

Evaluation of GenderMag Personas Based on Persona Attributes and Persona Gender

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Abstract. We examined personas to see if (a) gendered persona attributes and (b) the persona presentation, i.e. the randomly assigned gender, would affect the perception of the persona. As stimulus material we used the GenderMag personas that were developed to inform the design process regarding empirically validated gender differences. In a 2×2 experimental design, 36 participants were randomly assigned to evaluate a male or female GenderMag persona either in its original form or with the gender switched. The results indicate that the facets of gender differences were recognized and recalled by the participants. The masculine facets yielded an attribution of higher competence in the personas. The findings can serve as a basis to further discuss what gender-inclusiveness means with regards to personas.

Keywords: Personas · User representation · Social perception · Stereotypes · Usability · GenderMag · Experimental study

1 Introduction

People have the ability to understand others based on a minimum of information about this person. This ability has developed to efficiently process stimuli in the environment. With only a few pieces of information, people can organize and integrate the available material into significant categories. This process is called impression formation [1]: People evaluate social stimuli and then make attributions by inferring traits, intentions, and motivations. To a large extent, these evaluations are automatic processes [2], i.e. they happen without conscious endorsement. Person perception is something that has an imperative flavor; it happens with ease and gives people the feeling of understanding a person.

The persona method makes use of these social intuitions [3]: Personas are fictitious characters created as representatives of users in the design process [4]. They foreground people in the design process and rely on impressions made based on these descriptions. Their appeal lies in the fact that person perception is something familiar to everyone and happening with ease. Yet person perception is prone to numerous biases that can distort social judgment [5]. Since personas are used to inform design, biased social judgments might run the risk of leading to incorrect predictions and implications.

One major source of bias in person perception is gender, leading to numerous effects, e.g. unconsciously devaluing feminine attributes or viewing attributes differently when a male displays them as opposed to a female [6]. Gender is related to the

social attractiveness of an individual and a predisposition to interact with them [7]. Perception of gender is highly linked to role and trait inferences [8]. The two basic dimensions of person perception and social judgment, warmth and competence, are clearly correlated to gender [9]. Development of personas has been shown to rely on gender stereotypes regarding the warmth dimension [10, 11].

2 GenderMag Personas

In an effort to support the development of gender-inclusive software, Margaret Burnett and her colleagues have developed a method for considering existing gender differences [12, 13]. Taking into account actual statistical differences between men and women as they pertain to software tools, they have developed personas representing the different approaches to software that are found more often in males or females. Their method “GenderMag Method – GenderHCI Cognitive Walkthrough with Magnifying Persona” is a kit for software development teams to develop more gender-inclusive software. It consists of a cognitive walkthrough and several personas, including the persona of a female end-user programmer called “Abby”, to support analysis especially from a female perspective. The personas can be adapted regarding characteristics of different target user populations, e.g. occupation, age, or geographic location. The authors have carefully designed the personas to not reinforce stereotypes of female versus male users’ skills: They are presented as equally good problem-solvers and equally competent with their technical domain. The differences incorporated in the persona descriptions concern five facets: Their motivations to use technology, their information-processing style, computer self-efficacy, risk aversion, and tinkering.

3 Research Questions

With our study we wanted to answer the following research questions:

- Do the gender-specific attributes that the GenderMag Personas are based on make a difference, i.e. is the impression regarding the facets based on the content of the persona description?
- Do gender-specific attributes and/or the presentation as male or female influence the attractiveness of the persona?
- Do gender-specific attributes and/or the presentation as male or female influence the perceived competence or warmth of the persona?

4 Method

Participants. Participants were software engineering students of a large University of Applied Sciences in Germany. They participated in the lab study for course credits. 36 of them completed the questionnaire. The sample consisted of 27 males and 9 females, i.e. the gender ratio in the sample approximates the ratio in the population of IT students and software engineers.

Materials. Independent variables in the experimental design of the study were the persona presentation (male vs. female) and persona attributes (masculine vs. feminine). Stimulus material was the GenderMag Personas “Tim” and “Abby”, presented in their original, gender-conforming mode or with the gender switched. These personas are designed to describe the attitudes and behavior found more often in men (“Tim”) or women (“Abby”). Thus personas were presented either as male (“Tim”) vs. female (“Abby”) or with masculine vs. feminine attributes, yielding a 2×2 design. The dependent variables were operationalized in a questionnaire comprising the following scales:

- perception of the facets of the GenderMag personas (information processing style, computer self-efficacy, risk aversion, tinkering [12]), operationalized on a scale with two items per facet (e.g. “How confident is this persona in using computers?”) and a five-point Likert scale (1 = “not at all”, 5 = “extremely”)
- ratings of interpersonal attraction (task attraction and personal attraction), using the scale by [7]
- ratings of warmth and competence as basic dimensions of person perception, using the scale by [9].

Procedure. In a between-subjects design, participants were randomly assigned to one of four (persona presented as male vs. female x persona presented with masculine vs. feminine attributes) conditions. They were instructed to peruse the persona description and imagine introducing a new spreadsheet feature to this kind of user. Then they filled out the questionnaire with the scales presented above and basic socio-demographic information.

