Analyzing Usability and Interface Discrepancies Between Adobe Software Applications

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Jillian Duma, Joi Overby, Alissa Roy, Emma Strongin

Introduction

The purpose of this experiment is to determine in what ways people utilize the different Adobe software: InDesign, Illustrator, and Photoshop.

Introduction Continued

- Interfaces similar but usability varies in subtle ways
- 8 million users subscribe to Creative Cloud
- Ensure that best elements are being used to ensure audience's needs are met
- See how participants complete same tasks on different softwares
  - Test visuals of interfaces using Tobii Eye Tracker
  - Test stress using the Galvanic Skin Response (GSR) monitor

Background

- Research in mental models say interfaces that match user expectations of object placement improve overall user satisfaction and efficiency
  - McCarthy (2004)
    - Consistency of object placement throughout and within websites contributed toward a website's interface and overall user satisfaction
    - Efficiency of task completion diminished upon first interaction with the website, but improved with subsequent interaction
  - Heinz et al. (2016)
    - Consistency of object placement throughout website interfaces contributes to overall user expectation
  - Narwaz and Hertzum (2011)
    - High familiarity with an interface results in higher success rates for completing tasks
- **Hypothesis**
  - The interfaces that show consistency between tools and features result in higher overall user satisfaction and less stress

Research Question

What Adobe functions cause stress, and how can functions be standardized across programs to create an easier user experience?

Materials & Methods

Rationale of Software Applications

- Adobe InDesign, Illustrator, and Photoshop were chosen for their strong influences on the creative community
- Disparities include:
  - Different ways of saving as a PDF
  - No similar brush tool in InDesign
  - Different locations and icons for "Swatches" and "Color"
  - Text tool creating a new layer in Photoshop

Apparatus & Testing Facility

- School of Media Sciences Graduate Computer Lab
  - Controlled environment
- Computer had Adobe InDesign, Illustrator, and Photoshop installed on it
- Tobii Eye Tracking Device to gain data about where participants looked while exploring different interfaces
- NeuLog Galvanic Skin Response (GSR) Sensor measured changes in the skin's conductivity in order to gain quantitative results to how frustrated a participant became

Participants

- Students from the Rochester Institute of Technology
- 11 total
  - 18-24 years old
  - 3 male
  - 8 female
- Mix of ability using Adobe Software
  - 72% had experience with Photoshop and InDesign
  - 54.5% had experience with Illustrator

Procedure

- Consent form, pre-experiment questionnaire
- Have NeuLog GSR software set-up before experiment began
  - 20 microsiemens per second
  - Sensor attached to pinky and ring finger of non-dominant hand
  - Software would be started and stopped with experiment
  - Results saved as "LastName_Software"
- Tobii Eye Tracking Device
  - Run as administrator
  - Have three experiments set up - one for each type of software being tested
  - Each experiment would record the screen showing the participant work through the software
  - User would have to calibrate eye-tracker
  - Began Tobii and GSR at same time
  - Save files as "LastName_Software"

Procedure cont.

- Have proper Adobe software file open at the same time as the proper eye tracking experiment
  - Naming conventions important to make analyzing data easier
  - Had Adobe file prepared for each participant before they began experiment
  - Image of a field that was prepared to open in InDesign, Illustrator, and Photoshop
  - Were given the order of which software to use in a randomized order
- Had 5 minutes to complete tasks, which were printed out for them
  - If unable to complete tasks, had 2 minutes to try and save file
  - Had to complete Likert scales describing how easy/difficult it was to move through tasks after each software
- Every time a participant completed a task, experimenter would close out and reopen proper Tobii, NeuLog, and Adobe Software, resetting everything to default and ensuring all proper software was aligned. Would time everything as well.
- Post experiment questionnaire

Tasks:

Conditions Measured:

- GSR measured the conductance of the participant's skin.
  - Increase with anxiety
- Eye Tracker - fixations and length of time
  - The number of fixations correlates to the duration and performance of the task
  - The duration of where the eye looks reflects the difficulty of the usability of the software
- Task time
- User frustrations
  - Qualitative data

# Data Results

Completion Rate

- Broke up each task into different subtasks, analyzed file to see how many of these subtasks were completed in time allocated
  - The software for Adobe Illustrator crashed during two people's experiments crashed, making those particular results invalid.
- Highest completion rate in Photoshop
- Lowest completion rate in Illustrator
  - Only 40% of participants were able to determine how to save the file as a PDF

