectively design multi-tasking and task-switching goods.

Methodology

To examine the perspectives teens have on their interactions with mobile technologies for texting and instant messaging Q-methodology was used. This process of categorizing and sorting respondents opinions revealed characteristics of the distinct factors that represent teens' opinions and determine how they co-relate across variables. Mobile phone users between the ages of 14 and 18 were approached to conduct the Q-sort which involved sorting 36 statements onto a forced grid of strongly agree, strongly disagree, and neutral positions. We expected the results would factor our subjects into groups based on 1) texting is to stay socially connected, 2) texting is utilitarian, 3) texting is novel, with some reading into their sense of control over the use of the technology.

Creating the Q-sample

The 36 statements were created based on existing research on teens and behavioral studies conducted with adults, pre-interviews with teens, a survey done with a focus group, and observation of individuals and on-line communities. Although many of the statements do carry some cross-over they were separated into different areas of value to ensure we could capture various respondents' opinions.

The statements focusing on value being derives from the feeling of constant social connection include:

2. I feel that mobile technologies keep me connected to others.
7. I like being able to respond right away to incoming texts and emails, even if I'm in class.
8. I think that email and texting help me develop my relationships with friends.
16. I sometimes think friends are mad at me if I don't receive a text back right away.
18. I think that my mobile phone brand reflects my popularity.
23. I don't mind losing sleep to answer an incoming text or email overnight from a friend who wants to check in with me.
22. Texting helps me get to know people better than I did before.
24. I tend to remember texts messages more than actual conversations.
25. I believe texting makes me more spontaneous in my event planning with others.
31. It's okay to answer the phone at the supper table.
26. I feel parents and teachers don't understand why teens need to have their mobile phones on 24/7.
21. I think that having the most up to date mobile phone can help me look better in front of others.
29. I wouldn't have the same friends if I didn't have a mobile phone.
33. I can usually remember a text conversation and can paraphrase it to someone without looking at my phone.
35. I would feel out of touch without texting and email capabilities on my phone.

The statements focusing on value being derived from a utilitarian perspective include:

1. I think that mobile technologies (texting, email, IM) help me stay on time.
12. I feel panicked when I am out somewhere and I realize I forgot to bring my phone.
15. I worry about my friends and family if they don't respond to my emails right away.
19. I carry a mobile phone so that I can text others to let them know that I am safe.
20. I think mobile phone texting is a great way for my parents to keep track of me.
28. My texts can wait until I'm finished what I'm doing.
30. I have a sense of what my friends' schedules are like before texting them; I have a sense of whether they are available to text back.
36. I have "me time" where I don't answer emails or my phone.
32. My friends understand if I don't text them back right away.

The statements reflecting an awareness on the effects of interruptions include:

3. I'll rewind or watch a show/film again or reread pages/paragraphs if I'm doing a lot of texting in amidst these activities.
5. I find it hard to concentrate on the task at hand when I have my mobile technologies close at hand.
6. I hate the interruption of texts and emails when talking in-person with someone else.
9. I feel annoyed getting a text in the middle of something I consider important.
10. Texting offers a welcome distraction from homework and assignments.
11. I think it's rude to answer text messages in front of other people.
13. I think it's easy to switch back and forth between texting, emailing, and doing my homework.
14. I easily lose my place when reading or typing after being interrupted by texting.
17. I lose my train of thought when I am alerted to an incoming text or email.
27. When I get a text, I feel like it breaks my flow, especially when I'm caught up in a movie, book or TV show.
34. I get caught up in texting my friends and forget what I was doing.

