Usability Test Report for Tree

Date of Report: 12/17/12
Date of Test: 12/12-15/12
Location of Test: Syracuse, New York

Prepared for: Frank Biocca, PhD
Phone Number: (315) 443-1343
Email: fbiocca@syr.edu

Prepared by: Stephen Salvitti
Phone Number: 484-947-1590
Email: smsalvit@syr.edu

Table of Contents

Executive Summary

Overall task performance

      Users successfully completed the eleven tasks with the exception of two users unable to finish task eleven (11). Ambiguity arose because of two possible reasons: 1. The use of the word "transform" in the task eleven instructions confused users; 2. It is not obvious enough to users what the button labeled "Root/Word" does.

User difficulties and satisfaction

      Paths and routes are unclear to users. The back button does not go all the way back to the search engine page. This navigational error caused two users to go from screen to screen to find the one required to complete their given task. The visual attractiveness (attraction) and overall satisfaction and enjoyment (general) was ranked very highly by users on the exit questionnaire, with some suggestions to add color and change the font of the words.

Methodology

What happened during the usability test

The usability evaluation of Tree, conducted by Stephen Salvitti and Tianran Liu (Nature), was completed in Syracuse, New York between the dates December 12, 2012 and December 15, 2012.

During the usability evaluation, five participants, matching the typical user profile(s), were asked to spend approximately 10 minutes on the site. During this time, participants:

- Completed a three-question preliminary demographic questionnaire
- Performed eleven real-world tasks on the site
- Answered an exit-questionnaire about their overall experience/satisfaction

Who we tested

Five participants, having the following profile characteristics, evaluated Tree.

Age

18-25	5
26-39	0
40+	0
TOTAL (participants)	5

Gender

Women	2
Men	3
TOTAL (participants)	5

English Language

Native	1
Foreign	4
TOTAL (participants)	5

Participants, matching the Tree user profile, were recruited prior to testing via snowball sampling and with the assistance of social networking sites. Unfortunately, we were unable to compensate participants for their time.

What participants did

During the usability evaluation, participants were asked to complete eleven (11) "real-life" tasks on the Tree prototype site. The tasks were presented in chronological order and participants were instructed not to open any other applications (including web browsers) to search for help.

The following tasks were presented to users:

#	Task
1	Search the word "Photograph."
2	Select the root "graph" to see other words that begin with that same root.
3	Find more words that use the root "graph."
4	Explore the context of the chosen root word.
5	Find the definition of the root "geo."
6	Go back to the search screen
7	Search "telephone."
8	Select one of the roots (tele or phone).
9	Look at more words that use the root you chose.
10	Explore the context of the root you chose.
11	Transform the branched *words* connected to tele-phone into *roots*.

What data we collected

          10   [Task statement]

The following four metrics were collected from each user: General, Navigation, Attraction, and Opinion. Three of the four questions that make up 'General' use a five-point Likert Scale as the measurement instrument, as do 'Navigation' and 'Attraction.' 'Opinion' is something best acquired by allowing users to freely express themselves, thus, the items measuring this construct each require a short answer response. The following are the definitions of each metric/construct:

▪ The 'General' metric assessed overall user satisfaction/dissatisfaction with the website. It used an index consisting of questions two, three, and four. Question one was also included here, but responses were collected via short answer comments (see summary below).
▪ The 'Navigation' metric captured the satisfaction/dissatisfaction with the routing, paths, and structure of the website. This was measured with questions five, six, seven, and eight.
▪ The 'Attraction' metric obtained information regarding the satisfaction/dissatisfaction users have with the visual/aesthetic design of the website. This was an index using questions nine and ten of the questionnaire.
▪ The 'Opinion' metric was used to gather what users enjoyed most/least, as well as their personal recommendations on how to improve the website.

