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Multitasking across generations: Multitasking choices and difficulty ratings in three generations of Americans

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ABSTRACT

This study investigated whether changes in the technological/social environment in the United States over time have resulted in concomitant changes in the multitasking skills of younger generations. One thousand, three hundred and nineteen Americans from three generations were queried to determine their at-home multitasking behaviors. An anonymous online questionnaire asked respondents to indicate which everyday and technology-based tasks they choose to combine for multitasking and to indicate how difficult it is to multitask when combining the tasks. Combining tasks occurred frequently, especially while listening to music or eating. Members of the "Net Generation" reported more multitasking than members of "Generation X," who reported more multitasking than members of the "Baby Boomer" generation. The choices of which tasks to combine for multitasking were highly correlated across generations, as were difficulty ratings of specific multitasking combinations. The results are consistent with a greater amount of general multitasking resources in younger generations, but similar mental limitations in the types of tasks that can be multitasked.

1. Introduction

Three broad generations of persons in the United States often are described as Baby Boomers, born between 1946 and 1964 (Jones, 1980), Generation X, born between 1965 and 1979 (Coupland, 1991), and the Net Generation, born between 1980 and the present (Tapscott, 1997). Although there are individual differences among members of each generation, there also are within generational similarities. Baby Boomers are the current political leaders, business CEOs, middle managers, and shop owners, the earliest of whom are beginning to retire, and the workplace is now being populated by Generation X and Net Generation members.

Unlike the older generations, members of the Net Generation grew up with computer-based technology readily available and enmeshed in their school and home environments. Their social worlds include not only physical locations, but also online worlds. They are eager adopters of technology. For example, it took the Baby Boomer generation 10 years to adopt the computer, but the Net Generation adopted text messaging in 2 to 3 years. The generations also differ in how they communicate. Net Geners' preferred communication tools are different than other generations and they use a greater variety of media to communicate with the world and with their friends. Other key generational issues include differences in core values dealing with money, career goals, and leadership style (Rosen, 2007).

Technological changes are central to differences between generations. Present-day children are growing up in a new worldwide technological environment where new devices allow the integration of multiple tasks. Generational differences in technology-related behavior exist at home as well as in the workplace. Parents often describe how their teenage child performs their at home tasks while listening to music on their portable digital music player, watching television, sending text messages to friends, or checking their MySpace pages. Some researchers describe the situation at home for youths as media "saturation" through technology (Roberts, Foehr, & Rideout, 2005).

Associated with the expanse of technology-based media in the home is an ever-growing need to multitask. It is not surprising to hear young people describe multitasking as a "way of life" or to declare that it is "easy" (Rosen, 2007). Although brain research suggests that the brain centers responsible for executive functions, and hence multitasking, are not fully developed until after puberty (Blakemore & Choudhury, 2006; Conklin, Luciana, Hooper, & Yarger, 2007; Dux, Ivanoff, Asplund, & Marois, 2006; Luciana, Conklin, Hooper, & Yarger, 2005), research examining the behavior of members of the youngest generation suggests that they are multitasking frequently. Jordan et al. (2005) had junior high school and college students fill out daily media and non-media

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use questionnaires for a week, and then looked at the frequencies with which the students simultaneously combined media use with other tasks. They found that the modal behavior was multitasking. Foehr (2006), re-analyzing data from previous questionnaire and diary studies of 3rd–12th graders regarding media use, found that multitasking happened mostly at the computer and that only about one-fifth of the children and teens in the sample devoted little or no time to multitasking involving media. Jeong and Fishbein (2007) gave an online survey to 14-, 15-, and 16-year-olds that asked about media usage and owning personal media, finding that multitasking was common. The three most common forms of multitasking were listening to audio media while traveling, listening to audio media while interacting with friends, and watching television while eating. Very few youths reported that they never multitask with media.

