Child-User Abstractions

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Abstract

Interactive technologies are becoming ubiquitous in many children's lives. This work-in-progress paper briefly describes and illustrates a new approach for creating user abstractions of children. The technique is based on a theoretically and empirically grounded framework for creating child-personas. It is expected to reduce designer's assumptions about children. A preliminary assessment of this claim based on engagement, complexity and realism concludes this work in progress.

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Introduction

Children are increasingly frequent and experienced users of new technologies [11]. Meeting children's needs in deep and fulfilling ways requires that children be adequately considered in the design of technologies targeted to them. Options for representing children in the design process include user profiles and archetypes [15]. However, child-specific methods for creating such representations have yet to be developed. Without these methods, user representations are limited. For example, user profiles or descriptions created from market research are often simplistic since market information is rarely segmented beyond gender and broad age categories. Avoiding these limitations requires the development of

user abstraction techniques which have been adapted to model the age and context specific characteristics of children.

Design Context

The Canadian Broadcasting Corporation (CBC) experimented with their CBC4Kids.ca web site in early 2000. The project involved the design of a new brand, home site and three online activities. The target audience was Canadian children aged 8 to 12 years [1, 2]. Early in the project access to children was extremely limited due to policy and liability issues. We required an alternative way to include information about children in the design process. Cooper's method for creating and using personas was investigated [8, 9]. It became immediately evident that individual team member's preconceptions, assumptions and personal experiences (or lack thereof) with children deeply influenced the process of persona creation. In response to this, we decided to create a framework to guide the child-persona creation process. This was the starting point for our deviations from Cooper's and other's methods for creating personas [8, 9, 15, 17, 18].

Framework

A framework was created to help the team understand children and provide a systematic guide for data collection, summarization and analysis during persona creation. The framework was based on theoretical understandings and empirical findings taken from children's developmental psychology.

Understanding Children's Needs
Several authors have pointed out that most successful products for children are not so much goal or task oriented (as adult products are) but instead meet specific needs which are common to large groups of children in a particular age range [12, 13]. The focus of this child-persona framework was to represent broad groups of children by understanding their common needs. A review of child development literature revealed agreement on the following four needs of children [4, 5, 6, 12, 16]:

1. The need to balance love and security with independence
2. The need for positive social relationships
3. The need for mastery in learning
4. The need to attain control and power

These needs became the focus of child-persona development. A deeper reading of developmental literature provided theoretically and empirically based explanations for these themes. By combining specific, complementary theoretical frameworks, personas became explanatory rather than purely descriptive [see 3 for details].

Developmental Abilities
While many researchers recognize that all children develop differently and that individuals may differ substantially, general characterizations are still useful for creating personas. Age specific information on developmental abilities was included in the persona framework in the form of general guidelines. Guidelines were derived from children's cognitive, sensory-motor and social skills and abilities [7, 12]. These were incorporated into persona descriptions to ensure that interactions were well-matched with children's abilities. For example, reading ability, preference for concrete examples, and limits on motor control of input devices were included for each persona. Guidelines were validated by comparison with observed behaviors during off-site data collection sessions with children.

Determining Context Specific Experiential Goals
The need-related and developmental ability components of the persona framework can be used to create personas across a range of design situations. The personas were contextualized by incorporating details of the CBC4Kids.ca's design situation into the framework. During adult-oriented persona creation, product goals, as defined by marketing, are translated into life, experience and end goals. The end goals are the primary focus of persona creation and are typically task-oriented [9]. For CBC4Kids.ca the goals were formulated as experiences. Experiential goals are related to the users' felt experience with the product [14]. They concern how children will experience the product emotionally, socially, intellectually and sensually. Brand goals for CBC4Kids.ca were described as experiences. For example, we wanted children to feel like they could know more about and shape some part of their world as part of their experience with CBC4Kids.ca. The framework included these experiential goals. Persona creation included an exploration of archetypal ways that children might respond to these goals.

Persona Templates

Translating theories and concepts into guidelines that designers can use quickly and easily in practice is a challenge that faces all human computer interaction work. By selecting context-relevant concepts, re-formulating them as questions and using them as the basis of a template, theoretical concepts were used to guide data collection. Templates were organized to group information into common or archetypal themes with an eye to revealing, examining and understanding children's needs that the product would address.

For the CBC4Kids.ca project, the template contained sections on demographic information (e.g., age, gender); descriptive attributes (e.g., school, family structure); questions related to the four "need" themes; skills and abilities; and experience goals. The wording of questions in the templates was intended to direct designers to notice behaviors as well as make interpretations. Documentation of data sources has been identified as a key aspect of validity [18]. Templates provided a means to relate specific persona characteristics with source data. The template excerpt shown in Table 1 exemplifies how concepts from attachment theory were operationalized into questions.

Need for independence   How does s/he express his independence?   When does s/he feel independent?   When does s/he feel confined? How does s/he respond to this?
Need for security   When does s/he feel safe?   What behaviors exhibit his/her attempts to find safety?   What makes her/him feel insecure? How does s/he cope with feeling insecure?   How have these feelings and behaviors changed in the last year?

Table 1. Template excerpt

Data Collection

Data collection involved a range of techniques spanning user analysis and initial design phases and lasting six weeks. Parents and experts were interviewed probing for archetypal ways that children behave in their world as they try to meet the four "need" themes. Exploring these themes with children was much more difficult. To reduce the power imbalance inherent when working with children,

individual children (aged 9 to 11) were interviewed and videotaped by a fifteen year old. Open ended questions were based on the template questions and experiential goals. For example, "How do you know when you belong in the world? How does that feel?" Informant-based sessions bootstrapped on initial persona representations (initial photographs, artifacts and stories). We used personas as a mechanism to solicit rich feedback from children (e.g., What do you think Rachel does when she doesn't feel safe?). Field studies of children in homes, schools and public spaces provided contextual information. Together, these approaches resulted in rich, specific information about children's needs and abilities in the experiential context of the design activities.

