GenderMag 2.0

Extending and applying GenderMag with a transgender and a non-binary persona

Bachelor Thesis

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ZUSAMMENFASSUNG

Die heutige Forschung im Bereich Human-Computer Interaction bedient sich teilweise immer noch einer cisnormativen und binären Auffassung von Geschlecht, welche Transgender und nicht-binäre Geschlechter exkludiert. Mit dieser Arbeit soll diese Problematik für die Evaluationsmethode GenderMag adressiert werden. Die Methode wurde mit einer Transgender Persona und einer Persona mit nicht-binärem Geschlecht ergänzt. In einer Pilotstudie wurden diese und eine Cisgender Persona für eine GenderMag Evaluation verwendet und verglichen. Die Auswirkungen auf das Ergebnis der Evaluation und das stereotype Denken der Anwender wurde untersucht. Die Resultate zeigen, dass das Geschlecht einer Persona die Anzahl der identifizierten Probleme und das stereotype Denken beeinflussen kann.

ABSTRACT

Research in Human-Computer Interaction still seems to generally follow a cisnormative and binary logic. To address this problematic aspect with this thesis, the traditional version of the GenderMag usability evaluation method was extended with a transgender and a non-binary persona. In a pilot study, these personas and a cisgender persona were used for a GenderMag walkthrough and the implications of the personas' gender on the outcome of the walkthrough and the stereotypical thinking of the evaluators were investigated. The results indicate that the gender of a persona may affect the number of identified issues and the stereotyping of the personas.

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CONTENTS

LIST OF FIGURES

I INTRODUCTION

Gender bias and stereotyping are part of our everyday life and thus also are issues present in Human-Computer Interaction (HCI) research, software design and development. Several researchers in the fields of Gender HCI [1, 2], Feminist HCI [3] and Intersectional HCI [4] have tackled the influence of gender on HCI. The amount of attention these fields received in the last years, shows that there is a will to further investigate the influence of gender on HCI. A problematic area still needing improvement seems to be the underlying cisnormative and binary logic of gender. Ahmed [5] and Keyes [6] noted that this view leads to the exclusion of transgender and non-binary genders. The introduction of GenderMag [7, 8], a usability evaluation method, addressed the aim of gender-inclusive software. In addition, Hill et al. [9] attempted to improve the inclusivity of GenderMag by adding multiple pictures to the personas used for the method. Nonetheless, the research that GenderMag is based on [1, 2] is rooted in a cisnormative and binary logic as well and I, from the perspective of a cisgender female, argue that the method only insufficiently includes transgender and non-binary genders.

This thesis aims to address the issue of the exclusion of transgender and non-binary genders in HCI research and particularly GenderMag. By customizing a traditional persona of GenderMag, the range of personas were extended with a transgender and a non-binary gender persona. The goal was to investigate the implications of gender on the outcome of a GenderMag evaluation and the stereotypical thinking of the evaluators.
For the purpose of researching and writing about gender, the following definitions are vital and will repeatedly emerge in the following chapters [10]:

- *Cisgender:* people who identify with the gender they were assigned at birth
- *Transgender:* people who do not identify with the gender they were assigned at birth
- *Non-binary:* people who are not male or female
- *Agender:* people who have no gender
- *Genderqueer:* People who do not agree with or disapprove of the concept of gender

This paper is structured in the following manner: First, it starts with describing the background for the thesis and summarizing the related work in chapter II. In the following chapter, the methodology of the customization of the personas and the design of the pilot study are explained. The results and the discussion of the findings are presented in chapter IV, as well as some recommendations for the future use of GenderMag personas. Last but not least, in a final chapter the results are summarized, a conclusion is drawn and future work is discussed.

II BACKGROUND

2.1 GENDER IN HCI

There are several factors that may influence design choices and consequently the design and inclusiveness of software, i. e., culture [11, 12], age [13, 14] and gender [1, 3, 6, 8, 15]. Beckwith and Burnett [1] were one of the firsts to investigate in-depth the implications of gender on the usage of software and paved the way for further research in **Gender HCI**. Additionally, Beckwith and Burnett created a taxonomy containing the following three categories: confidence, support and motivation. *Confidence* – meaning a lack of self-confidence, overconfidence or the perceived risk – influences how users engage with software. *Support* – i. e., learning styles, the problem-solving style and information processing – has an influence on the ability of the user to understand communications and to effectively solve problems. The *motivation* – including the ease of use or usefulness and the technology use – affects the interest in the software feature. They argue that these issues may differ by gender and potentially have an impact on the success in end-user programming environments.
By drawing from this theoretical approach and through qualitative and quantitative work, Beckwith, Burnett, Wiedenbeck and Grigoreanu [2] later have shown, that "gender differences exist in the ways people solve problems." [2, p. 101] Their work reveals that software may influence the performance of females and males due to gender differences in problem-solving. Furthermore, they show that counting the feature usage is not sufficient, but that the style of usage matters. Additionally, to the issues identified in their previous work [1], they discovered the tinkering-behavior of males and females and how environments may encourage this behavior to a potential excess. As well as that, self-efficacy was identified as an influencing factor in the usage of software features. These results demonstrated that further research in the area was necessary, resulting in the development of GenderMag [8] which is further explained in chapter 2.2.

In addition to the work on potential issues of gender inclusiveness, there has been some broader work in **Feminist HCI** which closely relates to Gender HCI. Bardzell [3] outlines the deficiency of feminism in interaction design and proposes a more systematic way to integrate feminist approaches in the design process (including theory, methodology, user research and evaluation). The author points out how patriarchy is still present in product and industrial

design and how universality is still associated with masculinity. One new quality Bardzell proposes, is pluralism. Pluralism is the opposite view of universalism and universal usability and "refers to design artifacts that resist any single, totalizing, or universal point of view." [3, p. 1305] Moreover, there is an ethical dilemma Bardzell [3, p. 1304] poses, which is vital for both Feminist and Gender HCI: "How do we simultaneously serve real-world computing needs and avoid perpetuating the marginalization of women and indeed any group in technology?" In addition to Bardzell's framework, there is further analytical work about structural gender issues. Bivens and Hoque [16] discovered several failures of Bumble (a "feminist" dating app) regarding gender, sex and sexuality. They found that mechanisms like the "ladies ask first" principle (where only women are allowed to write first when they match with another person), follow a cisnormative, heteronormative and binary logic. Therefore, in addition to implications on performance and problem-solving, there are structural consequences on gender inclusiveness which can be caused by the design of the software.

Similar questions regarding the operationalization of gender, like for the design of the dating app Bumble, can be posed regarding the research in HCI. Keyes [6] used a content analysis to find out which gender models, respectively views, are used in HCI and whether gender is seen as binary, immutable and physiological. It can be seen that papers either mention the binary genders explicitly (stating that they only address two genders – male and female) or implicitly (not stating which genders they include but in the results presenting only two categories of gender). Furthermore, the content analysis showed that HCI papers have a disposition to not address mutability and do not discuss the relation of physiology and gender. These results indicate that "HCI research tends to use a traditional view of gender by default, even within Gender HCI, and rarely explicitly defines what view it is using." [6, p. 88:14] Inevitably, this leads to an exclusion of genders outside the cis- and binary gender spectrum and the reproduction of power and privilege structures [5], one of the reasons being a lack of the researchers/authors self-disclosure [3, 4]. Work on genderqueer and non-binary genders shows "how fluid, fuzzy, and ultimately difficult to categorize diverse articulations of gender can be, when thinking in terms of the gender binary." [17, p. 25] Ahmed [5, p. 67] further notes that current HCI literature handles trans lives "as an abstraction, or as identities that theoretically fit within a framework." There is more research [4, 15] showing that HCI papers rarely focus on gender and if they do, tend to erase trans, non-binary and genderqueer identities because of missing pluralistic notions [3].

Another closely related field and framework of Gender and Feminist HCI is **Intersectional HCI** which was investigated by Schlesinger, Edwards and Grinter [4]. Intersectionality means that categories like gender, race, class and more intersect. By analyzing HCI literature, they uncovered that HCI researchers need "to be more descriptive about who our users actually are, using a richer body of language to explain identity and its context" [4, p. 5421]. They provide five recommendations when using the Intersectional HCI framework, e.g., to provide an author disclosure and inform about the author's context.

2.2 GENDERMAG

As seen in the previous chapter, gender poses questions regarding software usage. Therefore, based on previous research [1, 2], GenderMag [7, 8] (Gender Inclusiveness Magnifier) was created by Burnett, Peters, Hill and Elarief and is "a systematic inspection method to enable software practitioners to evaluate their software for issues of gender-inclusiveness." [8, p. 2586] The method comprises a specialized cognitive walkthrough and three different faceted personas which are used in the walkthrough. Personas model fictional users and facilitate designing and talking about the potential users [18].

The description of a persona is built up of five facets which differ for each persona [7, 8]:

- *Motivation:*
  This facet describes the motive why the persona uses technology and can affect whether a persona would use a specific feature or not. For instance, while males tend to use software for pure enjoyment, for females it typically matters what they can accomplish with technology.
- *Information processing style:*
  The information processing style influences how a persona would solve problems. Different styles have different advantages which may become a disadvantage if the feature of a software does not support the style of information processing. For example, females show a tendency to first gather information and then proceed while males typically follow the first promising information.

- *Computer self-efficacy:*
  The persona's confidence in using software and solving tasks is reflected in the facet for computer self-efficacy. Previous research indicates, that females seem to have lower computer self-efficacy than males do.
- *Risk aversion:*
  The risk aversion of a persona influences the outcome of decision-making. Therefore, a persona with higher risk aversion may hesitate to use certain features of a software. Typically, females tend to be more risk-averse than males.
- *Tinkering:*
  A person may like to playfully use and experiment with certain features. This behavior is described by the facet for tinkering. Males seem to tinker more than females. Although, if females do it, they tend to profit more from this behavior.

In the most recent GenderMag kit [7], the three personas are *Abi* (= Abby in previous versions), *Pat* and *Tim*. All personas share the same job, place and comfortability with mathematics and technology. The facet values for Abi represent those most frequently associated with females and those for Tim are most frequently seen in males. Pat's facet values are in between the facet values of the other personas to cover the range of females and males which are unlike Abi and Tim. Though, the authors of GenderMag emphasize [8, p. 3] that "differences relevant to inclusiveness lie not in a person's gender identity, but in the facet values themselves." As well as that, the facets help not only to uncover gender-inclusiveness issues but also why they arise [19, 20]. The personas are explained further in chapter 2.2.1.

The walkthrough consists of subgoals and actions belonging to the scenario which is being evaluated. Before the evaluation, the software and scenario should be chosen and the list of subgoals and actions should be prepared. During the walkthrough session, the group of evaluators go through each of the subgoals and actions to answer the corresponding questions with "Yes", "Maybe" or "No". The reasoning to answer the questions should be based on the facet values of the chosen persona.

The questions are of the following structure [8, p. 3]:

- *Subgoal question:*
  "Will the <persona> have formed this sub-goal as a step to their overall goal? Why?"
- *Action question #1* (to be answered **before** the evaluator performs the action):
  "Will <persona> know what to do at this step? Why?"
- *Action question #2* (to be answered **after** the evaluator performs the action):
  "If <persona> does the right thing, will s/he know that s/he did the right thing, and is making progress towards their goal? Why?"

By combining the personas with the walkthrough, the gender-inclusiveness of a piece of software can be evaluated. Since the publication of GenderMag, it has already been successfully implemented by several companies [8, 20], even resulting in the closing of the gender gap [19]. Vorvoreanu, Zhang, Huang, Hilderbrand, Steine-Hanson and Burnett [19] used the results of a GenderMag analysis to redesign an interface and compared the two versions for gender-inclusiveness. Out of 10 issues they had found in their analysis, 6 were fixed based on the facets of the personas Abby and Tim. A qualitative empirical study was run to compare both prototypes. In the end, they successfully moved from a gender-biased to a gender-inclusive prototype. However, not only does GenderMag help developers and user experience professionals to identify gender-inclusiveness issues but it also helps to open people's eyes about the way their software is used and about cognitive processing styles they had not thought of before [8]. Moreover, even if focused on Tim only, improvements for Abi were observed too [19].

While GenderMag offers several benefits, there are always controversial aspects when talking about gender. Hilderbrand, Perdriau, Letaw, Emard, Steine-Hanson, Burnett and Sarma [20] addressed this with their work about the practices and potential pitfalls when using GenderMag. They found that people sometimes felt uncomfortable referring to GenderMag and therefore preferred to use the term InclusiveMag which is the name of the meta-method [21]. One of the pitfalls can be "that assuming Abi is exactly like some real person a team member knows can backfire, resulting in evaluators taking into account fewer facets than they should be." [20, p. 6] Sometimes teams used other approaches to get the personas and their facets more involved, e.g., they would integrate Abi in their office and daily routine or using the facets for surveys to find out more about the actual user group.

Today, there is even a meta-method which was developed by Mendez, Letaw, Burnett, Stumpf, Sarma and Hilderbrand [21] and consists of three steps: *Scope*, *Derive* and *Apply*. The following figure illustrates what these steps constitute of:

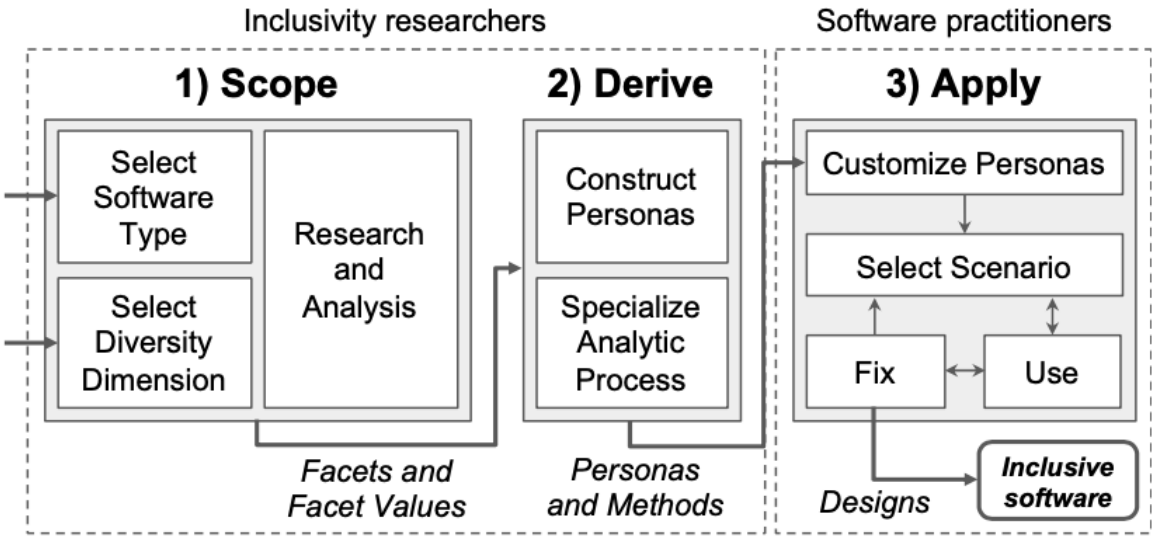


Figure 1: The InclusiveMag process [19]

The InclusiveMag process can be used to develop a method in order to include users of a specific diversity dimension, similar to GenderMag addressing gender. Therefore, in the first step of scoping, dedicated researchers select the type of software and diversity dimension (e.g., gender or age). They define the facets and facet values for the personas representing the chosen dimension. For the second step, the personas and methods are derived. Based on the previous work, the researchers construct the personas and select suitable evaluation methods. Afterwards, they hand over the personas and methods to software practitioners. They can then apply it to their software design.

2.2.1 PERSONAS

As mentioned in the previous chapter, the current GenderMag kit [7] consists of the three (multi-)personas[1] Abi (Abigail/Abishek), Pat (Patricia/Patrick) and Tim (Timara/Timothy) [9]. Parts of the personas are customizable, including their background, skills, abilities, name,

[1] Multipersona means that there are several pictures included in the description of the persona.

gender, pronouns and photos, whereas their motivations and approaches should not be changed as they reflect their different cognitive and problem-solving styles. Each persona has a nickname which can either belong to a male or female version of the persona. Figure 2 shows the description for the persona Abi. The red, underlined parts depict the facet values and are not customizable.