Where we tested

Following is a summary of the participants' computing environment:

URL of tested website:	www.tree.com (hypothetically)
Computer platforms:	Alienware M14x with an 15" display
Platform used:	Adobe Acrobat Pro
Screen resolution:	[1024 X 768]
Operating system:	[Windows XP]
Connection speed:	[Shared T1]

Data collection instruments:

▪ Morae Recorder, Morae Observer, Morae Manager
▪ 13" Macbook Pro was used to record two usability studies
▪ Testing was conducted in the dining/living rooms of participants' homes

Introductory Questions & Tasks

At the beginning of each session (prior to recording), we asked participants three preliminary demographic questions, including:

- What is your age?
- What is your gender?
- Is English a foreign or native language to you? If foreign, how many years of experience do you have learning English?

Participants were all very close in age, ranging from 21 to 24: 21, 22, 22, 22, 24. Three of them were males and two were females. It is noteworthy to highlight the fact that English is foreign to four users (all from China) while English is the native language of only one user. The four foreigners, though, all have 12-15 years of experience speaking and writing in English

Findings & Recommendations

Issue #1, Category: General

 Question: #1: Which if the above tasks was most difficult to complete?
 Task #11: Transform the branched *words* connected to tele-phone into *roots*.
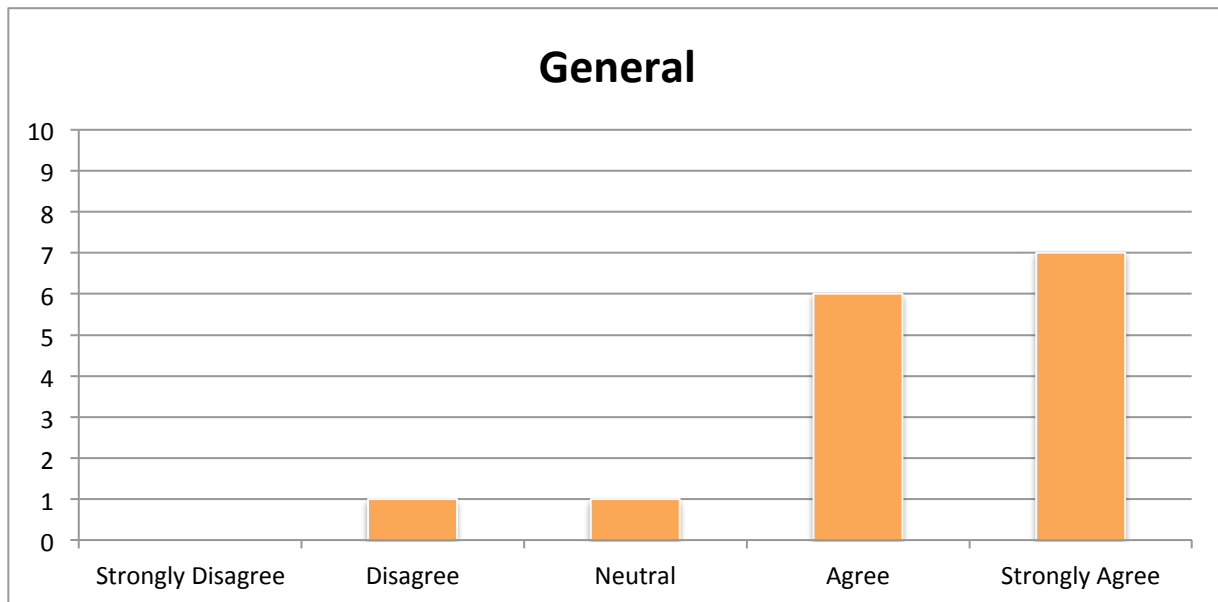
 Number of participants: Three (3)

Usability Finding [#1]: It is not obvious to users what the button labeled "Root/Word" does.

Below is a bar graph of the data gathered from the exit questionnaire. The following three questions make up the General (overall satisfaction) index:

 Question #2: The website was easy to use.
 Question #3: The 'network' visual representation assisted in my understanding of the
  connection between words.
 Question #4: The concept/idea behind the website is interesting.

