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Assignment 1

4-4.

Introduction: This exercise stated to base a table similar to Figure 4.14 in the HCI book in chaper 4 in terms of my groups research project idea. The exercise also requested that each member of the group provice 3 relevant and unique papers in the table, thus we would need 12 papers total. It also stated that the table needed to be organized into rows, methods, and relevant themes/finding related to our research project. Lastly, it asked that each group member reflected on their selected papers within this assignment. This exercise is meant to allow all members of a group to learn how to search for appropriate sources in relation to the question the group is researching. It is important for students to know how to reliable find sources related to their work and how to report those papers. This will help in the long run as well because these sources will likely be able to be reused for the end-of-term group project.

Methodology: For the most part, the specifications for this exercise were clear. I used Google Scholar to search for and find various potential resources for my 3 papers. As I searched through Google Scholar, I used a combination and variation of key terms relating to my group project, i.e. context-aware sounds. After each search I skimmed the paper titles and opened the potentially related papers in new tabs. Once I had several papers to look through, I took a closer look at each of the abstracts to decide whether they were applicable for our research topic. If they were applicable, I read further into the paper to understand the research that paper was conducting. Although a lot of papers did not fit the scope of my groups research project, I was still able to find 3 research papers that were relevant to my groups project and were unique to those of my team members.

Figures/Tables:

Group Member	Study (1st author)	Number of Audio Notifications	Number of Ambient Noises	Number of Participants	Notes
Zach Lowe	Lee [1]	6	2	30	Used EEG to measure mental workload and compare effectiveness of an alert based on attention to a task.
Zach Lowe	Slutsky [2]	8 and 4	1	5 and 12	Used a real kitchen environment for ambient noises. Two experiments were run, with 8 notifications and 5 participants for experiment 1 and 4 notifications and 12 participants for experiment 2.
Zach Lowe	Röer [3]	1	1	51	Used participants own ringtones with ambient noise representing an office environment.
Zack Lamb	Arfvidsson [4]	6	1	16	Using notification sounds to get the

					attention of individuals against the background noise of a store
Zack Lamb	Mehrotra [5]	0 *See Notes	0 * See Notes	74 Initial to subest of 20	Study looking at response time and measure disruption caused by different notification sounds. This study used purely visual notifications. However, it is relevant to our project as they measure response time in a specific way which we may be able to incorporate into our project.
Zack Lamb	Singer [6]	15	2 (Car Windows Down + Music)	20	Study looking at the alert sounds used in vehicles against the background noise of a moving car. Studying effectiveness of different alert sounds and response time.
Elita Danilyuk	Jung [7]	3	2	25	Study embedded audio cues in ambient soudscaped pieces of music. Conducted the study with 25 participants and tested the notification effectiveness and reaction speed between their approach and notable notification sounds not embedded into the soundscape.
Elita Danilyuk	Westermann [8]	*Varies (see notes)	*Varies (see notes)	*Varies (see notes)	This paper discusses how notifications are a means for app publishers to attract their audiences attention. This paper goes into several studies, including testing sounds along with vibration and visual alerts. It also goes into sound related to content and frequency as long as context factor time.
Elita Danilyuk	Gottselig [9]	2	2	32	This study approached sounds differently than how we intend to, but it will be useful to help us decide which sounds to use in our study. The study contains two EEG recordings while participants tried to ignore two devient sequences. Ultimately, the low frequencies were easier to ignore/discriminate.
Dan Butcher	Garzonis [10]	27	0 * See Notes	29	Expiriment based on classification of alert sounds from notifications in to 3 categories, Speech, Auditory Icon, and Earcon. Participants were initially trained on sound categories and asked to match a notification with a service.
Dan Butcher	Cabrera [11]	4	1 (Air Traffic Control	5	Study on 'auditory display', a method of conveying information through

			Simulator)		non-speech sound for applications in air traffic control alarms of varying importance. Also an intestigation in to parameratized sound design of notifications motivated by urgency, spacial localization and inteligibility in noisey environments.
Dan Butcher	Afonso [12]	4	0 * See Notes	19	4 different alert sounds were compared for their effectivness in alerting a subject to the possibility of a collision while navigating a virtual labyrinth, unsighted. The sounds were played from multiple virtual positions along walls thoughout the maze in an attempt to convey the location of walls and walkways to prevent collision.