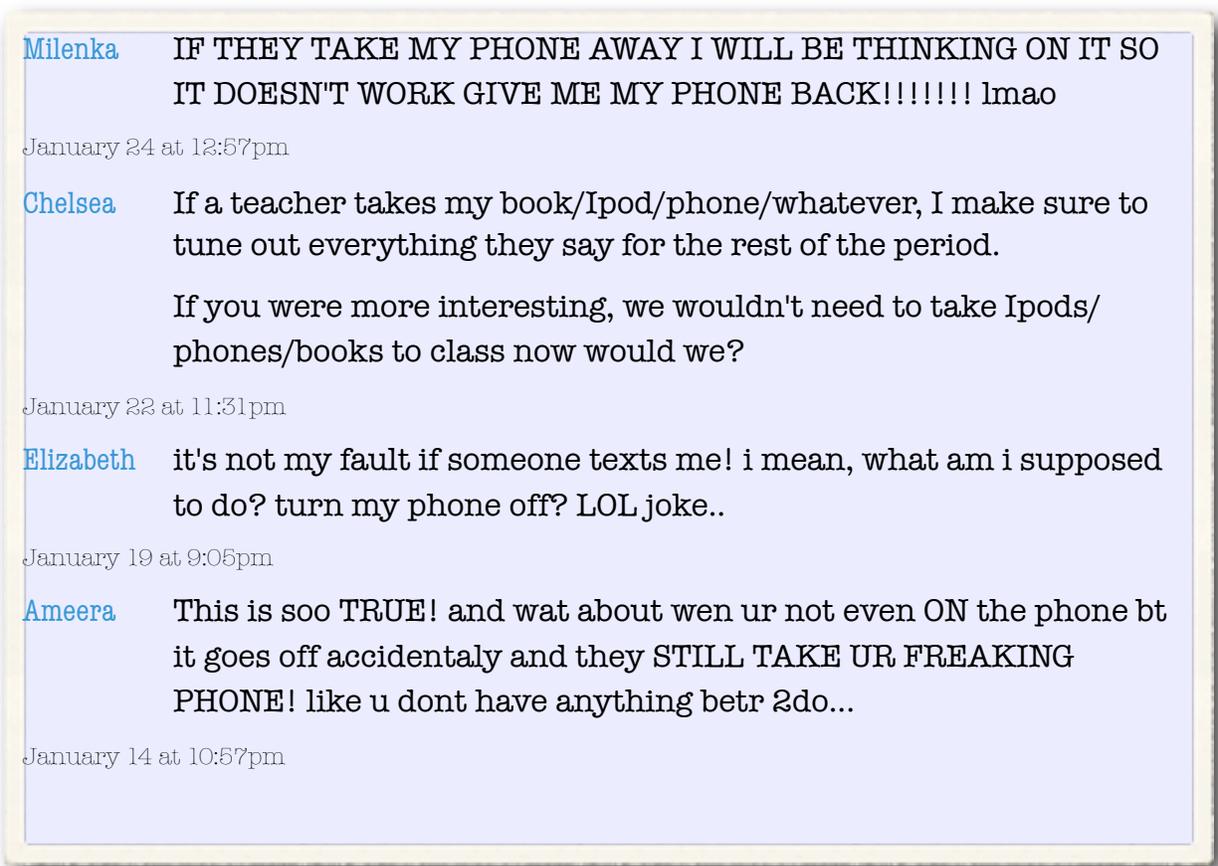
To get a sense of how teens feel connected to their phones, we interviewed a 15-year old teen who has her own mobile phone though her parents pay her bills. This is an excerpt from the interview:

J: How do you feel when you leave your mobile phone at home?
E: I don't leave it at home. I need it to stay connected with my friends.
J: Let's say it slipped out of your purse and you left it unknowingly.
E: I usually have it in my hand but I would be looking all over for it.
J: Would you say you wouldn't be able to rest until you knew where it was?
E: Ya.
J: Do all your friends have phones?
E: Ya
J: Do you feel like it helps your relationship with your friends?
E: We're always texting. It's like being together all the time.
J: You said you're in constant contact with your friends. How constant is that?
E: (scrolls through phone) I have two friends that I am constantly texting back and forth with.
C: (Emilie's mom chimes in) How many times have you texted Stephanie this month?
E: (continues to scroll through phone and checks) 1500 texts.
J: 1500 in a month?
E: Ya.
D: (Emilie's dad chimes in) No Emilie. Your mobile is billed by the start of the month. That's 1500 in 2 weeks Em.
E: (laughs sheepishly) Oh, ya.

