Computer and Internet Use Among People with Aphasia

Use of computers and the Internet are becoming increasingly critical in order to participate in many day-to-day activities. In 2001, Elman discussed a digital divide that was developing for people with aphasia with regards to the Internet and computer technology (Elman, 2001). This divide appears to have widened over the last decade, with computer and Internet access being routine in order to conduct many business or government transactions. In addition, social networking sites and tools such as Facebook, Twitter, and Skype have quickly become popular vehicles for personal, business, and political communication. The present study was undertaken in order to provide updated information about computer and Internet use among people with aphasia. These data may suggest whether an "action plan" is needed for increasing digital access and participation for people with aphasia.

METHOD

A questionnaire was designed for face-to-face administration to participants of an independent community-based Aphasia Center. Thirty-three individuals with aphasia who attended Aphasia Center services during a one-week period in September 2009 were included in the study. In order to obtain a general survey of computer and Internet use among people with aphasia, a diagnosis of aphasia by a speech-language pathologist was the only subject selection criterion used.

Administration of the questionnaire was accomplished in small groups of between 4 and 8 people with aphasia. A total of 33 individuals with aphasia completed the questionnaire, administered by a staff speech-language pathologist and a speech-language

pathology intern using supported conversation for adults with aphasia (SCA[TM], Kagan, 1998).

The questionnaire was designed to be brief and simple to complete. The first five questions required either a yes or no response and asked about past, current, and future use of a computer and the Internet. The remaining 10 questions requested specific information about computer use. These questions were divided into three time domains (past, current, future). Each time domain utilized a 5 point anchored response scale (1 = Never and 5 = A lot). These questions asked respondents to rate each of the three time domains for the following ten categories of computer use: Word processing, online shopping, e-mailing, online banking, Internet searching, reading of news/sports, online ticket purchasing, use of Facebook, use of Skype, and computer games. In addition, participants were given the opportunity to add other computer activities to the questionnaire. Pictographic support (Kagan & Shumway, 2003) was provided for each question. In addition, the questionnaire answer sheets included pictographs for each of the time domains.

Participant Characteristics

Participants ranged in age from 29 to 94 years (M = 62.15 years, SD = 15.63 years). Thirty-two of the participants had chronic aphasia (more than 6 months post-onset) and had completed individual speech-language treatment that was available to them through their insurance coverage. The range of time post-onset was 5 months to 18.4 years (M = 6.5 years; SD = 4.85 years). Of the thirty-three participants, twenty-four were Caucasian, six were Asian, two were African-American, and one was Hispanic. Ten participants were female and twenty-three were male.

RESULTS

General Computer Use

Of the 33 respondents, 25 individuals (76%) reported that they currently had a computer at their residence. Twenty-four individuals (73%) indicated that there was Internet access to their computer. Nineteen individuals (58%) reported that they currently used the computer. Twenty-six individuals (79%) reported that they had used the computer prior to their stroke. Twenty-seven individuals (82%) indicated that they would like to use the computer in the future.

Specific Computer and Internet Use

Past Use

The most common pre-morbid computer activity participants reported was having used a computer for word processing (M = 3.70; SD = 1.59). The ranking of the remaining computer and Internet activities was as follows: using e-mail (M = 3.03, SD = 1.91), online searching (M = 2.73, SD = 1.80), reading online news or sports (M = 2.61, SD = 1.65), playing computer games (M = 2.12, SD = 1.55), online shopping (M = 2.03, SD = 1.40), online banking (M = 1.94, SD = 1.51), making online travel arrangements (M = 1.94, SD = 1.53), using Facebook (M = 1.58, SD = 1.29), and using Skype (M = 1.45, SD = 1.12).

--Insert Figure 1 here--

Current Use

The most common current use of the computer and Internet was e-mail (M = 2.64, SD = 1.83), closely followed by reading online news or sports (M = 2.58, SD = 1.65).