Figure 2: The Abi persona [7]

Abi (Abigail/Abishek)[1]

- **28 years old**
- **Employed as an Accountant**
- **Lives in Cardiff, Wales**

Abi has always liked music. When Abi is on their way to work in the mornings, they listen to music that spans a wide variety of styles. But when they arrive at work, Abi turns it off, and begins the day by scanning all their emails first to get an overall picture before answering any of them. (This extra pass takes time but seems worth it.) Some nights Abi exercises or stretches, and sometimes plays computer puzzle games like Sudoku.

Background and skills

Abi works as an accountant. Abi is comfortable with the technologies they use regularly, but they just moved to this employer 1 week ago, and their software systems are new to them.

Abi says they' a "numbers person", but she has never taken any computer programming or IT systems classes. She likes Math and knows how to think with numbers. She writes and edits spreadsheet formulas in her work.

In her free time, she also enjoys working with numbers and logic. She especially likes working out puzzles and puzzle games, either on paper or on the computer.

Motivations and Attitudes

- ***Motivations*:** Abi uses technologies to accomplish her tasks. She learns new technologies if and when she needs to, but prefers to use methods she is already familiar and comfortable with, to keep her focus on the tasks she cares about.
- ***Computer Self-Efficacy*:** Abi has lower self confidence than her peers about doing unfamiliar computing tasks. If problems arise with her technology, she often blames herself for these problems. This affects whether and how she will persevere with a task if technology problems have arisen.
- ***Attitude toward Risk:*** Abi's life is a little complicated and she rarely has spare time. So she is risk averse about using unfamiliar technologies that might need her to spend extra time on them, even if the new features might be relevant. She instead performs tasks using familiar features, because they're more predictable about what she will get from them and how much time they will take.

How Abi Works with Information and Learns:

- ***Information Processing Style:*** Abi tends towards a *comprehensive information processing style* when she needs to more information. So, instead of acting upon the first option that seems promising, she gathers information comprehensively to try to form a complete understanding of the problem before trying to solve it. Thus, her style is "burst-y"; first she reads a lot, then she acts on it in a batch of activity.
- ***Learning: by Process vs. by Tinkering*:** When learning new technology, Abi leans toward process-oriented learning, e.g., tutorials, step-by-step processes, wizards, online how-to videos, etc. She doesn't particularly like learning by tinkering with software (i.e., just trying out new features or commands to see what they do), but when she does tinker, it has positive effects on her understanding of the software.

[1] Abi represents users with motivations/attitudes and information/learning styles similar to hers.
For gender distribution data on users similar to and different from Abi, see http://gendermag.org/

Hill, Maag, Oleson, Marsden, Sarma and Burnett [9] tested whether the use of multiple pictures of males and females leads to less stereotyping than using one picture of a woman for the persona Abby. Using multiple pictures did not seem to influence the stereotypical thinking and the participants did not perceive Abby as either stereotypically feminine or masculine. Hill et al. [9, p. 6667] have shown that "participants realized that the persona's appearance was not an important aspect of the persona." Additionally, they have found that using multiple pictures did not harm the participant's engagement but influenced how they engaged with the persona. Although, the earlier study of Marsden and Haag in 2016 [22] showed that personas with masculine problem-solving facets were attributed higher competence. Moreover, personas should have an explicit gender, otherwise evaluators would assign one themselves, mostly male [8]. The current version of GenderMag includes the multipersonas using multiple pictures [7]. These works indicate that even though the engagement and perception of the persona seems unbiased by the use of pictures, gender still matters and may influence the outcome of a GenderMag evaluation.

III METHODOLOGY

3.1 GOAL AND HYPOTHESES

Even though the creators of GenderMag have undertaken steps to make the method more gender inclusive, the preceding research is rooted in a cisnormative and binary view of gender. Therefore, the main goal of this thesis is to extend the original version of GenderMag by including a transgender and a non-binary persona and by investigating the implications on the results of a GenderMag usability evaluation and the impact on the stereotypical thinking of the evaluators. To achieve this goal, a pilot study was prepared and carried out. This included not only the redesign of personas and the preparation of the cognitive walkthrough but also a follow-up questionnaire to be able to analyze the number of facet-related issues and stereotypical thinking. The details of this process and the data analysis are specifically addressed in the following chapters.

As a side note, another promising approach would have been using the meta-method InclusiveMag [21] (Figure 1, chapter 2.2). Indeed, work on photo-less personas and facet values for non-traditional genders is in progress (M. Burnett, personal communication with E. M. Huang, Nov 5, 2019). For the scope of this thesis, exploring and researching the facet values for genders outside the cis- and non-binary gender range would have been too complex. Therefore, I decided to use the already existing personas and customize them (chapter 3.2) to compare the implications of the personas' gender.

To examine to what extent using transgender and non-binary personas influence the identification of issues and whether those personas may reinforce the stereotypical thinking in comparison to binary, cisgender personas, the following hypotheses were formulated:

H0: There is no difference in the identification of gender issues and stereotypical thinking when using non-binary or transgender personas for the GenderMag evaluation.

H1: Using a non-binary and transgender persona does not lead to identifying the same amount of issues as using a cisgender female persona.

H2: Participants using transgender and non-binary personas have less stereotypical thinking than participants using personas with a binary gender.

If the facets are the same for all personas and only the gender and appearance are different, the prediction is that all personas should be equally effective, as formulated in H0. This assumption is supported by the study of Hill et al. [9], showing that changing the appearance of the persona by adding multiple pictures did not have a significant impact on the outcome of an evaluation. In addition, Hill et al. mention that participants were able to grasp the overall idea, that the important aspect of the personas were the facet values rather than the gender. Therefore, according to H0 the stereotypical thinking should not be influenced by the gender and appearance.

In contrast, Grudin [18] emphasizes that the gender of a persona is an important factor. Hence, especially when using a persona with a non-binary gender, which evaluators might not be familiar with, participants may have trouble using such a persona. This could lead to differences in the amount of identified issues when comparing personas with a binary and non-binary gender, as formulated in H1.

H2 refers to the intention of using transgender and non-binary gender personas to reduce the stereotypical thinking of the evaluators. If we meet a person, we rapidly categorize them based on cues like gender, age, race, etc. This process is called stereotyping or stereotypical thinking. The stereotypical thinking biases how we perceive other people and can even lead to discrimination, as shown by Fiske [23]. As the goal of GenderMag is to prevent discrimination based on gender by designing gender-inclusive software, the goal should be to use personas that try to minimize the stereotypical thinking of the evaluators as well.

To verify or falsify the hypotheses, the study consisted of two parts. In the first part, participants were introduced to a persona (chapter 3.2) and informed about the cognitive walkthrough (chapter 3.3) of the customized GenderMag usability evaluation. After the introduction, they were able to conduct the evaluation themselves and fill out the questions of the walkthrough. In the second part, participants were required to answer a follow-up questionnaire (chapter 3.4). The total duration of a session, including all the mentioned steps, was calculated to be approximately 1 hour.

3.2 REDESIGN OF PERSONAS

As the usage of different personas will be compared, they are the key factors and should be appropriately designed. To customize the personas according to the goal of this study and to ensure comparability, **six requirements** were set to apply to the composition of the personas:

R1. The existing facets should only be reused but not changed. They are the vital basis to identify gender issues (as emphasized by M. Burnett, personal communication with E. M. Huang, Nov 5, 2019).
R2. The allocation of gender and facet is not of importance, as all facets can occur for every gender [7].
R3. The facets should be the same for all personas (comparability).
R4. The gender of at least one persona should indicate the mutability of gender ([6]).
R5. The gender of at least one persona should not be binary ([6]).
R6. The gender should be specified. If the gender is unclear, users tend to assume the gender is male [8].

Based on these assumptions, two new personas were composed: Transgender Abby and Agender Dylan. Except for R4 and R5, where the respective persona meets only one of the requirements, both personas fulfill all other requirements. The personas and their facet values are based on the cisgender Abi persona (“Abby” in earlier versions) which is part of the GenderMag kit [7]. Out of all three personas included in the kit, Burnett et al. recommend using Abi to find the most essential inclusivity issues [7]. Therefore, Abi was preferred over Tim or Pat and her facet values, background, occupation, age, skills, abilities and place of residence are the same for Transgender Abby and Agender Dylan.
The three personas and the adjustments can be found on the next page. Afterwards, the entire description for Agender Dylan is presented, whereas the other two personas can be found in the appendix (Figure 25 & Figure 26).

Figure 3:
Cisgender Abby Jones [16]

Cisgender Abby

Abby Jones is a persona created by Burnett et al. [7] which is named Abi in the latest version of GenderMag. The aim was to leave Abi as close as possible to the original version. Nonetheless, for the purpose of this project I decided to use the persona's previous name "Abby" and reduce the multiple pictures showing people with different genders to the main picture (Figure 3), which was the most notable picture for Abby. Because the gender is not stated explicitly in the original version, those measures were taken according to requirement R6.

Transgender Abby

To fulfill R4, the transgender female Abby Jones should emphasize the mutability of gender. Therefore, two pictures were chosen (Figure 4), one of Abby physically expressed as male, and one as Abby physically expressed as female, to indicate the transition from man to woman. It is clearly stated in the persona's description that Abby is a transgender female, the pictures should not suggest that Transgender Abby is both male and female. The face of the man was morphed to a woman by using the App *FaceApp* [24].

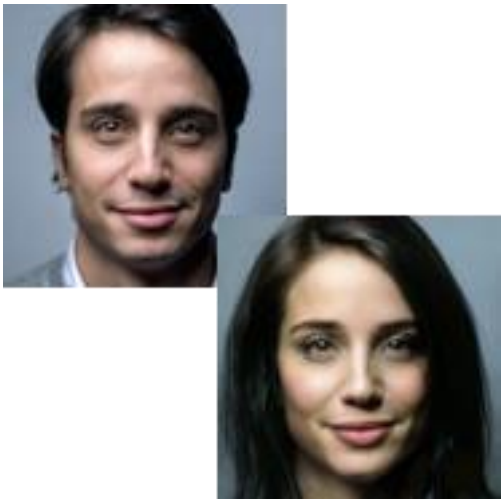


Figure 4: Transgender Abby Jones;
Photo by Jurica Koletić on Unsplash

Agender Dylan

Figure 5: Agender Dylan Jones;
Photo by Bruce Dixon on Unsplash

In accordance with R5, the cis-, agender persona Dylan was given a gender-neutral name and a gender-neutral picture (a picture that appeared when searching for an inclusive persona). With this picture (Figure 5), the participants would hopefully not assume Dylan having a binary gender based on physiological cues. As well as stating that Dylan is agender, e uses gender-neutral pronouns (e, em, eir, eirs, emself) [25]. These measures should emphasize the range of non-binary genders.

Figure 6: The Agender Dylan persona

Dylan Jones

- 28 years old
- Agender[1]
- Employed as an accountant
- Lives in Cardiff, Wales

Dylan has always liked music. When e[2] is on eir way to work in the morning, e listens to music that spans a wide variety of styles. But when e arrives at work, e turns it off, and begins eir day by **scanning all eirs emails first to get an overall picture before answering any of them**. (This extra pass takes time but seems worth it.) Some nights e exercises or stretches, and sometimes e likes to play computer puzzle games like Sudoku.

Background knowledge and skills

Dylan works as an accountant. E is comfortable with the technologies e uses regularly, but e just moved to this employer 1 week ago, and it's the first time for em to order something on this website. So **the website is new to em.**

Dylan says e's a **"numbers person"**, but e has never taken any computer programming or IT systems classes. **E likes Math and knows how to think with numbers.** E writes and edits spreadsheet formulas in eir work.

In eir free time, **e also enjoys working with numbers and logic**. E especially likes working out puzzles and puzzle games, either on paper or on the computer.

Motivations and Attitudes

- ***Motivations*:** Dylan uses technologies **to accomplish eirs tasks**. E learns new technologies if and when e needs to, but prefers to use methods e is **already familiar and comfortable with, to keep eir focus** on the tasks e cares about.
- ***Computer Self-Efficacy***: Dylan has **low confidence about doing unfamiliar computing tasks**. If problems arise with eir technology, e often **blames emself for these problems**. This affects whether and how e will persevere with a task if technology problems have arisen.
- ***Attitude toward Risk***: Dylan's life is a little complicated and e **rarely has spare time**. So e is **risk averse about using unfamiliar technologies that might need em to spend extra time** on them, even if the new features might be relevant. E instead performs tasks using familiar features, because they're more predictable about what e will get from them and how much time they will take.

How Dylan Works with Information and Learns

- ***Information Processing Style*:** Dylan tends towards a ***comprehensive information processing style*** when e needs more information. So, instead of acting upon the first option that seems promising, e **gathers information comprehensively to try to form a complete understanding of the problem before trying to solve it.** Thus, eir style is "burst-y"; first e reads a lot, then e acts on it in a batch of activity.
- ***Learning: by Process vs. Tinkering***: When learning new technology, Dylan leans toward **process-oriented learning**, e.g., tutorials, step-by-step processes, wizards, online how-to videos, etc. E **doesn't particularly like learning by tinkering with software** (i.e., just trying out new features or commands to see what they do), but when e does tinker, it has positive effects on eir understanding of the software.

[1] "Non-binary identities do not align with binary conceptions of male and female", see https://www.morgan-klaus.com/sigchi-gender-guidelines
[2] The Spivak pronouns (e/em/eir/eirs/emself) are preferred by Dylan as non-binary pronouns, see https://nonbinary.wiki/w/index.php?title=English_neutral_pronouns

3.3 PREPARATION OF COGNITIVE WALKTHROUGH

Besides the personas, a cognitive walkthrough which is adapted to the personas is at the core of GenderMag. The walkthrough comprises subgoals and actions which should be tailored to the specific scenario, respectively interface, which is to be evaluated. For each subgoal and action, the facets of the persona should be used to answer whether the subgoal/action would be set/solvable for the persona. After customizing the personas, the next step is to choose a software or website and scenario in order to adjust the walkthrough.

As for the goal of this pilot study, participants should have been able to perform the evaluation without the need to register or download anything. Therefore, a website was the preferred solution over a piece of software. The evaluation of a website would also allow participants to use their own laptops. To avoid the need to register, a part of an online shop was a reasonable option. Additionally, the website should not be "flawless" and relevant to all genders. I found that the comparison list of https://www.digitec.ch might be a feature that is unclear to a user like Abby who does not like to tinker and use unfamiliar features [7]. Hence, this website and particularly the comparison feature, where users can add and compare multiple products, was an interesting choice to me. An online shop for IT, electronics and telecommunication should be inclusive and facilitate the shopping for all genders. Beckwith et al. [1] mention how the future behavior and use of the software might be influenced by exclusive software, mentioning the person Ashley who was to be a graphic designer and majored in art instead because of difficulties using the software. It would be a shame if a technology store would exclude certain genders caused by usability flaws and possibly lead to a loss of interest in technological topics for some users.

The resulting scenario, subgoals, and actions can be found on the next page.

Scenario (Overall goal)

<Persona> wants to order a keyboard. <Her/Eir> boss just called because he needs a new keyboard for his workplace. He wants either the *Logitech MX Keys* or the *Logitech Craft* with a Swiss layout. He prefers the lighter keyboard of those two.

Subgoals (S #) & Actions (A #)

S 1: Search for the first keyboard (Logitech MX Keys, CH)
A 1.1: Click the search bar
A 1.2: Type in “Logitech MX Keys”
A 1.3: Press enter key

S 2: Add first keyboard (Logitech MX Keys) to the product comparison
A 2.1: Scroll down to keyboard (Logitech MX Keys, CH)
A 2.2: Click on button “Add to product comparison”

S 3: Search for the second keyboard (Logitech Craft)
A 3.1: Click the search bar
A 3.2: Type in “Logitech Craft”
A 3.3: Press enter key

S 4: Add the second keyboard (Logitech Craft) to the product comparison
A 4.1: Scroll down to keyboard (Logitech Craft, CH)
A 4.2: Click on button “Add to product comparison”

S 5: Compare keyboards for their weight
A 5.1: Click on button for product comparison
A 5.2: Click on button “Compare”
A 5.x: Click on checkbox to hide identical characteristics (“Identische Eigenschaften verbergen”)
A 5.3: Scroll down to weight in specification

S 6: *Buy the lighter keyboard*

A 6.1: *Scroll to start of page*

A 6.2: *Click on button to add "Logitech MX Keys" to shopping cart*

A 6.3: *Scroll down to end of page*

A 6.4: *Click on "Beenden" button*

A 6.5: *Click on button "Zur Kasse"*

(Note: The subgoals and actions in italic were removed after the first study session, as the walkthrough was too time-intensive.)