What effects will constant multitasking have on today's youths? Blakemore and Choudhury (2006) suggested that environmental input during this period might alter brain function. Potential effects upon multitasking ability include both negative and positive outcomes. A recent study showed that multitasking (or being distracted) affects the kinds of learning that take place in the brain and the brain areas involved in learning (Foerde, Knowlton, & Poldrack, 2006). Foehr (2006) speculated that constant multitasking by today's youths might have positive benefits in juggling multiple activities and using time efficiently. Levine, Waite, and Bowman (2007) suggested that repeated engagement in tasks that require frequent attention shifts (e.g., IMing) by youths could lead to a preference for frequent task switching over sustained attention during cognitive tasks.

No studies direct investigate the possibility that the younger generations exhibit a different pattern of multitasking behavior than the older generations. In the present study, the at-home multitasking habits of a sample of persons in the United States were examined with respect to the hypothesis that there are generational differences in multitasking limitations. The sample included persons of all ages and from a wide variety of ethnic backgrounds. Evidence was gathered using data from an anonymous, online questionnaire posted in the Fall of 2007. The choices of tasks combined for multitasking, as well as the perceived difficulty of combining certain tasks, was measured through self-report. Based on the possibility that there are generational differences in multitasking, the following research hypotheses were generated.

Hypothesis 1. More recent generations will multitask more than older generations. Specifically, when looking at the number of tasks performed at once and the number of combinations of tasks that are selected for multitasking, Net Geners will multitask more than Gen Xers who, in turn, will multitask more than Baby Boomers.

Hypothesis 2. More recent generations will show a qualitatively different pattern of task choices for multitasking than older generations. For example, if Net Geners are better at multitasking than members from other generations, then they should be able to multitask with combinations of tasks that differ from members of other generations.

Hypothesis 3. More recent generations will find it easier to multitask than older generations. For any given combination of tasks, the average ratings of difficulty should be lowest (i.e., easier) for the Net Geners, next lowest for the Gen Xers, and the highest for the Baby Boomers.

Hypothesis 4. More recent generations will show a qualitatively different pattern of task combination difficulty ratings than older generations. If each generation is changing in how it multitasks, then more recent generations and older generations should not find the same task combinations to be difficult. For example, task combinations that one generation finds to be "difficult" will not be the same task combinations that other generations find to be difficult.

2. Methods

2.1. Participants

We recruited 1319 participants through individual contact from students in an upper-division general education course (a cultural pluralism course) during the Fall of 2007. The course took place at a medium-sized four-year university in Los Angeles, California. Baby Boomers were defined as those whose birth years fell within the range 1946–1964, Gen Xers were defined as those whose birth years fell within the range 1965–1978, and Net Geners were defined as those whose birth years were after 1978. This categorization resulted in 312 Baby Boomers (23.7% of the sample), 182 Gen Xers (13.8%), and 825 Net Geners (62.5%). Overall, there were 772 females (58.5%) and 547 males (41.5%). The ethnically diverse sample was reflective of the Los Angeles basin: 435 Caucasians (33.0%), 374 Latinos (28.4%), 239 African–Americans (18.1%), 212 Asians (16.1%), and 59 missing ethnicities (4.5%). These numbers roughly approximated the most recent census figures for Los Angeles County (U.S. Census Bureau, 2006: Asian 13%, African–American 9%, Caucasian 29%, Latino 47%).

For the three generational subsamples, there were no significant differences in gender composition but there were some differences in ethnic composition. The percentages of females (and thus males) in each subsample were similar, with 60.9% of the Baby Boomers, 59.9% of the Gen Xers, and 57.3% of the Net Geners being female, χ^2 (2, N = 1319) = 1.35, p = .510. However, there were differences among the generations in ethnic composition, with the younger generation more likely to be Asian or Latino, and less likely to be African–American or Caucasian, than the older generations, χ^2 (6, N = 1319) = 78.12, p < .001 (Asian: 6.6% Baby Boomers, 17.8% Generation X, and 20.5% Net Generation; African–American: 20.5%, 25.3%, and 17.0%; Caucasian: 52.0%, 29.3%, and 29.0%; and Latino: 20.9%, 27.6%, and 33.5%). Although these differences are very interesting and probably represent trends in population growth in the Los Angeles, California area, interpreting these differences is difficult. The analyses were performed as planned under the assumption that the multitasking abilities under study would not be affected directly by ethnicity. However, there is a possibility that the ethnic differences in the makeup of the generational subsamples also might reflect differences in socio-economic status, and hence access to and experience with multitasking technology. These issues might warrant further analyses in a secondary study.