The same teen was able to give insight into the mobile phone as a status symbol for teens:

J: What kind of phone do you have?
E: A Blackberry Pearl. It's time to upgrade though. People judge you on the type of phone you have. It's important to give the right impression.

When determining teens' sense of control over mobile phones, a Facebook site revealed that teens just don't want to turn their phones off at all. An exit interview, following the Q-sort revealed some students turn them off out of respect for the teacher or their parents. On the Facebook group site titled, STUPID TEACHER! Taking My Phone Won't Make Me Pay Attention To You!, some of the comments included:



Gathering and Measuring Data

39 students were asked to participate in the Q-sort and 33 responses were turned in. Some of the students were not able to participate as they didn't use a mobile phone. The difference of ownership between grades is significant to note. 55% of 10th Grade students owned their own phones, while 74% of 11th and 12th Grade students owned their own

mobile phones. All but one student has texted before. 24 responses were usable. Of those, 9 were female and the rest were male.

Participants were instructed to select the 4 statements that they most agreed with and place them on the far right of the Q-sort grid. Next, they were asked to select the four that they least agreed with and place them on the far left. The instructions were clearly marked on the grid paper and we completed the first step of selecting the 4 most agreed statements together before going any further. Lastly, students were asked to sort the remaining statements by working their way into the neutral zone. They marked down the numbers representing the statements onto the grid and handed it back.

Exit interviews were completed. When asked about what it felt like to accidentally leave the phone at home, most students replied they felt out of touch. This was consistent with the pre-survey results that had been completed. One of the more interesting statements included, "It feels great. I don't have to be worried about being called in for work." This reveals an awareness that these technologies can put the user "on call". Another student said leaving the phone at home wrecked his sense of spontaneity. Living in the moment by remaining on call is a preference for this individual.

Results

Once the students all completed their Q-sort tables the information was recorded in to a computer system and sorted in to 3 factors. A total of 24 respondents were sorted in to these 3 factors. 2 respondents were confounded, or would fit in to 2 or more of the factors. 8 were non-significant. 3 respondents had spoiled Q-sort tables. While these 3 factors all have differing statements the respondents most agree with and least agree with, there were five responses that all three factors were neutral about:

1. I feel panicked when I am out somewhere and I realize I forgot to bring my phone. (0,1,0)
2. I believe texting makes me more spontaneous in my event planning with others. (0,-1,-1)
3. I have a sense of what my friends' schedules are like before texting them; I have a sense of whether they are available to text back. (1,0,1)
4. I tend to remember texts messages more than actual conversations. (0,0,0)
5. I can usually remember a text conversation and can paraphrase it to someone without looking at my phone.' (0,-1,0)

The neutrality of these statements suggests a few things about the pervasiveness of mobile phones and text-messaging in teen culture. The first statement suggests that either teens are never in the situation of being without their phones, or at least, being without access to a mobile phone. The neutrality around statement 2 suggests that teens do not believe text-messaging has made an overall significant change in their social life, while at the same time accepting that mobile phones may, at times, have an impact. Similarly, the

neutrality around statements 4 and 5 can suggest an absent-mindedness around the effects of mobile phones and text-messaging, this time however, on the memory. However, the neutrality surrounding statement 3 is quite interesting. While teens may not agree that they have a sense of friends' schedules they also do not disagree. Thus, this result can suggest the emergence of a new social code of "when to text", "how often to text" and so forth.

To further understand the habits of teens while text-messaging each factor was further examined. The examination included a review of the two statements each factor most agreed with and least agreed with. These results allowed us to understand how teens characterize their text-messaging experience and how they derive value from text-messaging.

Description of Factor A - Social Users

Factor A contains 9 respondents. The Q-sort table for this factor has the following distribution of responses:

									34										
									33										
									30										
									24										
									23										
									20										
									19										
									18										
								29	31	12	25	32							
								15	28	11	22	26							
		36	16	14	27	9	13	10	2	35									
		17	5	3	21	6	4	8	1	7									

Agreeing most with: (7) I like being able to respond right away to incoming texts and emails, even if I'm in class.
(35) I would feel out of touch without texting and email capabilities on my phone.

