

"She's just like me!": How to Develop Character Designs Reflective of Diverse Children

Momoko Hayakawa<sup>a</sup>, Linlin Li<sup>b</sup>, and Laura Beukema<sup>a</sup>

<sup>a</sup>Twin Cities PBS, Saint Paul, MN

<sup>b</sup>WestEd, Redwood City, CA

Author Note

Momoko Hayakawa, Ready to Learn, Twin Cities PBS; Linlin Li, WestEd; Laura Beukema, Ready to Learn, Twin Cities PBS.

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All correspondence concerning this study should be addressed to Momoko Hayakawa, Twin Cities PBS, 172 E. Fourth Street, St. Paul, MN 55101. E-mail: [mhayakawa@tpt.org](mailto:mhayakawa@tpt.org)

### **Extended Abstract**

Educational game development is a complex design process. Early collaboration between educational researchers and producers of educational games is important to ensure the products' academic potential and quality, as well as the diversity of media representation of characters. As games are perceived through the characters, the characters themselves act as a window for the game players to experience the world and events in the games. Therefore, characters need to have a connection with the game players in order to evoke engagement and learning. This is particularly true for games that are developed to be played in different educational settings. Therefore, it is important for the character designs to reflect the actual characteristics of the children playing the educational game for children to be engaged with their avatars.

Twin Cities PBS is developing educational games for a new property, "Hero Elementary (w.t.)," supported by the U.S. Department of Education Ready to Learn grant. As the targeted audience for the games are located in low-income communities, we want to ensure that the character designs are relatable to these children. Numerous studies have indicated that racial minority group members are underrepresented in the media - regardless of the specific ethnic subgroup examined (i.e. Asian, African, American, Native American, African-American) (e.g. Klein & Shiffman, 2006). Furthermore, when minority characters appear in the media, they are depicted in minor roles, compared to their Caucasian counterparts (e.g. Klein & Shiffman, 2006).

As children are exposed to animated characters at an early age, many studies have shown the influence of media on children's attitudes and beliefs about racial groups (Keys, 2016), the accuracy of representations among diverse characters is critical. Although the representation of minorities in the media have improved in recent years, there still remains grossly biased stereotypical portrayals of minority characters (Keys, 2016). Children must be able to not only see themselves reflected in the character designs, but also see their lived

experiences and communities reflected in the designs. To this extent, character designs must depict both a variety of social statuses as well as diversity in race, because it has been shown that these two attributes have disparate influences on perceptions of characters, depending on the ethnicity of the audience (Hoplamazian, 2013).

This paper describes our iterative and interdisciplinary methodology used to design and test superhero characters that represent diversity in various educational settings. We developed our character appeals protocol in collaboration with our independent evaluation partner, WestEd. Our superhero characters represent diverse kids (Black, biracial: Asian-American and White, Mexican-American and White) who solve problems through the power of science, and will be used across multiple digital and analog games as well as other transmedia products. We summarize our findings from three iterative testing sessions and provide concrete recommendations for testing children with character designs.

### **Methodology**

Our iterative and interdisciplinary method of conducting character design and test focuses not only on visual aspects of the design but also psychological aspects. In particular, our character design and tests address (1) the appearance of the characters and (2) the children's connections with the characters.

The target demographic of our educational games include: low-income, Latino, English Language Learners, and children with special needs. In order to develop character designs that engaged and reflected our target audience, we specifically sought out children matching our target demographic in our character testing. We recruited participants from an urban area of the West Coast, as well as participants from a mid-size city in the Midwest region.

At the beginning of each round of testing, children were read a brief summary of the biographies of each character to provide context (e.g. "This is Maika. She is a 7 year old girl and her superpower is flight- but sometimes she's afraid of heights and gets dizzy while she's flying!"). This step provides children with an opportunity to meet the characters and form a

connection. Following the description, children were shown the art designs and were asked specific questions about the character, as well as the character designs.

The first round of character appeals testing occurred with 83 kindergarten-second graders, that attended an urban school located in a low-income community. The demographic of this sample included: 40 boys, 68 free and reduced price lunch eligible, 60 English Language Learners, 67 Latinos, 7 Asian Americans, 6 Caucasians, 1 African American, and 5 identified as “other.”

In Round 1 of testing, all designs were presented on a single sheet of paper. Initially, children were asked to independently mark their favorite character design. Next, children were asked to vote on their favorite design in front of their peers by raising their hands. Children then explained their preferred in choice in front of their peers.

The objective of this testing session was to narrow the artist from a wide selection of artists and identify an artist that was able to illustrate engaging characters that had high appeal to a diverse audience. Children were encouraged to connect themselves with the characters and were presented with seven versions of Character S to express their opinions about the following series of questions. Further testing during the same round followed an identical protocol with seven versions of Character E.