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The remaining computer and Internet activities were ranked as follows: word processing (M = 2.21, SD = 1.49), online searching (M= 2.21, SD = 1.51), playing computer games (M = 2.21, SD = 1.53), making online travel arrangements (M = 1.88, SD = 1.43), online banking (M = 1.85, SD = 1.41), online shopping (M= 1.76, SD = 1.11), using Facebook (M = 1.61, SD = 1.22) and using Skype (M = 1.36, SD = 1.02).

--Insert Figure 2 here--

Future Use

The highest ranked use of the computer and Internet desired in the future was reading online news or sports (M = 3.45, SD = 1.56), closely followed by using e-mail (M = 3.42, SD = 1.67). The remaining computer and Internet activities were ranked as follows: using a computer for word processing (M = 3.33, SD = 1.55), online searching (M = 3.12, SD = 1.57), playing computer games (M = 2.76, SD = 1.54), online shopping (M = 2.61, SD = 1.41), online banking (M = 2.61, SD = 1.63), making online travel arrangements (M = 2.55, SD = 1.64), using Skype (M = 2.39, SD = 1.71), and using Facebook (M = 2.36, SD = 1.57).

--Insert Figure 3 here--

Other Computer and Internet Use

Two participants reported that in addition to the activities listed on the questionnaire, they currently used a computer for speech-language therapy related activities.

DISCUSSION

The results suggest that current computer and Internet use is reduced compared to pre-stroke levels. More than 75% of the respondents reported that they currently owned a

household computer with Internet access; however, fewer than 60% of the respondents reported using the computer after their stroke. The decline in usage is not attributable to lack of interest as more than 80% of the respondents reported that they were interested in using computers and the Internet in the future.

Different patterns of computer and Internet use were revealed across the three time domains. Prior to their strokes, respondents indicated that word processing was the most frequent reason for using the computer. Word processing use was reduced markedly after the stroke, likely due to spelling and written formulation issues secondary to aphasia with agraphia. Although Internet personal communication tools such as Facebook or Skype didn't exist prior to most participants' strokes, many reported being interested in learning to use these tools in the future. Online reading of news and sports was a highly desired future Internet activity. And given the availability of online screen readers, many people with aphasia could likely have enhanced access and comprehension to such content.

The present findings are consistent with the notion that specific training on computer and/or Internet skills is needed in order for people with aphasia to become proficient users (Egan, Worrall & Oxenham, 2004). However, given the rapid evolution of digital technology, it is likely that ongoing training or support is needed by people with aphasia in order to use new or updated computer hardware or software. One online support option suggested by Elman (2001) included providing assistance from "aphasia friendly" communicators who could use collaborative browsing in order to offer a flexible option for promoting digital access to people with aphasia. Two recent reports provide preliminary information on the use of this technology for people with aphasia

(Kuwabara, Hayashi, Uesato, Umadone & Takenaka, 2009; Yasuda, Nemoto, Takenaka, Mitachi , & Kuwabara, 2007).

The present study indicates that the digital divide for people with aphasia may be increasing. Individuals with aphasia are less likely to use previously learned digital technology after their stroke. And although social networking sites and tools such as Facebook, Twitter, and Skype offer enormous potential for reducing the isolation often caused by aphasia, successful use will not occur without intervention and support. Action by aphasiologists is needed in order to prevent people with aphasia from encountering significant barriers that are being created by new and expanding digital technology. Computer training programs and aphasia friendly Internet options must be made available in order to assist people with aphasia in negotiating a widening digital divide.