Disagreeing most with: (17) I lose my train of thought when I am alerted to an incoming text or email.
(36) I have "me time" where I don't answer emails or my phone.

Factor A reveals the portrait of a group of teens that are extremely invested in being technologically social, thus being called Social Users. Their need to be constantly kept in the loop is demonstrated through a desire to always be connected and never far from their mobile phones. Their agreement with statement 35 demonstrates the social interdependence respondents have with their phones. Similarly, the agreement with statement 7 suggest this relationship has become a reactionary one, as if teens feel their are in a constant conversation with friends. The disagreement with statement 36 further sustains this notion, supporting the desire these respondents have to be “constantly connected.”

The value these respondents derive from text-messaging comes from a perception of heightened social connectedness. They know their mobile phones allow for an experience where they constantly feel close and “in-touch” with friends. This experience has become so ingrained with their daily lives that teens in Factor A do not seem to notice the effect text-messaging has on other daily functions and on-goings. This idea is supported by both their agreement with statement 7 and disagreement with statement 17. The experience of being completely connected may have even produced an ability to easily switch between

tasks, juggling incoming e-mail, texts and phone calls between schoolwork and other activities.

Description of Factor B - Utilitarian Users

Factor B contains 3 respondents. The Q-sort table for this factor has the following distribution of responses:

				36				
				30				
				25				
				21				
				14				
				10				
				8				
				7				
			29	33	6	32	31	
			20	24	5	27	18	
35	34	19	16	3	12	17	11	28
22	23	4	13	1	2	15	9	26

Agreeing most with: (26) I feel parents and teachers don't understand why teens need to have their mobile phones on 24/7.

(28) My texts can wait until I'm finished what I'm doing.

Disagreeing most with: (22) Texting helps me get to know people better than I did before.

(35) I would feel out of touch without texting and email capabilities on my phone.

Factor B has been categorized as the Utilitarian Users, as students in this factor focus on the positive functions of text-messaging while ignoring any reason for mobile phones to control their daily activities. The agreement with statement 26 demonstrates that students

who fall in to factor B have an understanding that people are constantly connected with their phones and see this as a need. Additionally, the agreement with statement 28 demonstrates that while the utility of text-messaging is understood there is no sense of urgency to respond. Interestingly, respondents also disagreed with statement 35, demonstrating a complete understanding and acceptance of the place text-messaging has in the current teenage social atmosphere; suggesting that place is one where the mobile phone is a must-have tool.

While respondents in Factor B may value the social utility of text-messaging, they do not derive as much value for the social factors. Rather, respondents derive value from text-messaging in its ability to place them in constant contact with others yet do not find this ability to be constantly connected as a reason to increase their sociability. This is demonstrated in respondents agreement (+2) with statement 15, "I worry about my friends and family if they don't respond to my emails right away," and their disagreement (-4) with statement 22.

Description of Factor C - Nonchalant Users

Factor C contains the most, 12 respondents. The Q-sort table for this factor has the following distribution of responses:

				35				
				33				
				32				
				30				
				22				
				19				
				13				
				12				
			31	34	7	36	20	
			26	27	5	25	17	
29	21	23	24	4	14	9	11	28
18	16	15	8	3	10	6	1	2

Agreeing most with: (2) I feel that mobile technologies keep me connected to others.

(28) My texts can wait until I'm finished what I'm doing.

Disagreeing most with: (18) I think that my mobile phone brand reflects my popularity.

(29) I wouldn't have the same friends if I didn't have a mobile phone.

Factor C has the greatest amount of respondents. While they use text-messaging for social purposes, they feel no real attachment to their mobile phones. Thus, they are called Nonchalant Users. The agreement with statement 2 demonstrates a strong understanding and use of the social functionality of text-messaging and mobile phones. However, this feeling of connectedness does not overrule other aspects of their life, demonstrated with respondents agreement with statement 28. Moreover, respondents disagreement with

statements 18 and 29 demonstrate a disbelief that mobile phones and text-messaging have any weight to their social interactions and status.

