

**CORE:  
Comprehensive Overview of  
Requisite Email Skills**

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**Computer Science Technical Report 02-01  
October 2002**

**Department of Computer and Information Science  
University of Oregon**

This report describes the development of the Comprehensive Assessment of Requisite Email Skills (CORE), a prototype evaluation process to assess the needs of individuals with brain injury for using electronic mail (email). CORE is part of a series of research activities being conducted by our work group ([www.think-and-link.org](http://www.think-and-link.org)<sup>1</sup>). The group is dedicated to developing and studying tools to facilitate social interaction over the internet for persons with cognitive-linguistic impairments due to acquired brain injury (ABI).

Our report is organized into four sections. Section 1 provides background information on the target population and the results of preliminary work that motivated this project (p. 2). Section 2 presents an overview view of the CORE evaluation process and procedures (p. 8). Section 3 contains the CORE manual and protocols (p. 15) and Section 4 presents CORE data on our first longitudinal participant (p. 46).

## **SECTION ONE: BACKGROUND**

### **Target Population**

ABI results from a variety of etiologies including trauma, disease (e.g., tumor, infection), hypoxic events (e.g., drowning, cardiac arrest) and stroke. Prevalence estimates of brain injury due to trauma alone range from 2.5 to 6.5 million individuals annually in the United States. Interestingly, the incidence rate for traumatic brain injury is higher than that for spinal cord injury, multiple sclerosis, cerebral palsy, and muscular dystrophy combined (BIA, Inc., 2000). The numbers of brain injury survivors are growing in part due to advances in emergency medical care and neurosurgical treatment.

Several characteristics distinguish people with ABI from other neurologically impaired populations (e.g., persons with developmental conditions or progressive illnesses such as Alzheimer's disease). One of the hallmark characteristics is the heterogeneity of the population. The vast differences in the types of brain insults interacts with the neurological, psychological and sociological profiles unique to each person to produce a patient population where no two individuals are alike. Demographic studies show that it is also a young population. Most brain injuries occur in young people between the ages of 17-30 years. Further notable is the fact that most people with ABI experience a sudden, dramatic alteration in functioning.

A typical survivor of acquired brain injury is a young to mid-life adult living in either government assisted housing, with family or in their own house or apartment. Many individuals are left with permanent alterations in social, behavioral, physical and cognitive functions (Sohlberg, Mateer, 2001). A well documented, universal handicap is social isolation (Zencius & Wesolowski, 1999). Table 1 lists examples of cognitive, physical and psychosocial issues which commonly occur following ABI.

<b><i>Cognitive impairments may occur in:</i></b>		
<input type="checkbox"/> memory	<input type="checkbox"/> self awareness	<input type="checkbox"/> impulsivity
<input type="checkbox"/> initiation/planning/ organization	<input type="checkbox"/> attention	<input type="checkbox"/> visuoperceptual processing
<input type="checkbox"/> language (reading/writing)	<input type="checkbox"/> problem solving	<input type="checkbox"/> error detection/correction
<b><i>Sensory impairments may occur in:</i></b>		
<input type="checkbox"/> vision	<input type="checkbox"/> hearing	<input type="checkbox"/> touch/temperature/taste
<b><i>Motor issues:</i></b>		
<input type="checkbox"/> reduced mobility	<input type="checkbox"/> poor balance/coordination	<input type="checkbox"/> right hemiplegia
<input type="checkbox"/> reduced hand/finger use		<input type="checkbox"/> left hemiplegia
<b><i>Psychosocial issues:</i></b>		
<input type="checkbox"/> restlessness		<input type="checkbox"/> anxiety
<input type="checkbox"/> anger	<input type="checkbox"/> reduced self esteem	<input type="checkbox"/> social isolation
<input type="checkbox"/> depression	<input type="checkbox"/> fear	<input type="checkbox"/> social inappropriateness

Table 1. Cognitive, physical and psychosocial domains that are frequently disrupted after brain injury.

Each impairment may occur in combination with others and each has its own range of severity.

### **Preliminary Work**

Our pilot work (Sohlberg, Ehlhardt, Fickas & Todis, in press) suggested that email, if accessible, may offer a method to reduce the widespread social isolation for people with acquired cognitive-linguistic impairments (CLI). The increased awareness of the need for universal access has raised many questions regarding the needs of computer users with disabilities (Elman, 2001). Interest in Human Computer Interface (HCI) and assistive technology research is growing with calls for personalization of user interfaces for different ability ranges (Newell & Gregor, 2000). Most of the HCI research, however, focuses on the needs of persons with physical or sensory impairments (e.g. blind users) (Barnacle, 1999) or persons with developmental learning disabilities (Wehmeyer, 1999). There is one report describing access barriers due to memory and language impairments (Singh, 2001), but it does not address the attention and executive function impairments common to the brain injury population. Improvements in both the design and implementation of adaptive interfaces specific to persons with cognitive-linguistic impairments due to acquired brain injury assumes that we know the usability

requirements of this population. Unfortunately, however, there is little usability evaluation research investigating how people with CLI cope with standard or specially designed assistive user interfaces (Elman, 2001). The lack of research on HCI design for persons with CLI and the potential benefits of email motivated the formation of our research group.

Sohlberg's work focuses on developing and evaluating compensatory cognitive systems for persons with brain injury. In recent years, her university clinical practice has noted the increased interest on the part of clients to explore using electronic devices such as prosthetic memory aids (Sohlberg & Mateer, 2001). More systematic study of the barriers and needs of persons using electronic devices requires the development of monitoring devices and an understanding of computer technology on the part of rehabilitation researchers. In the spring of 2000, the mutual interests of Sohlberg and Fickas led to the formation of a graduate seminar at the University of Oregon for students in Computer Science with the help of several persons with brain injury and their caregivers. The topic was the use of technology to overcome social isolation suffered by people with cognitive impairments. The students in the course worked to develop a web enabled system that supported e-mail interaction. The prototypes that came out of the seminar provided enough of a proof of concept to encourage further exploration.

The seminar results encouraged the authors to run a more formal, follow-up study during summer 2000. This study focused on HCI issues in the population, and as a spin-off, the effectiveness of traditional user interface (UI) usability experiments with the population. Eight survivor/caregiver pairs displaying different cognitive-linguistic profiles were recruited to help evaluate the different e-mail interface conditions. All subjects indicated feeling socially isolated and desired more contact with family and friends. None were currently able to use a computer independently and had little or no experience with electronic mail. We can summarize the results as they pertain to this proposal as follows: There is high variability in the ability of those in the population to use traditional user interface designs. The project revealed that a one-size-fits-all approach that attempts to design the "cognitive-impaired interface" would not be effective. The study further helped to refine methods to measure user e-mail skills and document user response to support. Specifically, we developed a qualitative evaluation

process to log and analyze critical incidents observed by a multidisciplinary team of researchers in computer science, social science and cognitive rehabilitation while jointly watching participants compose and send e-mails. A summary of this work can be found in Sohlberg, et al., in press.

More recently, we have conducted focus groups around the state of Oregon, in both rural and urban settings. We have interviewed over 80 individuals and collected useful, and as far as we are aware, unique information on potential email use by both TBI survivors and their caregivers. Some items of interest from our studies are given below:

When asked why they would like to use (or currently use) email, participants' responses fell into one of the following categories:

- Maintain existing relationships/contacts
- Form new relationships/contacts
- Organizational assistance (e.g., appointment management, emergency contacts, have people send prompts)
- Information source about topics of interest
- Entertainment/therapeutic use (e.g., something to do, cognitive stimulation.)
- Self advocacy (i.e., can email legislators)

When asked about the advantages of email over other forms of communication such as telephone or mail, participants' responses fell into the following four categories:

- Efficiency (can be faster, less expensive than other modes of communication; essentially brings community inside your own residence)
- Therapeutic (something to anticipate, stimulates your brain)
- Accommodates cognitive problems (e.g., no time pressure; you can refer back and have a record of what someone wrote to you and what you responded; email can provide a prompting tool)
- It is safer than face to face contact.

Harder to quantify, but consistent throughout focus group sessions and lab studies, was a general enthusiasm by survivors for a prospect of gaining access to email. The current feeling is one of resignation that they will not be able to use a computer, certainly not email. Many TBI survivors in our focus groups reported having more than

one computer gathering dust in a corner or closet. In the groups we met with, there was unqualified excitement at the thought of being able to do something currently thought impossible.

### **Theoretical Foundation Underlying CORE**

Previous to our work, we are unaware of any research dedicated to developing methods to evaluate and monitor individual user needs, match the needs to interface design options, and monitor user satisfaction for persons with CLI desiring to utilize the internet or email. We began by looking to the fields of assistive technology (AT) and alternative augmentative communication (AAC) for theoretical grounding in conceptualizing the evaluation of needs and abilities for email users with cognitive-linguistic impairments. Both AT and AAC offer frameworks for organizing an evaluation process for potential technology users challenged by such disabilities.

The Assistive Technology Outcomes Model (ATOM) (Weiss- Lambrou, 2002) emphasizes a careful match between the person and technology and the environments in which the technology will be used. An important component of the model is to assess the social participation and quality of life needs of the user (Scherer, 1997; Weiss-Lambrou, 2002). Similarly, the Participation Model (Beukelman & Mirenda, 1992), used in AAC, emphasizes the need to evaluate the user within his or her individual ecology. For example, this model includes the assessment of "opportunity" and "access" barriers for communication by looking at partners and environmental parameters relevant to communication.

A critical feature of both the ATOM and Participation Model is the emphasis on functional, dynamic assessment rather than use of structured, standardized, norm-referenced tools to determine the potential for success using an AT/AAC system. Functional assessment depends upon observing performance on the actual activities that will be performed (e.g., email) in addition to assessing the factors unique to each person's abilities and environment that potentially influence their ability to successfully use technology. The dynamic quality of the assessment encourages the evaluation process to be tailored to the performance of the individual based on what is discovered during the

evaluation process. Examination of such models led us to adopt the following underlying assessment tenets:

1. Assessment should include direct observation of performance on functional tasks. It is important to directly observe participants' while performing actual email tasks.
2. Assessment should be dynamic. The testing of hypotheses regarding the nature of participants' strengths and limitations requires the examiner to modify aspects of the email task during the assessment process.
3. Assessment needs to include relevant aspects of the person's physical and social environment. An understanding of the individual's social network, leisure and vocational activities as well as the environment in which assistive services will be used is imperative.
4. Assessment needs to capture the perspectives of all relevant stakeholders. It is important to capture the views of participants, their careproviders, and potential email partners regarding opportunity and access barriers and expectations for using email.

The importance of a 'user-centered' approach to the assessment and implementation of assistive technology becomes clear when examining recent research accounting for why many individuals with disabilities discontinue use of technology supplied to them. Studies suggest that the ability to match individual needs to the selection and development of devices is critical, and that assessment practices for assistive technology must extensively involve the individual consumer (Bryant & Bryant, 1998; Reiman-Reiss 1999; Scherer, 2002).



## SECTION TWO

### OVERVIEW OF CORE

#### **Purpose**

CORE allows us to collaborate with individuals who have ABI and evaluate their individual skills and ecology to determine their needs for successfully using email. Ultimately, the evaluation process is designed to allow the delivery of an email solution or composite set of software tools tailored to needs of the individual participant profiles. In addition to helping match a person with appropriate computer tools, CORE also serves as an outcome measure to determine the impact (or lack thereof) produced by the participant interacting with the email system. Finally, we seek a more lofty goal with our hope that the general principles and procedures underlying CORE will be relevant to evaluating other assistive technology needs in persons with cognitive-linguistic disturbances.

#### **CORE Components**

CORE is an examiner-facilitated process. It is designed to be used by professionals who have experience working with ABI survivors and their families. Nine components comprise CORE. These components are described below and may be viewed in the CORE manual provided in the following section.

*Computer User Profile:* This questionnaire provides relevant demographic information about the client, the brain injury, self/other report of cognitive-linguistic symptoms, and current and previous computer use.

*Email Task Assessment:* A "mock up" e-mail system permits direct observation of participant performance during a wide range of email tasks. Unlike standardized testing, which requires strict adherence to task instructions, the examiner is free to modify input to the individual (e.g., repeat instructions; increase prompting) in order to determine the conditions necessary for optimal performance.

There are three clusters of email tasks requiring the user to read and respond to hypothetical email partners. The *Email Task Assessment* allows evaluation of basic computer knowledge and skills as well as compares response within different task conditions such as navigation modes (e.g., mouse vs. arrow key interface) and type of prompting (e.g., computer speech vs. text display instruction). During completion of the email tasks, the examiner evaluates potential difficulties relevant to motor and physical functioning, and a variety of cognitive domains including linguistic functioning (e.g., reading and writing), attention, memory, learning, and problem solving. Psychosocial issues such as motivation are also observed. A wide range of quantitative indices and qualitative observations are recorded.

*Natural Communication/Activity Patterns and Environmental Assessment:* A home visit is conducted to understand and document the current type and level of social and community interaction as well as to assess the physical environment in which the email system would be placed. The participant is asked about type and frequency of social interactions including phone, face to face interactions in the community, letters etc. A log of typical recreational and social activities is constructed. The participant is also asked to show the examiner the space where the computer would be placed. Space, ambiance, electrical/connection needs (e.g., presence of a grounded plug, possibility of DSL) are described.