Questions pertaining to character preferences:

*“Which character is most like you?”*

*“Why is this character most like you?”*

*“Which character is your favorite character?”*

*“Why is this character your favorite?”*

*“What games would you want to play with the character?”*

Questions about the compatibility of specific character designs:

*“Among the characters, which of these two characters are friends?”*

*“Why do you think they are friends?”*

Questions about personal interest in genre:

*“If you were a superhero, what powers would you want to have?”*

The subsequent round of character appeals testing (Round 2) was built on the previous round of testing. The second round of character appeals testing occurred with 112 kindergarten-second graders, that attended an urban school located in a low-income community. The demographic of this sample included: 59 boys, 59 FRPL, 50 ELL, 65 Latino, 20 White, 14 Asian American, 4 African American, 12 identified as “other.”

In Round 2, the designs for each character were organized and presented across separate sheets - one sheet per character. Children, once again, were asked to independently select their favorite character design by circling their favorite choice. Next, they were asked to vote on their favorite character by standing up. Children were then asked to explain their choice in front of their peers.

The objective of this testing session was to further narrow the character designs, as well as identify specific attributes that children preferred, in order to understand which characters had the most appeal to children and why. Four separate versions of Character S and four separate versions of Character E were tested. Additionally four versions of Characters S and E playing together as friends were tested. Children were presented with the following questions for the three sets of art:

Questions pertaining to character preferences:

“Which character is your favorite character?”

“Why is this character your favorite?”

“Which character is the same as you?”

“How is this character the same as you?”

“Which friends would you want to play with?”

“What games would you play with them?”

The final round of character appeals testing was conducted on 54 children across kindergarten-second grades. The demographic of this sample included 33 boys, 33 FRPL, 34 ELL, 35 Latino, 10 White, 4 Asian American, 3 African American, 2 identified as “other.”

The objective of this testing was to identify specific details that children liked or did not like and to understand whether or not children saw themselves reflected in these characters. We were also interested in identifying areas of improvement for each character design. Therefore, we tested one version of the five main characters developed for the property. The following questions were asked:

Questions pertaining to character preferences:

“Which character is your favorite character?”

“What games would you play with these characters?”

“(For each character) What do you like about this character?”

Question pertaining to design dislike:

“If you could change anything about how this character looks, what would you change?”

## **Results**

### **Round 1**

The initial round of testing provided insights for creating a developmentally appropriate protocol. When asked about preferences, first and second grade children were engaged throughout the session and discussed their opinions with each other. Contrary to this, kindergarteners had difficulty focusing on the task. Kindergarten children experienced fatigue much earlier compared to first and second grade children as researchers prompted feedback on all 7 character designs. Thus, kindergarteners were unable to respond to all of the questions.

All children were able to successfully select their favorite character(s) on the character sheet. However, when asked to vote for their favorite character, children either did not vote, or discussed their choices among their peers, prior to selecting their favorite character.

**Responses to questions pertaining to preferences.** While all children were presented with the same images in the same order, first and second grade preferences for character design were similar, unlike kindergarteners who voted across all designs evenly.

Across all children, specific attributes for each character resonated with the individual, and they commented on similarities between them and the character.

“I have a really strong mind, and he has a really strong mind” (2nd grade boy referring to Character S’s super power of thought projection)

“Because we like to do messy science” (1st grade girl)

First and second graders were able to provide specific feedback on attributes they liked about a design. This feedback provided us with concrete points to address in the subsequent revisions to the art. However, kindergarteners struggled to understand the task and while they were able to vote about preferences, had difficulty describing why they chose a specific design.

“She has long hair” (1st grade girl)

“I like science and she has the same hair as me” (1st grade girl)

“She is strong and I am strong” (2nd grade boy)

**Responses to questions about the compatibility of specific character designs.**

First and second grade children were able to identify and articulate specific designs and characteristics of the character art that implied that the characters belonged together.

“They both like chemistry because the one has a chemistry shirt and the other is doing chemistry and they are both girls” (2nd grade girl)

“They have big heads and small bodies” (1st grade girl)

**Responses to questions about personal interest in genre.** Children's reactions to this question indicated that they were all familiar with the superhero genre. First and second grade children were interested in the superhero genre and provide many different superpower ideas that reflected their own interests.

"Friendship and love, because that's the power of all things" (1st grade girl)

"Teleport and jump really high and go really fast" (2nd grade boy)

"Walk through walls so when you're playing tag, they can't get you" (1st grade boy)

## Round 2

The second round of testing provided an opportunity to further refine the protocol in order to efficiently use the limited time classrooms provided researchers, particularly with the kindergarteners. We reduced the number of questions which allowed kindergartener to answer all of the questions in a class period. In addition, we refined the protocol to encourage children to independently vote their preferences by standing up to avoid the peer discussion before the voting, thus biased votes were mitigated. After the independent voting, children were encouraged to share the reasons about their preferences with their peers.

**Responses to questions pertaining to preferences.** Children's preferences for the character designs varied greatly by grade level. Kindergarteners equally preferred three unique designs, of which one of the designs was highly preferred by the first grader. This same design, however, was least popular among the second graders.

When children were asked the reason they preferred a character, all grade levels were able to articulate detailed design elements that they liked.