This group of respondents seems to have experienced all the social benefits of text-messaging and mobile phones, but does not believe mobile phones provide any additional social value. Rather, for them value is a biproxi-derivative or one that is sustained through their peers use of phones. Interestingly, this factor was the one group of students who disagreed (-2) with the statement, "I feel parents and teachers don't understand why teens need to have their mobile phones on 24/7," (statement 26).

Comparison

While Factor C disagrees with statement 26, Factor A and B both agree (+2 and +4 respectively). This opposition on this statement between the factors is just an example of the differences respondents have in their experience and valuation of text-messaging. Factor A respondents strongly aligns with the value of social-connectedness that text-messaging provides. While Factor B respondents see this connectedness as a utility but care little about the social functionality provided by mobile phones. Respondents to Factor C on the other hand is completely indifferent to the social functions of text-messaging and mobile phones.

All three factors' respondents seem to have accepted mobile phones and experienced the constant connectedness text-messaging provides. They all understand that the technology can have value for more relaxed, social purposes, and deeper, more immediate and serious purposes.

Conclusion

Application of Findings

The comparison of all three factors of respondents allows us to derive some real-world conclusions about where the future of text-messaging could venture. An overall acceptance of text-messaging is good for the mobile phone industry. A inter-dependent attachment to mobile phones from one factor of respondents seems threatening to overall cognitive development, while a complete lack of attachment from another factor seems threatening to the pervasiveness of this technology. Below are some conclusions about future research that needs to be conducted, but these conclusions can also help future product development.

All three factors do not seem to mind the ability to be constantly contacted. They all understand they the technology can be switched off or ignored at any time. Regardless of whether they choose to do this, the more interesting opportunity is capitalizing on user's choice to opt-in. Already mobile applications are taking advantage of "push" technology that allows users to receive updates about specific things, much the same way they receive updates from their friends. From sports scores to discounted products from their favorite retailers, users are starting to choose to be contacted about more than just social information. This kind of opt-in-info can provide social or utilitarian function, but it also provides choice.

The research we have conducted seems to demonstrate that users are completely OK with the amount of control they have over the “when” factor of text-messaging. What some respondents were not OK with was the “what” factor. The current limitedness of text-messaging has restricted users to a one-to-one or a one-to-many conversation amongst peers in a social context. Expanding the “what” of text-messaging would change the experience and value for these users to something potentially much more informative and valuable.

Future Research

This study has both reinforced earlier findings and has revealed new ones with teens and texting. The results from Factor A fully support Sprenger’s finding that, “the main goal behind their multitasking is not so much to be productive as to be connected to someone,” (36). While the general neutrality of all 3 factors to other responses suggests a pervasiveness of interruptions in text-messaging that researchers like Konstand and Carlis may find to be a problem. This study also focused on a specific age range, not measuring on-going attitudes towards text-messaging. The conclusions drawn from this study suggest valuation splits between social purposes, utilitarian goals, and an indifference to how text-messaging is used currently. These conclusions can both be used to make text-messaging more useful and people more used and better equipped for the implications of text-messaging.

Some of these implications of text-messaging include its effect on task performance.

Future research should continue from the points raised by Iqbal and Horvitz, focusing on

the amount of time it takes a teen to return to a previous task after text-messaging. Factor A respondents revealed that they constantly let text-messaging interrupt themselves. A comparison between their productivity and that of Factor C respondents could reveal how much or little text-messaging affects task accomplishment timeliness.

Interestingly, while text-messaging may have a severe effect on productivity, respondents did not seem interested in external products controlling interruptions like those suggested in Adamczyk and Bailey's research. This, however, does not mean the area of the timeliness of interruptions should be abandoned as a research topic. Rather, more research should focus on the degree of irritation a user feels about interruptions, like that of Konstand and Carlis' research.

