

Personas and Identity

Looking at Multiple Identities to Inform the Construction of Personas

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ABSTRACT

Personas are valuable tools to help designers get to know their users and adopt their perspectives. Yet people are complex and multiple identities have to be considered in their interplay to account for a comprehensive representation – otherwise, personas might be superficial and prone to activate stereotypes. Therefore, the way users’ identities are presented in a limited set of personas is crucial to account for diversity and highlight facets which otherwise would go unnoticed. In this paper, we introduce an approach to the development of personas informed by social identity theory. The effectiveness of this approach is investigated in a qualitative study in the context of the design process for an e-learning platform for women in tech. The results suggest that considering multiple identities in the construction of personas adds value when designing technologies.

CCS CONCEPTS

Social and professional topics → **Gender**

KEYWORDS

Personas; Gender; Social Identity; Co-Design; Qualitative Study

ACM Reference format:

Nicola Marsden & Monika Pröbster. 2019. Personas and Identity: Looking at Multiple Identities to Inform the Construction of Personas. In *2019 CHI Conference on Human Factors in Computing Systems Proceedings (CHI 2019), May 4–9, 2019, Glasgow, Scotland, UK*. ACM, New York, NY, USA. 14 pages. <https://doi.org/10.1145/3290605.3300565>

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CHI 2019, May 4–9, 2019, Glasgow, Scotland, UK.

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ACM ISBN 978-1-4503-5970-2/19/05...\$15.00.

DOI <https://doi.org/10.1145/3290605.3300565>

1 INTRODUCTION

Personas were developed as one of the tools in HCI designed to help us understand users in the design process [1-4]. Personas are based on data about the people who are expected to be using a technology [5]; they are meant to connect the designers to the people they are designing for, make data about them more tangible [6], and present user identities [2].

Yet identities are usually not isolated: people are complex, they have several identities that they construct and that define them, some of them resulting from their identification with different social categories [7-9]. Also, identities do not stand by themselves: in order to understand or represent people, identities have to be considered in their interplay [10, 11] – the identity of a homemaker, a Muslim, and a man are not the same when looked at separately or when they exist together in one person.

Representing this complexity of people in personas is challenging: By definition, personas are models and have to simplify and abstract; an accurate portrayal of users has to be balanced with facilitating effective usage of the persona in the design process [12]. Therefore, personas do not typically present the simultaneous membership in different social categories but rather focus on “typical” qualities organized in a character with little complexity. Yet while overcomplication will usually be obvious, too much reduction can easily go unnoticed. Even worse, oversimplified personas might create a false sense of understanding [13]: They resonate with the design professionals not because they are correct representations but because they correspond to the images they have in their head, creating a feeling of authenticity by matching existing stereotypes.

Reductionist personas can thus create blind spots in the design process that have implications on several levels: First, there is the utilitarian argument focusing on the effect regarding the outcome: Representing user complexity brings more value to the design process and nuanced

personas contribute to serving a more diverse user base. Second, there is an ethical level on which we have the responsibility to our users to accurately portray them with their diversity and complexity [14-19]. For this, we need to be critical of how personas mediate identities in a way that marginalized and intersectional identities are made illegible and stereotypes are perpetuated [10, 11, 20-24].

Guiding our research is the question how multiple identities and their intersections can be considered in the construction of personas. Currently, three approaches can be distinguished regarding personas and stereotyping in HCI: 1) “immunity”: assuming that a data-based approach is “immune” to stereotyping, e.g. when personas are developed using analytics systems and computational techniques to generate data-driven personas [25], 2) “inevitability”: seeing stereotypes as unavoidable or useful, i.e. referring to existing stereotypes to make personas seem more “authentic” by yielding a high recognition value [4], 3) “troublesome”: trying to avoid stereotypes through qualitative research (and reflections on presenting “the other” [26]) or interventions in the design process, e.g. by creating “engaging” persons, through active stereotype monitoring, or by involving users in the creation of personas [27].

We contribute by offering an approach and an example of how social identity theory can be used to inform the creation of personas. This could help organize and represent the complexity of people’s identities in a way that reduces biases caused by stereotypes. Thus, personas could become a tool that shapes design practices for diversity and opens new perspectives for empowerment.

With the focus on social identity theory we complement the existing approaches in different ways: For 1) “immunity”: we argue that simply getting “better” quantitative data is not sufficient to develop better personas, for 2) “inevitability”: we posit that stereotyping is a problem in personas both ethically and regarding the effect, and 3) “troublesome”: we give an alternative approach that reduces the effects of stereotyping by representing the complexity of users.

The paper is organized as follows: we first introduce personas as a means of representing users. Next, we present social identity as the building blocks that make up a person, showing how the multiplicity of identity can be conceptualized. Then we share the approach to our qualitative study of women in tech. In the results section, we use an analysis of the women’s narratives to illustrate

how their identity work requires them to deal with multiple social and personal identities.

2 PERSONAS

Personas are representations of people that help us answer questions we encounter in design. They do so by telling us about the people’s goals, interests, and behavior embedded in the holistic image of a person [1]. This presentation as a “real” person is meant to decrease our reliance on our own egocentric perspective when reasoning about other people’s thoughts, feelings, and other subjective experiences. Personas resonate with people by engaging with them at different levels: In the same way as we perceive other people, we perceive personas both in view of the individual attributes they display and in view of group memberships and social categories.