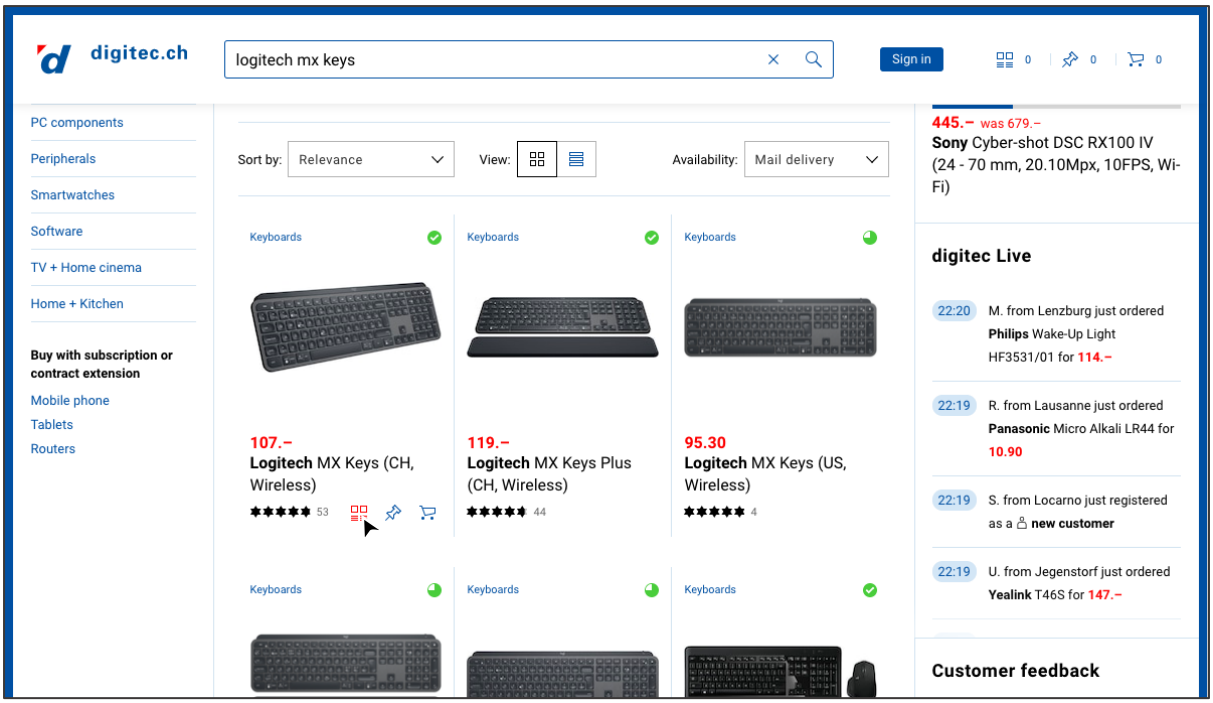


Figure 7: Action 2.1 & 2.2 – Scroll down to keyboard and add product to product comparison [26]

For example, for A 2.2 the evaluators must hover over the keyboard to make the button "Add to comparison list" appear and click it (Figure 7). Other screenshots of the other actions can be found in the appendix (Figure 45 - Figure 53).

3.4 FOLLOW-UP QUESTIONNAIRE

After participants finished the evaluation part, they had to handover the walkthrough and persona and were given the questionnaire. This means, participants filled out the questionnaire without being able to revise the persona, respectively the facet values. The questionnaire consisted of four sections: the demographics, the listing of similar and dissimilar people, the assessment of stereotypical statements and a field for comments. The purpose and analysis of these sections are further described in the next chapter and the full questionnaire can be found in the appendix (Figure 54 & Figure 55).

With respect to the demographics, participants had to write down their age, gender, educational level & discipline, occupation, nationality and ethnicity.
In the second part, they were asked to list the first names and gender of any friends/relatives/ co-workers/etc. that the persona reminded them of. They could list as many names as they liked. The same was to do for any person that they felt are the opposite of the persona they used for the evaluation. This approach was already applied by Hill et al. [9] to measure the gendering of search scope and felt appropriate for this study as well. The dependent variable "gendering of search scope" is explained in detail in the next chapter.
The third part constituted of 12 statements from the Bem Sex Role Inventory (BSRI) of Vafaei et al. [27]. The BSRI model is used to measure the stereotypical thinking of the participants. By using a Likert scale, participants were asked to assess if they agreed or disagreed with the statements describing the persona. Based on their assessment, a masculine and feminine score could be calculated. This process is further described in chapter 3.6.3.

The statements looked as follows:

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
<persona> is a gentle person.	o	o	o	o	o
<persona> is a warm person.	o	o	o	o	o
<persona> is sensitive to others' needs.	o	o	o	o	o
<persona> is a tender person.	o	o	o	o	o
<persona> is a sympathetic person.	o	o	o	o	o
<persona> is an affectionate person.	o	o	o	o	o
<persona> has leadership abilities.	o	o	o	o	o
<persona> possesses a strong personality.	o	o	o	o	o
<persona> acts like a leader.	o	o	o	o	o
<persona> defends <he/her/eirs> beliefs.	o	o	o	o	o
<persona> makes decision easily.	o	o	o	o	o
<persona> is a dominant person.	o	o	o	o	o

Figure 8: BSRI statements according to Vafaei et al. [27]

For the last part of the questionnaire, an empty field was provided where the participants were allowed to leave any comments about the study. After this, the questionnaire as well as the study was completed.

3.5 PARTICIPANTS & SETUP

If participants had previous experience with GenderMag, they would be familiar with the purpose of the evaluation and the personas. They probably would have been able to guess what the purpose of the study was. Therefore, it was required that the recruited participants should not have used GenderMag before (e.g. not have taken the People-Oriented Computing class, because using GenderMag was part of the course in the past years). Nonetheless, part of the recruitment criteria was that participants should have a background in computer science, interaction design or similar, meaning they should have been enrolled in a corresponding study program or work in either of these fields. Eligibility to participate also included fluency in English to understand all of the materials and instructions. Nevertheless, the instructions were given in German if all participants were fluent in German and wished so.

In total, the aim was to recruit at least 15 people (5 per persona) via mailing lists (e.g., of the IfI or ICU) and via snowball sampling (e.g., directly contacting co-workers and friends or hanging the flyer in the entrance hall of university). The recruited participants were presented with several time slots. Participants chose the time slot without knowing which persona was allocated to the session. Therefore, the assignment of the persona was random. They were invited in groups (max. 5 persons per session) according to the session they chose and participated at the same time in the same room. Hence, all participants in one group were given the same introduction. This approach reduced the time needed and ensured a large enough sample size. As they could fill out the walkthrough and questionnaire themselves, there was no need for participants to disclose any information to other participants in the session and therefore, there was no risk of data disclosure to other persons of the group.

At the beginning of the session, participants had to sign a form of consent (see Figure 22 & Figure 23 in the appendix), where they were informed about the anonymization and storage of the data. Furthermore, they were informed about the possibility to withdraw their participation at any point during the study. Participants were not informed about the goal of the study in advance. In the debriefing, they were told the purpose and were given the possibility to get informed about the results after the submission of the thesis if wished so. For each study session, a room or quiet spot was reserved, so participants could concentrate on the evaluation and were not disturbed. They were provided with a workplace to sit down and were asked to

bring their laptop to evaluate https://www.digitec.ch/ on their own device. A pen for the written part (signing any forms and filling out the walkthrough and questionnaire) was provided to them. For their time and effort (1 session = approx. 1 hour), participants were compensated with a gift card of CHF 15.- for either Coop or Migros at the end of the study session and signed the compensation form (see Figure 56 in the appendix).

The study was designed between-subject, meaning all participants of the same group were allocated to one of the three personas – Cisgender Abby (CA), Transgender Abby (TA) or Agender Dylan (AD). 16 participants were recruited (3 females, 13 males; CA = 5, TA = 5, AD = 6). The group size per session ranged from 1 to 5 participants.

3.6 DATA ANALYSIS

To compare the use of the three different personas for the usability evaluation method GenderMag, three dependent variables were measured: the number of identified issues, the gendering of search scope and the stereotyping. In the following chapters, the purpose of each variable as well as the data analysis will be explained.

3.6.1 NUMBER OF IDENTIFIED ISSUES

For each participant, the number of issues was counted and controlled for false positives. The issues were identified by the participants based on the cognitive walkthrough and the facets of the persona. The answers to every question of the subgoals and actions were digitalized in the manner of “Yes”, “Maybe” and “No”. The number of identified issues was calculated by counting all subgoals and actions where participants answered with “No” or “Maybe”. If the reasoning was not based on the facets of the persona, an issue was classified as a false positive and subtracted from the number of identified issues.

As the walkthrough was shortened after the first session and some participants did not manage to finish the walkthrough in time, the decision was made that participants must at least finish answering the question to subgoal S3 (see chapter 3.3). This should ensure, that all participants were exposed to the persona roughly the same amount of time. Hence, for the data analysis, the number of issues was counted up until and including subgoal S3. The possible number of

maximum issues was 13, assuming the answer would be “No” or “Maybe” to every question up until S3.

3.6.2 GENDERING OF SEARCH SCOPE

In the questionnaire, participants were asked to name people in their social environment which they felt are like and unlike the persona they used for the evaluation. Participants were able to name any gender (male, female, non-binary, etc.). Similar to the approach of Hill et al. [9], for each category (similar & dissimilar friends) the names were counted by gender and the ratio of the gender of recalled persons was calculated. Determining this ratio allowed to see whether the persona made participants mainly recall friends of a specific gender.

3.6.3 STEREOTYPING

Using the statements of the BSRI model of Vafaei et al. [27], introduced in chapter 3.4 (Figure 8), the stereotyping for each of the personas was measured. This approach, to measure whether participants apply either traditional masculine or feminine attributes to the personas, was used by Hill et al. [9] as well. To be able to measure the stereotyping, the Likert scale was used to calculate a feminine and masculine score for each of the personas. The average of the first 6 statements about the gentleness, warmth, sensitivity to others’ needs, tenderness, sympathy and affection was used to calculate the BSRI-feminine score. The average of the other 6 statements about leadership abilities, strength of personality, acting as a leader, defensiveness of beliefs,

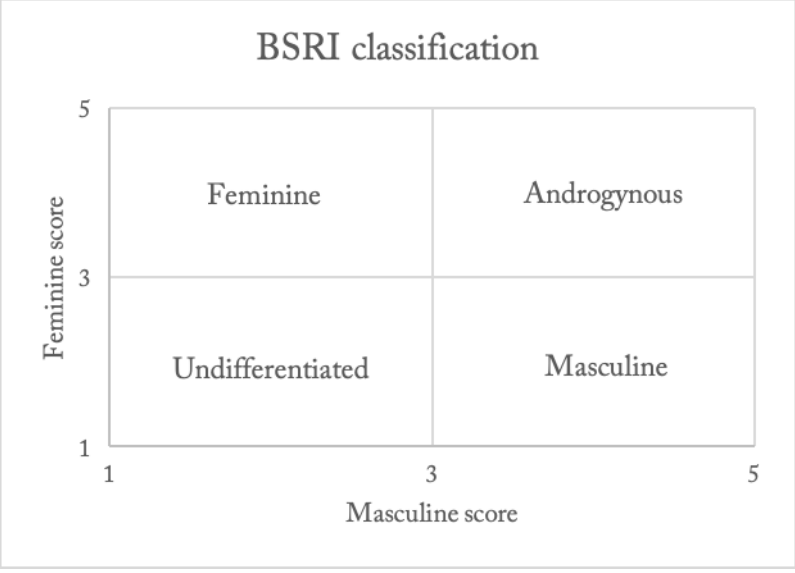


Figure 9: BSRI classification according to Vafaei et al. [26]

decision-making and dominance were used to calculate the BSRI-masculine score. Based on the scores, the personas were classified as seen as primarily feminine, masculine, androgynous or undifferentiated (Figure 9). E.g., if a persona would have a high feminine score and a high masculine score, the persona would be classified as androgynous.

IV RESULTS AND DISCUSSION

4.1 NUMBER OF IDENTIFIED ISSUES

Regarding the usability issues, Figure 10 demonstrates that participants found a range of 0 to 7 issues, meaning they answered with “No” or “Maybe” to a maximum of 7 questions (cleaned up for false positives, when participants did not (correctly) refer to a facet of the persona).

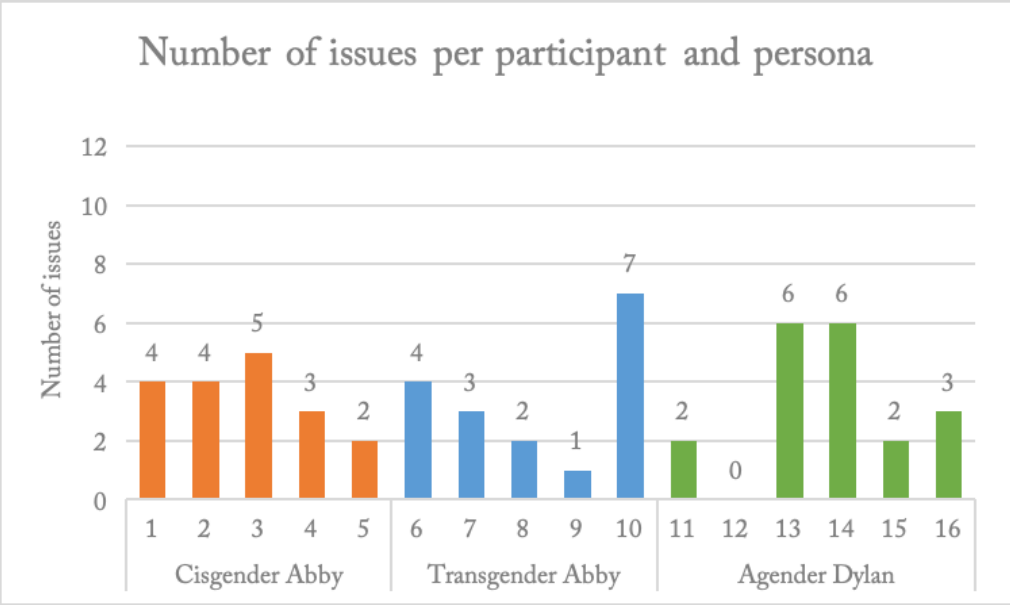


Figure 10: Number of issues per participant and persona

Concerning hypothesis H1 (“Using a non-binary and transgender persona does not lead to identifying the same amount of issues as using a cisgender female persona.”), the prediction was, that the number of identified issues would be less for the transgender and non-binary persona. Hill et al. [9] found, that using multiple pictures for one persona (including pictures of men and women) did not have a significant effect on the output of the GenderMag evaluation. Though, Grudin [18] argues that the gender of a persona is an important factor for the engagement with the persona. Hence, an effect on the outcome and number of identified issues may be possible, especially for Agender Dylan, as some participants may not be familiar with non-binary genders. Although the sample size is relatively small, to test if H0 (“There is no difference in the identification of gender issues and stereotypical thinking when using non-binary or transgender personas for the GenderMag evaluation.”) can be rejected, two-tailed t-

tests were used to compare Transgender Abby (TA) and Agender Dylan (AD) with Cisgender Abby (CA).

Indeed, participants using AD on average found the least issues (Mean = 3.17, Standard deviation = 2.4, p-value = 0.8675). Those using TA found slightly more issues (M = 3.4, SD = 2.3, p = 0.7066) and those using the CA persona found the most issues (M = 3.6, SD = 1.14), see Figure 11.