Figure 1: Group Research Papers

Conclusion:

By the end of this exercise I found 3 research papers that were relevant and unique for my groups research project (figure 1). The first paper I found researched ambient audio notification systems for multi-user environments [1]. The paper studied 25 subjects and looked at notification effectiveness through reaction speeds. This expirmenet had 2 independent variables, the notification sound and the ambient soundscape. At the end of the study the subjects filled out a questionnaire for qualitative data, such as factors of distractibility and other sounds they heard during the experiment. Through the quantitative and qualitative data, the researchers found that subjects declared other factors of concentration disruption. This paper will be a good resource to understand how to run our experiment along with what sort of demographical and quantitative questions to ask our participants.

The next paper I found was actually a book about mobile notifications and their acceptance by users [2]. This book was very interesting and different than my other sources because it contains more than one study and goes into detail for each expirement. The two experiments that relate most to our project are about users notification settings and how sounds accompanied with visual or physical cues are the most affective. That being said, our groups project will be conducting our experiment through only auditory cues and no other aids. This book will help us understand how we should approach our project from a development side, as one of the experiments created an app for their study.

The final paper I found also approached their sound experiment from a different point of view than our groups project. This paper researched whether certain tone sequences are easier to learn to discriminate and ignore [3]. Even though this paper approaches sound through a different research question, the results will help my group consider different tone sequences to determine whether different tone qualities alert users more than others. The information from this paper will also allow us to consider what tone qualities we should research and decide on for our independent variables.

This exercise was helpful for me because I was able to look for relevant papers with the thought of my teams research question. It allowed me to look more closely at papers while putting more thought into how my group will create our research project. Thanks to this exercise,

I now have a few ideas and considerations in respect to our research question. This exercise also gave me the opportunity to gather resources for my groups final paper, which will be extremely helpful toward the end of this semester.

References:

[1] R. Jung and A. Butz, “Effctiveness of user notification in ambient soundscapes.” 2005.

[2] T. Westermann, “User acceptance of mobile notifications.” Singapor: Springer, 2017.

[3] J. M. Gottselig, D. Brandeis, G. Hofer-Tinguely, A. A. Borbély, and P. Achermann, “Human central auditory plasticity associated with tone sequence learning,” Learning & Memory, 2004.

4-5.

Introduction: This exercise states to find three examples of artifacts. It asks that each example shows two implementations and to position them in a form vs function 2D graph. The exercise also states to have at least one of the artifacts to be computer-based and at least one to be non-computer-based. This exercise is meant to teach how to identify the principles of form and function. In human computer interaction (HCI), there are several examples of a balanced implementation of form and function because consupers often expect both. If a device has form but little to no function then it is useless to the consumer. On the other hand, if a device has high functionality but low form, it is likely difficult for the consumer to use the device.

Methodology: This exercise was fairly straightforward. I was sitting at my desk at home and looked for various items that I thought might have different iplementations/designs. I quickly realized I have favorite waterbottles due to their form and function. The same goes for keyboards. There are keyboards that feel natural and may seem dull but are highly functional and easy to use. Lastly, I noticed my toaster in my kitchen and it has low form but the functionality is high and thought I would be able to find an example of a toaster that is its inverse.

Figures/Tables:

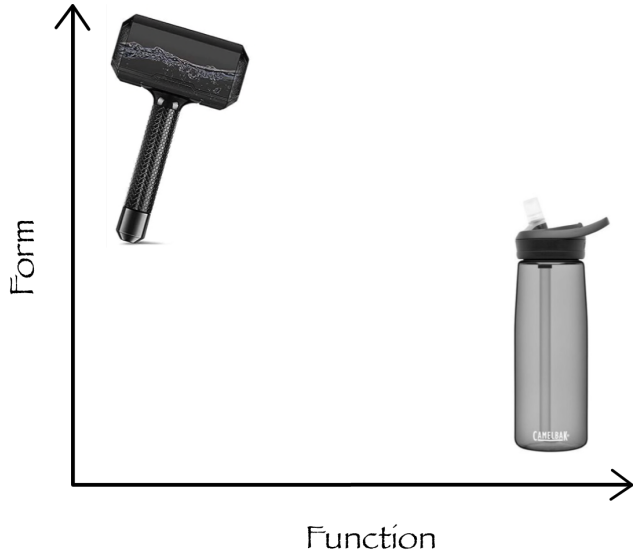

Figure 2: Waterbottles

I selected two waterbottles to show the trade-off of form versus function (figure 2). The waterbottle shaped like Thor's hammer has lots of form and design to it it has little function. It is an irregular shape for a water bottle and its use is not intuitive. For example, there is no indication of where the spout to fill or drink the water from is; this is why I ranked it low in function. However, the designer of this waterbottle did have a new out-of-the-box design that looks sleek and exciting; this is why the it is ranked high in form. On the other hand, the other waterbottle looks like any other waterbottle. It is a cylindrical container with a screwed top for refilling and a straw; this is why the form is ranked lower. Lastly, it is ranked high on function because it is intuitive, effective, and easy for the purpose of refilling and reusing it to drink water.

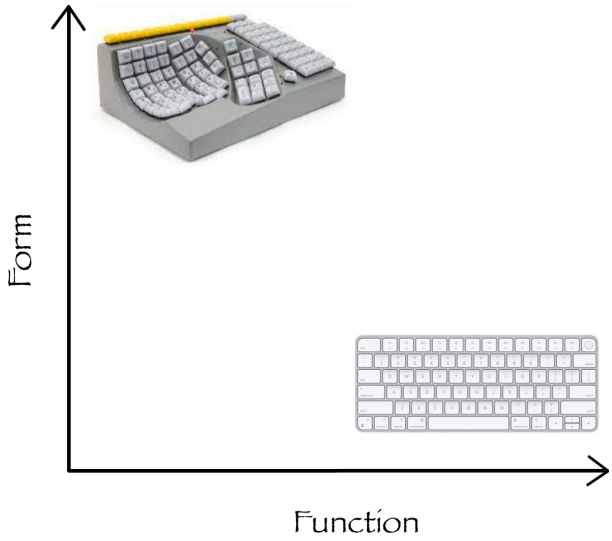

Figure 3: Keyboards

The two implementations of keyboards are drastically different (figure 3). The keyboard marked with high form has curves, valleys, and plains of keys. It has no indication of ease of use for its users, which is why it was given the ranking of lots of form. Because this keyboard was overdesigned with form, it made the functionality of the product significantly difficult. I ranked it in low function because it has no indication that it would allow users to type with low error rates. However, the other keyboard looks very similar to any other standard QWERTY keyboard design. It has the basic keys layed out like any other keyboard; this is why it is ranked low in form. Because it is designed with low form and like many other keyboards, the function is ranked high. It completes its intended task for typing with low errors and is easy to use.

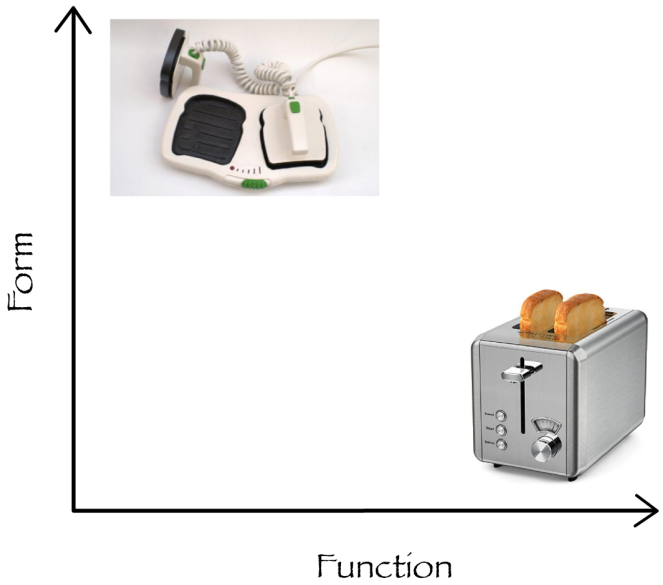

Figure 4: Toasters

The final two items I chose that showed the differences in form and function were two contrasting toasters (figure 4). The high functioning toaster is engineered to toast a piece easily and simply complete that task, which is precisely why it is ranked with high function. The design on the other hand is marked low in form because it looks like any other toaster with the typical options of bagel or toast, the button to start the toasting, and the burn dial; this is like almost any other toaster on the market. On the contrary, the other toaster is designed in a completely different manner. This toaster looks like a defibrillator and has cool features indicating what the use is for, which is why it is ranked high in form. Although, this toaster indicates where the toast goes and you can sort of tell that it is meant for toasting, it has no indication of how to complete the task of toasting your bread. Thus it has high form, and low function.