*Environmental & Capabilities Self Assessment:* The primary objective is to identify access and opportunity barriers and resources from the perspective of the participant and significant other. The protocol is completed using a structured interview process asking the participant (and/or caregiver) whether there are issues in the domains of physical, cognitive, and psychosocial functioning or computer knowledge that would affect the participant's ability to successfully use email. For those areas that are identified as potential barriers, the participant is asked to provide a specific example of the issue and rate the problem on a severity scale.

*Goals and Expectations:* Continuing the aforementioned interview process, the participant (and/or caregiver) is assisted in developing a list(s) of goals and expectations relevant to using email. Going through each of the previously rated domains, the participant is asked whether it is an area he or she would hope or expect to change if email were used regularly. From this list, the participant is helped to generate goals. A goal attainment scale is then constructed for each goal by assisting the participant in identifying “most favorable outcome”, “more than expected success”, “expected level of success”, and “less than expected success”. The examiner also records the names and contact information of the partners with whom the participant would like an email exchange.

*Email Partner Expectations:* Potential email partners are contacted to gather relevant information on email connections and to establish their preferences and expectations for becoming an email partner to the participant.

*Technology Fit Summary:* Once information has been gathered from the previously described assessments, the information is used to complete a list of optimal email features and needs. The email system is customized for the client based on this information.

*Training Plan:* Using the information obtained throughout the assessment, an initial training plan is developed. The plan identifies the requisite skills and knowledge needed for the participant to begin emailing. The sequence and training targets are listed.

## **CORE Schedule**

CORE is designed to be administered over a period of one to two weeks. Below we describe the schedule and sequence for administering the previously discussed assessment components:

- Initial contact

The examiner mails the *Computer User Profile* to participant or careprovider as appropriate. It takes a person without cognitive-linguistic impairment approximately 15 minutes to complete the form. They are asked to bring the completed form to their first visit.

- Visit 1

*EMAIL Task Assessment:* The client and careprovider come to the evaluation laboratory. The administration of the email tasks lasts approximately 60-90 minutes.

- Visit 2

*Home Visit:* A home observation is conducted to complete the *Natural Communication and Activity Patterns and Environmental Assessment Sheet*. This visit is generally one hour in duration. In some cases, two visits may occur if more time is needed to gather information.

- Visit 3

*Interview:* The client and careprovider return to the evaluation laboratory for a 60-90 minute visit. During this visit, the *Environmental & Capabilities Self Assessment, Goals and Expectations Sheets* and *Desired Email Partner List* are completed.

- Partner Phone (or Email) Contact: The potential email partners identified by the participant are contacted to obtain information on their email system and preferences for email contact. This information is recorded on the *Email Partner Expectation Sheet*.

- The examiner uses information gathered from above contacts to complete *Technology Fit Summary Sheet* and *Training Plan*.

- Assembly and delivery of email system.

- **Initiation of training plan.**

The CORE is necessarily a time-intensive process. The complexity involved in evaluating an individual 's skills and limitations and his or her natural environment requires a time committment. Our administration of the prototype CORE which imposes no time constraints requires 2-3 hours of face-to-face contact and 1-2 hours of home visit contact with an examiner familiar with brain injury. An additional 1-2 hours is required to contact potential email partners and draft the Technology Fit Sheet and the Training Plan.

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## **SECTION THREE CORE MANUAL**

This section contains the protocols corresponding to each of the CORE components. Specific examiner instructions are supplied for several of the components. As described in the previous section, the CORE consists of:

Computer User Profile Project.....	16
Email Task Assessment Project .....	20
Email Task Assessment Script Project .....	25
Email Task Assessment Sheet Project .....	29
Email Task Assessment Quiz Project .....	32
Sample Screen Shots Project.....	33
Natural Communication / Activity Patterns and	
Environmental Assessment Sheet Project .....	38
Environmental & Capabilities Self Assessment Project .....	40
Goals and Expectations Sheet Project .....	41
Desired Email Partner List Project.....	42
Email Partner Expectation Sheet Project.....	43
Technology Fit Summary Sheet Project.....	44
Skills Training Sheet Project .....	45



## Computer User Profile

### Section I

1. Gender:            female        male
2. Date of birth:       \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
                                  month        day        year
3. Ethnicity:            Caucasian                            Asian  
                           African American                Hispanic/Latino  
                           Native American                Other \_\_\_\_\_
4. Education:            under 8<sup>th</sup> grade                    some post-high school education  
                           8<sup>th</sup> – 11<sup>th</sup> grade                college graduate (four-year degree)  
                           high school graduate            post-graduate education
5. Living situation:    home/apartment                assisted living facility
6. People living in your home (check all that apply)  
 domestic partner/spouse        children            parents        roommate  
 paraprofessional careprovider    other \_\_\_\_\_
7. Do you have a paraprofessional careprovider?    yes        no  
    If Yes: How many hours per week?  
           1-10            11-20        21-40        over 40
- 
- 

### Section II

1. Approximately, how frequently do you do the following activities? (CHECK ONE BOX FOR EACH ITEM)

	Several times a day	About once a day	3-5 days a week	1-2 days a week	Every few weeks	Less often	Never
a. Spend time with friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Talk on the phone with friends or relatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Participate in a physical activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Play cards or board games with others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Do volunteer work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Take a class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Go to therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Attend a religious service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Attend a club meeting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Spend time reading a book, magazine, or newspaper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Watch TV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Play a video or computer game	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Select one person who is important to you that you keep in contact with who lives within one hour (driving time) from you.

a. What is this person's relation to you? (CHECK ONE BOX)

- |   |                                       |
|---|---------------------------------------|
| <input type="checkbox"/> Girlfriend/boyfriend | <input type="checkbox"/> Relative     |
| <input type="checkbox"/> Spouse/partner       | <input type="checkbox"/> Careprovider |
| <input type="checkbox"/> Friend               |                                       |

b. How frequently do you communicate with this person using each of these modes of communication? Select a frequency for each mode of communication. (CHECK ONE BOX FOR EACH ITEM)

	Several times a day	About once a day	3-5 days a week	1-2 days a week	Every few weeks	Less often	Never
a. In person	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Telephone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Electronic mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Written notes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Select one person who is important to you that you keep in contact with who lives more than one hour (driving time) from you.

a. What is this person's relation to you? (CHECK ONE BOX)

- |   |                                       |
|---|---------------------------------------|
| <input type="checkbox"/> Girlfriend/boyfriend | <input type="checkbox"/> Relative     |
| <input type="checkbox"/> Spouse/partner       | <input type="checkbox"/> Careprovider |
| <input type="checkbox"/> Friend               |                                       |

b. How frequently do you communicate with this person using each of these modes of communication? Select a frequency for each mode of communication. (CHECK ONE BOX FOR EACH ITEM)

	Several times a day	About once a day	3-5 days a week	1-2 days a week	Every few weeks	Less often	Never
a. In person	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Telephone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Electronic mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Written notes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. For what purposes would you use email:

- |  |   |
|--|---|
| <input type="checkbox"/> contact family        | <input type="checkbox"/> meet new people                      |
| <input type="checkbox"/> contact friends       | <input type="checkbox"/> inquire about business/organizations |
| <input type="checkbox"/> contact professionals | <input type="checkbox"/> forward information                  |
| <input type="checkbox"/> plan an event         | <input type="checkbox"/> other _____                          |

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### Section III

1. Date of your first head injury:

\_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
month      day      year

2. How did first head injury occur? (may check more than one)

- |   |  |
|---|--|
| <input type="checkbox"/> illness/tumor                | <input type="checkbox"/> weapons accident  |
| <input type="checkbox"/> motor vehicle crash          | <input type="checkbox"/> fall              |
| <input type="checkbox"/> assault/abuse                | <input type="checkbox"/> drugs/medications |
| <input type="checkbox"/> pedestrian/ bicycle accident | <input type="checkbox"/> heart attack      |
| <input type="checkbox"/> drowning                     | <input type="checkbox"/> stroke/aneurysm   |
| <input type="checkbox"/> OTHER _____                  |  |

3. Length of initial in-patient hospitalization?

- |   |  |
|---|--|
| <input type="checkbox"/> went home same day | <input type="checkbox"/> 1-3 months                        |
| <input type="checkbox"/> 1-2 days           | <input type="checkbox"/> 3-6 months                        |
| <input type="checkbox"/> 3-7 days           | <input type="checkbox"/> If over 6 months, how long? _____ |
| <input type="checkbox"/> 1-4 weeks          | <input type="checkbox"/> DON'T KNOW                        |

4. Estimate length of coma:

- |                                    |                                    |  |
|------------------------------------|------------------------------------|--|
| <input type="checkbox"/> none      | <input type="checkbox"/> 1-3 days  | <input type="checkbox"/> 4-6 days            |
| <input type="checkbox"/> 1-2 weeks | <input type="checkbox"/> 2-4 weeks | <input type="checkbox"/> more than one month |

5. Primary cognitive impairment:

- |  |  |   |
|--|--|---|
| <input type="checkbox"/> memory                    | <input type="checkbox"/> attention       | <input type="checkbox"/> initiation                 |
| <input type="checkbox"/> planning/organization     | <input type="checkbox"/> problem solving | <input type="checkbox"/> visuoperceptual processing |
| <input type="checkbox"/> language(reading/writing) | <input type="checkbox"/> impulsivity     | <input type="checkbox"/> error detection/correction |
| <input type="checkbox"/> limited self awareness    |  |   |

6. Sensory impairment:

- |  |                                  |  |
|--|----------------------------------|--|
| <input type="checkbox"/> vision              | <input type="checkbox"/> hearing | <input type="checkbox"/> touch/temperature |
| <input type="checkbox"/> other/explain _____ |                                  |  |

7. Motor impairment:

- |  |  |
|--|--|
| <input type="checkbox"/> difficulty ambulating   | <input type="checkbox"/> right hemiplegia    |
| <input type="checkbox"/> reduced hand/finger use | <input type="checkbox"/> left hemiplegia     |
| <input type="checkbox"/> movement/coordination   | <input type="checkbox"/> other/explain _____ |

8. Emotional issues:

- |                                       |  |                                  |
|---------------------------------------|--|----------------------------------|
| <input type="checkbox"/> restlessness | <input type="checkbox"/> anger               | <input type="checkbox"/> sadness |
| <input type="checkbox"/> loneliness   | <input type="checkbox"/> reduced self esteem |                                  |
| <input type="checkbox"/> fear         | <input type="checkbox"/> anxiety             |                                  |
| <input type="checkbox"/> other _____  |  |                                  |

---

---

## Section IV

1. Used computer prior to injury?  yes  no
2. Used computer following to injury?  yes  no
3. Do you currently own a computer?  yes  no
4. Are you able to read a short, type-written note?  yes  no
5. Are you able to write (compose) a short, type-written note?  yes  no
6. When you use the keyboard do you:  
 hunt and peck/1 finger  
 type but need to look at all the keys  
 type without looking much at keyboard
7. Is there someone available to help you if you want to use computer?  yes  no
8. If you are not using a computer, why not:  
 financial  it is too complicated  
 motor problems  takes too long  
 visual problems  feel intimidated  
 hand-eye problems  not interested  
 other \_\_\_\_\_
9. In the past six months, how frequently have you used a computer or the Internet for the following purposes? (CHECK ONE BOX FOR EACH ITEM)

	Several times a day	About once a day	3-5 days a week	1-2 days a week	Every few weeks	Less often	Never
a. Word processing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Organization (schedule, reminders, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Games	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Finding information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Buying a product or service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Downloading (music, images, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. email	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Chatrooms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## *E-Mail Task Assessment*

### **Setting:**

The participant sits facing the computer. The examiner sits slightly behind and to one side of the participant with a clear view of keyboard, screen and client's face.

### **I. Initial Navigation Demonstration: Mouse vs. Arrow**

The first activity is an assessment and demonstration of how to navigate in the computer program. During separate trials, the examiner models the use of the mouse and arrow key navigation. After being presented with the model, the client attempts the same mouse and arrow tasks. (Navigation-related observations are recorded in Section 5 of the E-Mail Task Assessment Sheet.) The client is allowed to practice using the arrow and mouse. When the client indicates feeling somewhat comfortable, a "mouse test" is administered to obtain a quantitative index of efficiency. (See sample screen shots A and B on pages [31 & 32]. The time to complete the mouse task is recorded on the protocol under computer skills.

### **II. E-Mail Tasks - Overview**

The following table outlines three clusters of CORE tasks (i.e., Task 1a-c, Task 2a-c, Task 3a-c), including the navigation modes (e.g., mouse vs. arrow), prompt conditions (speech vs. no speech vs. text list), the target functions employed during the tasks (e.g., "start, inbox, read, save"), the hypothetical e-mail partners (e.g., doctor, dentist, counselor), and the E-Mail Task Assessment Sheet Sections (1-6) targeted in each cluster. For Tasks 2a, 2b, and 2c, the examiner is required to evaluate all aspects of cognition under Section 3 (i.e., attention, executive functions, and procedural learning); however, for Task 2c, the examiner pays particular attention to initiation, problem solving, and task completion time. Sample screen shots to illustrate different types of email tasks are shown on pages 34 to 39].

## E-mail Tasks with Corresponding Impairment Domains by Section

(see E-Mail Task Assessment Sheet p.)