Most approaches advocate user data to create personas. Yet the analysis and preparation of data remains challenging: personas are typically based on data about the people who are expected to be using a technological artifact [5], sometimes with a specific focus or a theoretical grounding [28]. In participatory approaches, users collaborate in the construction of personas (e.g. [29]); one concern here is trying to ease the dangers of depicting “the other” in personas [30]. While there are variations of personas that are not strictly empirical (e.g. ad-hoc personas [31], personas derived from fiction [32], extreme characters to explore the edges of design spaces [33], or gender-swapped personas meant to induce reflection [34]), the value of personas is usually seen in them being valid because they are based on empirical data from user research [35]. In line with this argument, most approaches to create personas use data about the future users that is collected and analyzed as the basis for composing personas [2, 36-38].

Even if, or perhaps because, most approaches suggest engaging with real users, the creation of and interaction with persona is – just like interaction with other people – prone to biases and stereotypes [11]. HCI professionals’ grounding of personas in objective data is a way of ensuring they are valid [13]. Often, there is an attempt to portray attributes of the users in a representative way regarding age, race, gender, or sexual orientation. But in this representation diversity gets lost [17, 18] and it leads to a systematic underrepresentation of members of the target group that have a minority status: Personas usually come in sets of less than ten personas, so any attempt to be “representative” causes an exclusion of attributes that are in the minority in some of the dimensions considered relevant (and/or does not take into consideration possible effects

that the “co-occurrence” of certain attributes can have). Some approaches try to alleviate this effect by grounding the selection of characteristics for a persona in theory and past research. One example is the overweight personas based on self-determination theory [28] or the GenderMag personas designed to represent female target groups based on the prevalence of attributes that have been found in research on gender differences [39].

Personas are different from mere segmentations of user groups in that they present the data not as an accumulation of descriptions but as a “real” person that comes to life. Recent approaches to persona development and use go one step further by not creating an “individual persona” that is supposed to reflect parts of the user group, but developing “collective personas” (see [40] for a review). These “collective personas” are representations of collectives of users (groups, communities, etc.). They are referred to as “group personas”, “organizational personas”, “persona ecosystems”, “communitas”, or “collaboration personas” depending on the researchers and their understanding of a “collective personas”. Collective personas focus on groups of people and on identity aspects that are similar across groups of people. Individual personas focus on individuals, but one person can have several group identities – yet in the construction of personas, multiple identities and the resulting complexity are often neglected.

One way to deal with the complexity inherent in real people in personas is to use only data that is specific to the domain for which an IT solution is being designed. Lene Nielsen calls this the “focus area” [2] and shows how this can be a way to facilitate conflicting identities that might become salient in different contexts. She gives the example that “[s]omeone working professionally with tax matters can have one opinion about paying taxes at work and another as a private individual” (p. 6). She stresses that it is important to look at attitudes and identities within the specific area of focus.

Yet this focus can become blurred: HCI has been dealing with changes in the nature of technology, the ubiquity of computing, integration of IT in all areas of life and appropriation of technological infrastructures into a variety of societal forms. The “turn to practice” in HCI [41] tries to take these complexities into consideration: rather than viewing a situation as static and often immutable, it views it as a momentary result that is constantly under the influence of divergent forces. One of the forces is the people involved in these practices. They are shaped by the practices and at the same time active in shaping the physical and social environment through practice. In doing

so, they integrate multitudes of qualities, skills, and desires that are organized in identities and become salient in different situations. One way to conceptualize these different, potentially conflicting identities within the target group is to turn to social identity theory for the creation of personas.

3 MULTIPLE IDENTITIES

Social identity theory focuses on how people place themselves and others in the social world and assumes that part of a person’s self-concept is derived from the membership of a social group, conjoined with the values and emotional significance that comes with that membership [42]. People categorize themselves and others on the basis of both social and individual categories [8]. These categorizations can take place at different levels: a person can be perceived on the basis of individual attributes and qualities or on collective similarities with others, i.e. their personal or their social identity. Groups that social identity can be based on come in different sizes: a scrum team within a certain department of an organization, a sports club, or all the women in an organization could all be a relevant group. Larger groups or the membership in a social category can also be social identities if there is subjective claim or acceptance of a person regarding their membership in a social category. This categorical membership does not have to be based on direct interaction with all others who share the same position. The commonality may be based on ascribed attributes, such as gender or ethnicity, or on attainments, such as a professional or political affiliation. The subjective relevance is crucial, i.e. a social category is a collective identity only if it is personally acknowledged as being self-defining in some way [7].

People have several social identities: the same person can be a developer, a woman, and a Turkish migrant. People attempt to combine their identities in a coherent way [10]. Integrating multiple social identities in a comprehensive construal is particularly important to people who belong to a minority group: the minority status increases the salience of their group membership and the resulting identity is likely to be chronically accessible [9]. Furthermore, minority group identities are often distinct from majority groups, not only regarding the composition of group members (e.g. most women are not IT professionals and most computer scientists are not women), but also with regard to category prototypes (e.g. a typical woman is different from a typical IT professional) and norms and values (e.g. feminine attributes stressed in socialization are different from the attributes considered relevant in IT).