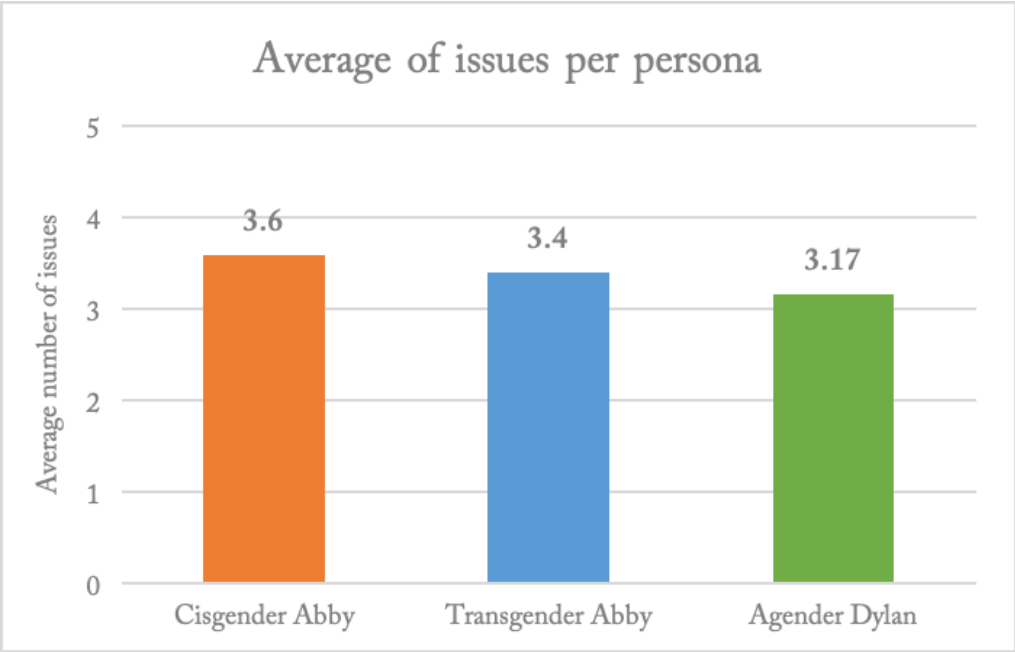


Figure 11: Average of issues per persona

Six participants (CA = 2, TA = 3, AD = 1) expressed difficulty using a fictive persona for the walkthrough and assess the persona in the questionnaire. Furthermore, participant #15 (using AD) seemed to be confused by using the gender-neutral pronouns for Agender Dylan and once used “they” instead of “em” to refer to the persona. These difficulties may have affected the outcome of the walkthrough and the number of identified issues.

The standard deviation for Transgender Abby and Agender Dylan is more than twice as high as for Cisgender Abby and there is no statistically significant effect on the number of identified issues. Nonetheless, the results indicate that gender may influence the outcome of a GenderMag usability evaluation. A higher sample size would be needed to see whether results may reject H0 and support H1.

4.2 GENDERING OF SEARCH SCOPE

The participants were asked to name friends, co-workers, relatives or other people who they felt are similar or dissimilar to the persona, they had used for the walkthrough, and indicate the gender for each person. The ratio of genders was then calculated separately for similar and dissimilar friends. Hill et al. [9] found that participants using a persona with multiple pictures recalled significantly more females for friends unlike the persona than those using a persona with only one picture of a woman. Hence, the prediction was that using Transgender Abby for the evaluation might lead to a de-gendering of search scope compared to Cisgender Abby. The gender-neutral pronouns in the description of Agender Dylan could potentially be confusing to participants which might lead to fewer recalls or even less gendering of search scope. As none of the participants named a person with a non-binary gender, the graphs include only two categories – female and male.

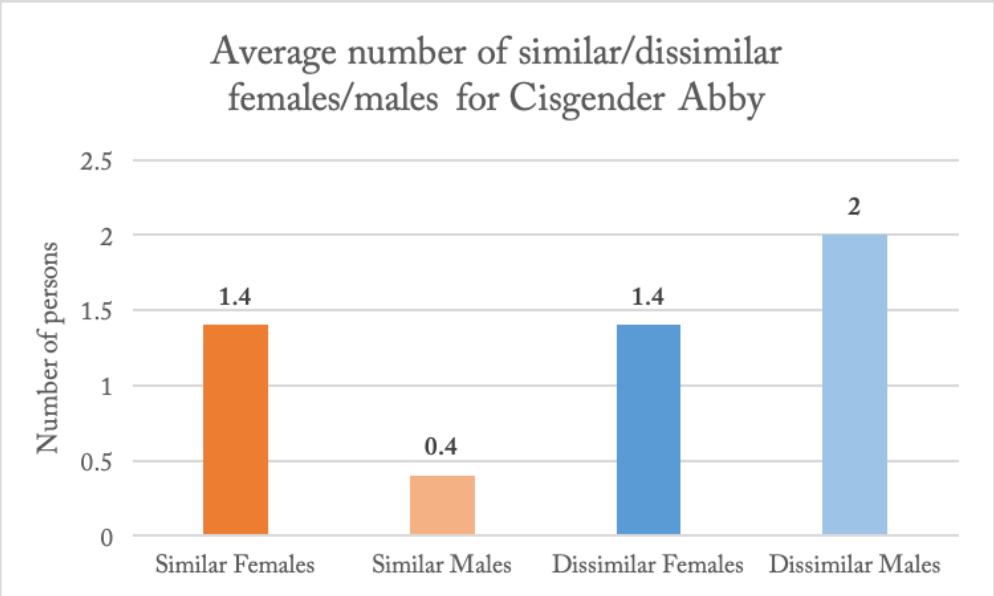


Figure 12: Average number of similar and dissimilar females and males for Cisgender Abby

Comparing the average numbers of recalled people for CA (Figure 12), TA (Figure 13) and AD (Figure 14), it seems that the most noticeable change is in the number of recalled dissimilar females and similar males. With on average 0.33 recalled people, the number of dissimilar females is very low for Agender Dylan, whilst the number of similar males is higher compared to the number of similar males for Cis- and Transgender Abby.

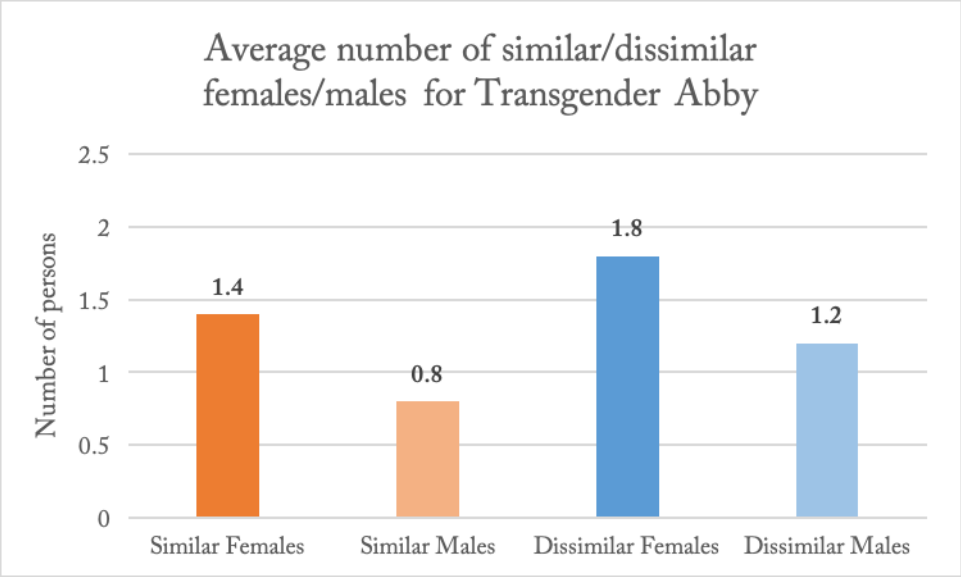


Figure 13: Average number of similar and dissimilar females and males for Transgender Abby

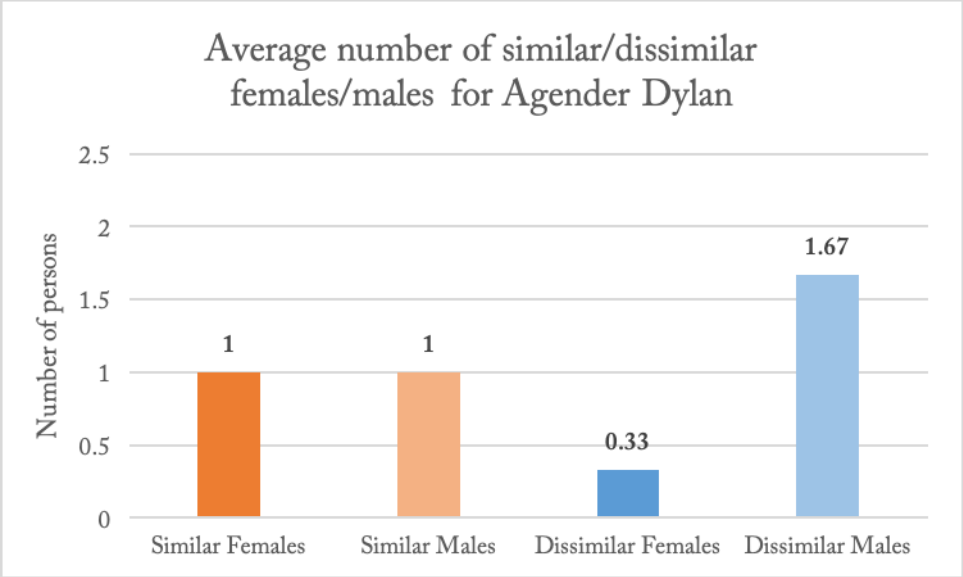


Figure 14: Average number of similar and dissimilar females and males for Agender Dylan

When calculating the ratio, the de-gendering of search scope for Agender Dylan is even more pronounced (Figure 15). While the average proportion of similar friends is 78% (SD = 0.4381) for Cisgender Abby, for Dylan it is much lower with 50% (SD = 0.3333). The effect that Hill et al. [9] observed is supported by these results too, as participants recalled more dissimilar females for Transgender Abby customized with two pictures (M = 60%, SD = 0.3584) than for Cisgender Abby (M = 41%, SD = 0.2739).

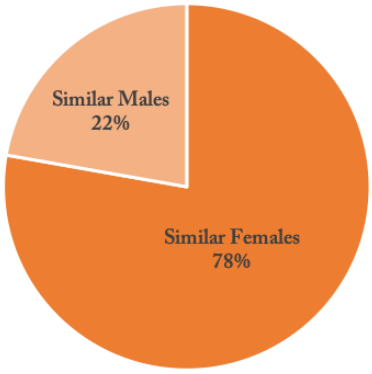
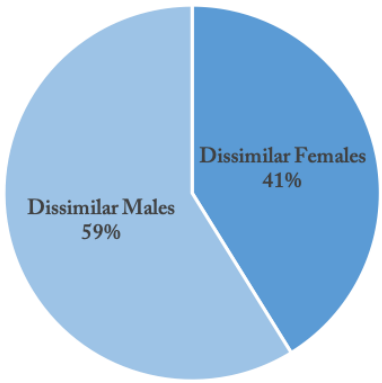
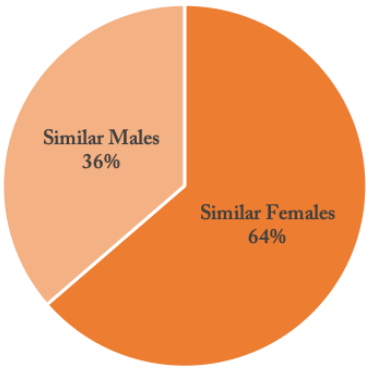
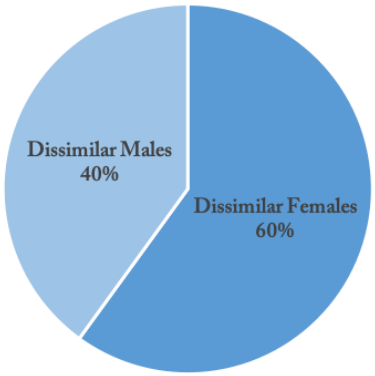
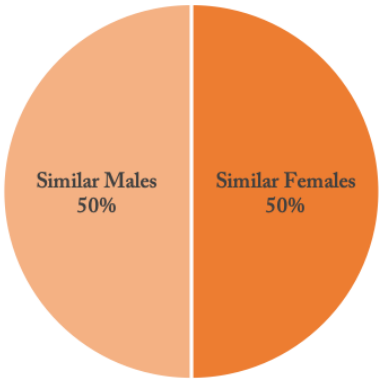
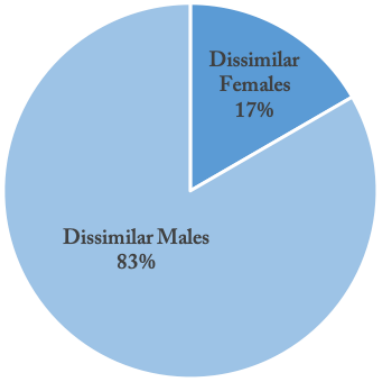
	Similar friends	*Dissimilar friends*
Cisgender Abby		
Transgender Abby		
Agender Dylan		

Figure 15: Proportion of similar and dissimilar females and males per persona

4.3 STEREOTYPING

The 12-item Bem Sex Role Inventory was used to be able to categorize how participants perceived the personas. By calculating the masculine and feminine score, it is possible to categorize whether the personas were perceived as feminine, masculine, androgynous or undifferentiated. Using multiple pictures for a persona has been shown to not influence stereotyping [9]. Hence, the stereotypical thinking was predicted to be the same for Cis- and Transgender Abby (H0: "There is no difference in the identification of gender issues and stereotypical thinking when using non-binary or transgender personas for the GenderMag evaluation."). Nonetheless, by making visible the transition from one gender to another for Transgender Abby and the non-binary gender of Agender Dylan, it was hoped to be able to reduce the stereotyping of the personas TA and AD (H2: "Participants using transgender and non-binary personas have less stereotypical thinking than participants using personas with a binary gender.").

On one hand, the average of the BSRI-feminine score is highest for Cisgender Abby and lowest for Agender Dylan (CA: M = 3.2, SD = 0.41; TA: M = 3.03, SD = 0.18; AD: M = 3, SD = 0.35). On the other hand, the BSRI-masculine score is highest for Agender Dylan and lowest

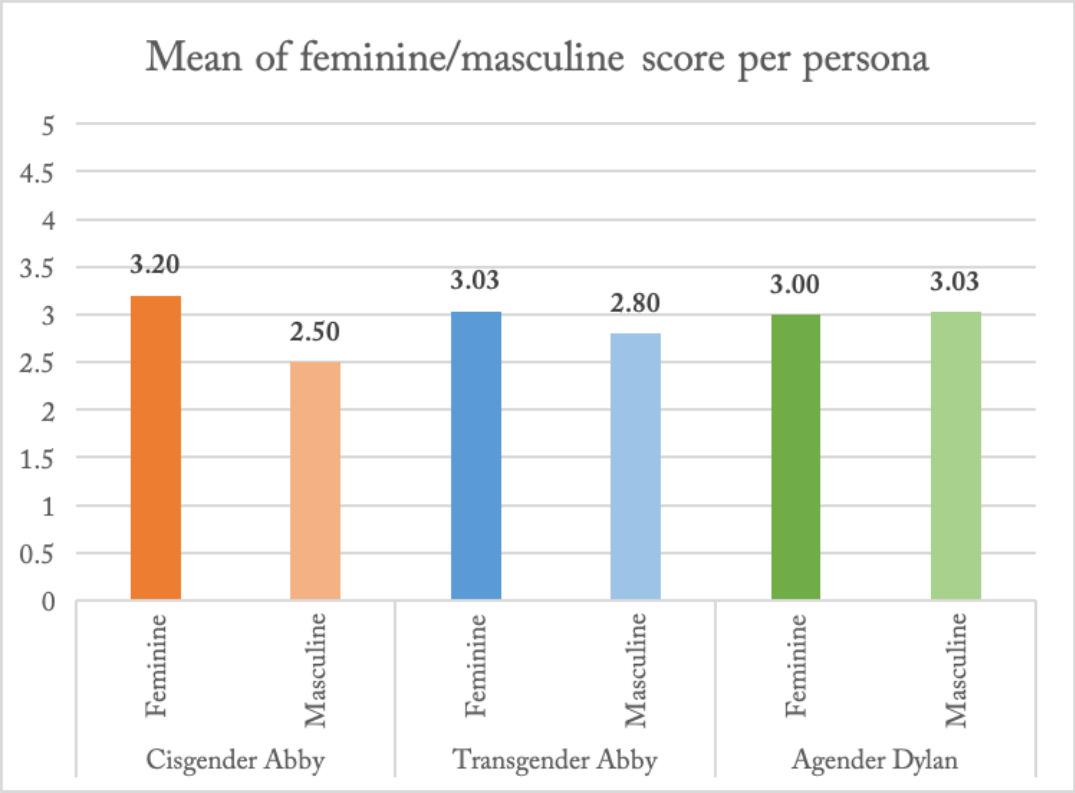


Figure 16: Mean of feminine and masculine score per persona

for Cisgender Abby (CA: M = 2.5, SD = 0.2; TA: M = 2.8, SD = 0.45; AD: M = 3.03, SD = 0.69). The masculine and feminine scores for AD are almost equal (Figure 16).