As respondents of all factors seem to accept that text-messaging is an interruption to stay, they do not expect to abandon their phones. However, understanding the effects these phones and text-messaging has on user psyche can help the development of tools to manage the additional mental strain. Like the research conducted by Oulasvirta and Saariluoma, where they discovered not all interruptions are negative, the effects of information-based text-message interruptions should also be examined.

As the functionality of text-messaging grows research into user attitudes should continue with expanded studies examining whether attitudes change depending on age. In addition, future studies should examine the relationship between attitudes towards text-messaging and other communications. People like those respondents in Factor A may use other forms of communication just like text-messaging - as a way to feel important and

connected. Whether this translates to other forms of media in the future is an interesting hypothesis that should be investigated further.

As more products and services are developed to attract the users that would fall in to Factor C, research should examine whether their use of mobile phones has increased, decreased or stayed the same. This kind of research would be similar to that of the research we conducted. Overall, using Q methodology allows researchers to understand the experience from the users' perspective. Continuing Q-sorts on the topic of text-messaging will add depth to our existing results. Whether it be new factors revealing other attitudes towards text-messaging, or a re-balancing of respondents, user-opinion on this pervasive technology is important to understand.

Works Cited

- Adamczyk, Piotr D. and Brian P. Bailey. "If Not Now, When?: The Effects of Interruption at Different Moments Within Task Execution." Graduate School of Library and Information Science and Department of Computer Science. 6:1 (2004): 271-278. Print.
- Bailey, Brian P, Joseph A. Konstan, and John V. Carlis. "The Effects of Interruptions on Task Performance, Annoyance, and Anxiety in the User Interface." INTERACT. (2001): 593-601. Print.
- Boyd, Danah. "Why Youth (Heart) Social Network Sites: The Role of Networked Publics in Teenage Social Life." MacArthur Foundation Series on Digital Learning – Youth, Identity, and Digital Media Volume (ed. David Buckingham). Cambridge, MA: MIT Press. 2007. Print.
- Gasser, Urs, and John Palfrey. "Mastering Multitasking." Educational Leadership. 66:6 (2009). 14-19. Academic Search Premier. EBSCO. Web. 17 Feb. 2010.
- González, V. M. and Mark, G. "Constant, Constant, Multi-Tasking Crazyiness." Managing Multiple Working Spheres. ACM. CHI '04. 113-120. 2004. Web. 22 Feb 2010.
- Iqbal, S. T. and Horvitz, E. "Disruption and Recovery of Computing Tasks: Field Study, Analysis, and Directions." ACM. 2007. Web. 22 Feb. 2010.
- Maclean, Emilie. Personal interview. 14 Feb. 2010.
- Mark, Gloria, et al. "Constant, Constant, Multi-Tasking Crazyiness: Managing Multiple Working Spheres." ACM. CHI. (2004): 113-120. Print.
- Mark, Gloria, et al.. "No Task Left Behind: Examining the Nature of Fragmented Work". ACM. CHI. (2005): 321-330. Print.
- Maglio Paul P. and Christopher S. Campbell. "Tradeoffs in Displaying Peripheral Information." CHI Letters. 2:1 (2000): 241-248. Print.
- Meyer, David E. Personal interview. 17 March. 2010.
- Oulasvirta, Antti, and Pertti Saariluoma. "Long-Term Working Memory and Interrupting Messages in Human - Computer Interaction." Behaviour & Information Technology. 23.1 (2004): 53-64. Print.
- Oulasvirta, Antti, and Pertti Saariluoma. "Surviving task interruptions: Investigating the implications of long-term working memory theory." International Journal of Human -- Computer Studies. 64.10 (2006): 941-961. Print.
- Rideout, Victoria J., et al. "Generation M2 Report: Media in the Lives of 8-18 Year Olds." Henry J. Kaiser Family Foundation. Jan. 2010. Print.
- Sprenger, Marilee. "Focusing the Digital Brain." Educational Leadership. 67.1 (2009): 34-39. Academic Search Premier. EBSCO. Web. 17 Feb. 2010.