These multiple identities that co-exist in an individual can be structured in several ways, e.g. intersection, dominance, compartmentalization, or merger [10, 23]. With regard to personas, representing diversity has become an overarching issue (e.g. [29, 39, 43, 44]) – targeting the coexistence of multiple identities could help conceptualize the complexity of people in personas and further support the representation of users that might otherwise be neglected. Representing complexity of identity in personas could also help reduce stereotyping of personas. Stereotyping has been found to be a difficult topic in persona research [13], with stereotypes seen as useful to generate social intuitions [45] on one side and seen as counterproductive to identification with the personas on the other [2, 46].

4 STUDY

We report on a study of women in tech conducted as the basis for persona development for a learning and networking platform. Our research was guided by the question of which different identities – personal, social, professional – are relevant in the context of professional development for women in tech and how their intersections can be used to inform the construction of personas. The backdrop of our attempt to create personas with multiple identities is the design of a learning and networking platform for women IT professionals. It is part of a federally funded project to support women in the IT field [47]. The target of our design is an emancipatory system (cf. [48]): women’s experiences in IT have been shown to be shaped by the masculinity of technology and oppressive gendered structures of the industry at large [49]. Being a woman in a male-dominated field requires negotiating feminine identity and the masculine norms of the working environment [50]. Giving women a voice to express their experiences and viewpoints by means of this platform is meant to mitigate the gendered structures of the IT environment and alleviate the burden of “doing” gender in this field where the traditional perceptions of two separate spheres is still prevalent [51].

The objective of our study is to create a data basis to develop personas that can initially serve to represent the women taking part in this study in the light of the socio-historical, political, and cultural contexts within which they are embedded. Furthermore, we want to know what role the coexistence of different identities plays from the perspective of female IT professionals. Thus our aim is twofold: regarding the content of the study, we want to find identity aspects that are relevant for the creation of personas; regarding the process, we want to explore if and

how an approach focusing on the multiplicity of identities can be helpful in informing the creation of personas.

4.1 Interviews

We used semi-structured interviews with female IT professionals to collect data. To gain in-depth understanding of how women in tech negotiate the coexistence of personal identity, culture, organization, gender, professional and other social identities, a qualitative, interpretivist approach was employed. Qualitative data analysis has been shown to be an effective basis for the creation of personas [52]. Making women and women’s issues heard through narrative interviewing has a special history and symbolic significance in a feminist research tradition [49].

Nine women in tech from various organizations in Germany were interviewed. The sample was selected through a combination of purposive and snowball sampling. The ages of the women ranged from 29 to 43 years. All women were highly qualified with the majority holding graduate degrees in computer science or related fields. Table 1 provides biographical information about the participants. The interviews were conducted in German or English, took place face-to-face or by telephone and lasted between 35 and 90 minutes with an average duration of approximately 75 minutes. The audio recordings of the interviews were transcribed verbatim in a simplified GAT style [53], i.e. noises and fillers were included and emphasized words marked.

Table 1. Overview of the interviewed women

#I	Info	Position
1	32 years, married, no children, German	Scrum master
2	34 years, single, no children, Mexican	Analyst
3	30 years, in relationship, no children, Mongolian	Developer
4	43 years, married, 2 children, German	Developer
5	37 years, married, 2 children, German	Project manager
6	32 years, in relationship, 2 children, German	Customer service
7	29 years, in relationship, no children, German/Polish	Programming language owner
8	29 years, married, 1 child, German	Research assistant
9	32 years, married, no children, German	Technical project lead

To structure the interviews, a guideline was developed, containing the key topics, questions, follow-up questions and prompts. Phrasing and sequencing of the invitations to talk about the topics made certain that the interview was conversational, open, and non-directive to give a maximum of latitude for responses and extensive narratives.

The interviews started with a broad lead question inviting the participants to talk about their current situation and describe their everyday life. This was followed by an elicitation of relevant identities in professional and private contexts. The interview continued with questions regarding formal and informal professional learning and qualification. Next, it covered professional development goals and career ambitions and finally addressed the aim of developing a learning and networking platform for women IT professionals and elicited wishes, ideas, and scenarios for such a platform. In line with our aim of empowering user-led participation in the design process [48], we discussed our next step in the design process, the development of personas, and asked how the interviewees themselves would want to be presented in a persona. In a final step, unaddressed issues were clarified [54] and demographic data was recorded.

4.2 Methods

The data analysis and persona development for this study was part of a co-design process with women IT professionals. Throughout the design process we were working with members of our future user group, i.e. both our workshop participants and the interviewees were members of the user group (but not the same people). We co-designed the personas in workshops and continuously got feedback about them from the target user group.

The data were examined using thematic analysis [55], which is a method for identifying, analyzing, and reporting patterns. It offers a flexible approach to the analysis of qualitative data. The analysis followed an iterative coding process.

The data set was initially structured using a deductive approach: we used the literature on social identity and on women in technical fields to inform our coding (see Figure 1), i.e. we looked for elements that constitute ingroup identity in the analysis, i.e. the social psychological markers of ingroup-outgroup formation, both social-cognitive (ingroup favoritism, group homogeneity, etc.) and emotional (as laid out in the BIAS map [56]). The researchers extracted approximately 300 affinity notes (i.e. small content units in the form of statements such as “I want to use my time efficiently”) as the basis for a one-day

co-design workshop with women IT professionals. For the workshop, the researchers also prepared an identity model [57] for each interviewee and extracts of the transcripts from the interviews. In several iterations of induction and deduction during the workshop, coexisting categories, contradictions, and inconsistencies in personal and cultural narratives were analyzed. The patterns that emerged in this process were clustered in six nuanced identities. After this workshop there was another iteration (deduction from the clusters and induction from the original interview text) through which the nuanced identities were further refined by the researchers.