The standard deviation for the masculine score of Agender Dylan is fairly high, which can also be seen in the scatter plot for the BSRI classification for all participants (Figure 17). For one participant, AD is classified as clearly undifferentiated while for another one, Dylan is classified as primarily androgynous.

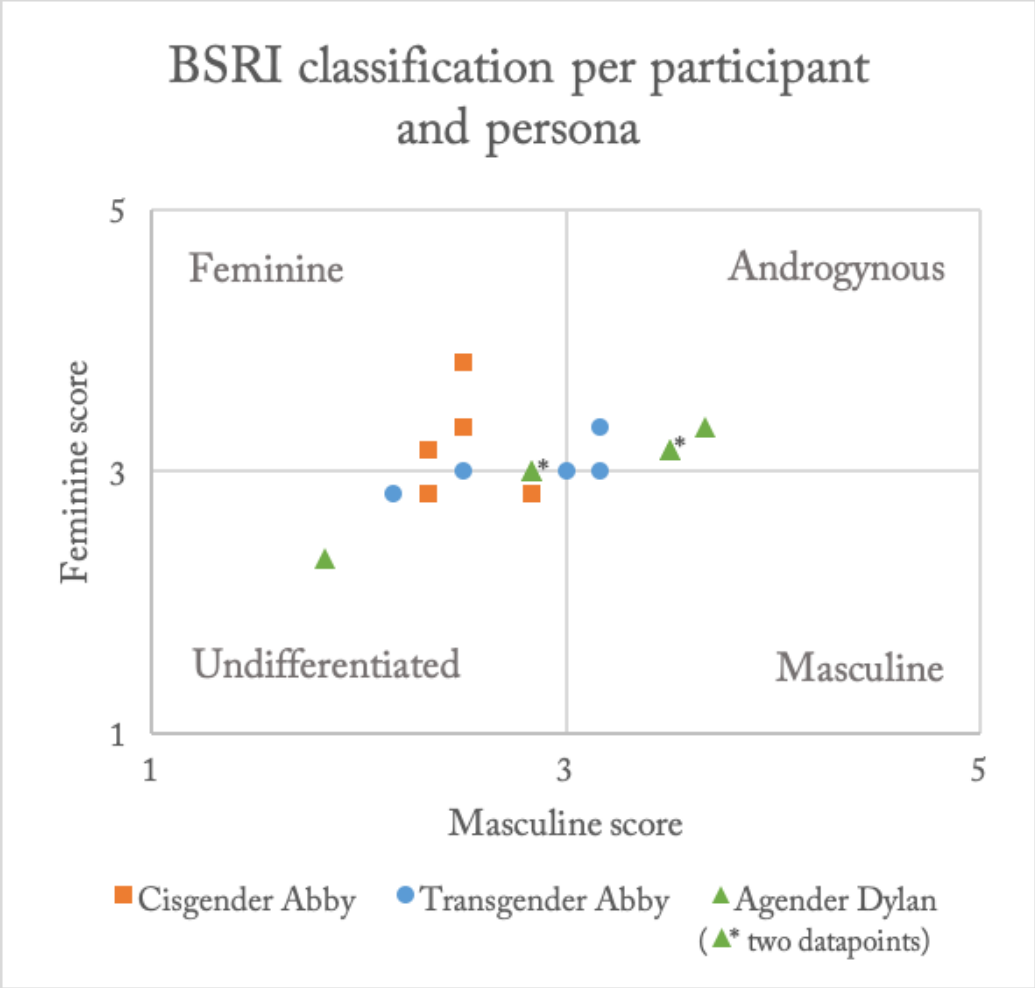


Figure 17: BSRI classification per participant and persona

Again, two-tailed t-tests were run to compare the scores of TA and AD to Cisgender Abby. The following p-values were calculated:

	Feminine score		Masculine score	
Persona	**TA**	**AD**	**TA**	**AD**
P-value	0.4485	0.4178	0.2213	0.1236

Figure 18: P-values for feminine and masculine score of TA and AD

The almost equal average of the feminine and masculine scores result in Agender Dylan being classified almost in the middle of all four categories of the BSRI model (Figure 19).

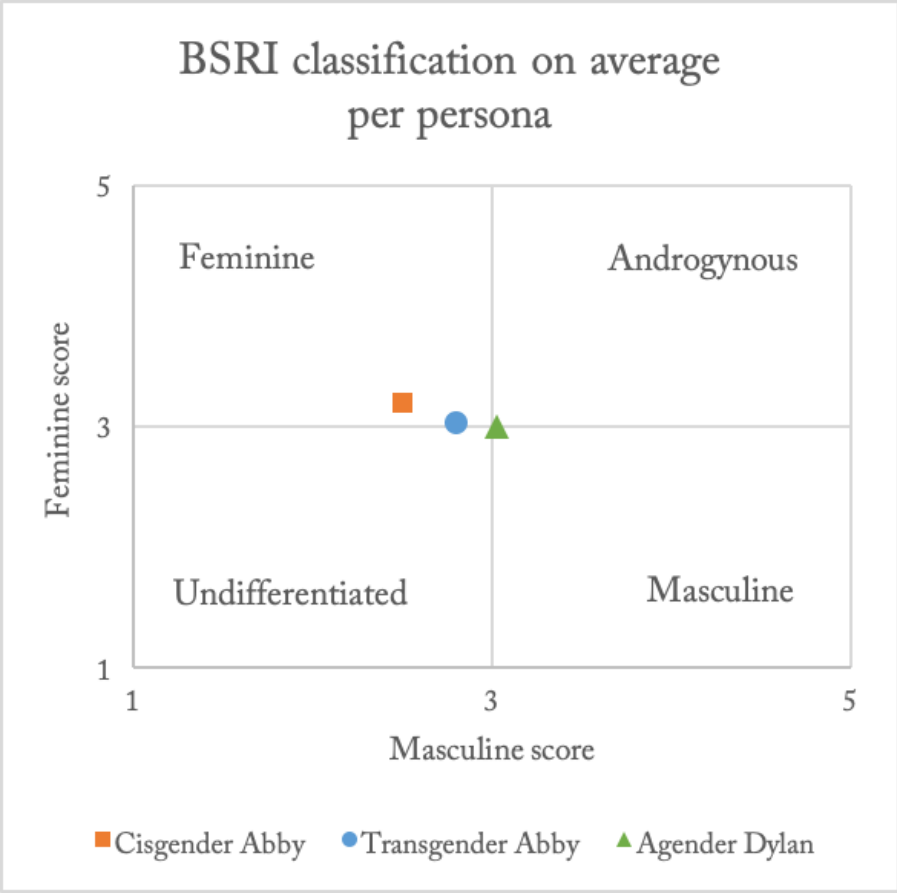


Figure 19: BSRI classification on average per persona

Although there is no significant difference in the scores, the p-value comparing the masculine value for Cisgender Abby and Agender Dylan and the BSRI-classification for Dylan indicate that participants using a non-binary persona tend to stereotype the persona less than when compared to a binary persona. For TA, there seems to be a similar effect, though less pronounced as for AD. Even if all personas share the same facet values, these results indicate that the gender of a persona seems to influence the stereotypical thinking. There is supporting evidence, that H2 should be further investigated in future studies.

4.4 RECOMMENDATIONS

The customization of a persona, and particularly of the gender of a persona, seems to play an important role for the outcome of a GenderMag evaluation. Therefore, this step should be handled carefully with regard to the desired result. Based on the findings of this pilot study the following recommendations for future evaluators using GenderMag can be drafted:

- *Take time to customize the chosen persona(s)*
  Small changes may have a substantial influence on the number of identified issues in a GenderMag evaluation and the stereotypical thinking. If in doubt, stick to the persona's gender and pictures included in the GenderMag kit [7] rather than changing the appearance of the persona. If the gender and pictures of the persona want to be changed, arrange enough time to customize the persona and reflect on the purpose of the customization.

- *Get familiar with the gender spectrum*
  Gender is complex and can be a sensitive topic. Therefore, it is important to get familiar with the gender spectrum before customizing the persona's gender. Consider getting in contact with respective researchers and include various perspectives (not solely a cisgender and/or binary perspective).

- *Emphasize the range of gender identities*
  While the effectiveness to evaluate gender-inclusiveness of software by using GenderMag is indisputable, it should be ensured that evaluators are able to grasp the idea of mutability and of non-binarity of gender in order to minimize stereotypical thinking. Hence, the importance of the facet values rather than the gender should be highlighted when using a persona of GenderMag.

4.5 LIMITATIONS

This pilot study investigating the implications of the usage of a transgender and a non-binary persona for a GenderMag usability evaluation revealed some compelling results. Nevertheless, there are certain limitations that need to be mentioned.

First of all, the small sample size constrains the significance of the results and the external validity of this study. Part of this constraint is the ratio of genders with 13 males, 3 females and no participants with a non-binary gender. In the data analysis, no relation of the participants' gender on the results could be found. This could partly be due to the gender ratio. In a study addressing non-binary genders, those should be included in the set of recruited participants in the future. The diversity of the cultural background was limited as well, leading to results representing one part of the Swiss population only.

In a usual GenderMag evaluation session, the group of evaluators, which work together on the walkthrough, is composed of software practitioners and designers evaluating a piece of software of their own devising. For the purpose of this thesis, comparability and time management, participants evaluated the website on their own in quite a constrained time frame. The exposure to and engagement with the personas, as well as the evaluation of a self-made product, might be different in a usual GenderMag session and influence the number of identified issues and stereotypical thinking. In this study, it was decided that participants were exposed to the personas for the same amount of time rather than requiring the participants to evaluate the same amount of subgoals and actions. As some evaluators were faster than others, every one of them got to a different point in the walkthrough. In further studies and analysis, it might be advisable to investigate other approaches to construct the evaluation part and investigate the impact on the results.

With respect to the gendering of search scope, there might have been extraneous variables influencing the results. E.g., the gender ratio of the participants' co-workers and friends might impact the gender ratio of their named friends.

In despite of these limitations, this thesis revealed some compelling results which in the future would be worthwhile to further investigate.

V CONCLUSION

5.1 SUMMARY

This thesis demonstrated that research in the field of Human-Computer Interaction still seems to follow a cisnormative and binary logic. This approach leads to the exclusion of transgender and non-binary genders. Although the creators of the usability evaluation method GenderMag haven undertaken steps to make it more inclusive, the research that it is based on is rooted in a cisnormative and binary view.

In an attempt to make GenderMag inclusive to transgender and non-binary genders, the customized personas Cisgender Abby, Transgender Abby and Agender Dylan were created based on the facet values of the GenderMag persona Abi/Abby. A pilot study with 16 participants was conducted to compare the use of the three personas in a GenderMag evaluation session. The implications on the amount of identified issues and on the stereotypical thinking were investigated.

The results indicate that even if the facet values are identical for all personas, the gender and appearance might influence the outcome of the evaluation and the stereotypical thinking of the evaluators. While the transgender and non-binary gender personas seem to be less effective regarding the number of identified facet-related issues, the stereotypical thinking may be reduced when using personas outside the cisgender binary gender spectrum.

5.2 FUTURE WORK

The pilot study was constrained by the small sample size and limited range of the participants' gender and cultural background. In further studies, the aim should be to recruit a set of more diverse participants with respect to gender and culture. Furthermore, the set of personas should be extended (e.g., transgender and non-binary personas with Tim's facet values) and compared to the traditional GenderMag personas. These steps would enhance the external validity of the study.

Using customized personas promises improvements towards a more inclusive GenderMag approach, but is limited concerning the full inclusion of transgender and non-binary genders.

In order to holistically include all genders, the foundational research of the facet values should be grounded in a more pluralistic approach. This thesis was written from a cisgender female perspective only, which should not be the approach strived for. Therefore, transgender and non-binary researchers and users should be included in future research. HCI research as a whole should strive for a gender-aware and -inclusive approach.

BIBLIOGRAPHY

[1] Beckwith, L., & Burnett, M. (2004). Gender: An Important Factor in End-User Programming Environments? *2004 IEEE Symposium on Visual Languages - Human Centric Computing*, 107-114. doi:10.1109/VLHCC.2004.28

[2] Beckwith, L., Burnett, M., Wiedenbeck, S., & Grigoreanu, V. (2006). Gender HCI: What About the Software? *Computers, 39*(11), 97-101. doi:10.1109/MC.2006.382

[3] Bardzell, S. (2010). Feminist HCI: Taking Stock and Outlining an Agenda for Design. *Proceedings of the SIGCHI conference on human factors in computing systems*, 1301-1310. doi:10.1145/1753326.1753521

[4] Schlesinger, A., Edwards, W. K., & Grinter, R. E. (2017). Intersectional HCI: Engaging Identity through Gender, Race, and Class. *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*, 5412–5427. doi:10.1145/3025453.3025766

[5] Ahmed, A. A. (2017) .Trans Competent Interaction Design: A Qualitative Study on Voice, Identity, and Technology. *Interacting with Computers, 30*(1), 53-71. doi:10.1093/iwc/iwx018

[6] Keyes, O. (2018). The Misgendering Machines: Trans/HCI Implications of Automatic Gender Recognition. *Proceedings of the ACM on Human-Computer Interaction, 2*, 88:1-88:22. doi:10.1145/3274357

[7] Burnett, M., Sarma, A., Stumpf, S., Beckwith, L., & Peters, A. (2019). *The GenderMag Kit: How to Use the GenderMag Method*. Accessed 19 October 2019 from http://gendermag.org

[8] Burnett, M., Peters, A., Hill, C., & Elarief, N. (2016). Finding Gender-Inclusiveness Software Issues with GenderMag: A Field Investigation. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*, *2586–2598*. doi:10.1145/2858036.2858274

[9] Hill, C., Maag, M., Oleson, A., Mendez, C., Marsden, N., Sarma, A., & Burnett, M. (2017). Gender-Inclusiveness Personas vs. Stereotyping: Can We Have it Both Ways? *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*, 6658-6671. doi:10.1145/3025453.3025609

[10] Richards, C., Bouman, W. P., & Barker, M.-J. (2017). *Genderqueer and non-binary genders*. London: Springer.

[11] Kyriakoullis, L., & Zaphiris, P. (2016). Culture and HCI: a review of recent cultural studies in HCI and social networks. *Universal Access in the Information Society, 15*(4), 629-642. doi:10.1007/s10209-015-0445-9

[12] Clemmensen, T., & Roese, K. (2010). An Overview of a Decade of Journal Publications about Culture and Human-Computer Interaction (HCI). In Katre, D., Orngreen, R., Yammiyavar, P., & Clemmensen, T. (eds), *Human Work Interaction Design: Usability in Social, Cultural and Organizational Contexts. HWID 2009. IFIP Advances in Information and Communication Technology* (p. 98-112). Berlin: Springer. doi:10.1007/978-3-642-11762-6_9

[13] Goodman-Deane, J., Keith, S., & Whitney, G. (2009). HCI and the older population. *Universal Access in the Information Society, 8*, 1-3. doi:10.1007/s10209-008-0125-0

[14] Silva, S., Braga, D., & Teixeira, A. (2014). AgeCI: HCI and Age Diversity. In Stephanidis C., Antona M. (eds). *Universal Access in Human-Computer Interaction. UAHCI 2014: Aging and Assistive Environments., 8515* (p. 179-190). Cham: Springer. doi:10.1007/978-3-319-07446-7_18

[15] Rode, J. A. (2011). A theoretical agenda for feminist HCI. *Interacting with Computers, 23*(5), 393-400. doi:10.1016/j.intcom.2011.04.005

[16] Bivens, R., & Hoque, A. S. (2018). Programming Sex, Gender, and Sexuality: Infrastructural Failures in the "Feminist" Dating App Bumble. *Canadian Journal of Communication, 43*(3), 441-459. doi:10.22230/cjc.2019v44n3a3375

[17] Vincent, B., & Manzano, A. (2017). History and Cultural Diversity. In Richards, C., Bouman, W. P., & Barker, M.-J. (eds), *Genderqueer and non-binary genders* (p. 11-30). London: Springer.

[18] Grudin, J. (2010). Why personas work: The psychological evidence. In Pruitt, J., & Adlin, T. (eds), *The persona lifecycle: Keeping people in mind throughout product design* (p. 642-663). San Francisco: Elsevier.