E-mail Tasks 1a, 1b, 1c (Start, Inbox, Read, Save)	Corresponding Section to be Completed
Task 1a: mouse condition; read Doctor's email aloud and save	Section 1: Physical – Observed across all e-mail tasks Section 2: Language <ul style="list-style-type: none"> <li>• auditory comprehension of instructions</li> <li>• reading comprehension 1a, 1b, 1c</li> </ul> Section 3: Cognition – Observed across all e-mail tasks Section 5: Response to Help – Observed across all e-mail tasks
Task 1b: arrow condition; read Dentist's email aloud and save	
Task 1c: arrow plus speech; read Counselor's email aloud and save	
E-mail Tasks 2a, 2b, 2c (Read, Reply, Compose, Send)	Section
Task 2a: mouse condition; read and reply to Doctor's message OR Task 2a: arrow condition; read and reply to Doctor's message	Section 1: Physical – all tasks Section 2: Language <ul style="list-style-type: none"> <li>• written expression 2a-c</li> </ul>
Task 2b: mouse condition; read and reply to Dentist's message OR Task 2b: arrow conditions; read and reply to Dentist's message	Section 3: Cognition – all tasks, plus: <ul style="list-style-type: none"> <li>• initiation 2c</li> <li>• problem solving 2c</li> <li>• time 2c</li> </ul>
Task 2c: mouse plus speech: read and reply to Counselor's message OR Task 2c: arrow plus speech; read and reply to Counselor's message	Section 4: Psychosocial – all tasks Section 5: Response to Help – all tasks
E-Mail Tasks 3a, 3b (Read, Open, Print, Close)	Section
Task 3a: mouse plus text list condition; read message from Doctor and print OR Task 3a: arrow plus text list conditions; read message from Doctor and print	Section 1: Physical – all tasks Section 3: Cognition – all tasks Section 4: Psychosocial – all tasks
Task 3b: mouse plus text list condition: read message from Dentist and print OR Task 3b: arrow plus text list condition: read message from Dentist and print	Section 5: Response to Help – all tasks

**Note:** Section 6 (Task Conceptualization Quiz) is completed following Task 3b.

## **Overview of Sections in the Impairment Domains and All Tasks**

### **Section 1: Impairment / Physical**

Specific e-mail tasks: All

Be sure to observe and note any behavior that or may suggest an impairment. In the corresponding line, write a concise description of problem (e.g., “rt. Index finger typing due to left hemiparesis” and then give a rating of the level of severity you judge the impairment (1=slight; 2=moderate; 3=severe). Examples of observations:

- **Motoric movements while keyboarding:** Hands/fingers used? Tremor? Ability to depress buttons and release? Speed? Body position?
- **Visuoperceptual:** Scanning behavior, squinting, moving toward screen or to one side, touching screen to keep place, asking for help reading
- **Verbal indicators:** Note any comments client offers that provide insight to difficulties or indicate problem symptoms such as complaining about back pain while sitting. If you observe a behavior that may be an indicator of an impairment it is acceptable to ask for clarification (e.g., a question to determine whether squinting is an indicator of a visuoperceptual problem or glare on the screen).

### **Section 2: Impairment / Language:**

Specific e-mail tasks: Tasks 1a, 1b, 1c; Tasks 2a, 2b, 2c

- **Auditory comprehension:** Observe whether client comprehends what you are asking during the portion of the initial instructions for 1a when you ask him/her to restate the task. If you note a problem, give a rating of the level of severity you judge the impairment (1=slight; 2=moderate; 3=severe)
- **Reading comprehension:** Score on-line the percent correct and total time to complete comprehension quiz of task 1a –1c
- **Written expression:** Complete the analysis components for task 2a, 2b (refer to protocol sheet for specific components)

### **Section 3: Impairment / Cognition:**

Specific e-mail tasks: All tasks; focus of 2c is evaluation of latency, problem solving and overall task time

Using the parameters listed below, log any evidence of problems and give a rating of the level of severity you judge the problem (1=slight; 2=moderate; 3=severe). (For the initiation component, note latency for completing task 2c.)

#### **Attention/Memory Observations**

- Ability to shift between different functions on the screen
- Holding on to instructions
- Holding on to help that is supplied

#### **Executive Function Observations**

- Initiation latency for task 2c
- Error monitoring
- Impulsivity
- Organization of content
- Problem solving strategy for task 2c

#### **Procedural Learning Observations**

- Identify several behaviors that you need to demonstrate or teach (e.g., a keystroke function such as backspace, clicking mouse to select option). Make a tally mark for every time you need to remind/correct them of that behavior. Note whether they learn it over time.
- Record Total Time for Task 2c

### **Section 4: Psychosocial Response to E-mail**

Specific e-mail tasks: Tasks 2a, 2b, 2c; Tasks 3a, 3b

- Rate level of interest/engagement: 1=independently indicates feeling enthusiastic or interested by the possibility of being able to email; 2=seems interested based on attentive attitude; 3=not overly engaged in task, but willing to complete it; 4=seems disinterested based on verbal response or inclination to engage in alternative activities.
- Record in corresponding space any ideas for personalizing email that the individual offers.



### **Section 5: Help Response**

Specific e-mail tasks: All; focus of 1a, 1b, and 1c to help determine preferred navigation system before advancing to Task 2.

Note preferred navigation system (during task 1a-1c). Also, note differences in response to the varying help conditions (e.g., speech prompt, text reminder list) as well as a general description of their approach to obtaining help.

- Prefers mouse or arrow (1a – 1c)
- Response to speech (1c, 2c)
- Response to text reminder list (3a, 3b)
- Response to examiner prompt (All)
- Approach to help (e.g., dependence on examiner vs. trial & error) (All)

### **Section 6: Task Conceptualization**

Administer the “Task Conceptualization” quiz after completion of task 3b

- Percent score on quiz
- Log all questions, requests for help

## ***Email Task Assessment Script***

### ***Examiner Script for E-Mail Tasks 1-3*** (Follows mouse/arrow navigation screening)

#### **E-mail Task**

##### **1. Introduction**

“I am going to ask you to do a series of computer activities designed to see what skills it would be helpful to teach you in order for you to use email. You will be reading and writing computer messages to pretend people. So, let’s begin with you telling me back what this is about...” Repeat and explain as necessary.

<b>RECORD ON E-MAIL TASK ASSESSMENT SHEET:</b>
--

- |  |
|--|
| <input type="checkbox"/> Section 2: Impairment/Language <ul style="list-style-type: none"><li>• auditory comprehension of instructions</li></ul> |
|--|

##### **2. Task 1a-1c:**

###### **Task 1a**

“We will start the first activity. The Doctor has just sent you an email message. I want you to start the email program, then open the message from the Doctor, then read the message aloud. After you’ve read the message, I will ask you some questions. So using the mouse, you will start the e-mail program, open the message, read it aloud, then answer some questions about the message.”

<b>RECORD ON E-MAIL TASK ASSESSMENT SHEET:</b>
--

- |   |
|---|
| <input type="checkbox"/> Section 1: Impairment/Physical   |
| <input type="checkbox"/> Section 2: Impairment/Language <ul style="list-style-type: none"><li>• note oral reading ability</li></ul> |
| <input type="checkbox"/> Section 3: Impairment/Cognition  |
| <input type="checkbox"/> Section 5: Response to Help Modes  |

(The user reads each question off a separate piece of paper and chooses a response. The e-mail message remains on the screen for user reference while answering the questions.)

<b>RECORD ON E-MAIL TASK ASSESSMENT SHEET:</b>
--

- |   |
|---|
| <input type="checkbox"/> Section 2: Impairment/Language <ul style="list-style-type: none"><li>• Reading comprehension</li></ul> |
|---|

“Good! Now, the last thing I want you to do is this (points to the line in the message which says ‘Save for future reference’).”

<b>RECORD ON E-MAIL TASK ASSESSMENT SHEET:</b>
--

- |  |
|--|
| <input type="checkbox"/> Section 1: Impairment/Physical  |
| <input type="checkbox"/> Section 3: Impairment/Cognition |

<input type="checkbox"/> Section 5: Response to Help Modes
--

**Task 1b**

“You will do something similar in the next activity. This time the Dentist has sent you an e-mail message. I want you to start the email program, then open the message from the Dentist, then read the message aloud. After you’ve read the message, I will ask you some questions. So using the arrow key, you will start the e-mail program, open the message, read it out loud, then answer some questions about the message.”

<b>RECORD ON E-MAIL TASK ASSESSMENT SHEET:</b>
<input type="checkbox"/> Section 1: Impairment/Physical
<input type="checkbox"/> Section 2: Impairment/Language <ul style="list-style-type: none"><li>• note oral reading ability</li></ul>
<input type="checkbox"/> Section 3: Impairment/Cognition
<input type="checkbox"/> Section 5: Response to Help Modes

(The user reads each question off a separate piece of paper and chooses a response. The e-mail message remains on the screen for user reference while answering the questions.)

<b>RECORD ON E-MAIL TASK ASSESSMENT SHEET</b>
<input type="checkbox"/> Section 2: Impairment/Language <ul style="list-style-type: none"><li>• reading comprehension</li></ul>

“Good! Now, the last thing I want you to do is this (points to the line in the message which says ‘Save for future reference’).”

<b>RECORD ON E-MAIL TASK ASSESSMENT SHEET</b>
<input type="checkbox"/> Section 1: Impairment/Physical
<input type="checkbox"/> Section 3: Impairment/Cognition
<input type="checkbox"/> Section 5: Response to Help Modes

**Task 1c**

“Now with this task, a Counselor has sent you an e-mail message. I want you to start the email program, then open the message from the Counselor, then read the message aloud. After you’ve read the message, I will ask you some questions. This time you will use the arrow key in addition to speech cues to help you. So again, you will start the e-mail program, open the message, read it out loud, then answer some questions about the message.”

<b>RECORD ON E-MAIL TASK ASSESSMENT SHEET</b>
<input type="checkbox"/> Section 2: Impairment/Language <ul style="list-style-type: none"><li>• reading comprehension</li></ul>

(The user reads each question off a separate piece of paper and chooses a response. The e-mail message remains on the screen for user reference while answering the questions.)

<b>RECORD ON E-MAIL TASK ASSESSMENT SHEET:</b>
<input type="checkbox"/> Section 1: Impairment/Physical
<input type="checkbox"/> Section 2: Impairment/Language • note oral reading ability
<input type="checkbox"/> Section 3: Impairment/Cognition
<input type="checkbox"/> Section 5: Response to Help Modes

“Good! Now, the last thing I want you to do is this (points to the line in the message which says ‘Save for future reference’).”

<b>RECORD ON E-MAIL TASK ASSESSMENT SHEET</b>
<input type="checkbox"/> Section 1: Impairment/Physical
<input type="checkbox"/> Section 3: Impairment/Cognition
<input type="checkbox"/> Section 5: Response to Help Modes

<b>CHOOSE NAVIGATION MODE FOR REMAINING TASKS</b>
<input type="checkbox"/> Following Task 1a, based on examiner observation and input from the participant, select a preferred navigation system. Use this navigation system for the remaining tasks.

### 3. Tasks 2a-c:

#### Task 2a

“For these next series of tasks, a professional has sent you an email message that is displayed on the screen. You are to read it, press reply, type an answer and then send the message you typed. Again, you read, reply, type and send. The first message is from a Doctor.”

<b>RECORD ON E-MAIL TASK ASSESSMENT SHEET</b>
<input type="checkbox"/> Section 1: Physical
<input type="checkbox"/> Section 2: Language • written expression 2a-c
<input type="checkbox"/> Section 3: Cognition
<input type="checkbox"/> Section 4: Psychosocial
<input type="checkbox"/> Section 5: Response to Help

#### Task 2b

Repeat above for task 2b – Dentist.

RECORD ON E-MAIL TASK ASSESSMENT SHEET	
<input type="checkbox"/>	Section 1: Physical
<input type="checkbox"/>	Section 2: Language <ul style="list-style-type: none"> <li>written expression 2a-c</li> </ul>
<input type="checkbox"/>	Section 3: Cognition
<input type="checkbox"/>	Section 4: Psychosocial
<input type="checkbox"/>	Section 5: Response to Help

**Task 2c**

Message from Counselor; here, you are observing initiation, problem solving so you will just introduce the task saying

“O.K., continue and do the same thing with this message from your counselor. This time I won’t help you much and you try and figure it out if you get stuck.”

RECORD ON E-MAIL TASK ASSESSMENT SHEET	
<input type="checkbox"/>	Section 1: Physical
<input type="checkbox"/>	Section 2: Language <ul style="list-style-type: none"> <li>written expression 2a-c</li> </ul>
<input type="checkbox"/>	Section 3: Cognition <ul style="list-style-type: none"> <li>initiation 2c</li> <li>problem solving 2c</li> <li>time 2c</li> </ul>
<input type="checkbox"/>	Section 4: Psychosocial
<input type="checkbox"/>	Section 5: Response to Help

**4. Tasks 3a, 3b:**

**Task 3a.**

“For these next series of tasks, you read an email from a professional and then open and print the attachment that is sent with the email. The first email is from the Doctor. So you will read, open attachment, print it and close the email just as the reminder list shows you on the side. (point to reminder list.)”

RECORD ON E-MAIL TASK ASSESSMENT SHEET	
<input type="checkbox"/>	Section 1: Physical
<input type="checkbox"/>	Section 3: Cognition
<input type="checkbox"/>	Section 4: Psychosocial
<input type="checkbox"/>	Section 5: Response to Help

**Task 3b.**

Repeat the above with the Dentist’s message.