5 Results

Facets. Regarding the perception of the personas in line with the facets that are used in the GenderMag personas to differentiate male and female approaches, the following results were found:

- Regarding information-processing style no significant effect could be found.
- Regarding computer self-efficacy, the main effect of persona gender was not significant. The main effect of persona attributes was significant, $F(1, 32) = 50.63$, $p < .001$: Computer self-efficacy was significantly higher for personas presented with masculine attributes ($M = 8.79$) than for personas presented with feminine attributes ($M = 4.94$). The interaction effect of persona gender and persona attributes was not significant.
- Regarding risk aversion, the main effect of persona gender was not significant. The main effect of persona attributes was significant, $F(1, 32) = 49.38$, $p < .001$: Risk aversion was significantly higher for personas presented with feminine attributes ($M = 6.35$) than for personas presented with masculine attributes ($M = 3.12$). The interaction effect of persona gender and persona attributes was not significant.

- Regarding tinkering, the main effect of persona gender was not significant. The main effect of persona attributes was significant, $F(1, 32) = 63.39$, $p < .001$: Tinkering was significantly higher for personas presented with masculine attributes ($M = 9.21$) than for personas presented with feminine attributes ($M = 4.71$). The interaction effect of persona gender and persona attributes was not significant.

Interpersonal Attraction. Regarding the interpersonal attraction of the personas evaluated, no significant effect could be found.

Stereotype Content. Regarding warmth no significant effect could be found. There was a significant effect regarding competence, which is visualized in Fig. 1.

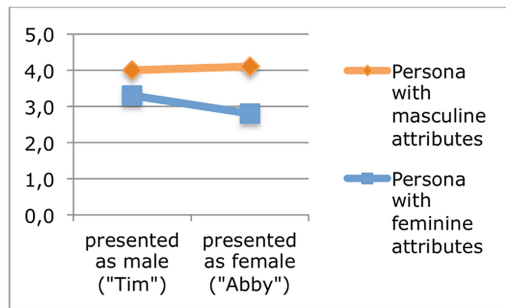


Fig. 1. Competence evaluation – visualization of the main effect of persona attributes on competence. (Color figure online)

Competence was significantly higher for personas presented with masculine attributes ($M = 4.07$) than for personas presented with feminine attributes ($M = 3.02$), i.e. the main effect of persona attributes was significant, $F(1, 32) = 14.50$, $p < .01$. The main effect of persona gender and the interaction effect of persona gender and persona attributes were not significant.

6 Discussion

Research into person perception regularly demonstrates gender influences – both in the way that masculine attributes are deemed more important than feminine attributes and that the same attributes are perceived differently when a female versus a male displays them [6]. We replicated some of these effects for personas. A two-by-two analysis of variance yielded a significant main effect for the persona description for most of the facets the gendered descriptions of the GenderMag personas are based on.

The data collected in this study provide evidence that the facets Margaret Burnett and her colleagues [12, 13] based their personas on for a gendered representation of the users were perceived and recalled by the participants. This indicates that they are clearly recognizable in the description. In our study, the descriptions of feminine and masculine attributes were more important than the sole information of a persona being

male or female. This can be interpreted as an indicator that the facets actually offer additional information, i.e. although gendered, they cannot be inferred from the information of a person's gender. Rather, they seem to be seen as facets that can actually be displayed by both females and males.

The data yielded regarding the competence dimension of the stereotype content model is disquieting. Presenting the persona as motivated by technology itself, selective in information processing, displaying a high computer self-efficacy, risk-taking, and tinkering made them seem more competent than presenting them as using technology for what it enables one to do, having a comprehensive information processing style, lower computer self-efficacy, be risk averse, and less likely to tinker. The qualities that have been found to be more prevalent in female users thus lead to a depreciation of the person's competence. The attribution of higher competence to males is prevalent in society, so Margaret Burnett and her colleagues explicitly emphasized that the personas were carefully constructed to display equal technical expertise. Our data provide evidence that the display of masculine attributes overrides the expertise assigned to a persona and leads to a devaluation of competence on other grounds. In line with results on the stereotype content model this further shows how unconscious processes influence the work with personas regarding the dimension of competence. The results of this study can also supplement the study by Marsden and colleagues [10]: Their content analysis of personas showed gender differences in warmth but not in competence – it seems that when constructing personas, designers are careful to create females and males equally competent. The study presented in this paper suggests that even personas carefully constructed to display equal competence may yield a perceived inequality for the people working with the personas.

The participants had evaluated task attraction and personal attraction of the personas, but gendered attributes and persona gender did not yield any differences. This seems to suggest that the two personas that the study was based on are equally attractive.

7 Conclusion

Gender biases in person perception are a comprehensively researched topic in social psychology. So it might come as no surprise that they can also be found in the perception of personas. Nevertheless, the personas used in this study were carefully created to display equal competence and to further an appreciation for the facets that have been shown to be relevant gender differences in the use of technological artifacts. Therefore the results are unsettling: Gender biases might be seen as unavoidable in impression formation of real people one encounters. Yet in the creation of fictitious characters that are developed to base design decisions on they could be seen as a call for action. A solution might be to consider existing gender biases in the development of personas. Designing personas to be impartial and fair might then imply one has to put less emphasis on statistical gender differences in user groups and rather consider statistical differences in the perception of personas. Compensating existing gender biases in person perception would thus be a way to ensure that existing gender biases are not used to inform design of future technological artifacts.

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