The nuanced identities were used in another co-design workshop in which the outlines of the personas were developed. Based on the nuanced identities we went back to the identity models and chose specific interviewees as starting points for the development of persona [57]. We created a set of four personas based on the six identity patterns we found in our analysis: We selected the content of the personas and the mode of presentation of the personas in the workshop. Our considerations included the following: it was important to portray the diversity within the social category “women” and thus help deconstruct binary gender beliefs, and to consider their special circumstances, preferences and the identity work challenges they face. Recurring, central themes for women in tech had to be included. Furthermore, as the platform is focused on learning as well as networking and exchange, learning-related interests and preferences were also integrated. Keeping in mind previous research on women’s professional identity in IT [11, 50, 58], we attempted to use the coexisting identities we found in the data to create personas that illustrate the complexity and diversity of the target group and the individual women.

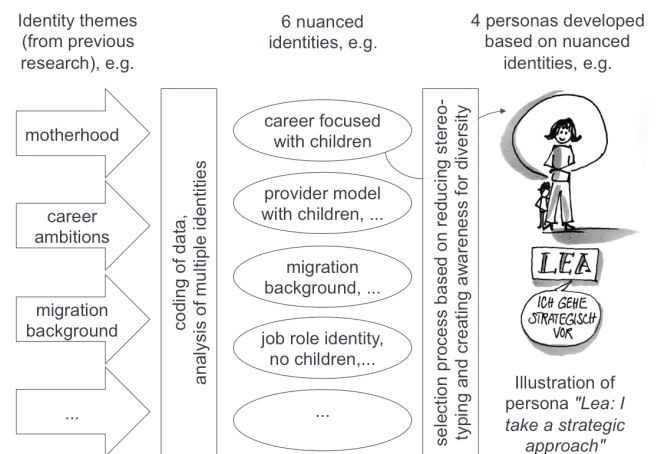


Figure 1. Data analysis process

For example, previous research on personas has shown that persona descriptions of women mention children more often than persona descriptions of men do [59] – to counter rather than activate or reify the existing stereotypical perceptions, we therefore chose to present only one of the four personas with children, and we chose the persona with the highest career focus to be presented as a mother.

Based on this draft of the personas the researchers then fleshed out the persona descriptions. They once again presented and discussed them in another workshop to ensure the future users (although not identical with the interviewees) could see themselves in the artifacts and feel accurately represented. The personas were further refined and used as the basis for the ongoing co-design process.

5 RESULTS

The analysis showed that all the interviewees felt being a woman in tech, or more specifically in IT, was a relevant identity. Beyond this, multiple identities were found in different interviews, based on job roles, career orientation, national background, motherhood, household roles, sexual orientation, age, and other categories. From the many possible multiplicities of these different multiple ingroups, our analysis yielded six relevant nuanced identities. The overlapping identities that emerged as gestalts were primarily differentiated on the basis of motherhood, job roles, national background, career orientation, and career change.

Other ingroup identities added to the insights into the interviewees' experiences, yet the reconstruction of our data yielded them as confounded (e.g. national background and race), or compartmentalized, (e.g. sexual orientation – see Andrea van Dommelen and colleagues [10] for alternative structures of multiple ingroup representations). In the following sections, we will first present the results for our interviewees' experiences of being a woman in IT and then give an insight into the six multi-faceted identities that were foregrounded by our analysis.

Being a woman in IT

As women who work in a male-dominated field, most of our participants addressed being a woman in IT and therefore a visible minority without being triggered. The interviewees dealt with this status in different ways, which consequently had different effects on their identity and feelings of belonging. I1 has found her role as a scrum master and part of the agile community, thinking of it as a job that calls for “typically feminine” qualities. She hopes more women will join the ranks. I2 has the impression that

her gender makes it harder for her to be promoted or taken seriously. I3 does not have a sense of belonging with “male developers” and feels left out of the mutual understanding men seem to have. I5 talks “preventially” about her family situation. Classical stereotypes about women using technology make her angry. I7 thinks it is a problem that so few women study IT. She had tried to but was by discouraged by some subjects and the required programming skills. This is also mentioned by I8, who often finds she is the only woman on otherwise male teams and adds that anything that puts a focus on her gender is problematic, as it activates stereotypes.

5.1 IT career, migration background, (no children)

Three of the interviewees have an international background. I2 was born in Mexico and did her Master's degree in Germany. She says she is “fairly dissatisfied” in her professional life, because she feels her work is overlooked. “I think it's because I'm a woman ... I mean, I'm not 25 any more, but I think bosses tend to be older and male”. Although she initially had very positive feedback and the prospect of a promotion, after 28 months with the company, “nothing has really changed”. She also said it was difficult to present ideas: “so I'm sitting there at a table with 20 people and 90% of them are men and just think they are great.”. She thinks they have a hard time admitting that her idea might be good and feels that she constantly has to deal with convictions of masculine superiority and hierarchical power structures in the workplace. The age gap between her and her superiors seems to aggravate the problem. She says it is important for her to dress professionally and look elegant and sophisticated.