### *Email Task Assessment Sheet*

<b>Section 1: Impairment/Physical</b>		<b>Target E-mail tasks:</b> All
<b>Impairment Area</b>	<b>Description of observation</b>	<b>Severity Rating (1-3)</b> 1=slight/2=moderate/3=severe
<b>Motoric (upper extremity/finger)</b>		
<b>Visuoperceptual</b>		
<b>Problem symptoms</b>		

<b>Section 2: Impairment/Language</b>		<b>Target E-mail tasks:</b> 1a-1c; 2a-2c
<b>Impairment Area</b>	<b>Description of observation</b>	<b>Severity Rating (1-3)</b> 1=slight/2=moderate/3=severe
<b>Auditory Comprehension</b>		
<b>Reading</b>	<b>Comprehension Score:</b> <b>Total time:</b> Task 1a: x/5                    _____ Task 1b: x/5                    _____ Task 1c: x/5                    _____	
<b>Writing</b>  2a: "..."  2b: "..."  2c: "..."/>	<b>Analysis components</b> <b>Task 2a.</b> <ul style="list-style-type: none"> <li>• Total # of utterances</li> <li>• Mean length of utterance</li> <li>• Utterance type:</li> </ul> <b>Task 2b.</b> <ul style="list-style-type: none"> <li>• Total # of utterances</li> <li>• Mean length of utterance</li> <li>• Utterance type:</li> </ul> <b>Task 2c.</b> <ul style="list-style-type: none"> <li>• Total # of utterances</li> <li>• Mean length of utterance</li> <li>• Utterance type:</li> </ul>	

Section 3: Impairment/Cognition		Target e-mail tasks: All tasks; focus on 2c	
Impairment Area	Description of observation	Severity Rating (1-3) 1=slight/2=moderate/3=severe	
<b>Attention/Memory</b> <ul style="list-style-type: none"> <li>Ability to shift between different functions on the screen</li> <li>Holding on to instructions</li> <li>Holding on to help that is supplied</li> </ul>			
<b>Executive Functions</b> <ul style="list-style-type: none"> <li>Initiation</li> <li>Error monitoring</li> <li>Impulsivity</li> <li>Organization of written content</li> <li>Problem solving</li> </ul> (** = problem areas)	Latency for Task 2c:  Strategy for Task 2c:		
Procedural Learning			
Target Procedure/Behavior	Examiner Cues	Independently Correct	Able to learn (Y/N)? plus comments
"Save"			
"arrow/select"			
"click cursor"			
"send with mouse"			
Total time for Task 2c:			

Section 4: Psychosocial Response to E-mail		Target e-mail tasks: 2a-c, 3a-b	
Level of interest/engagement:	Observations:	Ideas suggested for customizing email:	
10. independently indicates feeling enthusiastic or interested by the possibility of being able to email 11. seems interested based on attentive attitude 12. not overly engaged in task, but willing to complete it 4. seems disinterested based on verbal response or inclination to engage in alternative activities			

Section 5: Response to Help Modes		Target e-mail tasks: All; focus on 1a-1c navigation system selection	
Preferred Navigation System	Response	Programming Suggestion	
Mouse Arrow key			
<b>Help Mode</b>			
Computer speech			
Text list prompts			
Examiner verbal prompt			
General approach to help (e.g. dependence/trial & error)			

<b>Section 6: Computer Skills</b>			<b>Target e-mail tasks: Follows All Tasks</b>		
• Basic mouse movement:	m	e	a	• Uses keyboard arrow keys:	m e a
• Mouse double click:	m	e	a	• Knows cursor marks spot:	m e a
• Mouse single click:	m	e	a	• Uses navigation	
• Hunt & peck:	m	e	a	• Arrow keys:	m e a
• Respond to cursor:	m	e	a	• Touch typing:	m e a
<b>Keyboard Skills</b>					
• Backspace:	m	e	a	• auto return wrap:	m e a
• Delete:	m	e	a	• manual return:	m e a
• Cursor:	m	e	a	• caps:	m e a
				• letters:	m e a
				• punctuation:	m e a
Mouse test results: time _____ number completed _____					<i>m = mastered e = emerging a = absent</i>

<b>Section 7: Task Conceptualization</b>	<b>Target e-mail tasks: Follows Task 3b</b>
Score on email quiz: x/10 correct	

<b>Question Log</b>
• _____
• _____

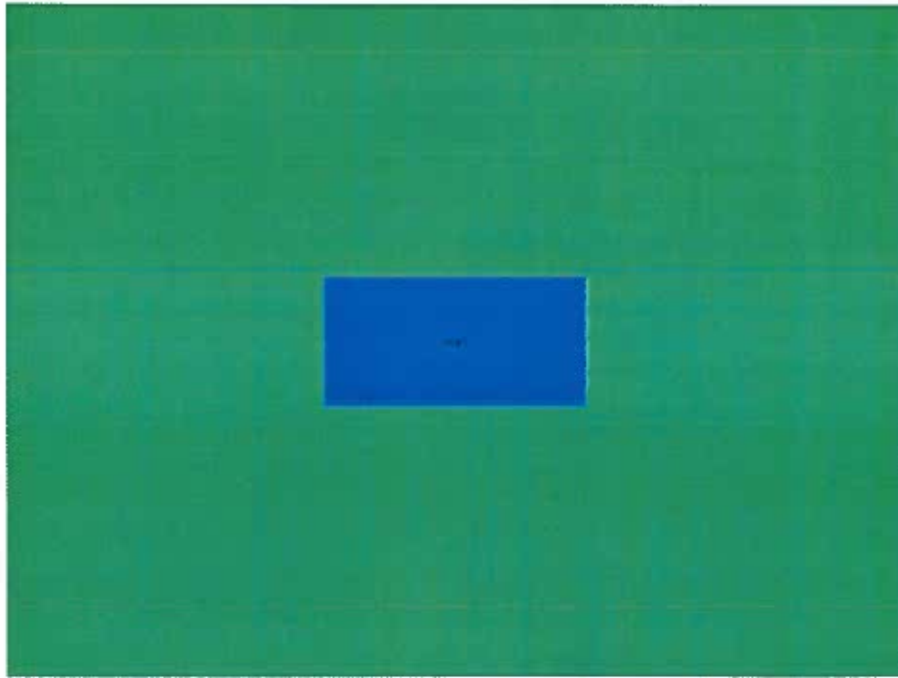
<b>Summary of Performance:</b>
<b>Strengths:</b>
<b>Challenges:</b>
<b>Assessment:</b>



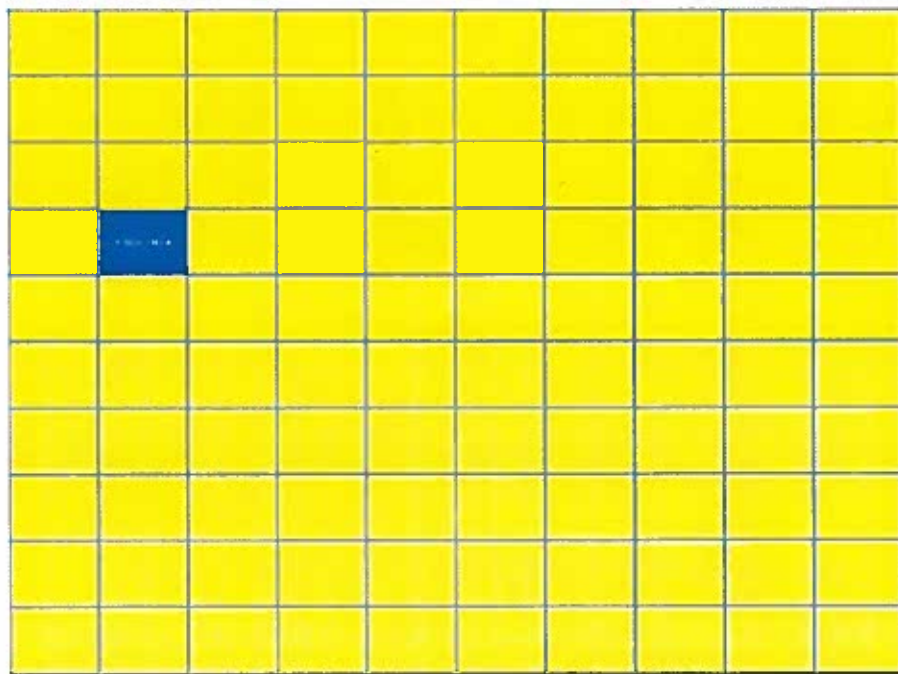
## *Email Task Assessment Quiz*

1. **The Internet is:**
  - A. a computer program that office workers use in their own building
  - B. a network of computers all over the world which communicate with each other
  - C. only used for e-mail
  - D. none of the above
2. **E-mail is:**
  - A. mail sent from one computerized device to another
  - B. mail sent from the post office to mailboxes outside one's house
  - C. a word processing program for writing letters
  - D. none of the above
3. **To "open" an e-mail means:**
  - A. to open an envelope in order to read the letter inside
  - B. to click on the name of the person who sent the e-mail, so that the entire message appears
  - A. on the computer screen
  - B. printing a letter you have written on the computer
  - C. none of the above
4. **To "reply" to an e-mail message means:**
  - A. to compose a letter with word processing and print it for mailing
  - B. to pick up the phone and call the person who sent the e-mail
  - C. to click on the "reply" button in order to write a return e-mail message
  - D. none of the above
5. **How do you "compose" or write an e-mail?:**
  - A. you write the message out by hand and scan it into the computer
  - B. you type a letter using a word processing program
  - C. you type an e-mail message using a computer e-mail program
  - D. none of the above
6. **To "send" an e-mail message:**
  - A. you put the message in the mailbox for the postman to pick up
  - B. you click the "send" button and send the message through the Internet
  - C. requires that only the person writing the e-mail message needs to have the e-mail program
  - D. none of the above
7. **To "delete" an e-mail message means:**
  - A. to erase it from the computer
  - B. to type the e-mail into the computer
  - C. to take it out of the mailbox located outside the house
  - D. none of the above
8. **An "attachment" is:**
  - A. a computer file (such as a picture, word processor document, or even a software program) that is sent along with an e-mail message
  - B. a chord that runs from a computer into an electrical outlet
  - C. a package that is sent through the mail from the post office
  - D. none of the above
9. **An e-mail "address book" is:**
  - B. the book containing phone numbers, addresses, and business cards
  - C. the reference display for the Internet webpages
  - D. contains e-mail addresses, which are kept on the computer, so they do not have to be re-typed
  - E. none of the above
10. **To make a "draft" of an e-mail message means:**
  - A. to write out a rough draft by hand on a piece of paper
  - B. to immediately send it to the person
  - C. to click on the "draft" button on the computer screen to save the e-mail to work on it later
  - D. none of the above

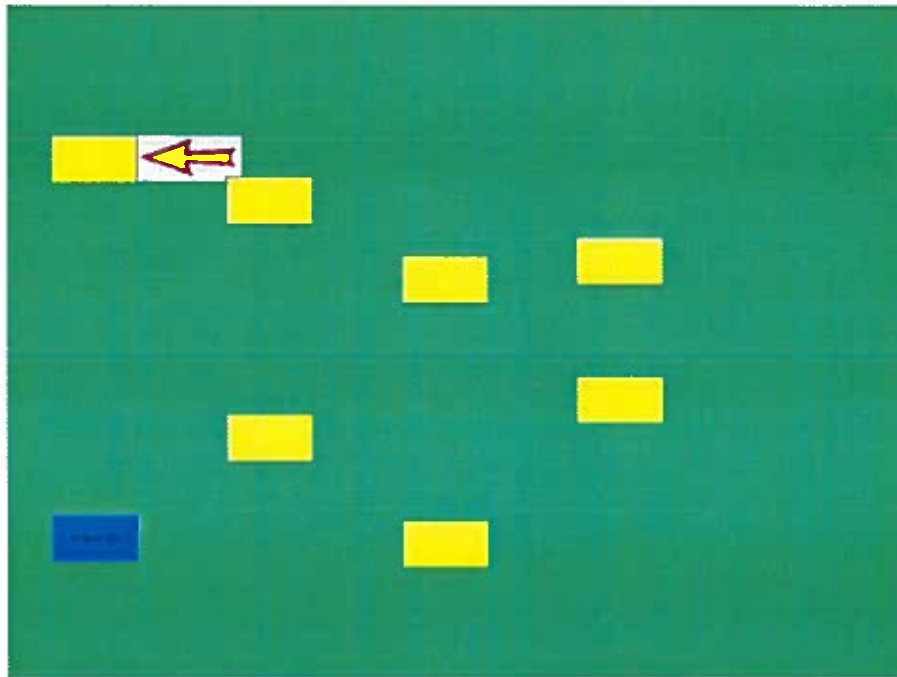
### *Sample Email Screen Shots*



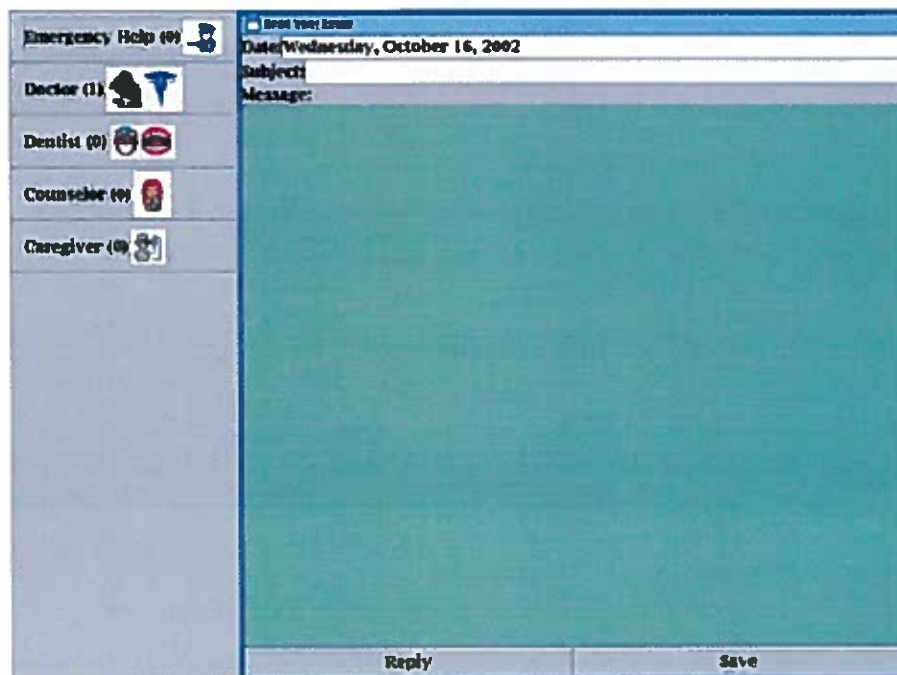
Screen Shot A: Initial trial in the Mouse Test which measures time and accuracy for clicking on increasingly smaller targets.