<div align="center">REFERENCES</div>

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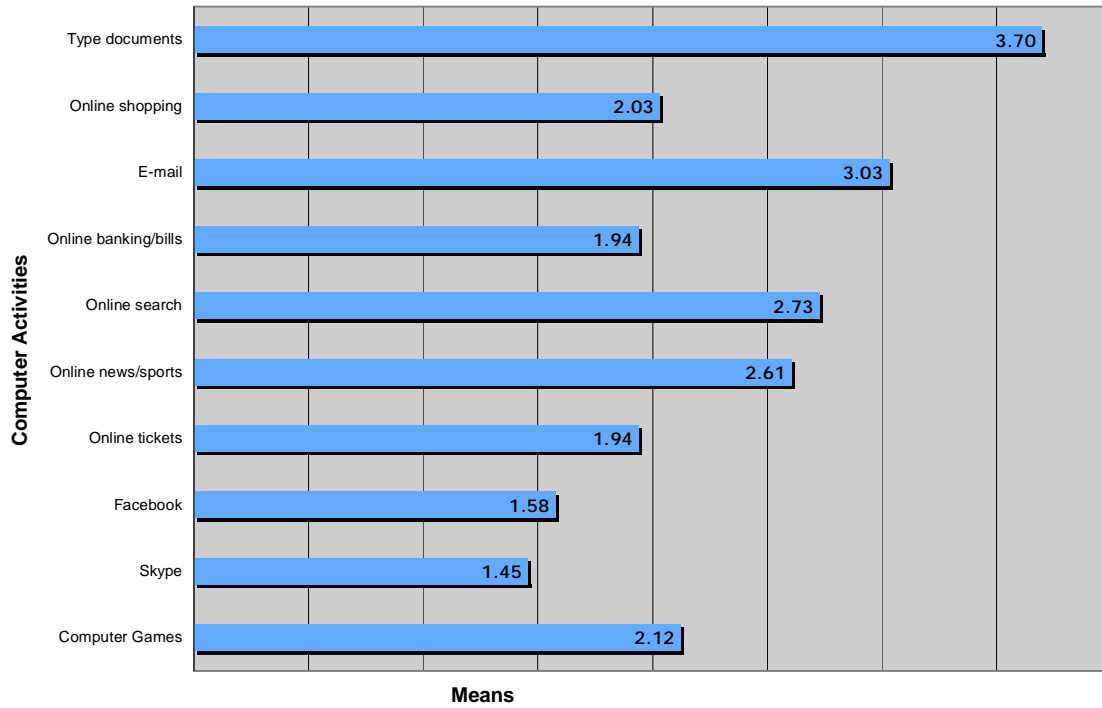   *Aphasiology, 21*(9), 867-882.

Past Use of Computer and Internet

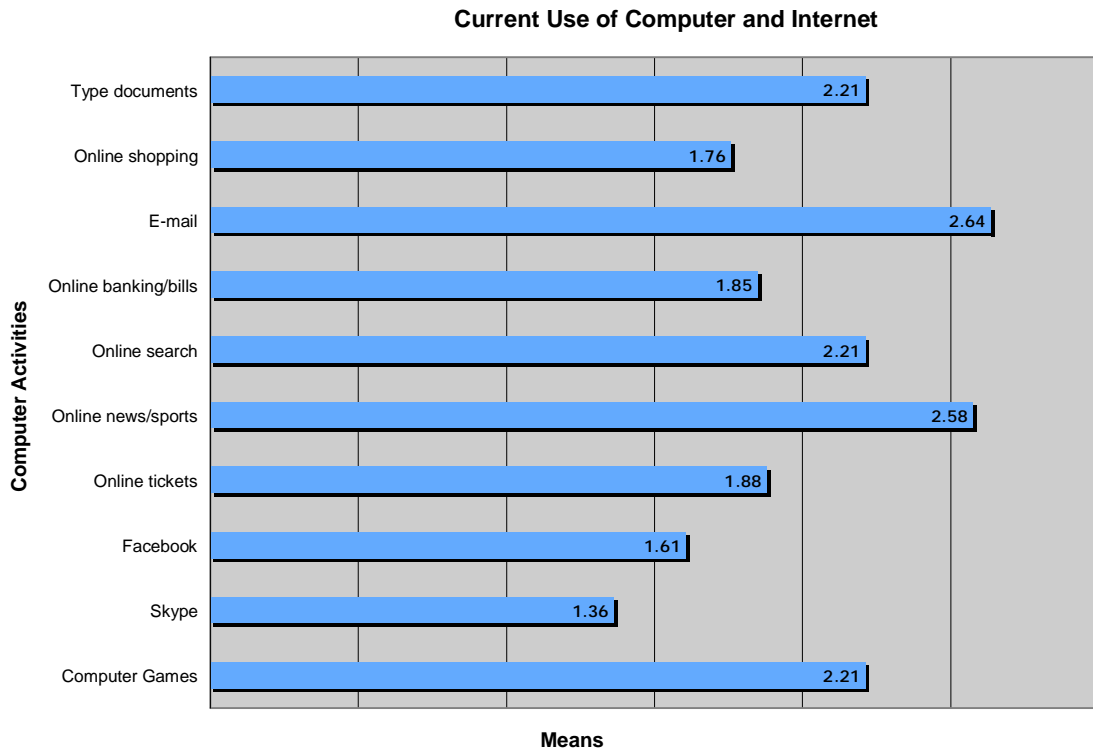Figure 1. Mean scores for past use of the computer and the Internet