Participants were not compensated but were given the chance to enter a lottery for one of several $50 prizes. The study was conducted anonymously; however, participants who wished to participate in the lottery were required to provide an e-mail address for entering the optional lottery. The e-mail addresses were separated from the rest of the data and then discarded after the lottery had been conducted.

2.2. Materials and apparatus

The online questionnaire was administered through SurveyMonkey.com. Following the consent form, items asked about 12 different tasks that were typically done at home, most of which were technology-related. These 12 tasks were: Surfing the World-Wide Web (WWW), Doing Offline Computing, Emailing, Instant Messaging (IM)/Online Chatting, Using the Telephone, Text

Messaging (Texting), Playing Video Games, Listening to Music, Watching Television (TV), Eating, Reading Books and Magazines for Pleasure, and Talking Face to Face with Someone (Talking In-Person). Baseline performance on these tasks was measured in two ways. First, each respondent was asked to indicate how many hours were spent each day performing each of the tasks. For each of the 12 tasks, respondents selected a category that included a range of hours spent using the task each day. The following scale was used: "Not at all," "1 h/day," "2 h/day," "3 h/day," "4–5 h/day," "6–8 h/day," "9–10 h/day," and "More than 10 h/day." The goal was to include a quantitative analysis of these data, so the categorical responses were converted to numerical responses by assigning the midpoint numerical value of each category to each respondent. ("More than 10 h/day" was coded as 11 h to be conservative.) Second, for each task, respondents were asked whether they performed the task and, if so, whether they combined the task with any of the other 11 tasks on the list (i.e., multitasked). Further, when respondents indicated that they did combine two tasks, they were asked to rate the difficulty level of combining the tasks as "easy" or "difficult." An additional item inquired about which of the 12 tasks participants might do together during "typical free time" at home. There was no limit on the number of tasks that could be selected.

The final items on the questionnaire asked about basic demographic information, including age, sex, and ethnicity. The item about age asked the respondent to choose an age category from a list of categories; in other words, the exact ages of the respondents were not collected. Here are the categories that appeared in the item: "18–25," "26–29," "30–39," "40–49," "50–59," and "60 or older."

2.3. Procedure

After IRB approval, participants were recruited by students in an upper-division undergraduate social science course and given a website link. Participants were allowed to choose the physical location for completing the questionnaire. The study started with the participant giving informed consent to provide responses. Next the questionnaire items appeared on consecutive screens at the SurveyMonkey.com website, with each screen containing a subset of items. Participants were not allowed to continue to the next screen until all items on the current screen had been completed and were not allowed to revise answers once they had completed each screen. At the end of the questionnaire, respondents were provided with a brief description of the study (debriefing).

3. Results

3.1. Baseline task performance

Initial analyses examined how often each generation used the 12 basic tasks included in the study. Fig. 1 shows the data from the simple question about whether each task was performed or not. These data reflect the likelihood of each generation performing each task by itself, without combining it with another task during multitasking. The data were collected for only 9 of the 12 tasks since it was assumed that all respondents would eat, talk to others face to face, and use the telephone on a regular basis. It was clear that some tasks were much less likely to be performed than other tasks. For example, playing video games and using instant messaging (chat) were relatively unlikely to be performed. Also, some of