Percent Completed vs. Software
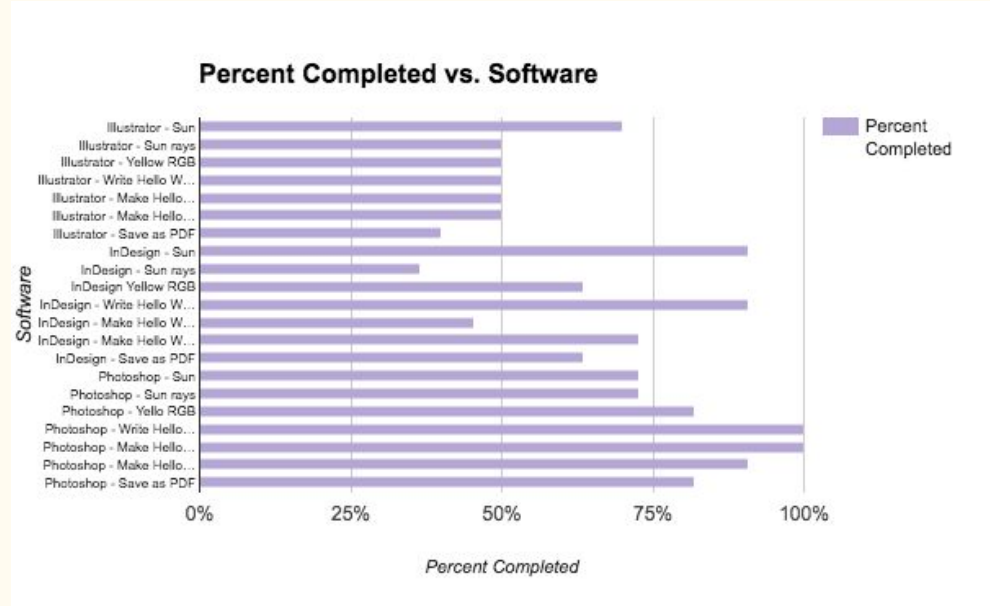
Overall Average Task Completion	
Illustrator	57%
InDesign	66%
Photoshop	85.70%

Tobii Eye Tracking

- Primary focus area: left-hand menu
- Secondary: image itself
- Tertiary: right-hand menu
- Fourth: top menu
- Eyes would search more rapidly when a tool worked differently than expected
- Exploratory similar in that participants would try tools until something worked, and would focus on specific tools trying to discern meaning
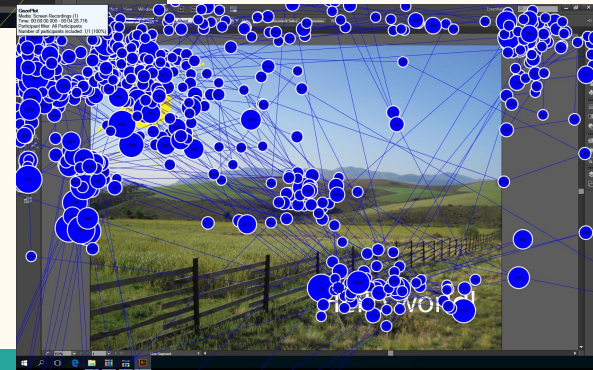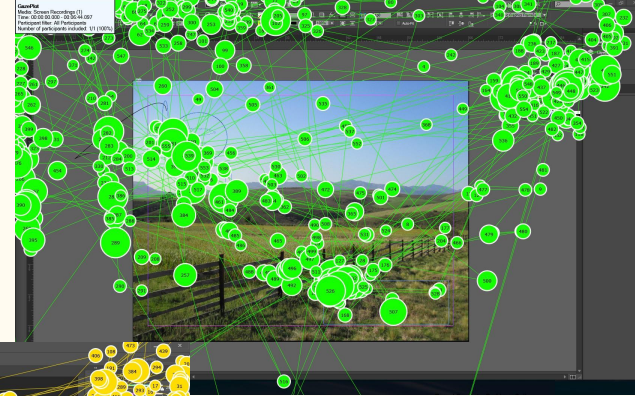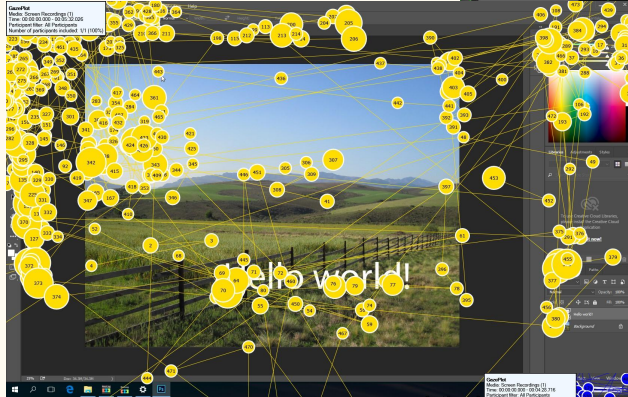
*Images top to bottom: InDesign, Photoshop, Illustrator*