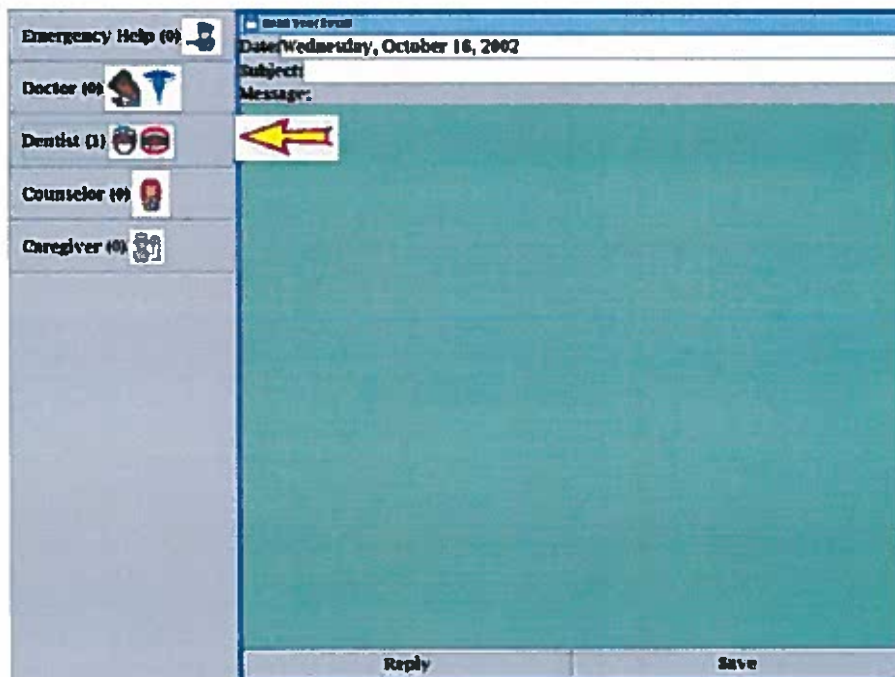
Screen Shot B: Later trial in the Mouse Test requiring clicking on a smaller target.



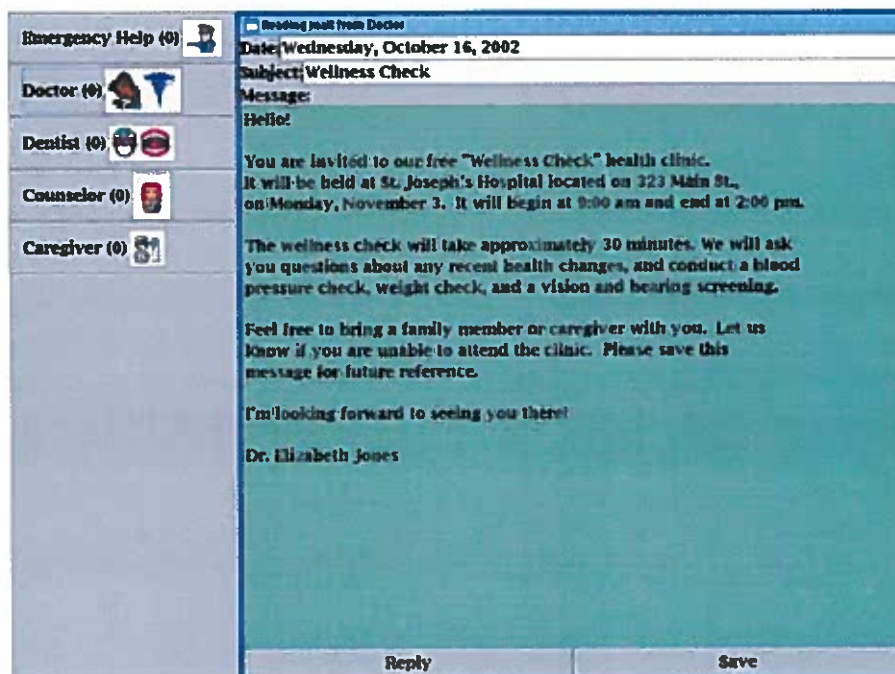
Screen Shot C: Later trial in Arrow Navigation Training which trains user to select increasingly smaller targets using the arrow mode.



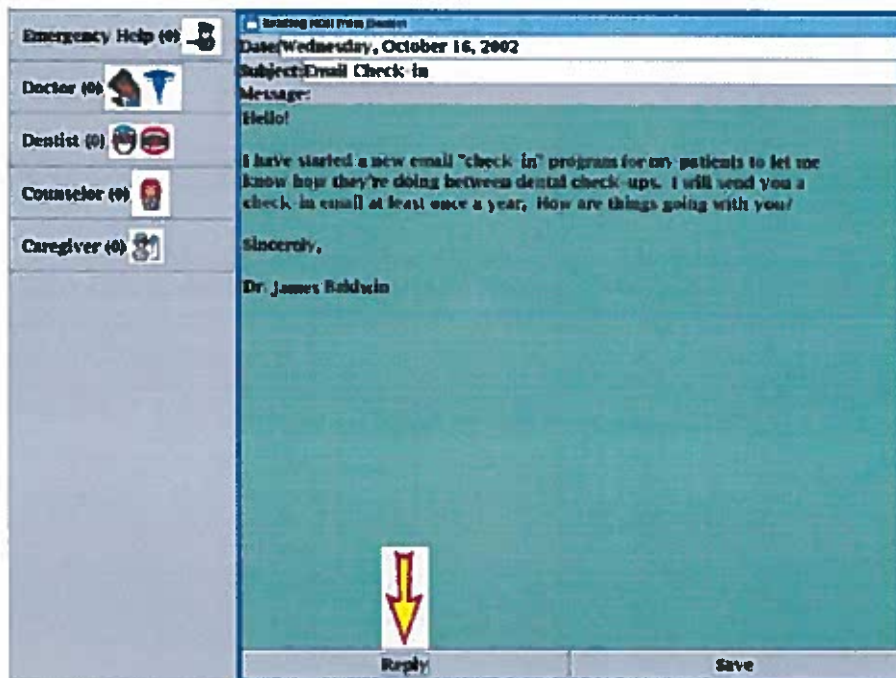
Screen Shot D: Start up window showing pictorial inbox in mouse navigation mode. There is one new message from the doctor. This line is flashing. This window corresponds to task 1a.



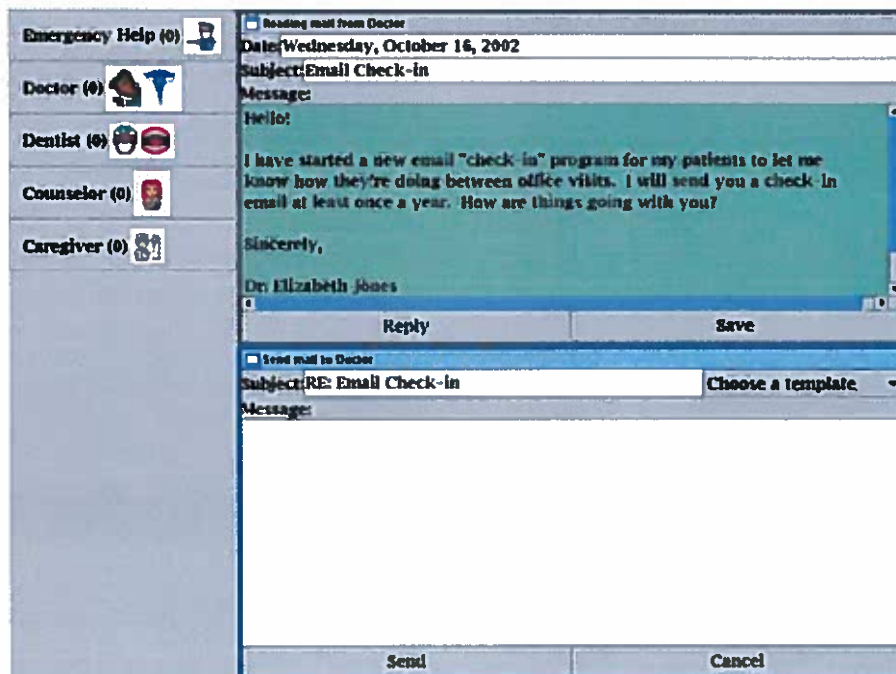
Screen Shot E: Start up window showing pictorial inbox in arrow navigation mode. There is one new message from the dentist. This line is flashing. This window corresponds to task 1b.



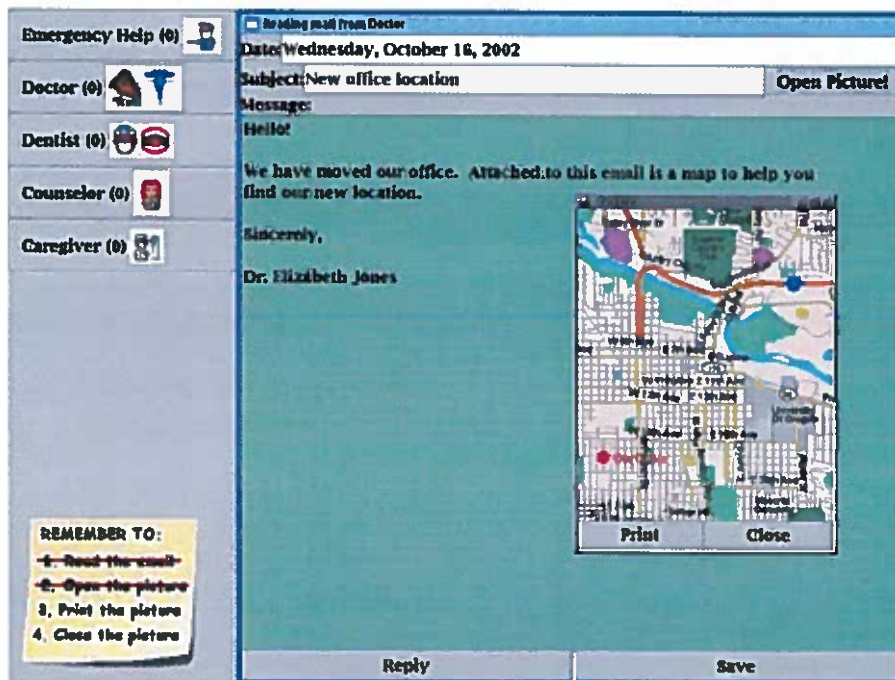
Screen Shot F: Message window that appears when user clicks on Doctor in the inbox using the mouse navigation mode. This window corresponds to task 1a.



Screen Shot G: Message window that appears when the user clicks on dentist in the arrow navigation mode. This window corresponds to task 1b.



Screen Shot H: This split-screen compose window pops up when user clicks “reply” displayed on screenshot F. This window corresponds to task 1a.



Screen Shot I: This window appears when user clicks on doctor inbox. As each step is completed a corresponding red line crosses out the step on the “sticky note.” This window corresponds to task 3a.

### *Natural Communication/Activity Patterns and Environmental Assessment Sheet*

The examiner conducts a home visit to assess communication patterns and the physical space in which the email computer will be placed. During the visit, the examiner interviews the participant and completes the following form in order to record natural communication patterns. The examiner then asks to view the space where the emailing will take place and independently fills out the bottom portion of form pertaining to the physical environment.