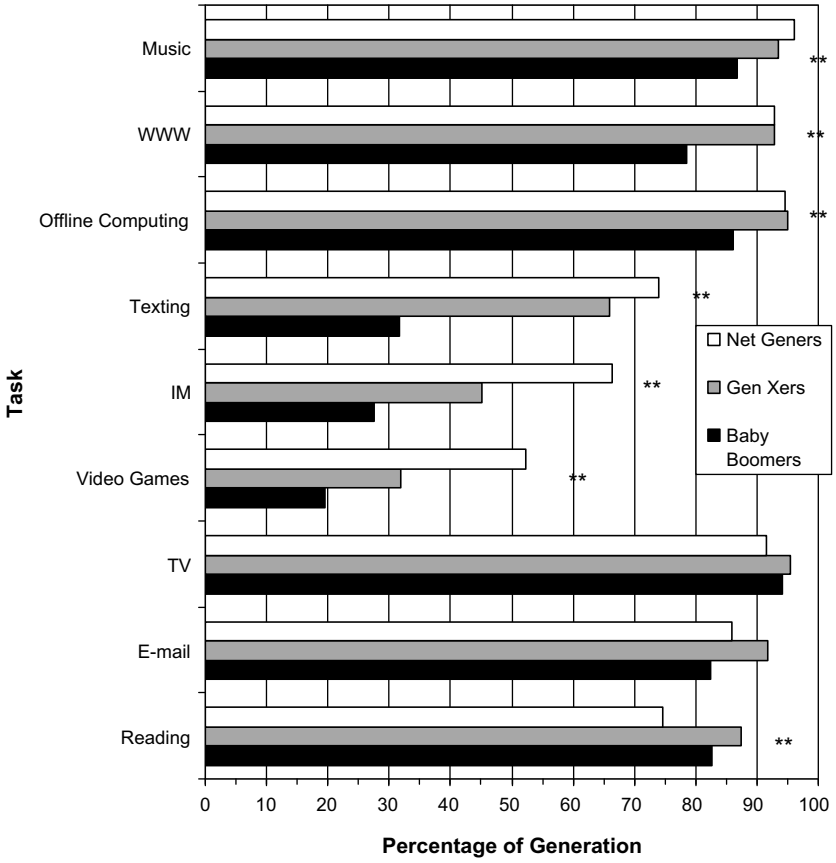

Fig. 1. Percentages of each generation that perform each task. *Note:* ** Indicates that the percentages of participants from each generation engaging in a task are not the same ($p < .01$).

the tasks showed generational effects and others did not. A series of individual χ^2-tests were performed to compare the proportions of subjects who performed each task within each generation. After adjusting for multiple tests by lowering the alpha level to 0.01, the following tasks showed generational effects: WWW, Offline Computing, IMing, Texting, Video Games, Music, and Reading. The following tasks did not show generational effects: E-mail and TV.

The frequency of use data also revealed clear generational differences in baseline task performance. A 3×12 Analysis of Variance (ANOVA) was conducted on the amount of time spent performing each task, using the factors of Generation (Baby Boomer, Generation X, Net Generation) and Task (the 12 tasks). Results showed there was (1) a significant effect of task, $F(11, 14476) = 216.60$, $p < .001$, with some tasks performed more than others, (2) a significant effect of generation, $F(2, 1316) = 68.86$, $p < .001$, as well as (3) a significant interaction between the two, $F(22, 14476) = 15.29$, $p < .001$. The means are depicted graphically in Fig. 2. As is evident from Fig. 2, the youngest generations are spending increasingly more time than the oldest generation with 8 of the 12 tasks. Post hoc tests of the simple effects of generation upon each task were conducted and revealed that not all of the tasks were sensitive to generation. After adjusting for an inflated Type I error for multiple tests, the following tasks showed a significant effect of generation: WWW, Offline Computing, IM, Texting, Video Games, Music, Eating, and Talking In-Person. The following tasks did not show a generation effect: Reading, TV, Telephone, and E-Mail.

The pattern of tasks showing generational effects is extremely similar between the two different measures of baseline task performance. In almost all tasks showing generational effects, Baby Boomers were less likely to engage in them than other generations and spent fewer hours engaging in the tasks when the tasks were performed. The task that showed a different pattern across the measures was Reading, which did not show a generational effect in the number of hours spent per day performing the task. It appears that although Net Geners are less likely to be readers than other generations, the Net Geners who do read spend the same amount of time reading as the readers from the other generations.