The third interviewee came to Germany from Mongolia. She thinks female and male developers are different. Attempting to categorize herself, she says “I'm introverted and I'm a woman and a developer, so, yeah I work with a lot of men (...) I have met only very few, um, female developers and I have not worked with them much. I feel it is different to meet female developers and male developers and their work approach is different and their talking styles is different, and I also feel like I belong to a different group when it comes to, even when it comes to the developers' perspective (...). I cannot really describe it, it's hard to describe it. It's more like a feeling. I feel different. (...) It's nothing to grasp. (...) There are a number of things, um, do men feel like connected to each other? They just talk about something and they just catch it (...) and when girls talk about some things, then they just catch it up and they understand the context behind.” When asked if she felt left out sometimes. I3 said yes and added, “it's not really a

problem, it's not really like I feel left out because people are ignoring me... it's just the way it is, (...) you can't fix it, it's (...) really annoying."

Belonging insecurity in minority groups in tech has been found to be a barrier that hinders their ability to identify with people working in the profession [60]. Sylvia Hewlett and colleagues [60] reported that 44% of women in engineering feel extremely isolated. The interviewee mentions she had thought about dropping out of software engineering at university. She got into programming because it "sounds cool and interesting", the job prospects were very good and the profession seemed to be "really flexible". The first two years of her bachelor course were "really hard, especially programming, because I had no idea (...) and most of my fellow class mates and the boys had already had some experience with programming. They already had done some courses in their high schools. The thing was, lots of the other girls in my class (...) also had the same problem as I did, they didn't understand" although the "boys" tried to help but lacked teaching skills. However, she did not give up, read a lot, asked for help from fellow and senior students, took lots of classes and then "once I understood the concept, it was pretty easy to step on and understand how it works and then I graduated and dropped the idea to go to some other field".

In terms of how I3 would like to be presented as a persona, she describes her persona as having the multiple identities she possesses: a woman, a migrant from Mongolia, an introvert, someone a bit "nerdy" and a developer. However, the last identity refers to a group she does not feel she really belongs to because of her minority status. People try to combine their identities into a single, coherent one, and this is especially important for people who belong to a minority group, as their minority status increases the salience of their group membership. Although I3 has graduated successfully and her doubts about whether IT is for "us girls" have been dispelled, her minority status, the salience of her gender and the isolation she experiences make it hard for her to combine her identities successfully.

5.2 (High) career-orientation, mother

I5 had been working for a large, international company after she had finished a vocational training as an IT systems manager for less than a year when she had her first child "and then stayed at home for a few years. Then my second daughter was born and I returned to work part time". However, "by the time both children were at school I wanted more, I wanted to pursue a career".

For this reason, she left work to begin a degree course at a university. "It was a joint decision with my husband, because of course the whole family has to be behind it if it means one wage is going to stop and a woman is going to do a full-time degree course for two and a half years. Other family members have to be supportive, or it won't work". She adds that she is also "very, very ambitious" and "expected a lot of myself". After having children and staying at home (also without an adequate support system), "I was completely out of touch with IT. I had said I didn't want to go back into IT. For a long time my family came first. (I said) I don't want a career, I want to have kids and stay at home, I was absolutely sure of that, but at some point I changed my mind".

She describes a pivotal moment when she received notification of her pension entitlement and realized there were still several decades ahead of her. It made her realize she wanted to do something she enjoyed. "My husband said he didn't want to pursue a career, he would let me go ahead". It took her a while to decide what she actually wanted. She also investigated what the male fellow students from her high school were doing and discovered some of them were in quite good jobs. This interviewee includes her marital status and her two kids in her self-presentation, beginning with "yes, I am married with two children, er, as a project manager". She mentions her children "because they are an important part of my life and because I think it's great for me that I want to have a career and have children". She says she was anticipating the question that was bound to come up: "I have to travel so far to work and how do I manage? When I say my husband works part time the matter is closed".

The interviewee is confident and open but she is aware that there is a certain need to justify or explain her status as a mother and an ambitious IT professional in a high position. As Wendy Faulkner has noted [61], this need for justification is common for women in tech. Our interviewee says to be successful in her field, you "have to be able to accept help, because playing politics is normal and happens every day in projects and you have to get used to dealing with it (...) and networks are always extremely important for everything".

When asked what would annoy her about a persona, she says "I hate clear-cut gender roles. Like the woman who stands in the kitchen and reaches for her mobile and logs in, that kind of thing. You know, the classic ones, I find them difficult and I always react aggressively when something like that comes up". Later she says, "those classic gender roles don't suit me at all or my environment, so I wouldn't

be able to relate to them”. What would also annoy her is “a raving feminist, yes, the total opposite, I think that’s stupid too, whichever extreme it goes to”. She adds, “but it is difficult to make it completely neutral... but I think... oh, I don’t know... no”.

5.3 Career-orientation, no children, special job role, self-categorization as “social”

The first interviewee, a scrum master, did not think being in IT and working with people was a contradiction, as the stereotypical image of the field might suggest. Her main motivation was to work with people and help others work together. “I’m curious about people, about what they know and what makes them tick. (...) Helping people means a lot to me, (...) if something goes wrong at a meeting (...) I want to be able to help (...) so meetings go smoothly and are productive”.

I9, who works as a technical project leader, also describes herself as “very communicative”, “open-minded”, “very funny” and someone who “talks and laughs a lot.” Her social skills were also an important reason why she got her promotion, as her boss told her they needed someone who, besides having a technical background, is communicative, has a “certain amount of assertiveness but is also able to empathize, since there are a lot of stakeholders to manage.”