[19] Vorvoreanu, M., Zhang, L., Huang, Y.-H., Hilderbrand, C., Steine-Hanson, Z., & Burnett, M. (2019). From Gender Biases to Gender-Inclusive Design: An Empirical Investigation. *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, 53:1-53:14. doi:10.1145/3290605.3300283

[20] Hilderbrand, C., Perdriau, C., Letaw, L., Emard, J., Steine-Hanson, Z., Burnett, M., & Sarma, A. (2018). *Engineering Gender-Inclusivity into Software: Tales from the Trenches*. arXiv:1905.10361

[21] Mendez, C., Letaw, L., Burnett, M., Stumpf, S., Sarma, A., & Hilderbrand, C. (2019). *From GenderMag to InclusiveMag: An Inclusive Design Meta-Method*. arXiv:1905.02812

[22] Marsden, N., & Haag, M. (2016). Evaluation of GenderMag Personas Based on Persona Attributes and Persona Gender. *HCI International 2016 – Posters' Extended Abstracts. HCI 2016. Communications in Computer and Information Science, 617*, 122-127. doi:10.1007/978-3-319-40548-3_20

[23] Fiske, S. T. (1998). Stereotyping, prejudice, and discrimination. In Gilbert, D. T., Fiske, S. T., & Lindzey, G. (eds), *The handbook of social psychology* (p. 357-411). New York: McGraw Hill.

[24] FaceApp. (n.d.). Accessed 18 November 2019 from https://faceapp.com/app

[25] Non-binary wiki. (2020). *English neutral pronouns*. Accessed 8 November 2019 from https://nonbinary.wiki/w/index.php? title=English_neutral_pronouns

[26] Digitec (n.d.) Accessed 7 April 2020 from https://www.digitec.ch

[27] Vafaei, A., Alvarado, B., Tomás, C., Muro, C., Martinez, B., & Zunzunegui, M. V. (2014). The validity of the 12-item Bem Sex Role Inventory in older Spanish population: An examination of the androgyny model. *Archives of gerontology and geriatrics, 59*(2), 257-263. doi:10.1016/j.archger.2014.05.012

[28] Richards, C., Bouman, W. P., & Barker, M.-J. (2017). Introduction. In Richards, C., Bouman, W. P., & Barker, M.-J. (eds), *Genderqueer and non-binary genders* (p. 1-8). London: Springer.

APPENDIX

#	Description	Duration
1	Instructions on experiment	02:00
2	Hand out persona description & let participant read through it	05:00
3	Hand out walkthrough form and demonstrate software	08:00
4	Let participants fill out the walkthrough	40:00
5	Hand out questionnaire and let participants fill it out	05:00
	Total duration (minutes)	**60:00**

Figure 20: Step-by-step description/timeline of study session

SEEKING PARTICIPANTS FOR SOFTWARE EVALUATION STUDY

For my bachelor thesis I'm looking for participants to try out the GenderMag walkthrough. GenderMag is an evaluation method to find software features with gender-inclusiveness issues. In a session together with other participants, you will be evaluating a website using the GenderMag method and answer a follow-up questionnaire.

Eligibility to participate:

- you are a computer science student, software practitioner, interaction designer or similar
- you don't have experience with GenderMag yet
- you are fluent in speaking and writing in English
- you own a laptop to use during the study

The evaluation session will take approx. 1 hour and you will receive a compensation in form of a 15.- CHF gift card (Coop or Migros).

Do you want to try it and gain an insight in gender and HCI research?

If you are interested, please contact:

Lina Witzel
BSc student in People-Oriented Computing
lina.witzel@uzh.ch

Figure 21: Participation flyer

University of Zurich[UZH]

People and Computing Lab

University of Zurich
Department of Informatics
Binzmühlestr. 14
CH-8050 Zurich

Contact person:
Lina Witzel
Phone +41 78 739 36 39
lina.witzel@uzh.ch

Informed Consent Form

A pilot study to explore GenderMag 2.0

The purpose of this study is to gain insight into the evaluation method of GenderMag. Our findings from this study will help to inform future practitioners of the GenderMag method and researchers in the field of HCI and Gender. The study is part of my bachelor thesis.

What will I be asked to do?

If you choose to participate in this study, you will be asked to:

(1) Evaluate a website by using the GenderMag method and document your findings
(2) Fill out a questionnaire containing some follow-up questions

The total duration of this study is approx. 1 hour.

What information will be collected?

The **documentation of your findings**, which you will write down during the walkthrough, will be transcribed and used for analysis.There may also be notes taken during the evaluation.

The questionnaire will include some **demographic information** including your age, gender, nationality, ethnicity, educational background and job title. Furthermore, you will answer some **questions about your impression of the persona** you will be introduced to for the walkthrough.

Participation in the study is voluntary and confidential. Your data will be anonymized. If it is ever shared with anyone outside of the research team, including any written publications or oral presentations based on this research, you will be identified only by a participant number (e.g. P12) or a pseudonym.

What happens to the data?

All of your original data (the filled out walkthrough and questionnaire) will be saved on password-protected devices or locked in university filing cabinets before their destruction after 5 years. After the transcription, all forms will be destroyed immediately.

Are there risks to participating?

There are no risks to participating.

You are free to withdraw your participation at any point during the study, without needing to provide any reasons. However, unless you request otherwise, any information you contribute up to the point at which you choose to withdraw will be retained and may be used in the study.

Are there benefits to participating?

You will help advance the scientific understanding about the GenderMag evaluation method. Your participation will be compensated with a 15 CHF gift card. After the study, if you are interested in our research results or participating in any future studies on this topic, we will be happy to keep you informed.

Figure 22: Informed consent form (1/2)

University of Zurich[UZH]

People and Computing Lab

University of Zurich
Department of Informatics
Binzmühlestr. 14
CH-8050 Zurich

Contact person:
Lina Witzel
Phone +41 78 739 36 39
lina.witzel@uzh.ch

Consent

By signing this form, you confirm the following statements:

- A researcher explained the study and the listed conditions to me.
- I had the opportunity to ask questions.
- I understood the answers and accept them.
- I am at least 18 years old.
- I had enough time to make the decision to participate.
- I agree to the participation.

In no way does signing this form waive your legal rights or release the investigators or involved institutions from their legal or professional responsibilities. You are free to withdraw from this research project at any time. Please feel free to ask for clarification or new information at any time during your participation.

Participant's name (please print)	Researcher's name (please print)
Location and date	Location and date
Participant's signature	Researcher's signature

Questions or Concerns?

A copy of this consent form has been given to you to keep. The researcher has kept a copy of the consent form. If you have further questions regarding our research, and/or your participation in this study, please contact:

Lina Witzel (primary contact) lina.witzel@uzh.ch University of Zurich	Prof. Elaine M. Huang, Ph.D. huang@ifi.uzh.ch University of Zurich

Figure 23: Informed consent form (2/2)

INSTRUCTIONS

What is GenderMag?

GenderMag is an **evaluation method** to find software features with **gender-inclusiveness** issues. The method includes a specialised **cognitive walkthrough** consisting of several subgoals and actions. Furthermore, it includes **personas** representing "archetypes" of users to conduct the walkthrough.

You will be using a predefined cognitive walkthrough and persona.

What will the steps of this session be?

1. Explanation of the scenario and desired use case
2. Introduction to the persona
3. Evaluation of digitec.ch using GenderMag
4. Fill out follow-up questionnaire

What are the rules?

- **Stay true to the persona**: This session is about what your specific persona will do, not what you yourself would do or what some other user would do.
- **Follow the sequence**: Your job is not to predict some sequence of actions the persona might engage in. Instead, just answer the questions about the subgoals and about a set of actions the designer/developer wants the persona to do with them.
- **Answer every question**: Don't skip any question. Answer them all as though your persona has gotten this far—even if you think the persona wouldn't have gotten this far—so that you can continue the evaluation.
- **Just find the issues**, but don't spend time trying to solve them.
- **Close all other applications**, focus on the evaluation, do not answer e-mails etc.
- **You are allowed to ask questions** about the persona or the walkthrough during the evaluation, just raise your hand.

Figure 24: Instructions

Figure 25: Cisgender Abby persona

Abby Jones

- 28 years old
- Employed as an accountant
- Lives in Cardiff, Wales

Abby has always liked music. When she is on her way to work in the mor ning, she listens to music that spans a wide variety of styles. But when she arrives at work, she turns it off, and begins her day by **scanning all her emails first to get an overall picture before answering any of them**. (This extra pass takes time but seems worth it.) Some nights she exercises or stretches, and sometimes she likes to play computer puzzle games like Sudoku.

Background knowledge and skills

Abby works as an accountant. She is comfortable with the technologies she uses r egularly, but she just moved to this employer 1 week ago, and **their software systems are new to her.**

Abby says she's a **"numbers person"**, but she has never taken any computer pr ogramming or IT systems classes. **She likes Math and knows how to think with numbers.** She writes and edits spreadsheet formulas in her work.

In her free time, **she also enjoys working with numbers and logic** . She especially likes working out puzzles and puzzle games, either on paper or on the computer.

Motivations and Attitudes

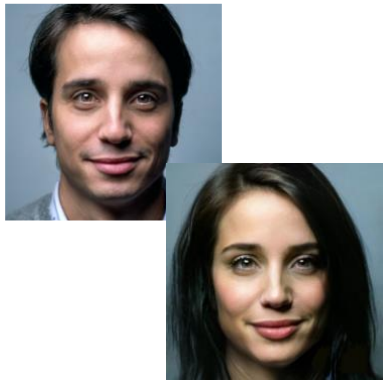
- ***Motivations*:** Abby uses technologies **to accomplish her tasks**. She learns new technologies if and when she needs to, but prefers to use methods she is **already familiar and comfortable with, to keep her focus** on the tasks she cares about.
- ***Computer Self-Efficacy***: Abby has **low confidence about doing unfamiliar computing tasks**. If problems arise with her technology, she often **blames herself for these problems**. This affects whether and how she will persevere with a task if technology problems have arisen.
- ***Attitude toward Risk***: Abby's life is a little complicated and she **rarely has spare time**. So she is **risk averse about using unfamiliar technologies that might need her to spend extra time** on them, even if the new features might be relevant. She instead performs tasks using familiar features, because they're more predictable about what she will get from them and how much time they will take.

How Abby Works with Information and Learns

- ***Information Processing Style*:** Abby tends towards a ***comprehensive information processing style*** when she needs more information. So, instead of acting upon the first option that seems pr omising, she **gathers information comprehensively to try to form a complete understanding of the problem before trying to solve it.** Thus, her style is "burst-y"; first she reads a lot, then she acts on it in a batch of activity.
- ***Learning: by Process vs. Tinkering***: When learning new technology, Abby leans toward **process-oriented learning**, e.g., tutorials, step-by-step processes, wizards, online how-to videos, etc. She **doesn't particularly like learning by tinkering with softwar e** (i.e., just trying out new features or commands to see what they do), but when she does tinker, it has positive effects on her understanding of the softwar e.

Figure 26: Transgender Abby persona

Abby Jones



- 28 years old
- Transgender woman
- Employed as an accountant
- Lives in Cardiff, Wales

Abby has always liked music. When she is on her way to work in the mor ning, she listens to music that spans a wide variety of styles. But when she arrives at work, she turns it off, and begins her day by **scanning all her emails first to get an overall picture before answering any of them**. (This extra pass takes time but seems worth it.) Some nights she exercises or stretches, and sometimes she likes to play computer puzzle games like Sudoku.

Background knowledge and skills

Abby works as an accountant. She is comfortable with the technologies she uses r egularly, but she just moved to this employer 1 week ago, and **their software systems are new to her.**

Abby says she's a **"numbers person"**, but she has never taken any computer pr ogramming or IT systems classes. **She likes Math and knows how to think with numbers.** She writes and edits spreadsheet formulas in her work.

In her free time, **she also enjoys working with numbers and logic**. She especially likes working out puzzles and puzzle games, either on paper or on the computer.

Motivations and Attitudes

- ***Motivations*:** Abby uses technologies **to accomplish her tasks**. She learns new technologies if and when she needs to, but prefers to use methods she is **already familiar and comfortable with, to keep her focus** on the tasks she cares about.
- ***Computer Self-Efficacy***: Abby has **low confidence about doing unfamiliar computing tasks**. If problems arise with her technology, she often **blames herself for these problems**. This affects whether and how she will persevere with a task if technology problems have arisen.
- ***Attitude toward Risk***: Abby's life is a little complicated and she **rarely has spare time**. So she is **risk averse about using unfamiliar technologies that might need her to spend extra time** on them, even if the new features might be relevant. She instead performs tasks using familiar features, because they're more predictable about what she will get from them and how much time they will take.

How Abby Works with Information and Learns

- ***Information Processing Style*:** Abby tends towards a ***comprehensive information processing style*** when she needs more information. So, instead of acting upon the first option that seems pr omising, she **gathers information comprehensively to try to form a complete understanding of the problem before trying to solve it.** Thus, her style is "burst-y"; first she reads a lot, then she acts on it in a batch of activity.
- ***Learning: by Process vs. Tinkering***: When learning new technology, Abby leans toward **process-oriented learning**, e.g., tutorials, step-by-step processes, wizards, online how-to videos, etc. She **doesn't particularly like learning by tinkering with software** (i.e., just trying out new features or commands to see what they do), but when she does tinker, it has positive effects on her understanding of the software.

GenderMag – Digitec.ch *Participant ID: _____*

Scenario (Overall Goal): **Abby wants to order a keyboard.** Her boss just called because he needs a new keyboard for his workplace. He wants either the *Logitech MX Keys* or the *Logitech Craft* with a Swiss layout. He prefers the lighter keyboard of those two.

Subgoal #1: *Search for the first keyboard (Logitech MX Keys, CH)*

1. *Will Abby have formed this subgoal as a step to her overall goal (scenario)?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

Figure 27: Walkthrough Abby (1/18)

Action #1.1: Click the search bar

a. ***[BEFORE ACTION]*** *Will Abby do this action? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

b. ***[AFTER ACTION]*** *If Abby does the right thing, will she know that she did the right thing and is making progress toward her goal? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

Figure 28: Walkthrough Abby (2/18)

Action #1.2: Type in "Logitech MX Keys"

a. ***[BEFORE ACTION]*** *Will Abby do this action? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

b. ***[AFTER ACTION]*** *If Abby does the right thing, will she know that she did the right thing and is making progress toward her goal? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

Figure 29: Walkthrough Abby (3/18)

Action #1.3: Press enter key

a. ***[BEFORE ACTION]*** *Will Abby do this action? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

b. ***[AFTER ACTION]*** *If Abby does the right thing, will she know that she did the right thing and is making progress toward her goal? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

Figure 30: Walkthrough Abby (4/18)

Subgoal #2: *Add first keyboard (Logitech MX Keys) to the product comparison*

2. Will Abby have formed this subgoal as a step to her overall goal (scenario)?

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

Figure 31: Walkthrough Abby (5/18)

Action #2.1: Scroll down to keyboard (Logitech MX Keys, CH)

a. ***[BEFORE ACTION]*** *Will Abby do this action? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

b. ***[AFTER ACTION]*** *If Abby does the right thing, will she know that she did the right thing and is making progress toward her goal? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

Figure 32: Walkthrough Abby (6/18)

Action #2.2: Click on button "Add to product comparison"

a. ***[BEFORE ACTION]*** *Will Abby do this action? Why?*

☐ Yes	☐ Maybe	☐ No
Which, if any, of Abby's facets did you use to answer the question?		
☐ Motivations ☐ Information Processing Style ☐ Computer Self-Efficacy ☐ Attitude Towards Risk ☐ Learning: by Process vs. by Tinkering ☐ None of the above	☐ Motivations ☐ Information Processing Style ☐ Computer Self-Efficacy ☐ Attitude Towards Risk ☐ Learning: by Process vs. by Tinkering ☐ None of the above	☐ Motivations ☐ Information Processing Style ☐ Computer Self-Efficacy ☐ Attitude Towards Risk ☐ Learning: by Process vs. by Tinkering ☐ None of the above
Why?	Why?	Why?

b. ***[AFTER ACTION]*** *If Abby does the right thing, will she know that she did the right thing and is making progress toward her goal? Why?*

☐ Yes	☐ Maybe	☐ No
Which, if any, of Abby's facets did you use to answer the question?		
☐ Motivations ☐ Information Processing Style ☐ Computer Self-Efficacy ☐ Attitude Towards Risk ☐ Learning: by Process vs. by Tinkering ☐ None of the above	☐ Motivations ☐ Information Processing Style ☐ Computer Self-Efficacy ☐ Attitude Towards Risk ☐ Learning: by Process vs. by Tinkering ☐ None of the above	☐ Motivations ☐ Information Processing Style ☐ Computer Self-Efficacy ☐ Attitude Towards Risk ☐ Learning: by Process vs. by Tinkering ☐ None of the above
Why?	Why?	Why?