Conclusion: Form and function must both be thought through and considered when designing and implementing both hardware and software procedures, especially when users will be interacting with them. Users should be given products that perform with intended tasks in mind that complete the tasks effectively and without error. After the task is completed, then form can and should be considered. A product that has both form and function will give users a sense of ease and convenience when using the product while efficiently completing their intended task. I did find it interesting and amusing to consider the differences in form and function. This exercise allowed me to notice items in my everyday life that are mostly on the function side while other things have a good balance of form and function.

5-4.

Introduction: This exercise asks for a simple questionnaire to gather information about users and computers. It is designed for me to learn how to design and administer a survey/questionnaire. The exercise asked for four items of information which allowed the opportunity to interpret and gather different types of information.

Methodology: I created the questionnaire with google forms. For the survey, I used a closed information question for gender, a ratio-scale data set for age, an option for their preferred mac or PC (Windows) computer use, and a limited but open-ended question for how many hours per day (on average) they use a computer. I posted the questionnaire link on my Instagram story, course discord, and as a Facebook post to invite a large population to participate, this allowed the opportunity for people from wide gender groups, geographical dispersion, and age groups. My goal with this method was to avoid gathering data from only computer sciences students at CSU. When I noticed I had over 25 participants, I closed the questionnaire and analyzed the data.

Figures/Tables:

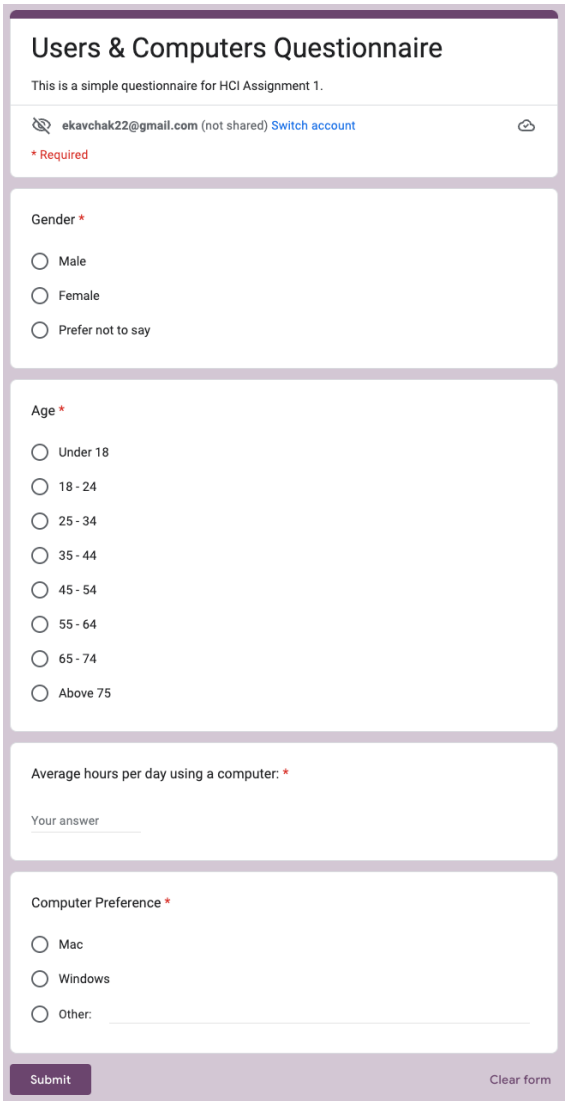

Figure 5: The Questionnaire

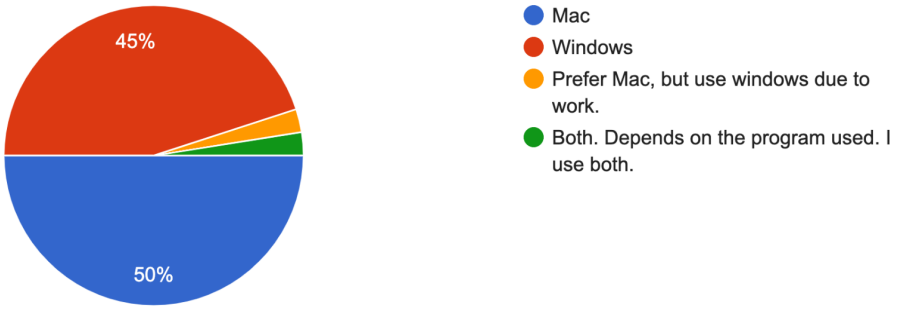

Figure 6: The Questionnaire - Computer Preference

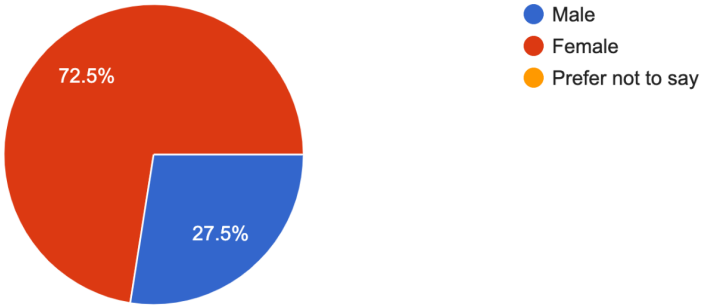

Figure 7: The Questionnaire - Gender

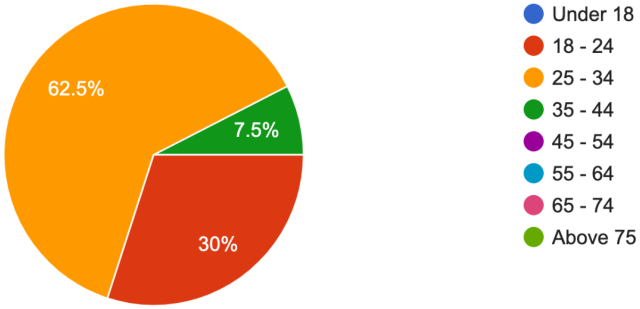

Figure 8: The Questionnaire - Age

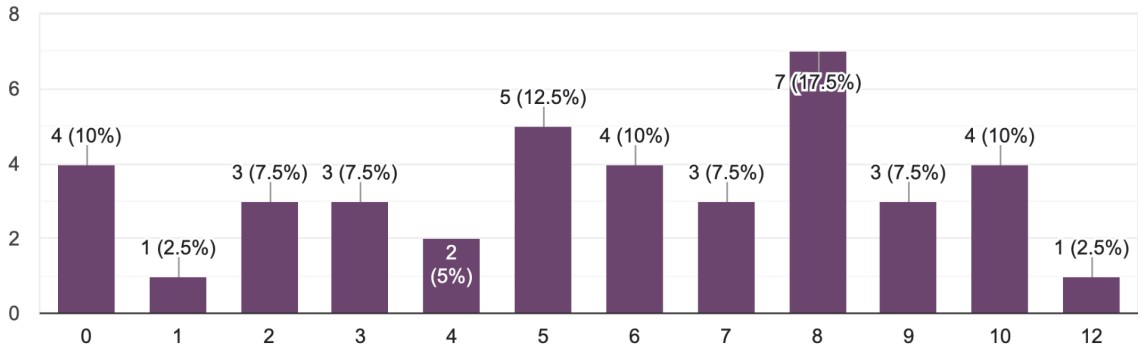

Figure 9: The Questionnaire - Average Hours Per Day Using A Computer

Conclusion: Out of the sample and data I collected, out of the varied genders and ages, 45% of the participants stated they preferred using a PC (Windows) compared to a mac (figure 6). I was surprised to have a majority of female participants. Of the 40 participants, 72.5% were female (figure 7). Although I posted this on social media, I did post it in discord and sent it to males to try to get a dispersed group given gender. This being said, given the locations where the questionnaire was posted, I am not surprised to find that the age group of participants entirely consisted of people between the ages of 18 - 44 years. That said, I was quite surprised to find that 62.5% of the participants were between 25 - 34 years old (figure 8). Given the age demographic I was surprised to find that the sample average of hours using a computer per day was only 5.725 (figure 9). Considering I sent this questionnaire to social media and that the majority age group likely consists of full-time employees, I was expecting the average time to be closer (if not past) 8 hours of use.