<i>Natural Communication/Activity Sheet</i>						
Context	Who? (relationship)	Comments	Initiator		Frequency (in last 2 weeks)	Duration
			Self	Other		
<b>Groups</b>						
Attend Support Group						
Attend AA/NA meeting						
Attend Advocacy meeting						
Attend a class (type?)						
Attend a party						
Attend a concert, play, etc.						
<b>Phone</b>						
Personal phone call						
Business phone call						
Makes emergency call						
Makes reservation (food, travel)...						
<b>In Person</b>						
Have a meal or beverage with other (who?)						
Plays game with other						
Visits someone						
Talk with other at store/business						
Talk with other at church						
Talk with other at work						
Talks with people (walking or riding bike, etc.						
<b>In Writing</b>						
Write a letter						
Read a letter						
Send a card						
Read a card						
<b>Other</b>						
Listen to music with other						
Watch TV with other						
Walk with other						
Go to movies/concert						
Health club/physical activity						

<i>Physical Environment Assessment Sheet</i>	
<b>Space for the computer</b>	<i>Is there a table or desk (currently) available?</i>
<b>Ambiance</b>	<i>Is lighting adequate?</i>
<b>Organizational Issues</b>	<i>Is lack of organization a barrier for communication</i>
<b>Other</b>	

### *Environmental and Capabilities Self Assessment*

Environmental and Capabilities Assessment;

This portion of the CORE is to be completed *after* the E-Mail Task Assessment during the second laboratory visit in order to ensure users are familiar with demands & requirements of email.

The protocols are completed using a structured interview process. The examiner begins with open questions and narrows them in order to obtain a “construct” or example of each area of concern and then has user/s.o. rate the degree of problem caused by that issue.

- a. “Are there any issues for you in the area of \_\_\_\_\_ that would affect your ability to use email?”
- b. “Can you give a specific example of that issue?”
- c. “On a scale of 1-5 can you tell me how much of a problem that would be?” (show them scale: 0=no problem; 1=very slight; 2=mild problem; 3=moderate problem; 4=big problem; 5=it could not be worse)



<i>Environmental Self Assessment Sheet</i>		
<b>Domain</b>	<b>Construct</b>	<b>Problem Rating</b>
<b>ENVIRONMENT</b> <input type="checkbox"/> Space for Computer <input type="checkbox"/> Ambiance <input type="checkbox"/> Organizational issues		
<b>AVAILABLE SUPPORT</b> <input type="checkbox"/> Access to available, present person <input type="checkbox"/> Access to experienced person <input type="checkbox"/> Attitudinal issues/Expectations		
<b>EMAIL PARTNERS</b> <input type="checkbox"/> Email buddies currently on email <input type="checkbox"/> Potential email buddies <input type="checkbox"/> Attitudinal Issues/Expectations		
<p style="text-align: center;"><b>Problem Ratings</b></p> <p>           0 = no problem                      1 = very slight problem                      2 = mild problem            3 = moderate problem              4 = big problem                                  5 = it can not be solved         </p>		

<i>Capabilities Self Assessment Sheet</i>		
<b>Impairment Domain</b>	<b>Construct</b>	<b>Problem Rating</b>
<b>PHYSICAL</b> <input type="checkbox"/> Visuoperceptual <input type="checkbox"/> Hearing <input type="checkbox"/> Upper extremity <input type="checkbox"/> Problem Symptoms		
<b>LANGUAGE</b> <input type="checkbox"/> Spontaneous speech <input type="checkbox"/> Auditory Comprehension <input type="checkbox"/> Reading <input type="checkbox"/> Writing		
<b>COGNITION</b> <input type="checkbox"/> Attention (vigilance, alertness) <input type="checkbox"/> Memory/learning <input type="checkbox"/> Executive function (initiation, planning, task persistence, error detection/correction) <input type="checkbox"/> Self awareness/judgment		
<b>PSYCHOSOCIAL</b> <input type="checkbox"/> Mood <input type="checkbox"/> Connectedness with friends <input type="checkbox"/> Connectedness with family/relatives		
<b>MOTIVATION</b> <input type="checkbox"/> Connecting with others		
<p style="text-align: center;"><b>Problem Ratings</b></p> <p>           0 = no problem                      1 = very slight problem                      2 = mild problem            3 = moderate problem              4 = big problem                                  5 = it can not be solved         </p>		

## *Goals and Expectations Sheet*

### **Instructions**

The examiner assists the user and significant other (so) in developing a goal attainment scale. They begin by reviewing both the Environmental and Capabilities Assessment Sheets. As they review each of the domains, the examiner asks, "Is this an area you hope/expect to change if you were to use email regularly?"

For those areas that the user/so endorses as an area they might expect to change or improve, the examiner facilitates constructing a goal and writes the goal on the protocol. Then for each goal area the user/so is asked to determine "most favorable outcome"; "more than expected success"; "expected level of success"; "less than expected success"; "least favorable outcome thought likely". These are written on the goal attainment scale labeled Goals and Expectations.

The client is also asked to identify desired email partners. Contact information and frequency of contact expectations are recorded on the contact sheet.

<i>Goals and Expectations Sheet</i>
<b>What effects do you hope/anticipate that increased email will have in your life?</b>
<b>Goal #1:</b>
Most favorable outcome thought likely: .....
More than expected success: .....
Expected level of success: .....
Less than expected success: .....
Most unfavorable outcome thought likely: .....
<b>Goal #2:</b>
Most favorable outcome thought likely: .....
More than expected success: .....
Expected level of success: .....
Less than expected success: .....
Most unfavorable outcome thought likely: .....
<b>Goal #3:</b>
Most favorable outcome thought likely: .....
More than expected success: .....
Expected level of success: .....
Less than expected success: .....
Most unfavorable outcome thought likely: .....

***Desired Email Partner List***

Who do you want to establish email contact with?

What is your current relationship and contact with this person?

How often would you like to email this person? (# of emails per week/ time spent on the email)

<b>Email partner Name</b>	<b>Email &amp; Phone</b>	<b>Relationship &amp; current contact</b>	<b># of emails per week/ time on email</b>

### *Email Partner Expectations Sheet*

The examiner contacts email partners by telephone or email and completes the information on the protocol shown below.

#### Sample Phone Script:

"I am a researcher working with *Tina* to teach her to use email. She has indicated she would like to have you as an email partner. Would you like to hear more about the project? She is learning to use a simple email box. If you were to be her partner you would need to send you mail. If you are interested, I have a few questions about how best to contact you, your experience with computers and your preferences for emailing with *Tina*. Should I continue?"

Email Partner's Name:
Contact Information Address Phone Email Address
Current frequency/purpose of personal email use:
Current mode of communication w/participant:
Goals/preferences related to emailing participant:
Desired frequency of email contact:
Would you like further outside support to facilitate Email contact with participant?

## *Technology Fit Summary Sheet*

NOTES	
<b>INTERFACE/SOFTWARE NEEDS</b>	
System automatically 'on'	<input type="checkbox"/> Yes <input type="checkbox"/> No
Photos of partners in inbox	<input type="checkbox"/> Yes <input type="checkbox"/> No
Names printed below photos	<input type="checkbox"/> Yes <input type="checkbox"/> No
Photos positioned left vs. right side vs. horizontal	<input type="checkbox"/> Yes <input type="checkbox"/> No
Restricted # of partners in inbox	<input type="checkbox"/> Yes <input type="checkbox"/> No
Eliminate multiple windows	<input type="checkbox"/> Yes <input type="checkbox"/> No
Split screen during composition/reply	<input type="checkbox"/> Yes <input type="checkbox"/> No
'Print only' labels for function buttons	<input type="checkbox"/> Yes <input type="checkbox"/> No
Arrow prompts	<input type="checkbox"/> Yes <input type="checkbox"/> No
Arrows plus speech prompts	<input type="checkbox"/> Yes <input type="checkbox"/> No
Font/size adjustment	<input type="checkbox"/> Yes <input type="checkbox"/> No
Font color	<input type="checkbox"/> Yes <input type="checkbox"/> No
Background color	<input type="checkbox"/> Yes <input type="checkbox"/> No
Automatic delete old emails	<input type="checkbox"/> Yes <input type="checkbox"/> No
System prompts new email	<input type="checkbox"/> Yes <input type="checkbox"/> No
System prompts regular time to check email	<input type="checkbox"/> Yes <input type="checkbox"/> No
Message monitoring prompts	<input type="checkbox"/> Yes <input type="checkbox"/> No
Prompts to limit	<input type="checkbox"/> Yes <input type="checkbox"/> No
Text-to-speech for incoming/outgoing message	<input type="checkbox"/> Yes <input type="checkbox"/> No
Volume control	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>HARDWARE ADAPTATIONS</b>	
Mouse control	<input type="checkbox"/> Yes <input type="checkbox"/> No
Mouse speed	<input type="checkbox"/> Yes <input type="checkbox"/> No
Arrow control	<input type="checkbox"/> Yes <input type="checkbox"/> No
Adapted keyboard	<input type="checkbox"/> Yes <input type="checkbox"/> No
Joy stick	<input type="checkbox"/> Yes <input type="checkbox"/> No
Screen magnification	<input type="checkbox"/> Yes <input type="checkbox"/> No
Close positioning of monitor	<input type="checkbox"/> Yes <input type="checkbox"/> No
Sticky keys	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>INSTALLATION PLAN</b>	
Network hook up	<input type="checkbox"/> Yes <input type="checkbox"/> No
Location in home	<input type="checkbox"/> Yes <input type="checkbox"/> No
Optimal lighting conditions	<input type="checkbox"/> Yes <input type="checkbox"/> No
Materials to purchase	<input type="checkbox"/> Yes <input type="checkbox"/> No
Environmental modifiers	<input type="checkbox"/> Yes <input type="checkbox"/> No

## *Skills Training Sheet*

<b>Computer Skill</b>	<b>Instructional Plan</b>
<b>1. Keyboard skill</b>	
<b>2. Email steps:</b>	
<b>3. Responding to prompt systems:</b>	
<b>4. Other:</b>	

## **SECTION FOUR**

### **CORE Results for Michael: A Case Example**

The CORE was developed in collaboration with individuals who have brain injuries, which enabled us to pilot and revise the various assessment components during the development process. In this final section of our report, we provide the results of the CORE on Michael, the first individual to complete the CORE who was not involved in its development. To ensure confidentiality, we have altered names and identifying details.

Michael is the first participant in a longitudinal study we are conducting over a five year period. We used his CORE results to identify what type of email tools, support and training he would require to successfully use email. We also gathered information regarding his and his partners' goals and expectations regarding email connection which we will use as part of our outcome measurement. We have developed a low cost, Linux-based box and modified OS interface which was delivered to Michael with the software in response to his CORE evaluation. At the time of this report, Michael is participating in training to learn to use his email interface.

We have not provided the demographic information that is part of the Computer User Profile for privacy protection. The reader would benefit from knowing that he is a 57 year old male, 7 years post surgical resection of an extensive right frontal brain tumor. He was divorced following his surgery and has two children who live with their mother in a neighboring town. He was a professor in a university music department. He did not use email prior to his surgery and had previous little computer use. His primary areas of impairment included blindness in the right eye, and significant difficulty with attention, memory, new learning, organization and word finding. He also exhibited some social inappropriateness. He did not work following his surgery and reported extreme social isolation. Although he often ventured into the community, most contacts were structured (e.g., support group participation) and he had never had anyone over to his home prior to our researchers.

## *Michael's Computer User Profile*

<b>Question</b>	<b>Answer</b>
<b>General Demographics</b>	
Gender	male
Date of Birth	00/00/0000
Ethnicity	-----
Education	post-graduate education
<b>Assistance/Living Situation</b>	
Living Situation	home/apartment
People living in your home	none
Do you have a paraprofessional careprovider?	no
<b>Recreational Activities</b>	
Spend time with friends	1-2 days a week
Talk on the phone with friends or relatives	1-2 days a week
Participate in physical activity	several times a day
Play cards or board games with others	every few weeks
Do volunteer work	1-2 days a week
Take a class	1-2 days a week
Go to therapy	never
Attend a religious service	never
Attend a club meeting	every few weeks
Spend time reading a book, magazine, or newspaper	about once a day
Watch TV	never
Play a video or computer game	never
<b>Proximate Contact</b>	
What is this person's relation to you?	friend
How frequently do you communicate with this person in person?	1-2 days a week
How frequently do you communicate with this person by telephone?	3-5 days a week
How frequently do you communicate with this person by electronic mail?	never
How frequently do you communicate with this person by written notes?	every few weeks
<b>Distant Contact</b>	
What is this person's relation to you?	relative
How frequently do you communicate with this person in person?	1-2 days a week
How frequently do you communicate with this person by telephone?	1-2 days a week
How frequently do you communicate with this person by electronic mail?	never
How frequently do you communicate with this person by written notes?	less often
<b>Email use</b>	
For what purposes would you use email?	contact family
For what purposes would you use email?	contact friends
For what purposes would you use email?	contact professionals
For what purposes would you use email?	inquire about business/ organizations
<b>Trauma Statistics</b>	
Date of your first head injury	00/00/0000
How did your first head injury occur?	-----
Length of initial in-patient hospitalization?	1-4 weeks
Estimate length of coma:	2-4 weeks



Primary cognitive impairment	memory
Primary cognitive impairment	planning/organization
Primary cognitive impairment	language(reading/writing)
Primary cognitive impairment	attention
Primary cognitive impairment	problem solving
Primary cognitive impairment	visuoperceptual processing
Primary cognitive impairment	error detection/correction
Sensory impairment	vision
Sensory impairment	hearing
Sensory impairment	touch/temperature
Emotional issues	none
<b>Computer history/ability</b>	
Used computer prior to injury?	no
Used computer following injury?	no
Do you currently own a computer?	yes
Are you able to read a short, type-written note?	yes
Are you able to write (compose) a short, type-written note?	yes
When you use the keyboard do you	type but need to look at all the keys
Is there someone available to help you if you want to use a computer?	yes
If you are not using a computer, why not:	not hard