Figure 33: Walkthrough Abby (7/18)

Subgoal #3: *Search for the second keyboard (Logitech Craft)*

3. *Will Abby have formed this subgoal as a step to her overall goal (scenario)?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

Figure 34: Walkthrough Abby (8/18)

Action #3.1: Triple-click the search bar

a. ***[BEFORE ACTION]*** *Will Abby do this action? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

b. ***[AFTER ACTION]*** *If Abby does the right thing, will she know that she did the right thing and is making progress toward her goal? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

Figure 35: Walkthrough Abby (9/18)

Action #3.2: Type in "Logitech Craft"

a. ***[BEFORE ACTION]*** *Will Abby do this action? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

b. ***[AFTER ACTION]*** *If Abby does the right thing, will she know that she did the right thing and is making progress toward her goal? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

Figure 36: Walkthrough Abby (10/18)

Action #3.3: Press enter key

a. ***[BEFORE ACTION]*** *Will Abby do this action? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

b. ***[AFTER ACTION]*** *If Abby does the right thing, will she know that she did the right thing and is making progress toward her goal? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

Figure 37: Walkthrough Abby (11/18)

Subgoal #4: *Add the second keyboard (Logitech Craft) to the product comparison*

4. Will Abby have formed this subgoal as a step to her overall goal (scenario)?

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

Figure 38: Walkthrough Abby (12/18)

Action #4.1: Scroll down to keyboard (Logitech Craft, CH)

a. ***[BEFORE ACTION]*** *Will Abby do this action? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

b. ***[AFTER ACTION]*** *If Abby does the right thing, will she know that she did the right thing and is making progress toward her goal? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

Figure 39: Walkthrough Abby (13/18)

Action #4.2: Click on button "Add to product comparison"

a. ***[BEFORE ACTION]*** *Will Abby do this action? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

b. ***[AFTER ACTION]*** *If Abby does the right thing, will she know that she did the right thing and is making progress toward her goal? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

Figure 40: Walkthrough Abby (14/18)

Subgoal #5: *Compare keyboards for their weight*

5. *Will Abby have formed this subgoal as a step to her overall goal (scenario)?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

Figure 41: Walkthrough Abby (15/18)

Action #5.1: Click on button for product comparison

a. ***[BEFORE ACTION]*** *Will Abby do this action? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

b. ***[AFTER ACTION]*** *If Abby does the right thing, will she know that she did the right thing and is making progress toward her goal? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

Figure 42: Walkthrough Abby (16/18)

Action #5.2: Click on button "Compare"

a. ***[BEFORE ACTION]*** *Will Abby do this action? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

b. ***[AFTER ACTION]*** *If Abby does the right thing, will she know that she did the right thing and is making progress toward her goal? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

Figure 43: Walkthrough Abby (17/18)

Action #5.3: Scroll down to weight in specification

a. ***[BEFORE ACTION]*** *Will Abby do this action? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

b. ***[AFTER ACTION]*** *If Abby does the right thing, will she know that she did the right thing and is making progress toward her goal? Why?*

☐ *Yes*	☐ *Maybe*	☐ *No*
Which, if any, of Abby's facets did you use to answer the question?		
☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*	☐ *Motivations* ☐ *Information Processing Style* ☐ *Computer Self-Efficacy* ☐ *Attitude Towards Risk* ☐ *Learning: by Process vs. by Tinkering* ☐ *None of the above*
Why?	*Why?*	*Why?*

Figure 44: Walkthrough Abby (18/18)

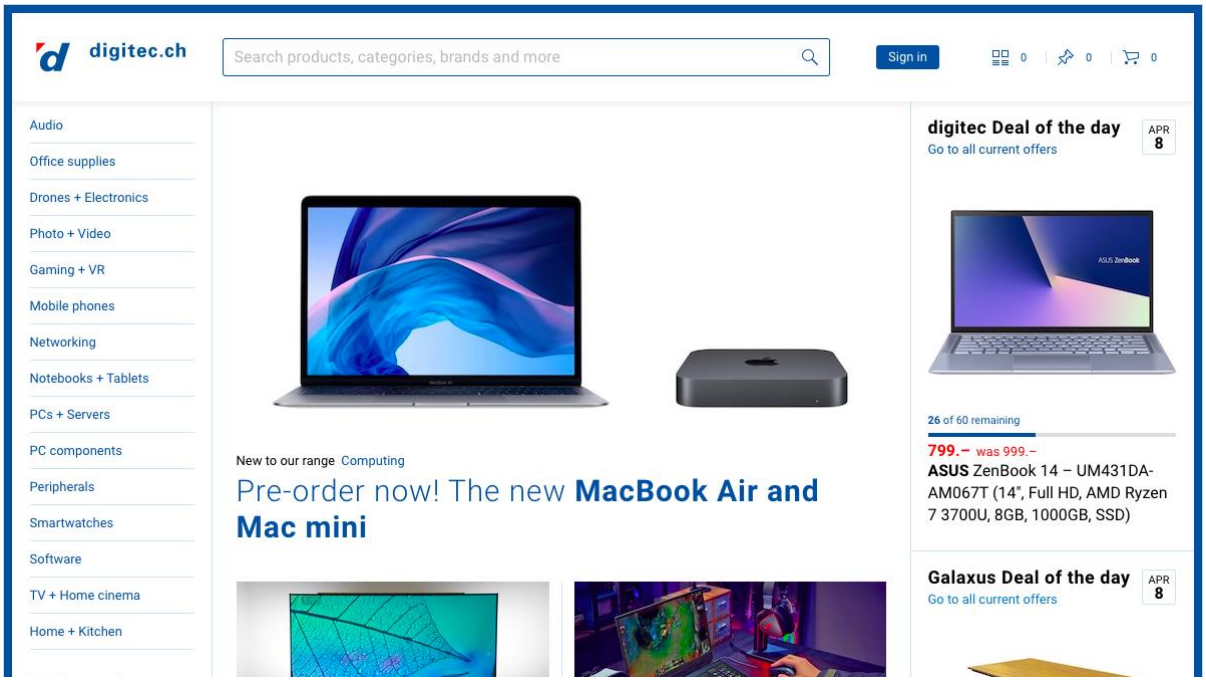


Figure 45: Digitec.ch starting page [26]

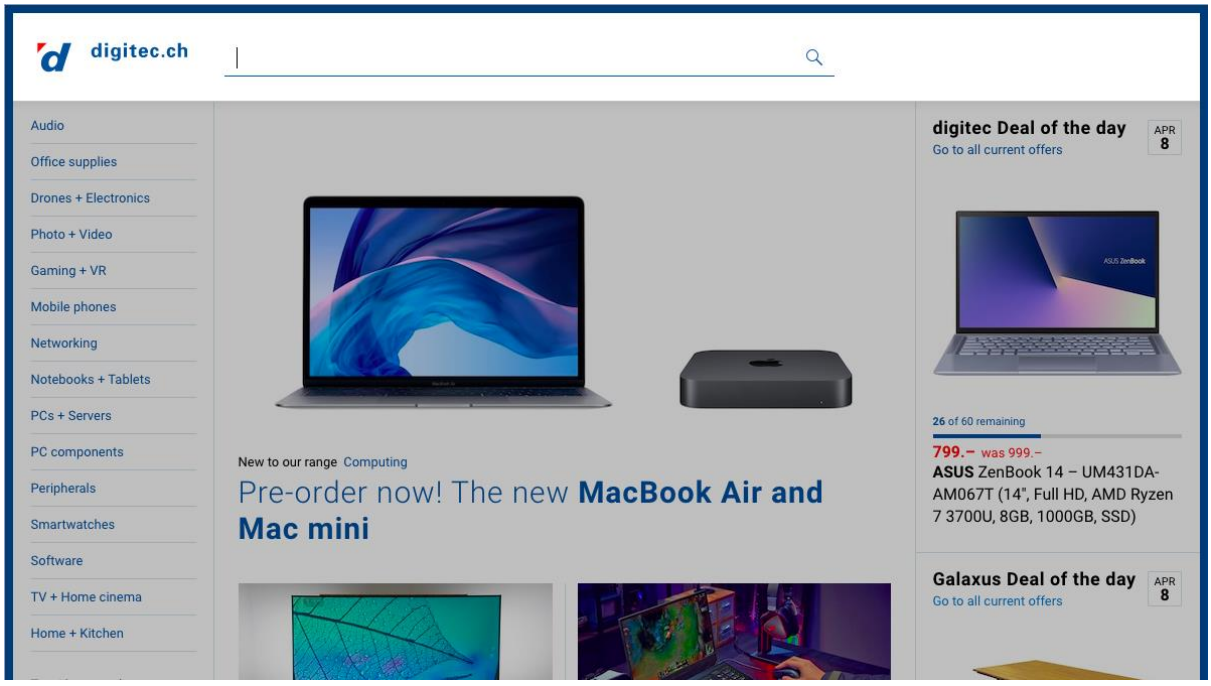


Figure 46: Action 1.1 – Click the search bar [26]

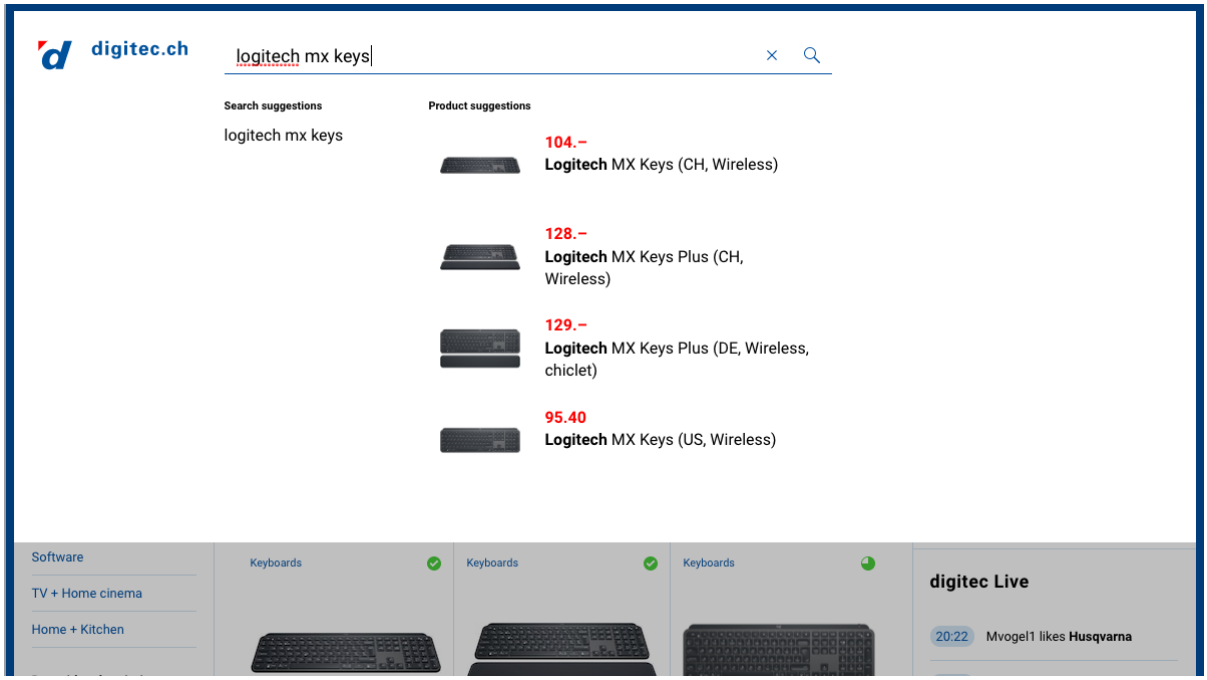


Figure 47: Action 1.2 & 1.3 – Type in first keyboard and press enter key [26]

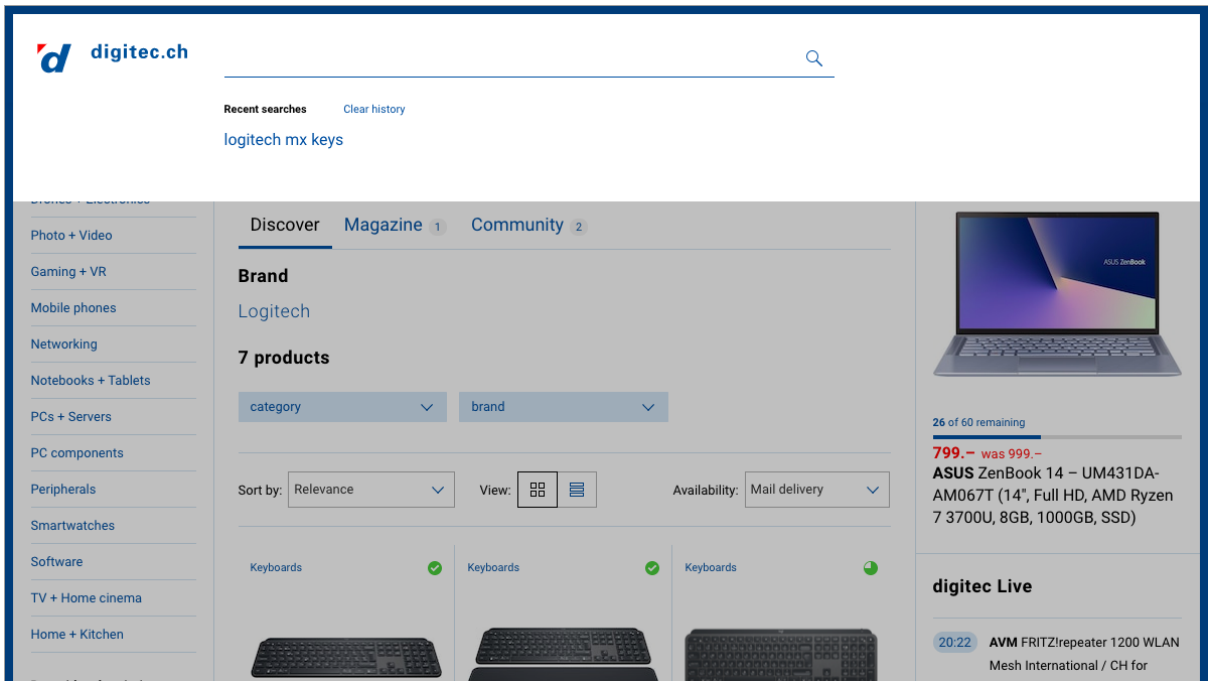


Figure 48: Action 3.1 – Click the search bar [26]

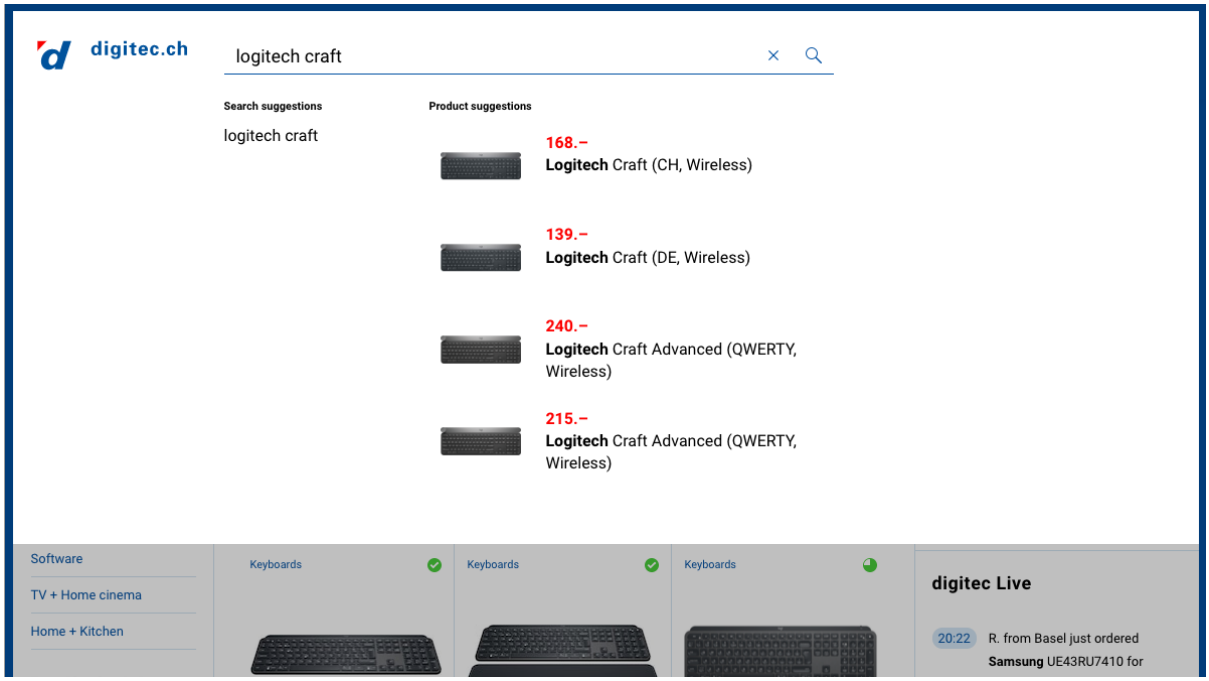


Figure 49: Aciton 3.2 & 3.3 – Type in second keyboard and press enter [26]