General

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
0	1	1	6	7

(Bar graph: y-axis scale 0 to 10. Strongly Disagree = 0, Disagree = 1, Neutral = 1, Agree = 6, Strongly Agree = 7)

Note: The responses to questions 2,3, and 4 (all five-point Likert Scale) were tallied up to create the General index

Supporting Evidence	Recommendations/Comments
Question #1 Problematic Responses: "The instruction is not so clear and may confuse users." "The last. Wasn't sure how to 'transform' the words." "Task 11." Two users were unable to complete task #11.	It is likely this issue is due to a lack of clarity in the instructions (see first comment under Supporting Evidence). Therefore, when creating the website video tutorial, do not use the word "transform," or any other ambiguous words/phrases that may confuse the user. Make the instructions elementary in order to be understood by both native and foreign English language speakers. If the issue is indeed an interface problem, the solution is to eliminate the button altogether. As a substitute, when the cursor hovers over a word, the roots can appear in bold while the opacity of the other parts of the word decrease in opacity. Previous usability tests prove this to satisfy users because no clicks are needed.

Issue #2, Category: Navigation

Number of participants: Five (5)

Usability Finding [#2]: There are several buttons on the interface that users are unsure of where they lead. The back button does not go all the way back to the search engine page. This obscure navigational structure caused two users to repeatedly click on several links, going from screen to screen, to find the one required to complete any given task.
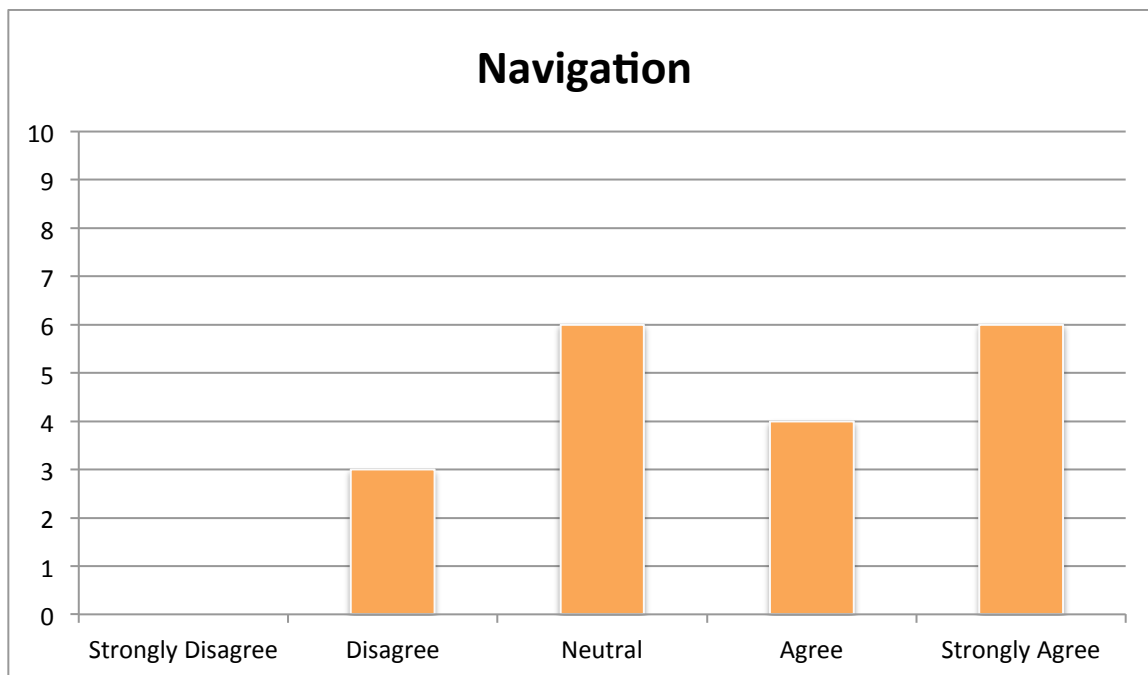
Below is a bar graph of the data gathered from the exit questionnaire. The following four questions were used to create the navigation index:

Question #5: I knew the possible paths I could take from each page.
Question #6: The structure of the website was confusing.
Question #7: Each button did what I though it would do.
Question #8: The font of the text appeared active/clickable.