Skin Conductivity - Galvanic Skin Response

- Participants had, on average, a slightly higher level of stress in Illustrator
- The median μS per second was also higher for Illustrator, at 6.4205
- During the third quartile of time that the experiment was run, the highest skin conductivity was in InDesign, interesting because began with lowest skin conductivity
- Participants had the most consistent stress levels while using Photoshop, as seen as this software had the lowest variance out of the three, 3.914403081 μS per second. Lowest levels of stress by third quartile
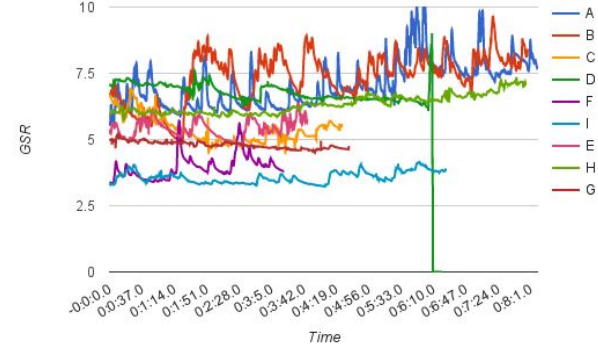
| Software	InDesign	Photoshop	Illustrator
Standard Deviation	2.17717173	1.978485047	2.011442913
First Quartile of Data	4.6274	5.2492	4.9889
Second Quartile	5.9645	5.9758	6.4205
Third Quartile	8.23745	7.4379	7.6214
Variance	4.740076743	3.914403081	4.045770584
Means	6.447079758	6.422548774	6.519144496
Median	5.9645	5.9758	6.4205
Mode	9.9999	9.9999	9.9999
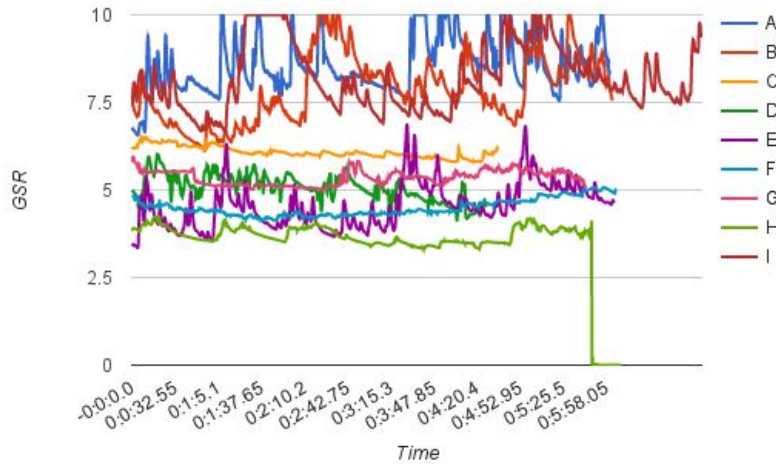
GSR per Software
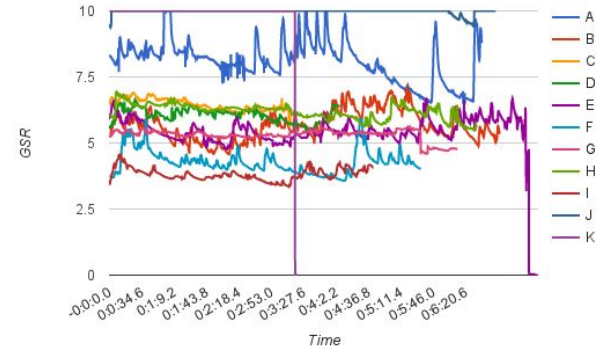
Pre-Questionnaire

- Questions that would let us know how familiar our participants were with the products we were having them use
    - 6 use Creative Cloud for school, 1 for work, 1 for leisure, and 2 for something else
    - Only 4 participants have a subscription to Creative Cloud
        - 2 pay for the subscription themselves, 2 have it paid for by a relative

Major	Number of Participants
Biomedical Sciences	1
Environmental Sustainability, Health & Safety	1
Film & Animation	1
Game Design & Development	2
Industrial Design	1
Mechanical Engineering	2
Media Arts & Technology	1
New Media Design	2

Have you ever used Photoshop?