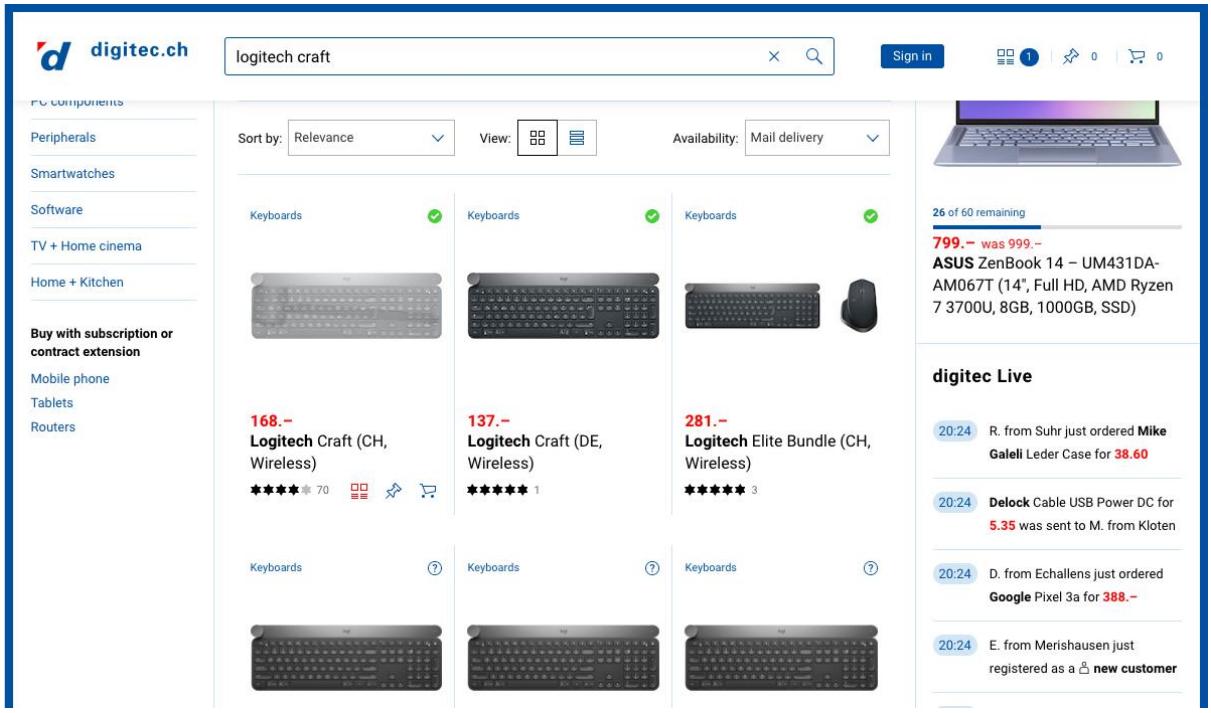


Figure 50: Action 4.1 & 4.2 – Scroll down to keyboard and add product to product comparison [26]

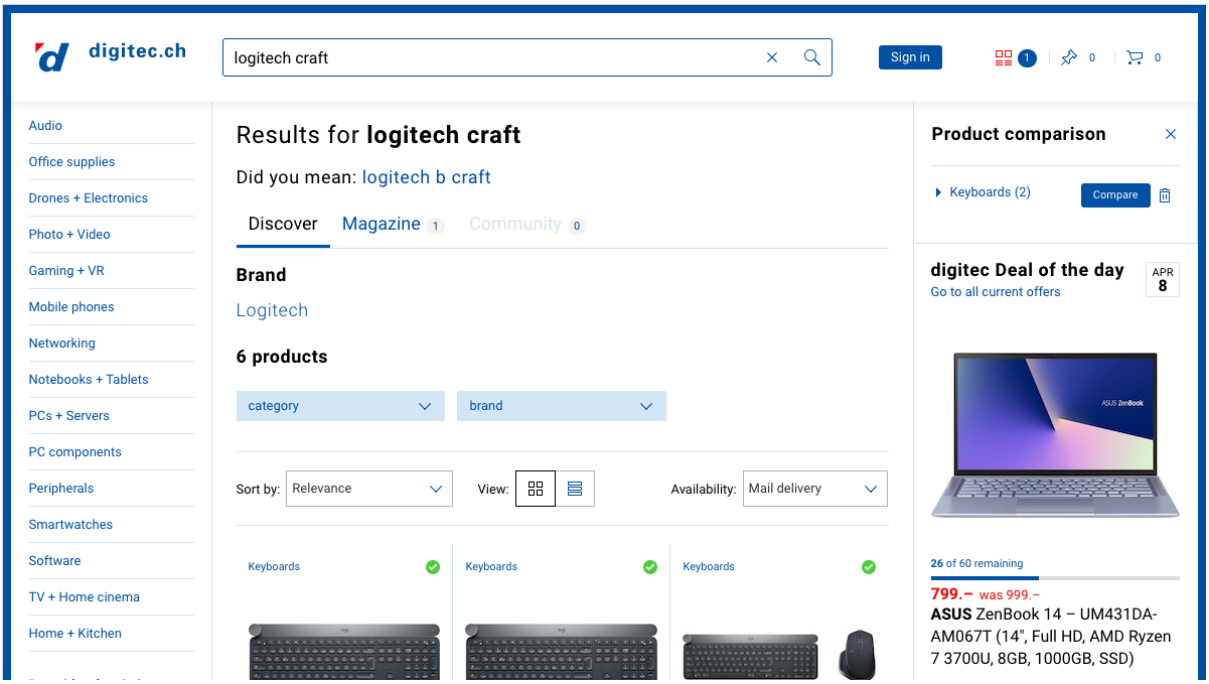


Figure 51: Action 5.1 – Click on button for product comparison [26]

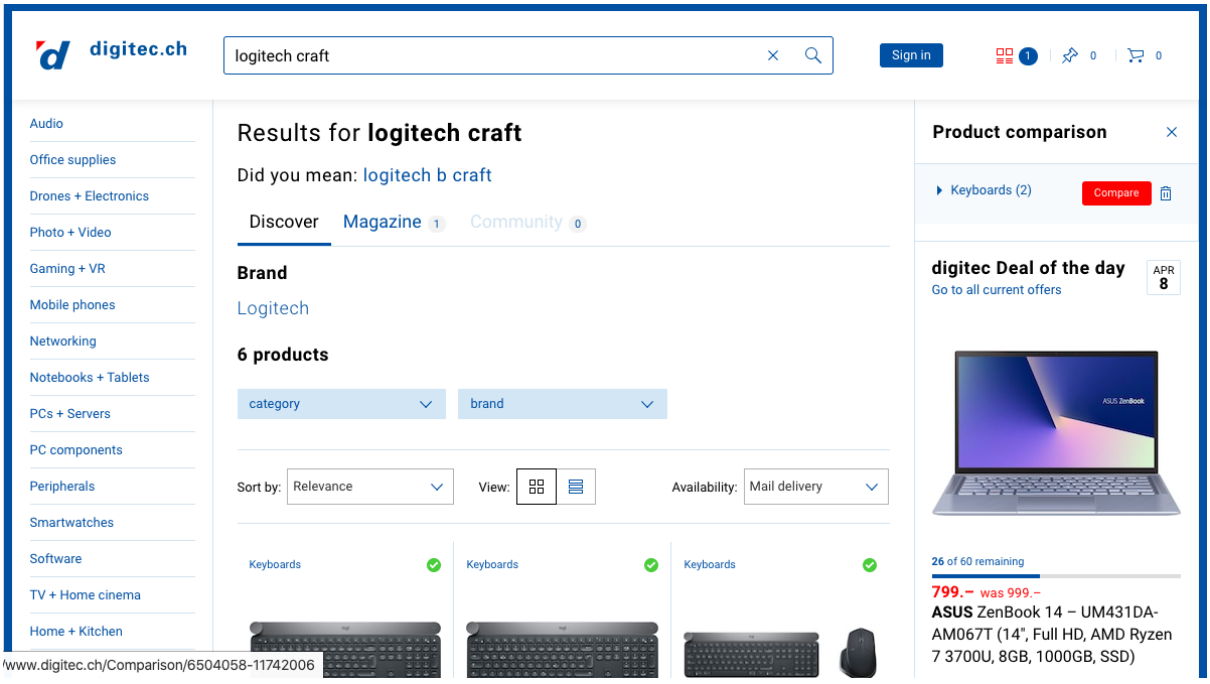


Figure 52: Action 5.2 – Click on button "Compare" [26]

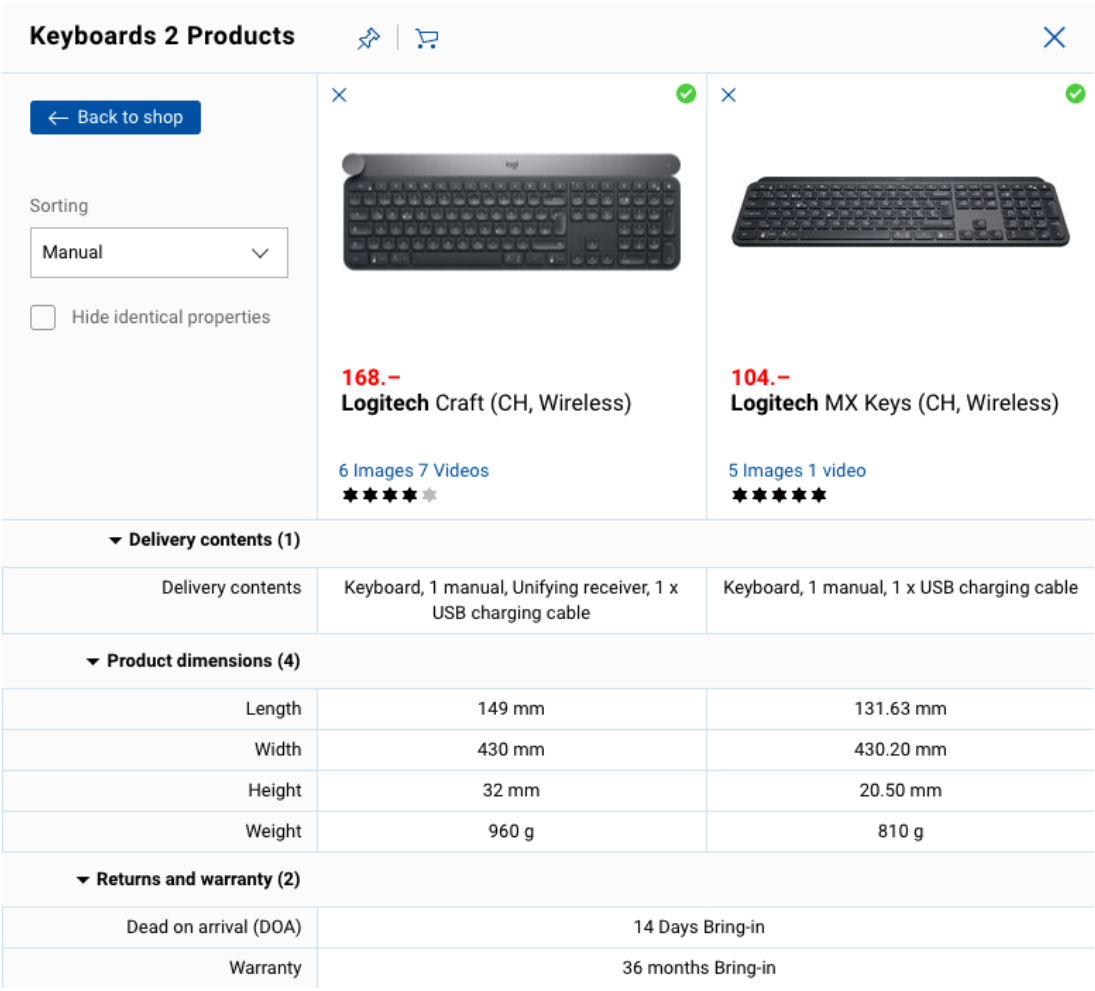


Figure 53: Action 5.3 – Scroll down to weight in specification [26]

Participant ID:

Age: _____

Gender: _____

Educational level & discipline: _____

Occupation: _____

Nationality: _____

Ethnicity: _____

a)

Please list some of your friends/relatives/etc. (first names) that **<persona> reminds you of** and indicate the gender (female, male, non-binary, etc.) for each name. List as many names as you like.

Name	Gender

Please list some of your friends/relatives/etc. (first names) that are **the opposite to <persona>** and indicate the gender (female, male, non-binary, etc.) for each name. List as many names as you like.

Name	Gender

1

Figure 54: Questionnaire template (1/2)

Participant ID:

b)

How much do you agree/disagree with the following statements?

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
<persona> is a gentle person.	○	○	○	○	○
<persona> is a warm person.	○	○	○	○	○
<persona> is sensitive to others' needs.	○	○	○	○	○
<persona> is a tender person.	○	○	○	○	○
<persona> is a sympathetic person.	○	○	○	○	○
<persona> is an affectionate person.	○	○	○	○	○
<persona> has leadership abilities.	○	○	○	○	○
<persona> possesses a strong personality.	○	○	○	○	○
<persona> acts like a leader.	○	○	○	○	○
<persona> defends <he/her/eirs> beliefs.	○	○	○	○	○
<persona> makes decision easily.	○	○	○	○	○
<persona> is a dominant person.	○	○	○	○	○

c)
Do you have any comments regarding the study?

2

Figure 55: Questionnaire template (2/2)

University of Zurich[UZH]

People and Computing Lab

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Department of Informatics
Binzmühlestr. 14
CH-8050 Zurich

Receipt of Participant Incentive

I, _____ received an incentive in the amount of 15 CHF in form of a gift card for my participation in the GenderMag 2.0 study, by researchers in the People and Computing Group, Department of Informatics at the University of Zurich on _____.

_____ _____

Participant's signature Researcher's signature

Figure 56: User study compensation form

Persona	ID	Gender	Identified issues	Similar females	Similar males	Dissimilar females	Dissimilar males	Feminine score	Masculine score
Cisgender Abby	1	male	4	3	2	2	2	2.833333333	2.833333333
	2	female	4	2	0	1	1	3.333333333	2.5
	3	male	5	0	0	4	4	2.833333333	2.333333333
	4	female	3	1	0	0	2	3.166666667	2.333333333
	5	male	2	1	0	0	1	3.833333333	2.5
Transgender Abby	6	male	4	2	1	3	1	3	3
	7	male	3	0	1	3	0	3.333333333	3.166666667
	8	male	2	1	1	1	3	3	2.5
	9	male	1	3	0	1	0	3	3.166666667
	10	male	7	1	1	1	2	2.833333333	2.166666667
Agender Dylan	11	male	2	0	1	1	3	3	2.833333333
	12	male	0	1	1	0	1	3	2.833333333
	13	male	6	1	0	0	2	2.333333333	1.833333333
	14	male	6	1	1	0	0	3.166666667	3.5
	15	female	2	2	1	1	2	3.166666667	3.5
	16	male	3	1	2	0	2	3.333333333	3.666666667

Figure 57: Pilot study data