3.2. Task combinations

Pairwise combinations of all 12 tasks queried in the study were examined (66 in all) in two ways: (1) how often each combination was performed by each generation and (2) how difficult it was for each combination to be performed by each generation. The first question was answered simply by looking at whether or not each respondent indicated that each pair of two tasks was performed at all. The second question was answered by looking at the participants' selection of each task combination as "easy" or "difficult" under the condition that they did perform the two tasks together. Participants who indicated that they did not perform one of the two tasks in a task combination were excluded.

3.3. Multitasking quantity

To allow a quantitative comparison across the three generations regarding multitasking frequency, the number of task combinations that were multitasked on average (out of the possible 66)

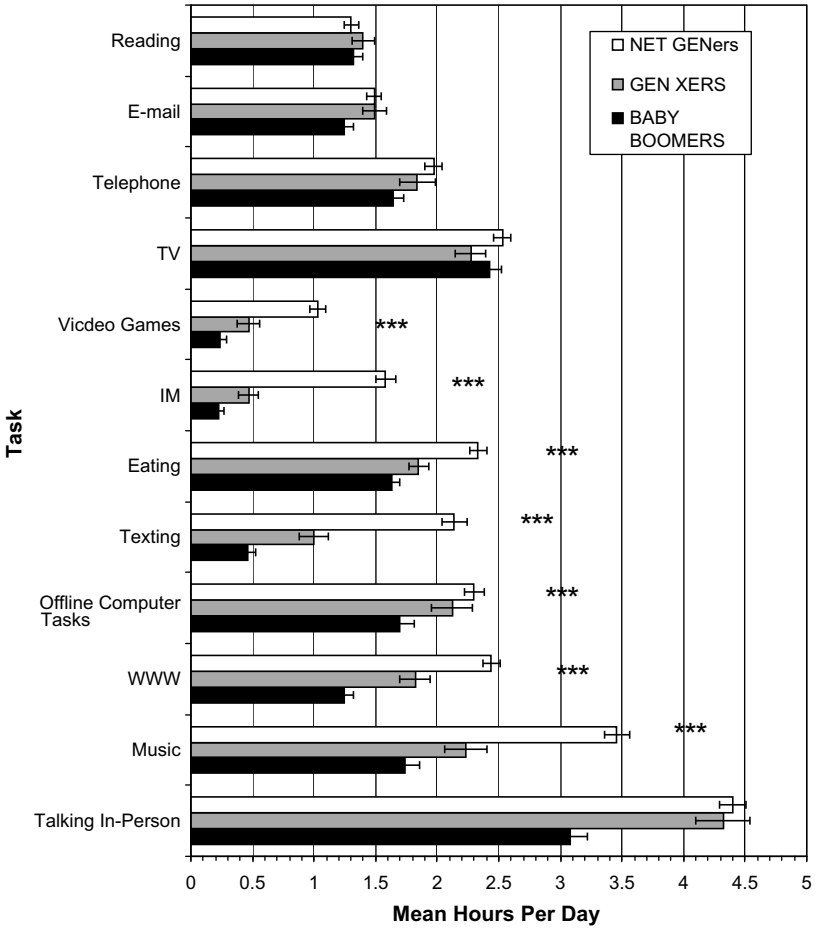

Fig. 2. Daily performance of each task by generation. Note that the error bars represent +/− 2 standard errors. *Note:* Tasks marked with *** Indicate that there was a significant effect of generation on hours per day ($p < .001$).

for each of the three generations was counted and the means were compared. The means and standard deviations were as follows: Baby Boomers ($M = 23.2$, $SD = 13.5$), Gen Xers ($M = 32.4$, $SD = 15.0$), and Net Geners ($M = 37.5$, $SD = 15.0$). A one-way ANOVA revealed a statistically significant effect of generation, $F(2,1316) = 107.64$, $p < .001$. The pattern of means indicates that, although all generations were engaging in multitasking, there was an increase in multitasking from the older to the younger generations. All of the differences between the means were significant using Scheffe's Test (all $p < .001$).