I1 describes herself as a “scrum master with a heart”, stressing her emotional, likeable qualities, ones that are stereotypically associated more with females than males. She refers to this too. She thinks the role of scrum master is described fairly accurately in this way: “typical female abilities like having an instinct about people, being sensitive to others’ needs, bringing people together, looking after them, making sure everyone’s ok, good communication skills”.

She also adds that developers often have a “developer’s mindset” which creates “problems for lots of scrum masters (...). People with a background in social sciences, such as “teachers, social science graduates (...), psychologists, (could) all become scrum masters but they don’t, (...) because there’s such a huge myth that you have to be able to program. I think this is a field or a (...) position or a job that should be used by lots more women, (...) or that lots more women could do, because it encourages and demands skills that are usually attributed to women.” Later, she describes herself as “open to others”, “bubbly”, “happy”, and “sometimes funny”, with high intrinsic motivation and high motivation to learn new things.

Faced with the challenge of describing a persona, she initially says the picture should feature a woman, but is then unsure, adding, “Yes, I would hope it was a woman, because it would perhaps show that it would be great if more women were scrum masters”. Emphasizing the social aspects of her role, she also distances herself from the “technical role” employing a so-called role balancing strategy [50], that implies distancing oneself from the “asocial image” associated with engineers. She believes it is incongruent with her self-conception and actual work. Her many roles at work include being a coach, a trainer, a motivator, and a facilitator. “I’m all kinds of things”.

She does have a software engineering degree, but distances herself from developers. She could not identify with and would be annoyed by a persona with the image of a “typical scrum master” who is “male, (...) has been a developer for a long time, but can’t be bothered doing development any more, and wants to do more in communication”. These are, according to her, the “scrum masters there are most of...and who maybe have lots of problems with it”.

Returning to her persona description, she says, “I’m (...) over 26”, because you need “a bit of life experience” and a “way with people” (...) “in a relationship, kids or no kids”, she is not sure about the latter. She only knows “childless” scrum masters in her company and thinks scrum masters should work “full time”. In terms of social identity theory [62], the agile community seems to be her “ingroup”, the one she feels part of. She says “we scrum masters have a real team spirit, (...) the whole community (...) this agile mindset”. Taking an active part in this community, she has “been to lots of meet-ups and conferences – BarCamps as well”. Moreover, she considers people from the social sciences to be like-minded (and potentially part of her ingroup), and wishes more of them would join the field instead of the “typical developers”.

5.4 Career-oriented, career changer, no children

I7 talks a lot about her company’s vision and values. About her career goals she says “my career path is really in management”. She has a background in social sciences and works for an app development company. She mentions one problem being that very few women study computer science and says there are some “atypical and outgoing” people and “lots who are also a bit nerdy”. But she can and always has “got on well with people (...) because I can really talk a lot (...), you know all this culture language, I can do it quite well, I think. You know, I can speak Star Wars any time”. I7 says she did consider going into the software

engineering field because of good job prospects and “because I just think it’s quite an exciting field”, but decided against it, because she did not want to code all day and “my strength and passion (...) is writing texts or (...) thinking that way”. She had also visited lectures in informatics but was disappointed because she was not interested in math-related assignments and “well, I thought (...) it was really, really hard to get into it and you practically had to be able to program (...) because lots of people (...) got a computer when they were 12 or 10 and started programming then”.

In passing, she mentions having a girlfriend. When asked about designing a persona she could identify with, she says “Well it would have to be different (...) a nice photo, just four white men with short hair probably wouldn’t really do it for me”. A profile that is “really sexist” or “a classic, typical nerd” “aimed primarily at men” would annoy her. Her reference to the culture of Star Wars does show that she thinks she has a common basis with her co-workers, but on the other hand it reflects a common stereotype of IT people and a certain outgroup homogeneity.

5.5 Maternal role, mother, low career-orientation

I6 recently returned from maternity leave of a year and a half. She had been worried it would be boring, but “in retrospect, it was a wonderful time”. She thought it would be “difficult” coming back after such a long time, but “within about a week (...) everything was just like it used to be”. On the other hand, she did not get all of her projects and customers back which “couldn’t be done timewise” and since she works remotely actually prefers a role where she does tasks that have little relation to tasks that others do, “because it does make a difference that you’re just not there physically”. Having a child has changed her role and responsibilities at work considerably – from having numerous projects to working less and often only on small tasks. When asked about her professional goals, I6 mentions that although she likes her job, she has recently started a business on the side with her knitting and crochet instruction manuals and “I’m going to see if it comes to anything (...) I’m not really a career woman - I don’t need to become a team leader or boss or anything like that, I’m quite happy (...) but if I could earn my living doing it, (...) I’d move into the other line of business.” When asked which features of a persona would represent or annoy her, she replies: “career oriented would not represent me, I mean if all you ever do is aim for the next job up” and are “self-centered”. She would rather be presented with in a team mindset “more of a team thing, team-building, team-oriented, yes, something like that”.

When asked whether she felt part of the “IT group” she replied “Hmm, that’s difficult (laughs), I think I’m more of an in-between, in-between person (laughs), I don’t like being assigned to groups, that’s definitely true, er, I don’t want to be an IT nerd nor do I want to be given a business label. I’m more a kind of intermediary, that’s what I do at work too, it’s just like that actually, we mediate a lot there too”. In I6, the interplay of various factors seems to account for her decision to try and leave the field – less interesting projects, more duties at home, lack of identification with her job and a fulfilling hobby. (I5 also did not initially want to return to IT after having children, but has changed her mind.) She expressly distances herself from the term “career oriented”, and like I4, stresses her social orientation and focus on teamwork.