Persona Creation and Refinement

After initial data collection, each member of the team wrote two personas (total of fifteen). The personas were compared, refined and then limited to the smallest set that could best represent the unique needs of the audience. This resulted in six personas. Rachel and Dodge were designated as primary [9]. During this process, information gaps and conflicting ideas were resolved with further sessions with children (which became possible off site, later in the project). Sessions were designed to address specific questions about personas in the context of design. Findings included deeper understandings of the complexity of children's social relationships, the power imbalance with adults, and children's often quirky sense of humor. The personas continued to evolve throughout the design process.

CBC4Kids.ca Personas

This technique is illustrated by describing the personas created for a story creating activity [1]. Two of the experiential goals for the activity were to support children

to know about the world and to be creative and shape their world.

Personas Excerpt: Meet Rachel and Dodge
Rachel, age 10 – almost 11, lives in Toronto, Canada. Rachel is in grade 6 at an elementary school north of Yonge and Bloor streets. She skipped grade 2 and is one of the youngest kids in her class. She is the oldest daughter of a Rabbi and his wife, a teacher. Rachel has 3 siblings: Becky, age 9, Samuel, age 7 and Sally, age 2. For Rachel, the theme of love, security and independence is paramount. Rachel is torn between trying to meet adult's expectations (and the security their positive feedback gives her) and her desire to find out who she really is. Rachel can't wait to leave home and have her own life. She needs the courage to cope with these dueling desires and often finds this in her choice of books. She reads Lemony Snicket books the way other kids eat potato chips.

Dodge, age 10, lives in rural Saskatchewan, Canada. Dodge is in grade 4 at Waschicho Elementary School in a mixed class of grade 4 and 5 students. He is quite bright (although he doesn't like to admit it). Easily bored, he often listens in on the grade 5 class, only to drift and get abrupt accusations of daydreaming. He can watch the colors in the sky change for hours and not get bored. He eats spaghetti-Os one at a time. His stories reveal his sensitivity juxtaposed with his attempts to deal with issues of poverty and isolation. For Dodge the theme of love, security and independence is also paramount. He is an only child and lives with his single mom Katja, a nurse at Saskatoon General Hospital. Although he can't articulate it, he is deeply attached to his mother and he craves more time with her. Since he can't have this he spends much of his free time alone or with his one best

friend, Ben Tzu, who is 12. He longs to be connected to the world but doesn't know how.

Assessment

Using a theoretically and empirically-based framework to create child-personas was expected to result in engaging, complex and realistic child-user abstractions which would reduce designer's assumptions about children.

Engagement

In order to replace designers' assumptions with concrete understandings of children, the process of working with personas had to be engaging. That is, the process had to sustain the team's attention and be intrinsically motivating [10]. Learning requires both motivation and attention. Evidence for learning (and engagement) came through observations and analysis of the team's changing understandings of children and their ability to incorporate this information in design tradeoffs. The personas were more frequently referenced during early generative stages of design than later testing phases. However, while the frequency of direct reference to the personas tapered off, their impact did not. The information contained in personas was assimilated by designers. This was evident in the progression of design discussions and design rationale from intuitive (and often assumptive) to rational (and referenced) explanations of end-users. The team learned basic concepts from developmental psychology, learned to apply that information to children they observed and worked with, and dove deeply into needs-based design as the project proceeded. The ability to see the direct relevance in design for the ongoing persona work was cited by team members as a factor promoting engagement. The personas were also educational for new members joining the team and served as a record for future projects targeted at this market segment.

Complexity

If child-personas are to replace designers' assumptions about children they must be complex enough to be applicable in a wide variety of situations. Narrow or shallow characterizations quickly expend their utility. This was assessed by looking at the range of design tasks that personas were included in. Review of meeting documentation revealed that Rachel and Dodge were instrumental in the development of brand, concepts, content, functionality, user interface and usability. The personas quickly became the core focus of most requirements and early design sessions. They were not involved in implementation or technical design discussions.

Unlike Cooper's adult persona technique [9], we continued to develop the child-personas throughout the requirements and design phases of the project. When we could not address design issues using the personas, we conducted further child-centred sessions to explore the issues. As this information was incorporate into the personas, they became more complex. This is a salient feature of this technique for creating child-personas. It allows personas to be tailored to their situation of use as this is revealed over time.

Realism

One of the ways that we validated the realism of the personas was to portray them as fictitious users during design sessions with children. Groups of children were introduced to one or two personas and then asked how they thought the personas would react to a particular design. This provided immediate feedback on the realism of the personas. Perhaps even more importantly it helped the children work together and reduced the power imbalance common in design work with children. This

value of personas was one of the most important (and unexpected) contributions of this method to child-oriented design and evaluation work.

Summary

Child-based personas is a technique which allows designers to use both theoretical and empirical information about children's needs, developmental abilities and experiential goals to create engaging, complex and realistic child-user abstractions. This technique makes an important and much needed contribution to user modeling of children by presenting an alternative to user profiles based on broad market segmentations of children or designer's personal childhood experiences. Further investigations will involve refinement of the technique and an analytical exploration of the technique's value in design practice.

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