3.4. Patterns of choices of tasks to combine

To assess the possibility that there are generational differences in which tasks are multitasked, the choices of multitasking combinations were examined across the three generations by performing pairwise correlations of the generations' choices of task combinations to multitask (i.e., the popularities of the different task combinations). There was surprisingly large agreement across the generations in which task combinations were chosen for multitasking. The absolute sizes of the correlations were supported by statistical tests; all three pairwise correlations were found to be strongly positive and statistically significant: Baby Boomers and Gen Xers $r(64) = 0.90$, $p < .001$; Baby Boomers and the Net Geners $r(64) = 0.81$, $p < .001$; and Gen Xers and the Net Geners $r(64) = 0.91$, $p < .001$. In other words, a relatively unpopular combination of tasks to multitask among the Net Geners (e.g., pleasure reading while playing video games) also was found to be relatively unpopular among the Gen Xers and the Baby Boomers. Conversely, a highly popular task combination among the Net Geners (e.g., listening to music while eating) also was likely to popular among the Gen Xers and the Baby Boomers. The data from all three generations are combined in Table 1 to show the popularities of the specific task combinations.

3.5. Difficulty of task combinations

In addition to looking at *whether* each task combination was performed, it was also important to analyze the difficulty level when performing each task combination. This was done by looking at the difficulty ratings assigned to each task combination. Participants were allowed to indicate either that the task combination was "easy" or that it was "difficult." To allow a quantitative comparison across the three generations, the proportions of attempted task combinations reported as "difficult" on average for each of the three generations were tallied and the means compared and found to be significantly different [$F(2,1303) = 12.44$, $p < .001$; Baby Boomers: $M = .30$, $SD = .01$; Gen Xers: $M = .26$, $SD = .02$; and Net Geners: $M = .23$, $SD = .01$]. Scheffe's Test indicated that the Baby Boomers reported significantly more task combinations to be difficult than the Net Geners ($p < .001$), but that no other differences between generations were significant.

3.6. Patterns of difficulty of task combinations

Correlations were used to study the similarities of difficulty ratings from one generation to the next by comparing the pattern of difficulty ratings across the 66 task combinations between generations. As before, the actual analysis focused upon the cases when participants rated a task combination as "difficult" and ignored the cases when a task combination was rated as "easy," as these two ratings mirror each other. The correlation between the Baby Boomers and the Gen Xers was $r(64) = 0.88$, $p < .001$; the correlation between the Baby Boomers and the Net Geners was $r(64) = 0.89$, $p < .001$; and, the correlation between the Gen Xers and the Net Geners was $r(64) = 0.90$, $p < .001$. These correlations revealed very large positive and statistically significant relationships suggesting that when one generation finds a task combination to be relatively difficult, then the other generations also find that task combination to be relatively difficult.

3.7. Tasks done during free time

Participants also were asked to indicate which of the 12 tasks they would choose to do during their "typical free time" at home. Analysis of these responses revealed high amounts of multitasking from each generation, as well as a clear generational effect. The Baby Boomers indicated that they multitasked a mean of 4.70 tasks ($SD = 2.43$); followed by the Gen Xers ($M = 5.41$; $SD = 2.40$); and the Net Geners ($M = 5.90$; $SD = 2.55$). The rise in the number of tasks performed together from the oldest to the youngest generation was statistically significant, $F(2,1316) = 26.38$ $p < .001$, as were the differences between all means, using Scheffe's Test.

4. Discussion

This study investigated generational differences in multitasking. The goal was to collect data that would allow comparisons of multitasking frequency and multitasking difficulty across generations. The unambiguous detection of differences in multitasking ability across generation could have implications for the sociological study of persons over time, as well as for the psychological understanding of basic mental operations. The procedure used

Table 1
Proportions of participants combining tasks for multitasking.