- Yes
- No

27.3%

72.7%

8 out of 11 participants have used Photoshop
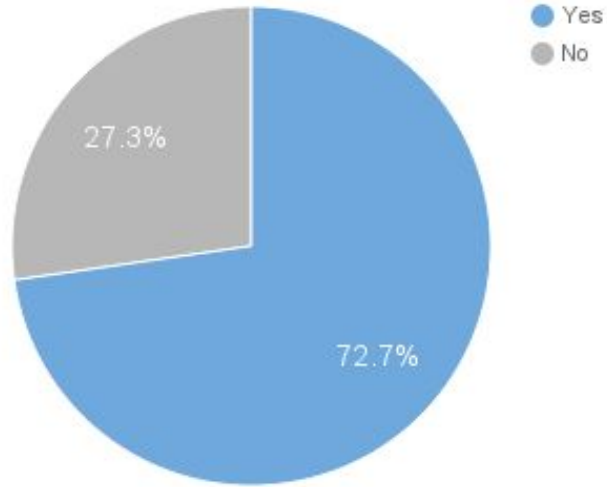
- Of the 8 participants, 6 were weekly users, 2 rarely use the program

Have you ever used InDesign?

Yes
No

27.3%

72.7%

8 out of 11 participants have never used InDesign
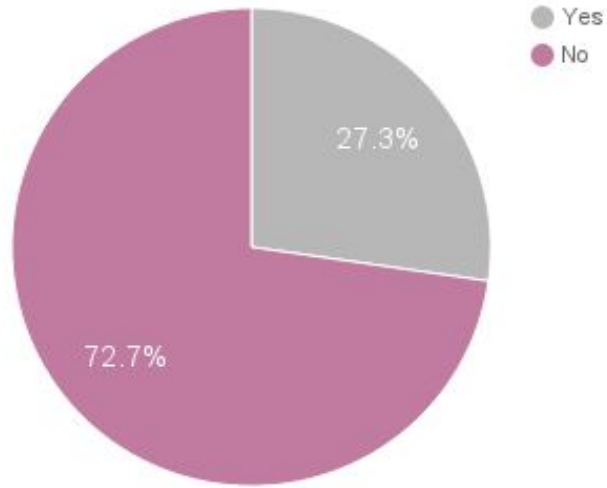
- Of the 3 participants, 2 were weekly users, 1 rarely uses the program

Have you ever used Illustrator?

Yes
No

45.5%

54.5%
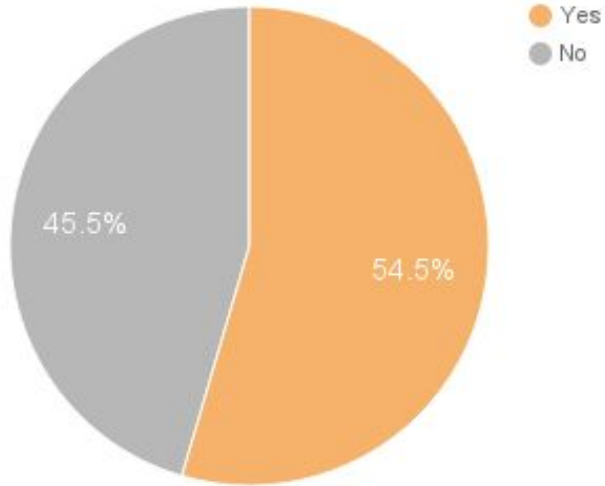
- Of the 6 participants, 1 was a daily user, 3 were weekly users, 2 rarely use the program

6 out of 11 participants have used Illustrator

Qualitative Results During Experiment

- After each software, participants were asked a number of questions about how difficult they found each task
- They were asked to rate difficulty on a Likert-type scale
- A response of "-" represents that the program did not allow for the participant to complete the task