Current Use of Computer and Internet

Computer Activities	Means
Type documents	2.21
Online shopping	1.76
E-mail	2.64
Online banking/bills	1.85
Online search	2.21
Online news/sports	2.58
Online tickets	1.88
Facebook	1.61
Skype	1.36
Computer Games	2.21

Figure 2. Mean scores for current use of the computer and the Internet.

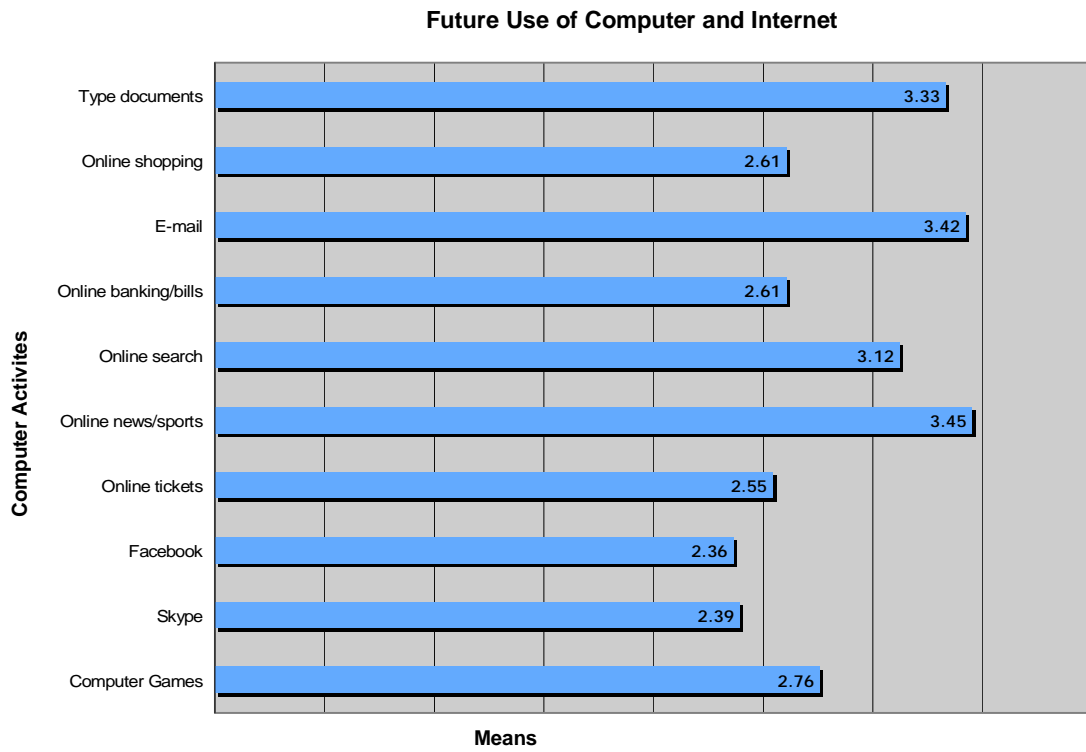**Future Use of Computer and Internet**

Figure 3. Mean scores for future desired use of the computer and the Internet.