### *Michael's Email Task Assessment Sheet*

<b>Section 1: Impairment/Physical</b>		<b>Target E-mail tasks: All</b>
<b>Impairment Area</b>	<b>Description of observation</b>	<b>Severity Rating (1-3) 1=slight/2=moderate/3=severe</b>
<b>Motoric (upper extremity/finger)</b>	2-handed, hunt 'n peck; some minor difficulty with key action--slow release of keys; tip of left index finger missing	0-1
<b>Visuoperceptual</b>	wore glasses for computer work; blind in left eye; moved head to fully scan display; may have had some difficulty perceiving the flashing cursor	1-2
<b>Problem symptoms</b>	Start 10:00-Finish 11:25; denied any problem such as headaches	0

<b>Section 2: Impairment/Language</b>		<b>Target E-mail tasks: 1a-1c; 2a-2c</b>
<b>Impairment Area</b>	<b>Description of observation</b>	<b>Severity Rating (1-3) 1=slight/2=moderate/3=severe</b>
<b>Auditory Comprehension</b>	adequate; remembered 2 of 3 essential command details; required cue for missing detail; problem due to retention, not comprehension, per se	0
<b>Reading</b>	<b>Comprehension Score:</b> Task 1a: 3/5 Task 1b: 4/5 Task 1c: 4/5	1-2
<b>Writing</b>  2a: "Thank you very much. [first-middle-last initials]"  2b: "To: Dr. James Baldwin Muchis Gracious [first-middle-last initials]"  2c: "To: Dr. Smith! Muchos gracious. [first-last initials](spelled this out)"	<b>Analysis components</b> Task 2a. <ul style="list-style-type: none"> <li>• Total # of utterances 1</li> <li>• Mean length of utterance 4</li> <li>• Utterance type: sentence-exclamatory</li> </ul> Task 2b. <ul style="list-style-type: none"> <li>• Total # of utterances 2</li> <li>• Mean length of utterance 3</li> <li>• Utterance type: non-sentence</li> </ul> Task 2c. <ul style="list-style-type: none"> <li>• Total # of utterances 2</li> <li>• Mean length of utterance 3</li> <li>• Utterance type: non-sentence</li> </ul>	<b>Difficult to adequately assess linguistic ability due to so few sentences (See Section 3 for comments concerning content/organization.);</b>  <b>very slow production of content due in part to laborious search process for target letters/keys.</b>  <b>Wanted to use letter writing format</b>

Section 3: Impairment/Cognition		Target e-mail tasks: All tasks; focus on 2c	
Impairment Area	Description of observation	Severity Rating (1-3) 1=slight/2=moderate/3=severe	
<b>Attention/Memory</b> <ul style="list-style-type: none"> <li>• Ability to shift between different functions on the screen</li> <li>• Holding on to instructions</li> <li>• Holding on to help that is supplied</li> </ul>	-Difficulty with alternating attention(e.g., switching back 'n forth between different elements on the screen) -Difficulty holding onto instructions -Learning decreased with distraction between trials (e.g., problems switching from mouse to arrow)	2	
<b>Executive Functions</b> <ul style="list-style-type: none"> <li>• Initiation</li> <li>• Error monitoring **</li> <li>• Impulsivity</li> <li>• Organization of written content **</li> <li>• Problem solving **</li> </ul> (** = problem areas)	-(3b) wanted letter format--moved cursor to make it correct--noticed spelling error; kept looking up at monitor while writing but didn't always notice mistakes -doesn't double click -written content didn't correspond to requested information in partner's email  Latency for Task 2c: 14' 20" Strategy for Task 2c: trial & error	2	
<b>Procedural Learning</b>			
<b>Target Procedure/Behavior</b>	<b>Examiner Cues</b>	<b>Independently Correct</b>	<b>Able to learn (Y/N)? plus comments</b>
"Save"	1, 2	3	
"arrow/select"	1,2,4,5,6	3,7	
"click cursor"	1,2,3,4,5		will want to train this skill
"send with mouse"	1,3	2	
Total time for Task 2c:			

Section 4: Psychosocial Response to E-mail		Target e-mail tasks: 2a-c, 3a-b
<b>Level of interest/engagement:</b>  2,3 when questioned  1 independently indicates feeling enthusiastic or interested by the possibility of being able to email 2 seems interested based on attentive attitude 3 not overly engaged in task, but willing to complete it 4 seems disinterested based on verbal response or inclination to engage in alternative activities	<b>Observations:</b>  frustrated at feeling slow	<b>Ideas suggested for customizing email:</b>  -train keyboard skills -make cursor bigger

<b>Section 5: Response to Help Modes</b>		<b>Target e-mail tasks: All; focus on 1a-1c navigation system selection</b>
<b>Preferred Navigation System</b>	<b>Response</b>	<b>Programming Suggestion</b>
Mouse	arrow hard to learn to select/move	
<b>Help Mode</b>		
Computer speech	helped by "reply" speech cue on task 2c	-teach problem solving technique--to "say step out loud" and "scan the screen"
Text list prompts	initially helped with this but lost set	-training to use "text list" as a reminder system
Examiner verbal prompt	frequently asked for/relied on verbal prompts & models	-possibly re-look at speech prompts--slow down speech prompts for "send"???
General approach to help	says "Don't know what to do"	-enlarge print; white font for "start email program"
Dependence/trial & error	highly dependent	

<b>Section 6: Computer Skills</b>		<b>Target e-mail tasks: Follows All Tasks</b>
<ul style="list-style-type: none"> <li>• Basic mouse movement      <b>A</b></li> <li>• Mouse double click          <b>A</b></li> <li>• Mouse single click          <b>E</b></li> <li>• Respond to flashing         <b>M</b></li> </ul>		<ul style="list-style-type: none"> <li>• Uses arrow keys              <b>A</b></li> <li>• Knows cursor marks spot    <b>A</b></li> <li>• Difficulty moving &amp; selecting arrow              <b>A</b></li> <li>• Touch typing                  <b>A</b></li> </ul>
<b>Keyboard</b>		
<ul style="list-style-type: none"> <li>• backspace                      <b>A</b></li> <li>• delete                          <b>A</b></li> <li>• cursor                           <b>A</b></li> </ul>		<ul style="list-style-type: none"> <li>• return wrap                   <b>A</b></li> <li>• caps                             <b>A</b></li> <li>• letters                         <b>A</b></li> <li>• punctuation                  <b>E</b></li> </ul>
<i>M = mastered                      E = emerging                      A = absent</i>		
Need to train keyboard skills: backspace		
Mouse test results:	time:	number completed:

<b>Section 7: Task Conceptualization</b>	<b>Target e-mail tasks: Follows Task 3b</b>
Score on email quiz: 7/10 correct	

<b>Question Log</b>
<ul style="list-style-type: none"> <li>• questions about keyboard and cursor</li> <li>• questions about arrow select</li> </ul>

<b>Summary of Performance</b>	
<b>Strengths:</b>	<ul style="list-style-type: none"> <li>• motivation/task persistence</li> <li>• awareness of problem areas; requests help</li> <li>• potential to benefit from computer-generated prompt systems with training (e.g., text list; speech prompt)</li> <li>• functional spelling</li> <li>• ability to learn selected, "intuitive" features of the e-mail system with minimal assistance (e.g., start e-mail program, select partner with flashing icon to open e-mail)</li> </ul>
<b>Challenges:</b>	<ul style="list-style-type: none"> <li>• mild reading comprehension difficulties</li> <li>• ability to generate an adequate amount of relevant e-mail content in reply to a partner's message</li> <li>• ability to hold onto instructions</li> <li>• alternating between interface features/functions</li> <li>• learning decreases with distraction between trials</li> <li>• doesn't scan entire screen when confused</li> <li>• keyboard &amp; computer skills knowledge</li> <li>• tendency toward frustration with his own performance</li> </ul>
<b>Assessment:</b>	<p>good potential for using customized e-mail system</p> <p>challenging areas should be addressed by a combination of interface modifications (e.g., enlarge flashing cursor) (See "Technology Fit Sheet.") and explicit instruction in selected skill areas (e.g., keyboard knowledge, problem solving strategy) (See "Skills Training Sheet" below.)</p>

## Michael's Email Task Assessment Quiz

1. The Internet is:
  - A. a computer program that office workers use in their own building
  - B. a network of computers all over the world which communicate with each other
  - C. only used for e-mail
  - D. none of the above
2. E-mail is:
  - A. mail sent from one computerized device to another
  - B. mail sent from the post office to mailboxes outside one's house
  - C. a word processing program for writing letters
  - D. none of the above
3. To "open" an e-mail means:
  - A. to open an envelope in order to read the letter inside
  - B. to click on the name of the person who sent the e-mail, so that the entire message appears on the computer screen
  - C. printing a letter you have written on the computer
  - D. none of the above
4. To "reply" to an e-mail message means:
  - A. to compose a letter with word processing and print it for mailing
  - B. to pick up the phone and call the person who sent the e-mail
  - C. to click on the "reply" button in order to write a return e-mail message
  - D. none of the above
5. How do you "compose" or write an e-mail?:
  - A. you write the message out by hand and scan it into the computer
  - B. you type a letter using a word processing program
  - C. you type an e-mail message using a computer e-mail program
  - D. none of the above
6. To "send" an e-mail message:
  - A. you put the message in the mailbox for the postman to pick up
  - B. you click the "send" button and send the message through the Internet
  - C. requires that only the person writing the e-mail message needs to have the e-mail program
  - D. none of the above
7. To "delete" an e-mail message means:
  - A. to erase it from the computer
  - B. to type the e-mail into the computer
  - C. to take it out of the mailbox located outside the house
  - D. none of the above
8. An "attachment" is:
  - A. a computer file (such as a picture, word processor document, or even a software program) that is sent along with an e-mail message
  - B. a chord the runs from a computer into an electrical outlet
  - C. a package this sent through the mail from the post office
  - D. none of the above
9. An e-mail "address book" is:
  - A. the book containing phone numbers, addresses, and business cards
  - B. the reference display for the Internet webpages
  - C. contains e-mail addresses, which are kept on the computer, so they do not have to be re-typed
  - D. none of the above
10. To make a "draft" of an e-mail message means:
  - A. to write out a rough draft by hand on a piece paper
  - B. to immediately send it to the person
  - C. to click on the "draft" button on the computer screen to save the e-mail to work on it later
  - D. none of the above

TOTAL SCORE: 7/10 correct

**Michael's Natural Communication Activities Patterns  
and Environmental Assessment Sheet**

Context	Who?	Comments	Initiator		Frequency (this past week)	Duration
			Self	Other		
<b>Groups</b>						
Attend Support Group		Attends 4 different groups			4 per week	2 hours ea.
Attend AA/NA meeting						
Attend Advocacy meeting						
Attend a class (type?)		Has thought about taking one				
Attend a party						
Attend a concert, play, etc.						
<b>Phone</b>						
Personal phone call		To organize support group attendance	9	1	10	
Business phone call			<1		<1	
Makes emergency call						
Makes reservation						
<b>In Person</b>						
Have a meal or beverage with other (who?)						
Plays game with other			<1		<1	
Visits someone			1		1	2 hours
Talk with other at store/business						
Talk with other at church						
Talk with other at work						
Talks with people (walking or riding bike, etc.		Casual chats with people he comes in contact with	10 to 12		10 to 12	2 or 3 minutes
<b>In Writing</b>						
Write a letter		Feels like he's "butting in" to their lives by writing				
Read a letter				1-2/ week		
Send a card						
Read a card						
<b>Other</b>						
Listen to music with other						
Watch TV with other						
Walk with other						
Go to movies/concert						
Health club/physical activity						

<b>PHYSICAL ENVIRONMENT ASSESSMENT</b>	
<b>Space for the computer</b>	There was about a 6 X 8 foot clearing where he was setting up a bookshelf to house the computer. He has a 4-socket electrical outlet that he has grounded to a stake outside. Note: he will need to obtain a desk.
<b>Ambiance</b>	No lighting or noise problems noted
<b>Organizational Issues</b>	The entire house is filled with clutter and boxes. There is not an easy path to the computer space. The house is extremely unkempt and quite musty. He shared that the researchers are the first visitors in his house in many years. Note: We assigned him to clear a path and obtain a desk & chair)
<b>Other</b>	Need to enter the house through the back; front door blocked. He apologized repeatedly for the mess and the odor. No noticeable barriers to communication.