5.6 Career changer, children

I4 has a degree in chemical engineering, but says she did not want to spend her life in a laboratory. Instead she wanted to do something with computers and travel abroad. She describes her CV as quite “diverse” and has taught herself how to code. She works from home, is married and has two children. She describes herself as “communicative” and a “team player.” She would be offended by a persona description that might be “not communicative”, “not helpful”, “not goal-oriented” and “not a team player”. I4 repeatedly mentions her great connection with her team and their good communication. This may be one of the main reasons she does not mention her minority status as a female - unlike I3, for example, she does not feel left out. I4 says her approach is “learning by doing” and trying to solve work problems on her own with the internet. Of her career goals, she initially says she wants to learn more “just for myself”, but later mentions her husband’s dream of being self-employed and says she would support him with her skills and focus on whatever was needed.

I8 has a degree in psychology and is doing an interdisciplinary PhD in robotics. She works from home and has a “great arrangement with my boss, it wouldn’t be at all possible otherwise”. When asked about her further career plans, I8 says she hopes for a permanent position, or “actually to be honest a professorship, that would be nice”. But she knows it is “fairly unrealistic (...) particularly because I’m not very flexible about where I live. Family is very important to me, particularly in view of what I’ve experienced in life (...) so I’ll just have to find something else”. When asked “if it came to it, would you put your career second?” she says “Yes. And, er, yes, of course it is a shame... but I don’t think I really need to elaborate on how the system doesn’t really work very well if it does come

down to it”. Also, she is considering a move from research to a job in industry.

I8 would prefer to leave her family background out of a persona description, “because I don’t think it’s very relevant at this point”. Characteristics of a persona that would annoy her include “everything that draws too much attention to gender. It is important, I suppose (...) that I am actually female at a given time, but, um, there are lots of things that can very quickly be interpreted as sexist. And, er, for example I have often worked as the only woman in otherwise male teams and I think if there was a focus like that it would bother me, (...) because you then unnecessarily steer the focus during reading to gender and in doing so activate lots of concepts. The most important thing at any given time is that I am an expert. What gender I am is secondary, that’s exactly how it should be portrayed.”

6 DEVELOPING THE PERSONAS

As described in the methods section, the nuanced identities were the basis for another co-design workshop in which the outlines of the personas were developed. Four personas based on the nuanced identities emerged in the co-design process.

Persona “Lea”

We built a persona called “Lea” with a high career orientation (I5), with a supportive husband who works part-time and two children. This persona is ambitious, very organized, strategic and interested in networking. She also networks in a very strategic way, reaching out to people who can help her. Gender stereotypes annoy her and she cannot relate to any of them.

Persona “Gerel”

The “Gerel” persona was created to account for the culturally diverse background in some of the interviewees. She encompasses a migration background (based on I2) and a position as a software architect. Based on the experiences of I3, we integrated into this persona’s profile the introversion, a self-image of being a bit “nerdy”, issues of belonging and a need to connect with others.

Persona “Julia”

Julia is based on I1, created to represent women with a special role at work that they identify with highly (in this case, scrum master) and with high motivation to learn. In terms of social identity theory, this persona has a strong feeling of belonging to the agile community in general and to scrum masters in particular. She stresses her social and

communicative skills, a form of self-stereotyping found to be a recurring theme in the interviews.

Persona “Mira”

Some of the interviewees originally had a non-IT-focused education, which heightened their perception of being an outgroup to the IT environment, so we created a persona addressing this issue. “Mira” combines identity aspects of I4 and I7, covering career orientation and career change. Stefanie is proud to be self-taught, works from home, and describes herself as unconventional. She thinks sexism and stereotypes must be avoided and diversity must be represented.

Based on our interviews we tried to represent the complexity of identity in two directions: For one, there was a coexistence of a self-description that fits stereotypically feminine attributes in one area of life and rejecting them in another, e.g. being a “typical female scrum master” but not wanting to be associated with other stereotypes like a woman cooking. For another, contradictory approaches appear in the different phases of life, e.g. when being on leave due to parenthood and coming back to work with a different perspective and aims. These intrapersonal and temporal tensions and contradictions are situated with regard to cultural and professional identities. The interviewees are aware of them in their working life and describe ways to deal with them, e.g. by proactively pointing to the fact that there is a husband working part-time and taking care of the children.

We chose to present the personas with quotes and narrative elements to underline the dynamism of the personas. In this way we tried to do justice to our results and the contradictions inherent in the multiple identifications, e.g. when the same persona identifies and even self-stereotypes with characteristics that are considered feminine while at the same time rejecting feminine attributes for other areas of their life.

The personas were further enriched by relevant personal characteristics that the interviewees mentioned, in order to make them plausible and rounded [2]. We made the personas more accessible and credible by presenting them with pullout quotes as entry points into the narrative, i.e. a paragraph would usually start with a quote in a large font. Such pullout quotes have been shown to be an effective way to shape the readers’ perception [63]. We used six to eight of such pullout quotes, i.e. almost every paragraph of the persona description started with one. Instead of photos, whose details carry rich information on social class and categories, we used rough sketches to illustrate the persona.