Task 2	Task 1											
	Surf the Web	Offline Computer Tasks	E-Mail	IM	Telephone	Text	Video Games	Listen to Music	Watch TV	Eat	Pleasure Read	Talk Face to Face
Surf the Web		0.76	0.87	0.81	0.86	0.78	0.53	0.91	0.76	0.83	0.48	0.74
Offline Computer Tasks	0.76		0.83	0.76	0.80	0.72	0.43	0.87	0.66	0.79	0.43	0.70
E-Mail	0.87	0.83		0.79	0.82	0.73	0.46	0.90	0.72	0.78	0.44	0.71
IM	0.81	0.76	0.79		0.81	0.76	0.54	0.88	0.75	0.77	0.49	0.68
Telephone	0.86	0.80	0.82	0.81		0.70	0.68	0.84	0.83	0.77	0.55	0.63
Text	0.78	0.72	0.73	0.76	0.70		0.54	0.88	0.82	0.79	0.59	0.72
Video Games	0.53	0.43	0.46	0.54	0.68	0.54		0.77	0.50	0.68	0.31	0.59
Listen to Music	0.91	0.87	0.90	0.88	0.84	0.88	0.77		0.73	0.93	0.75	0.87
Watch TV	0.76	0.66	0.72	0.75	0.83	0.82	0.50	0.73		0.92	0.59	0.81
Eat	0.83	0.79	0.78	0.77	0.77	0.79	0.68	0.93	0.92		0.77	0.82
Pleasure Read	0.48	0.43	0.44	0.49	0.55	0.59	0.31	0.75	0.59	0.77		0.57
Talk Face to Face	0.74	0.70	0.71	0.68	0.63	0.72	0.59	0.87	0.81	0.82	0.57	

All generations combined.

was to obtain data from persons from three generations in the United States using an online, anonymous questionnaire which asked people to indicate which tasks they did simultaneously and how difficult it was to do so with each of 66 task pairs.

Hypothesis 1 predicted that more recent generations would multitask more than older generations. The results show clear increases in the number of task combinations that are multitasked from the older to newer generations. When asked how many tasks are done together during one's typical "free" time, there also was a clear increase when going from the Baby Boomers to the Net Geners. Further, the increase from one generation to the next was statistically significant. Thus, there is clear evidence that Hypothesis 1 is supported.

Hypothesis 2 asserted that more recent generations would show a qualitatively different pattern of choices of tasks to multitask than older generations. This hypothesis was not supported by the results. When the patterns of choices of which tasks to combine for multitasking were compared across generations, there were extremely high levels of similarity. The generations agreed on which tasks should be combined for multitasking and which should not. Hypothesis 3 postulated that more recent generations would find it easier to multitask than older generations. If one looks at the number of task combinations found to be "difficult" by the participants, then it is clear that Net Geners were less likely to find task combinations difficult than the Baby Boomers, although the differences between the Net Geners and the Gen Xers and the Gen Xers and the Baby Boomers were not significant. Thus, Hypothesis 3 appears partially to be supported by the data.

Hypothesis 4 stated that more recent generations would show a qualitatively different pattern of difficulty ratings than older generations. This did not hold true in the data. The task combinations that Net Geners found to be difficult tended also to be the task combinations that Gen Xers and Baby Boomers found to be difficult. The generations agreed on which task combinations are relatively hard and which combinations are relatively easy.

One possible explanation for these results is a "Cognitive Load" interpretation suggested by Fishbein and colleagues (Jeong & Fishbein, 2007; Jordan et al., 2005). These authors reported that some task combinations were multitasked more than others by youths and speculated that the preferences for certain task combinations were possibly due to the cognitive demands of the individual tasks. The basic proposition is that tasks place a "load" on general cognitive resources for multitasking, and that different tasks place different loads depending upon the task characteristics. Fishbein and colleagues put forward the possibility that certain task combinations are more frequently multitasked than others because the combined cognitive loads of the tasks do not exceed human performance limitations.