### *Michael's Environmental Self-Assessment Sheet*

Domain	Construct	Problem Rating
<b>ENVIRONMENT</b> <input type="checkbox"/> Space for Computer <input type="checkbox"/> Ambiance <input type="checkbox"/> Organizational issues	<ul style="list-style-type: none"> <li>• space for computer: a "medium" problem</li> <li>• "lighting excellent"; "noise minimal" not a problem</li> <li>• organization: "medium opportunity for improvement"</li> <li>• "I have a substantial plan to locate specific things for that activity. I will make a shelf."</li> </ul>	2 0 3
<b>AVAILABLE SUPPORT</b> <input type="checkbox"/> Access to available, present person <input type="checkbox"/> Access to experienced person <input type="checkbox"/> Attitudinal issues/ Expectations	<ul style="list-style-type: none"> <li>• No one else besides research staff to support him with the project.</li> </ul>	no rating
<b>EMAIL PARTNERS</b> <input type="checkbox"/> Email partners currently on email <input type="checkbox"/> Potential email partners <input type="checkbox"/> Attitudinal Issues/Expectations	<ul style="list-style-type: none"> <li>• Not sure, but perhaps at least 4 of the 5 partners have e-mail. His daughter probably doesn't, but he could send it to her mom.</li> <li>• "I think it will be motivating."</li> </ul>	no rating
<b>Problem Ratings</b> 0 = no problem      1 = very slight problem      2 = mild problem 3 = moderate problem      4 = big problem      5 = it can not be solved		



## Michael's Capabilities Self-Assessment

Impairment Domain	Construct	Problem Rating
<b>PHYSICAL</b> <input type="checkbox"/> Visuo-perceptual <input type="checkbox"/> Hearing <input type="checkbox"/> Upper extremity <input type="checkbox"/> Problem Symptoms	<ul style="list-style-type: none"> <li>• sees two images on the screen, but knows which is real</li> <li>• reports hearing-problems, but not with hearing computer (speech)</li> <li>• left index finger (missing at the 1st joint)</li> <li>• no</li> </ul>	1 0 1 0
<b>LANGUAGE</b> <input type="checkbox"/> Spontaneous speech <input type="checkbox"/> Auditory Comprehension <input type="checkbox"/> Reading <input type="checkbox"/> Writing	<ul style="list-style-type: none"> <li>• slight word finding problems</li> <li>• no problems</li> <li>• "slow" "mild difficulty with e-mail"</li> <li>• word finding is a problem</li> </ul>	1 0 2 2
<b>COGNITION</b> <input type="checkbox"/> Attention (vigilance, alertness) <input type="checkbox"/> Memory/learning  <input type="checkbox"/> Executive function (initiation, planning, task persistence, error detection/correction)  <input type="checkbox"/> Self awareness/judgment	<ul style="list-style-type: none"> <li>• "varies a little bit" "I think it's okay."</li> <li>• "generally okay"; "I forget the names of familiar things."</li> <li>• "Repetition helps."</li> <li>• "Slower (since injury) but almost the same." "(I) love learning something new."</li> <li>• Impulsivity--"I'd say, yes" (this is a problem). Gave several examples</li> <li>• Organization--"I don't keep track of specific requirements, duties. My attention goes elsewhere."</li> <li>• Topic maintenance--"yes" (endorsed problems here)</li> <li>• (Do you think you realistically judge your actions?) Michael--"yes"</li> <li>• (Would someone else say you have good judgement?) Michael--"mild problems"</li> <li>• "I'm not the same as society. "He gave example of social misjudgement when trying to act the same as someone with retardation at a bus stop (in an attempt at social empathy) and was misjudged by those around him. Judgment has changed as a result of the injury.</li> </ul>	0-1 (attention)  1 (memory) 2 (learning)  3 (executive function)  2 (awareness)
<b>PSYCHOSOCIAL</b> <input type="checkbox"/> Mood <input type="checkbox"/> Connectedness with friends  <input type="checkbox"/> Connectedness with family/relatives	<ul style="list-style-type: none"> <li>• "sometimes I do get depressed"</li> <li>• "Essentially no. I feel like I turn into a hermit."</li> <li>• "There is substantial opportunity for improvement"</li> </ul>	1 4  4
<b>MOTIVATION</b> <input type="checkbox"/> Connecting with others <i>(How important is it to you, to connect with others?)</i>	"I want it to mean something."	not rated
<b>Problem Ratings</b> 0 = no problem      1 = very slight problem      2 = mild problem 3 = moderate problem      4 = big problem      5 = it can not be solved		

## *Michael's Goals & Expectations Sheet*

What effects do you hope/anticipate that increased email will have in your life?

**Goal #1:**

"I want to improve my ability to learn a new skill, specifically e-mail."

Most favorable outcome thought likely: "proof of e-mailing independently; no help required"

More than expected success: "When stuck, I could be helped via phone contact (with support staff)."

Expected level of success: "I want to learn how to e-mail. I may occasionally get stuck and need help (i.e., someone comes to my home to show me what to do)."

Less than expected success: "I will need lots of help."

Most unfavorable outcome thought likely: "I can't learn e-mail. You have to tell me how to do it."

**Goal #2:**

"I want to feel more connected with my e-mail partners, particularly my son."

Most favorable outcome thought likely: "I want to feel like I'm sharing deep information with everyone, especially my son."

More than expected success: "Sharing deep content with at least one friend and one family member."

Expected level of success: "Sharing deep content with at least one person."

Less than expected success: "E-mails will be mostly superficial."

Most unfavorable outcome thought likely: "Responses to e-mails will be negative. They will hate what I say."

**Goal #3:**

"I want to decrease my impulsivity and increase my social judgment, and organization."

Most favorable outcome thought likely: "Very few instances of impulsivity & lapses in social judgment; less than 1 per week."

More than expected success: "Instances of impulsivity & lapses in social judgment decrease to no more than 1-2 instances per week."

Expected level of success: "Instances of impulsivity & lapses in social judgment decrease to no more than 2-3 instances per week."

Less than expected success: "Barely noticeable change; 4-6 instances per week."

Most unfavorable outcome thought likely: "No change."

**Goal #4:**

"I want to expand my list of e-mail partners." (Currently has 5 potential partners.)

### *Michael's Desired Email Partner List*

Who do you want to establish email contact with?

What is your current relationship and contact with this person?

How often would you like to email this person? (# of emails per week/ time spent on the email)

Email partner Name	Email & Phone	Relationship/current contact/level of closeness (authentic sharing connection) (1-5 scale; 1= no closeness to 5 = very close)	# of emails per week/ time on email
-----	-----	<ul style="list-style-type: none"> <li>• daughter, 15 yrs</li> <li>• current contact 1x week in person; increased frequency via phone</li> <li>• 1.7 on above rating scale</li> </ul>	<ul style="list-style-type: none"> <li>• desires to e-mail once a day, but recognizes the need to negotiate this with her and her mother</li> </ul>
-----	-----	<ul style="list-style-type: none"> <li>• son, 10 yrs</li> <li>• current contact 1x week in person</li> <li>• minimal phone conversation</li> <li>• 1.6 on above rating scale</li> </ul>	<ul style="list-style-type: none"> <li>• need to talk with his mom</li> </ul>
-----	-----	<ul style="list-style-type: none"> <li>• stepsister</li> <li>• current contact via letter every couple of months</li> <li>• 3 on above rating scale</li> </ul>	<ul style="list-style-type: none"> <li>• would like to e-mail him 1x a week, "depending" upon sister's interest</li> </ul>
-----	-----	<ul style="list-style-type: none"> <li>• stepsister #2</li> <li>• current contact via phone 2-3x per year</li> <li>• 2 on above rating scale</li> </ul>	<ul style="list-style-type: none"> <li>• same as above</li> </ul>
-----	-----	<ul style="list-style-type: none"> <li>• friend from support group</li> <li>• current contact 1x at support group mtgs &amp; 1x monthly phone conversations</li> <li>• 2 on above rating scale</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>

## *Michael's Technology Fit Summary Sheet*

<b>INTERFACE/SOFTWARE ISSUES</b>		
System automatically 'on'	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Photos of partners in inbox	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Names printed below photos	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Photos positioned left vs. right side vs. horizontal	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	possibly right side, due to visual impairment left side
Restricted # of partners in inbox	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Eliminate multiple windows	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Split screen during composition/reply	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
'Print only' labels for function buttons	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	for initial stage, but will need to reassess
Arrow prompts	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Arrows plus speech prompts	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Font/size adjustment	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	keep as is for now, but assess need for change (enlargement)
Font color	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	? may be okay, but could assess further
Background color	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	current system okay to start with, but may need to reassess
Automatic delete old emails	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
System prompts new email	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
System prompts regular time to check email	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	anticipate self-initiation, but will need ot monitor
Message monitoring prompts	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	via sticky note guidelines
Prompts to limit	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	will need to assess
Text-to-speech for incoming/outgoing message	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Volume control	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	?--does have hearing impairment; probably won't need, but should assess
<b>HARDWARE ADAPTATIONS</b>		
Mouse control	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Mouse speed	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	possibly, need to assess
Arrow control	N/A	
Adapted keyboard	N/A	
Joy stick	N/A	
Screen magnification	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Close positioning of monitor	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Will need to be somewhat close given vision impairment
Sticky keys	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	????
<b>INSTALLATION PLAN</b>		
Network hook up		in process
Location in home		in process
Optimal lighting conditions	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Materials to purchase	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	appears adequate, but will need to modify
Environmental modifiers	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	participant organization of space (see physical environment assessment)

*Michael's Technology Fit Summary Sheet continued*

**OTHER ADDITIONS**

1. Slightly larger cursor arrow to make it easier to locate
2. More salient cursor "flash" to make it easier to locate.
3. Limit number of unread messages per partner to 3.

**PLAN**

1. Implement recommendations above.
2. Customize sticky note to include e-mail procedures and organizational content guidelines:  
Examples of items to include on stick notes (will need to be refined):
  - "Look at the entire computer screen."
  - "Click on the inbox"
  - "Read e-mail"
  - "Look at the entire computer screen."
  - "Click on the reply button"
  - "Write one statement related to what your partner has said."
  - "Write one statement that's interesting to you."
  - "Re-read your message."
  - "Look at the entire computer screen."
  - "Click on send."
3. Evaluate/develop different "levels" of sticky notes (e.g., broad/general/fewer steps vs. specific/detailed/many steps). Use real (i.e., paper sticky notes) to evaluate effectiveness of the different levels before programming these?
4. Consider use of message template in the future, particularly if the participant has difficulty with generating appropriate organization content given the above plan.

## *Michael's Skills Training Sheet*

Skill	Instructional Strategies
<b>1. Keyboard skills</b>	
<ul style="list-style-type: none"> <li>• backspace</li> <li>• delete</li> <li>• cursor (move/click)</li> <li>• return wrap</li> <li>• punctuation</li> <li>• save message</li> </ul>	<ul style="list-style-type: none"> <li>• typing test assessment</li> <li>• target 1 skill at a time</li> <li>• use a direct instruction training format, including high amounts of "model/practice" repetition and spaced retrieval practice</li> <li>• conduct review sessions once skill #2 is introduced</li> </ul>
<b>2. Use of computer prompt systems to aid task completion:</b>	
<ul style="list-style-type: none"> <li>• "to do" list (i.e., "sticky note") in lower left (changed from right corner due to visual impairment) corner in response to "Where would you look to remember the next step?"</li> </ul>	<ul style="list-style-type: none"> <li>• use a direct instruction training format, including high amounts of "model/practice" repetition and spaced retrieval practice</li> </ul>
<b>3. Problem solving strategy:</b>	
<ul style="list-style-type: none"> <li>• say step outloud and scan the screen for target feature(s)</li> </ul>	<ul style="list-style-type: none"> <li>• same instructional system as above; blend # 2 and 3 together once each practiced/learned individually</li> </ul>
<b>4. Organization of email content/generating appropriate response to partner's e-mail:</b>	
<ul style="list-style-type: none"> <li>• read message twice, write down message first and see if it corresponds to email, then type into computer. (This strategy relieves him from the burden of having to juggle all the computer features along with generating the message itself.)</li> </ul>	<ul style="list-style-type: none"> <li>• use a direct instruction training format, including high amounts of "model/practice" repetition and spaced retrieval practice</li> <li>• also include instructor-generated negative vs. positive examples, then include participant examples</li> <li>• begin with "mock" messages, then practice with "real" messages</li> <li>• add guidelines to sticky note (see section #2) to facilitate--(e.g., "Make one comment related to what your partner has said." "Make one comment that's interesting to you."</li> </ul>

### *Summary of Michael's CORE Results*

The CORE provides a comprehensive overview of the factors that we believe are critical for successful selection, training and implementation of an email system. Specifically the CORE provided:

- A snapshot of Michael's current strengths and weaknesses in terms of email skills.
- Information about his personal environment and current social circle.
- The goals and expectations of Michael and his email partners for introducing email into his life.

We cannot say that paying attention to each of these factors guarantees success. But we can confidently argue that failure is more likely if we do not attend to the various components, and instead deliver a generic system. The CORE allowed us to build an email client tailored to Michael's skills. For example, his system avoids the complication of navigating between windows which the CORE suggested would be difficult for him. When he clicks on the picture of one of his five partners, their last email comes up with a composition screen below it. There is very little demand on working memory. With each screen there is a sticky note with procedural directions to guide Michael through the process of selecting unread mail and responding to it. His CORE suggested that he could follow text displays of step by step directions. Given his memory and his cognitive impairments, he would not be able to manage or archive old messages. Hence his system deletes mail once he responds to it and never allows more than the latest two messages from each partner to stay in his inbox.

The CORE also allowed us to determine what would be a successful outcome for Michael. If we had not gone through the goal/expectations interview, we would have assumed that Michael's primary goal would be to become less socially isolated. However, the interview revealed that his most favorable outcome is to learn a new skill and require little assistance from others. He is intellectually curious and would feel extremely satisfied if he could use contemporary email technology regardless of whether he felt more connected. Similarly, the goal identification process revealed that Michael would not be satisfied with frequent emails as he was more interested in exchange of

interesting “deep” ideas than chit chat. These will be examples of factors we measure as part of our outcomes assessment within the longitudinal study.

We recognize the initial CORE results as preliminary. While we are encouraged about how the information within the CORE guided our development of a tailored set of email tools, the ultimate test of its utility will be in its ability to capture changes resulting from continuous email use and replicating its utility with other participants who have cognitive-linguistic impairments.