7 DISCUSSION AND CONCLUSION

We conducted a study of women in tech to inform the construction of personas for an e-learning and networking platform. For our qualitative analysis of interviews with women in the field, we developed an approach based on social identity theory. We identified six identities patterns through which the socio-historical, political, and cultural context was combined with individual identities by women in tech. They show how the interplay of different social identities leads to different ways of experiencing their situation and navigating through experiences that women in tech have in common regarding the expectations they are faced with. For example, the experience of having one's technical competence questioned and social competence attributed, causes some women to try and fulfill the expectations they are confronted with; however, their account then oscillates trying not to essentialize the identities imposed on them.

The nuanced identities that resulted from our analysis of the women's narratives illustrate how their identity work requires them to deal with many things: the interplay of multiple social and personal identities, a professional environment and majority/minority structures that make their gender salient, a masculine conception of how professional development takes place, and deeply embedded cultural prescriptions of how women ought to be and how they can get ahead in an IT organization. The persona development was part of a co-design process, i.e. the creation of the personas was based on the interviews and their thematic analysis based on social identity theory, but went through iterations of (re)construction and interpretation with members of the intended users. As part of this co-design process we moved from the identity patterns found in the data and towards the creation of personas. Since this required another reduction of complexity and therefore the exclusion of intersections that the analysis showed to be relevant, the reflection with the target group helped in the process of choosing which intersections should be focused on.

We thus achieved two goals: on the one hand we found identity aspects and their intersections on which we can base personas. These personas show the diversity within the social category "women in tech" and empower identities that might be marginalized in the prevalent discourse. On the other hand, we offer an approach and an example of how to create a basis for the construction of personas that takes into consideration how simultaneous membership in different social categories can influence the experiences of users.

We showed that this approach helps achieve a deeper understanding of how several identity aspects in combination can change a person's (self-)perception. This was especially true for professionals with children. However, our interviews not only revealed the diversity of women in the field, but also vividly illustrated the diversity of the tech field itself, and thus could help overcome stereotypes and misconceptions. We used our data to develop four different personas for use in the project, which will be further evaluated. As far as the creation process is concerned, we found using a social identity approach helpful for identifying relevant identity combinations to inform the construction of personas.

Our approach of asking the participants how they would want to be presented turned out to be very beneficial since it gave the interviewees a looking-glass self-perspective and created a lot of input regarding characteristics and attributes. It was interesting to note that this question generated a lot of information not only about how the interviewees would want to be represented, but also about how they would not want to be represented and what they are eager to distance themselves from.

We framed our study in the context of social identity complexity and aimed to create personas that minimize stereotypical attribution of roles. This approach might be useful in other areas where the voices of users that do not present the majority might fall through the cracks, e.g. women working in other male-dominated fields, but also men working in stereotypically feminine professions.

In our study we elicited data only from women and developed personas that portray the diversity of women. For persona sets that represent both male and females, a social identity approach to developing personas can underline the fluidity of genders and deconstruct the belief of a gender duality. This is particularly important since differentiation between males and females promotes exaggerated gender beliefs, which in turn have been shown to promote sexism [64]. Therefore, using social identity complexity to inform personas can promote design that aims to reduce sexism by targeting these exaggerated gender beliefs.

Overall, our approach based on social identity can help presenting others in a way that is ethically responsible and does justice to the users (1) by offering a framework that acknowledges that the social groups a person belongs to creates a frame of reference that has an impact on their perception, behavior, etc. in a comprehensive way, (2) by showing that ignoring the dynamics of different social

identities (and their intersections) lead to biases and personas that discriminate diverse populations, and (3) by showing how considering identity complexity of users can help overcome an egocentric bias and I-methodological approaches [17-19].

Limitations and Future Research

Along with the benefits, our research has limitations. Our sample and the societal structures represented in it limited the findings. In future research, more of the social identities that intersect in an individual could be considered: in our empirical study, we are referring to the population of IT women in Germany as it is today.

Yet this population already comprises many exclusions, e.g. regarding age, class, and race. To envision technologies that go beyond the societal status quo, future approaches for personas should consider how the identity aspects that are invisible or non-existent in an empirical study can be considered. A possible method of persona development might be to systematically and reflectively combine empirical data with fictional aspects that address the socio-cultural exclusions that exist in the population in focus.

Research is needed to examine whether design teams will do better work with personas that present multiple social identities. Future work should examine whether these personas actually convey complex identities to developers and other stakeholders and which effect they have on the basic tendencies of person perception and the design process.

Future research in HCI could use a social identity approach to multiple identities in personas to conceptualize the complexity of personas. This might add to the fruitfulness of personas and show that the typical characteristics (e.g. age, education, professional background) are not as relevant to the design process as situational experiences faced in and throughout different life phases. A social identity approach might also offer a frame to understand how the teams working with the personas perceive personas differently depending on their own social identities and thus open up new perspectives in and through HCI.

ACKNOWLEDGMENTS

This work has been partially funded by the German Federal Ministry of Education and Research (BMBF) under grant numbers 01FP1616, 01FP1617, and 01FP1618 as part of the project „IT&me – Konzeption, Umsetzung und Evaluation eines modellhaften multimedialen Wissenspools in der IT-Expertinnenbildung unter Berücksichtigung unter-

schiedlicher Lebenssituationen und Lernstrategien“. The responsibility for all content supplied lies with the authors. We thank Maren Haag for conducting the interviews. And we thank the interviewees and the women IT professionals that work with us in the co-design process.

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