One of the main findings in the current study is that Net Geners multitasked more than other generations and that they found multitasking to be easier. From a cognitive load point of view, one might argue that Net Geners have a larger source of general cognitive resources for multitasking than other generations. In other words, Net Geners might be capable of handling a larger cognitive load than members of the other generations. The second main finding was that Net Geners agree with other generations on which task combinations are chosen for multitasking and on which task combinations are relatively harder to perform. For example, all generations combined listening to music or eating with almost all of the other tasks, and, conversely, all generations were unlikely to combine pleasure reading with the other tasks (see Table 1). From the cognitive load perspective, one might suggest that Net Geners share the same physical and cognitive mechanisms with the other generations that make some tasks (for instance, pleasure reading) place larger "loads" than others. Thus, this theoretical approach could explain the present results, although it should be kept in mind that other theories of basic limitations on human multitasking exist (refer to Reed, 2004).

4.1. Limitations

This cross-sectional study of generational differences inherently confounds generation with chronological age. In other words, not only are the Net Geners in this study drawn from a different generation of Americans as the older participants, but they also are younger at the time of sampling than persons from the other generations. This raises a natural concern: Are the multitasking behaviors of the Net Geners due to the generation from which the participants were drawn, or due to having "younger" brains at the time of testing? The observed differences in the amount of multitasking—that Net Geners multitask more than the other generations—could potentially be due to chronological age rather than generational differences. However, the lack of a difference in the patterns of choices of which task combinations to multitask retains an unambiguous interpretation. All generations agree on which tasks they multitask and thus there is no evidence that the quality of multitasking is changed in the youngest generation. The same logic applies to the data from the difficulty ratings. Essentially, although the younger generations found task combinations easier to combine, this ease could possibly be attributed to their young ages and not to their generation. On the other hand, the high similarity of relative difficulty ratings of task combinations across generations is interpreted unambiguously as showing that the younger generations do not differ in the specific combinations of tasks that are difficult to combine for multitasking.

Another potential limitation of this study is that the measures of multitasking performance could be biased. Since the study used questionnaire responses as indirect measures of multitasking, it is possible that the responses reflect the respondents' *perceptions* of their own multitasking experiences, rather than their real multitasking behaviors. However, the finding that the youngest generation is engaging in significant amounts of multitasking is consistent with measures of the quantity of multitasking in youths obtained in earlier studies (Foehr, 2006; Jeong & Fishbein, 2007; Jordan et al., 2005).

There are at least three issues that are to some degree overlooked in the present study. First, cognitive psychologists make a distinction between task switching and parallel processing. Task switching involves the rapid alternation between two or more tasks. In contrast, parallel processing involves the simultaneous performance of two or more tasks. From the present data, there is no way to tell which of these apply to the respondents' reports of multitasking. Second, the present study does not distinguish between decisions made about multitasking and the actual ability to multitask. For example, a person can choose to do two tasks at once yet not do them well together. Third, there probably are costs associated with multitasking (task-switching) that could apply to all generations. These costs could not be measured in the design of the present study. Cognitive psychologists have established that slowing of responses can occur when multitasking or when attempting to perform multiple tasks at once. Recent laboratory studies of task switching reveal multiple costs of switching between tasks (e.g., Phillip, Kalinich, Koch, & Schubotz, 2008). At a less fine-grained level, there could be long-term costs associated with multitasking. For instance, multitasking involving laptop computer use while sitting in a classroom lecture could negatively impact one's understanding of lecture material (Fried, 2008).

The present study asked participants about their at-home multitasking habits without distinguishing between tasks that might be more important than others (e.g., preparing a job presentation versus watching TV). It would be interesting to know whether engaging in an important task changes the propensity for an individual to

simultaneously perform another task, and whether this propensity changes with the generation from which the individual comes.

5. Conclusion

The proliferation of technological devices and new choices of software programs, especially of those that aid in communication, allows the integration of some tasks (e.g., chatting) while carrying out other tasks. The data from the present study suggest that large amounts of multitasking are occurring across all generations of persons in the United States. The main question of this research study was, are there generational differences in multitasking skills? The data show that the younger generations report lower difficulty ratings when multitasking and multitask more than the older generations. However, there was agreement across generations in relative ratings of difficulty of task combinations and agreement in choices of task combinations for multitasking. This finding is consistent with the idea that all generations share mental limitations affecting which tasks can be combined with other tasks. Thus, some basic human limitations in multitasking ability appear to be shared by all generations.

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