Navigation

A bar graph titled "Navigation" with a vertical axis from 0 to 10. The categories on the horizontal axis and their values are:
- Strongly Disagree: 0
- Disagree: 3
- Neutral: 6
- Agree: 4
- Strongly Agree: 6

Note: The responses to questions 5, 6, 7, and 8 (all five-point Likert Scale) were tallied up to create the Navigation index

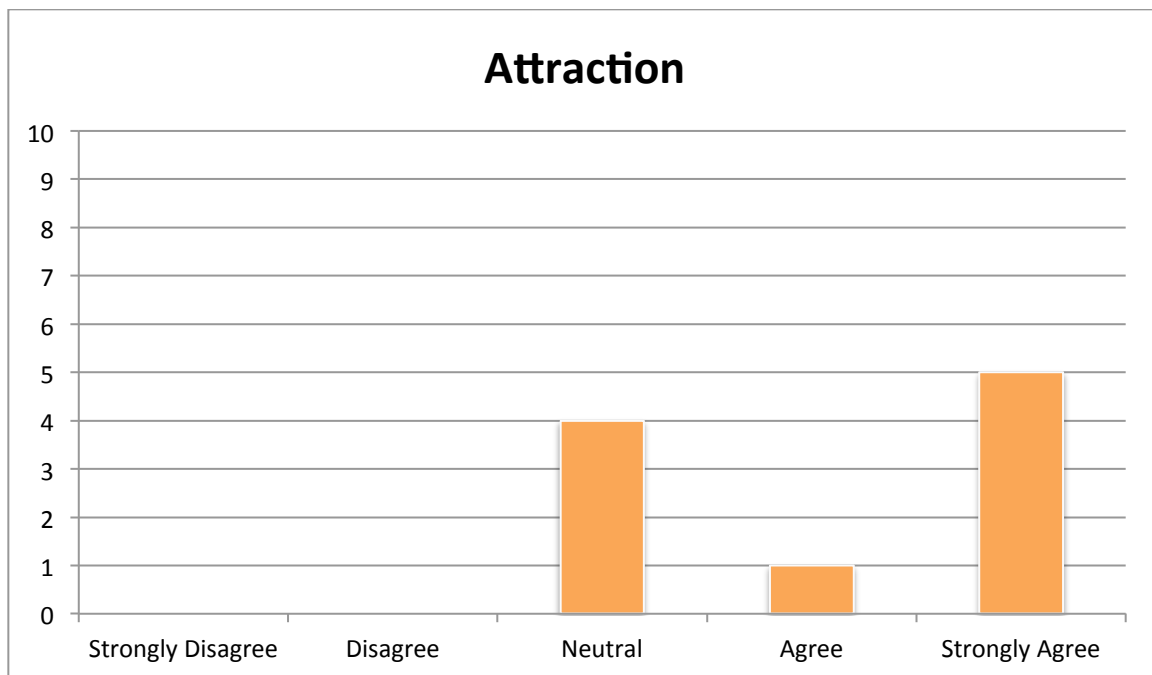| Supporting Evidence	Recommendations/Comments
Question #5 Problematic Responses: "When I clicked the 'back' button, it didn't go back to the search engine page." "It took a bit of time to understand what buttons were clickable and what each button was meant to do." *Question #7 Problematic Responses: 1 Neutral, 1 Disagree*	A large-scale shift in function is needed along with a simplification of button label names. Users verbally indicate that they very much enjoy the structure of the website, but are just unsure of how to successfully maneuver through it. Concerning simplification of button labels, the "More" and "Less" buttons could be replaced with "+" and "-" to communicate the same function. The recommendation in issue number one would also aid in this issue as it would eliminate a button altogether while keeping its original function available for use.

Issue #3, Category: Attraction

Number of participants: Five (5)

Usability Finding #3: Most users find the layout attractive or remain neutral in their perception of its visual appearance.

Below is a bar graph of the data gathered from the exit questionnaire. The following two questions were used to create the attraction index:

Question #9: The layout of the website was appealing.
Question #10: I would use this website to study for the GREif it were available.

Attraction

Note: The responses to questions 9 and 10 (all five-point Likert Scale) were tallied up to create the Attraction index.