1	2	3	4	5	6	7
Not Difficult At All	Not Difficult	Slightly Not Difficult	Neutral	Slightly Difficult	Difficult	Very Difficult

Difficulty Ratings - Photoshop

Participant	Text	Drawing	Saving	Average for all tasks
A	4	7	-	5.5
B	1	2	7	3.3
C	3	2	2	2.3
D	1	2	-	1.5
E	1	7	7	5
F	1	3	1	1.7
G	2	5	1	2.7
H	1	4	1	2
I	1	-	1	1
J	2	2	5	2.3
K	1	1	1	1
Average	1.6	3.5	2.9	2.7

- Averages
  - Text: 1.6
  - Drawing: 3.5
  - Saving: 2.9

Difficulty Ratings - InDesign

Participant	Text	Drawing	Saving	Average for all tasks
A	5	6	2	4.3
B	5	5	3	4.3
C	2	2	2	2
D	7	4	3	4.7
E	1	1	1	1
F	2	5	1	2.7
G	7	1	1	3
H	2	6	2	3.3
I	1	5	1	2.3
J	4	5	2	3.7
K	3	5	2	3.3
Average	3.5	4.1	1.7	3.1

- Averages
  - Text: 3.5
  - Drawing: 4.1
  - Saving: 1.7

Difficulty Ratings - Illustrator

Participant	Text	Drawing	Saving	Average for all tasks
A	7	7	-	7
B	2	7	2	3.7
C	-	4	2	3
D	7	7	2	5.3
E	1	1	1	1
F	1	3	1	1.7
G	1	1	1	1
H	1	7	3	3.7
I	1	4	1	2
J	1	5	1	2.3
K	2	5	2	3
Average	2.4	4.6	1.6	2.9

- Averages
  - Text: 2.4
  - Drawing: 4.6
  - Saving: 1.6

Overall Averages

Task	Photoshop	InDesign	Illustrator
Text	1.6	3.5	2.4
Drawing	3.5	4.1	4.6
Saving	2.9	1.7	1.6
Overall	2.7	3.1	2.9

- Photoshop had the lowest overall difficulty rating, highest difficulty rating for saving/exporting as a PDF
- InDesign had the overall highest difficulty rating, highest difficulty rating for adding text
- Illustrator had the highest level of difficulty for drawing

Post-Questionnaire

- What was particularly frustrating?
  - Out of our 11 participants, eight of them had problems finding the correct tool or using the tools properly
  - Many were looking for a pre-made shape tool, similar to what you might find in Microsoft Word
  - Some tasks participants were asked to complete were not tasks one would generally use one of the programs to complete
    - Text in Illustrator
    - Drawing in InDesign
- What suggestions do you have for Adobe?
  - Participants expressed interest in a more standardized UI
  - Desire for tools and shortcuts to function the same across all platforms
  - Tutorials, instructions

Discussion & Conclusions

Discussion

While Illustrator was the most stressful to use, InDesign was found to be the most difficult to use. Participants had trouble with the location of the tools. There was interest in standardizing of tool locations and functions. For example, Photoshop had the highest completion rate of saving a file as a PDF. Saving files could be standardized across interfaces to be most similar to Photoshop.

Conclusion

From the use of the Tobii eyetracker and the GSR sensor, we were able to conclude that although Adobe Photoshop, Illustrator and InDesign have similar tools and interfaces, the difficulty of usability ranged depending on the software since each of the programs are meant for different purposes.

Recommendations:
- Standardizing tools across all three softwares to improve usability. This could potentially attract more users by showing that people with any skill level (beginner to expert) are able to use the softwares.
  - Brush tool in Illustrator vs. Photoshop
  - The "Save as/Export" option across all three softwares
- Formatting the software layout in similar fashions to lessen stress level of users
  - InDesign vs. Photoshop layout

Limitations & Future Work

The limitations of this experiment included:

- Small sample pool with low diversity in gender, age and ethnicity
- Operating the Tobii Eye Tracking software, the GSR software, Adobe Photoshop, Illustrator and InDesign all on one small laptop
  - With all of these softwares running at the same time, this potentially resulted in the Tobii software to crash during some experiments
- Human error

For future work it would be interesting to focus more on the usability range between beginner and expert users of each of the softwares to further analysis how to improve the softwares. Analyzing how users interpreted icons that represented certain tools in the softwares would be interesting to explore too.

Acknowledgements

We would like to thank all of the participants that agreed to take the time and participate in our experiment.

Questions?

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