Supporting Evidence	Recommendations/Comments
(See graph) *Question #9 Response:* "The overall layout is nice." *Other Comments (See videos):* "The layout is simple and cute." "The bubbles just invite you to click them, which makes it kind of fun." User Suggestions "Add more color." "Change the font and size of characters."	As evidenced by the above graph and other written/verbal comments, for the most part users found themselves to be visually attracted to the website, which makes them want to use it more because it's more appealing (in a small sense, "gamified,") than reading plain text. It's simplicity and minimalism also seems to be a factor in its appeal. Colors should be added, but not haphazardly. Colors produce subtle psychological effects on people. It would be wise to research color combinations that would induce higher learning outcomes. This could also be used as a marketing selling point. One user complained about the size of the font, but this did not appear to be a problem. Videos indicate users keeping a normal distance from the screen and none of them once squinted. This leads me to believe the comment is the user indicating her preference and nothing more. This can be capitalized on. A future version of Tree could incorporate custom made fonts and colors, allowing users freedom to customize/personalize their experience with Tree.

Issue #4: General

Problem Question: #2: The website was easy to use.

Number of participants: One (1)

Usability Finding [#4]: The test took users longer to complete than expected. This can be attributed to the faults and less developed aspects of the second-generation prototype, which have been a cause for delayed time in completing tasks. During this extra time spent, users drag their mouse over every single word and wait for it to morph into a hand, meaning that word is clickable. Considering the amount of words branching off each root, this is a time-consuming process, and a bit of frustration can be seen on users' faces.

Supporting Evidence	Recommendations/Comments
Question: The website was easy to use. Response: "It took a bit of time to understand what buttons were clickable and what each button was meant to do."	This problem would not be encountered in the final version of this product. However, this issue is a cause of frustration for the users subsequently altering their perception of the website and possibly influencing their responses to other questions based on their mood. Thus, to reduce this unnecessary bias in future prototype usability tests, each word should be made active/clickable leading to its respective linked page.

Exit Questions/User Impressions

At the end of each session, we asked participants thirteen questions:

<u>Legend</u>
1=Strongly Agree
2=Strongly Disagree
3=Neutral
4=Disagree
5=Strongly Disagree

General
- Which of the above tasks was most difficult to complete?
- The website was easy to use.
- The 'network' visual representation assisted in my understanding of the connection between words.
- The concept/idea behind the website is interesting.

Navigation
- I knew the possible paths I could take from each page.
- The structure of the website was confusing.
- Each button did what I thought it would do.
- The font of the text appeared active/clickable.

Attraction
- The layout of the website was appealing.
- I would use this website to study for the GRE if it were available.

Opinion
- What did you like most about the website?
- What did you like least about the website?
- What suggestions do you have to improve the website?

Summary of participant responses to short answer questions and any comments (See 'Findings and Recommendations' above for all other Likert Scale responses):

Question: Which of the above tasks was most difficult to complete?

> Responses: "To search another word." "Task 11." "The instruction is not so clear and may confuse users." "Number 9." "The last." "Wasn't sure how to 'transform' the words."

Question: The website was easy to use.

> Response: "It took a bit of time to understand what buttons were clickable and what each button was meant to do."

Question: I knew the possible paths I could take from each page.

> Responses: "When I clicked the 'back' button, it didn't go back to the search engine page." "It took a bit of time to understand what buttons were clickable and what each button was meant to do."

Question: The layout of the website was appealing.

> Response: "Like I said, it's a bit confusing, but the layout overall is nice."

Question: What did you like most about the website?

Responses: "The interface, it's pretty cool." "I can learn derived words of each root." "The layout is simple and cute." "Context of words." "The idea of exploring through the root words is compelling."

Question: What did you like least about the website?

Responses: "The color." "The instruction is confusing." "User interface." "Just the confusing aspect of the buttons."

Question: What suggestions do you have to improve the website?

Responses: "Add more colors in it." "Change the font and size of the character." "The instruction can change automatically." "Make sure to indicate what buttons are clickable (inside and outside the word bubbles)."

Appendices

Appendix A

INFORMED CONSENT

Tree (Website Application):

PROTOCOL DIRECTOR: Dr. Frank Biocca

DESCRIPTION: You are invited to participate in a research study for an early version of a website application designed to assist in expanding vocabulary. You will be asked to complete a task and then fill out a five-minute questionnaire where you can inform us of your thoughts about the application (i.e., what you liked/didn't like). The purpose of this research is to help us correct any weaknesses and improve the design and functionality of Tree. A program called Morae will be used to record audio and video while you use Tree. These recordings will be stored on a single password protected computer and destroyed in three months. The Protocol Director (Dr. Frank Biocca), and the two primary researchers (Stephen Salvitti and Tianran Liu) are the only people who have access to or will view these recordings.

TIME INVOLVEMENT: Your participation will take approximately 15 minutes.

RISKS AND BENEFITS: There are no foreseeable risks in participating in this research study. The benefits which may reasonably be expected to result from this study are the potential that your useful feedback will be incorporated into a future design, thus playing a role in helping all who use Tree in the future have an enhanced, more enjoyable experience when expanding their vocabulary and learning a language. We cannot and do not guarantee or promise that you will receive any benefits from this study

PAYMENTS: Unfortunately, we cannot provide compensation for your participation.

SUBJECT'S RIGHTS: If you have read this form and have decided to participate in this project, please understand your participation is voluntary and you have the right to withdraw your consent or discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled. The alternative is not to participate. You have the right to refuse to answer particular questions. Your individual privacy will be maintained in all published and written data resulting from the study. If you do not agree to have your identity revealed (asked below) in written materials resulting from this study, a pseudonym will be created to ensure confidentiality.

CONTACT INFORMATION: If you have any questions, concerns, or complaints about this research, its procedures, risks and benefits, or your rights as a participant, contact the Protocol Director, Dr. Biocca, M.I.N.D. Lab, fbiocca@syr.edu, 240-324-6222.

(Continued)

CONSENT

I give consent to be audiotaped during this study.

      Please initial: ___Yes ___No

I give consent to be videotaped during this study:

      Please initial: ___Yes ___No

I give consent for tapes resulting from this study to be used in a Human Computer Interaction class project to be submitted by Tianran Liu and Stephen Salvitti to Dr. Frank Biocca:

      Please initial: ___Yes ___No

I give consent for my identity to be revealed in written materials resulting from this study (If no, a pseudonym will be used):

      Please initial: ___Yes ___No

The extra copy of this consent form is for you to keep.

SIGNATURE _____ DATE _____

Appendix B:

Usability Introduction Video

Each user was presented with a 1½-minute video introducing them to Tree and providing a brief outline of the process of the usability study. The video can be found here.

Appendix C:

The following preliminary questionnaire, task list, and exit questionnaire were entered into Morae Manager.

Preliminary Questions

1. What is your age?
2. What is your gender?
3. Is English a foreign or native language to you? If foreign, how many years of experience do you have learning English?

Tasks

1. Search the word "Photograph."
2. Select the root "graph" to see other words that begin with that same root.
3. Find more words that use the root "graph."

4.   Explore the context of the chosen root word.
5.   Find the definition of the root "geo."
6.   Go back to the search screen
7.   Search "telephone."
8.   Select one of the roots (tele or phone).
9.   Look at more words that use the root you chose.
10. Explore the context of the root you chose.
11. Transform the branched *words* connected to tele-phone into *roots*.

Exit Questionnaire

Please write a number ranging from 1 though 5 for each of the questions below.

 Legend
1- Strongly Agree
2- Agree
3- Neutral
4- Disagree
5- Strongly Disagree

General:

1. Which of the above tasks was most difficult to complete?
2. The website was easy to use.
3. The 'network' visual representation assisted in my understanding of the connection between words.
4. The concept/idea behind the website is interesting.

Navigation:

5. I knew the possible paths I could take from each page.
6. The structure of the website was confusing.
7. Each button did what I thought it would do.
8. The font of the text appeared active/clickable.

Attraction:

9. The layout of the website was appealing.
10. I would use this website to study for the GRE if it were available.

Opinion:

11. What did you like most about the website?
12. What did you like least about the website?
13. What suggestions do you have to improve the website