"It looks like she can teleport and using her ring to read people's minds"

(kindergarten girl)

"I like the twisty thing coming out of her ring" (kindergarten boy)

"She has a ring and it looks like the ring has power" (1st grade boy)

"Looking at her legs, she looks like she is teleporting" (2nd grade boy)



From the same set of character designs, children selected characters that looked like themselves. Kindergarten through second graders, to varying degrees, were able to articulate which design attribute reflected themselves. Many of these included physical characteristics and the design's reflection of a potential ability.

"She is strong and I help my dad carry stuff" (kindergarten girl)

"I always wear my hair down at home and I always do that pose when I have a ring" (1st grade girl)

"She looks like she is ready to run fast and I run so fast now" (1st grade boy)

"The height is the same" (2nd grade boy)

### Round 3

The third round of testing was implemented to further refine the character designs based on children's interest, and to identify design elements that children did not like. The number of questions were further reduced to ensure complete participation from all children and more in depth discussion on each item.

*Responses to questions pertaining to preferences.* In the third round of testing, Kindergarten through second grade children unanimously selected the same characters as their top choices. Although some drastic changes to the images were implemented since Round 2, children were able to identify the character designs as representing the same characters from the previous round of testing.

"He cut his hair!" (1st grade girl)

"Ooooh, I like his, he got the hair cut" (kindergarten boy)

Children were selected specific design elements as reasons for their preference for the character.

"Because he's the only black dude!" (2nd grade boy)

"I like his hair-line" (2nd grade boy)

“I like because she has two ponytails” (2nd grade girl)

Furthermore, children remembered the characteristics of the characters beyond their physical appearance and commented on them:

“I like when she flies but when she looks down, I don’t like that” (2nd grade girl)

“Because he can make a lot of things” (kindergarten boy)

“She’s like ‘What’s up, y’all? I’m stronger than you at the gym” (kindergarten girl)

**Responses to question pertaining to design dislike.** In the third round of testing, children were also asked to comment on attributes of the character they would change. Many children provided comments that reflected age-appropriate current trends.

“What I think you should change about M is his hair. I want it to be blue. To dye it” (1st grade girl)

“I’ll change her hair because it kind of looks like rock and roll hair” (2nd grade boy)

“I want her hair to be like this (points to own hair, which is in a pony-tail)” (1st grade girl)

### **Discussion and Recommendations**

Our three rounds of character tests reflect the interactive design and testing process. Results from Round 1 testing provided recommendations for characters’ refinement and also informed the focus and modifications for Round 2 testing. Round 3 testing used the effective elements of Round 2 testing, but also emphasized on how to help refine and polish character designs based on children’s feedback. Below, we list our recommendations based on the results of our multiple rounds of testing.

- Due to the limited cognitive capacity a young child can handle before reaching fatigue, numbers of artists presented to children must be limited and organized. If testing multiple artists, it is important to group all designs created by each artist, and then display and test all designs of each artist at a time. If needed, conduct separate test sessions for different artists. Also, ensure that the designs tested are similar in color and quality (e.g. all line drawings, all in color)

- Young children are overwhelmed by choices. Limit the number of choices they have to select from. For instance, if testing different character designs by the same artist, limit options to a maximum of 5 options per question. This reduces decision fatigue. Moreover, test the characters in the same poses (e.g. all characters standing and smiling) to reduce bias.
- Limit the number of questions to approximately four to six items. As children's (particularly kindergarteners) attention span is limited, limit the questions to ensure sufficient time for children to process the question, formulate their answer, and articulate their responses.
- Ask the most critical questions in the beginning. Children may not have the ability to sustain their attention on the task and may not get to the last questions. The ordering of the question is important - from most critical to least critical. Furthermore, ensure that all questions are developmentally appropriate (both in form and diction).
- When asking children questions about the specific designs, make a large copy of the image available to the children. In Round 1, children could not remember the names of the characters when asking questions about the designs. Printing out enlarged illustrations of the character designs and placing them on the wall for everyone to see helped remind children about all of the design options.
- Ask questions that children can better understand and connect with themselves. For instance, we found that children have difficulty with the Round 1 question of "Why is this character most like you?" We modified the question in Round 2 by asking "How is this character the same as you?"
- Test children in small groups to reduce bias. Larger groups of children have a higher chance of discussing reactions with each other and influencing each other's choices.
- Encourage independent voting and then provide opportunities for discussion to avoid biased selection and enhance shared opinion as a group. For instance, we encourage

children to identify preferences through standing up to vote, versus raising hands to reduce bias. Based on the results from Round 1 testing, where children discussed their character design preferences, in Round 2, we asked children to stand for their preferred character design. This reduced the frequency of children discussing their preferences with each other and limited influences on one another. Following the independent voting by standing, we provided opportunities for children to share why selected designs were their preference one by one in a group setting.

### **Future Directions and Conclusions**

The present study explored variations among the character appeals testing protocols and procedures through an iterative process. Each session was built on knowledge gained as a result of the previous session. Many of the refinements in the protocol and procedure were constrained by the time /attention span of the young children. Future research may explore character testing protocol differences in parents, teachers, and adults, in comparison to testing with children. Perhaps the iterative process would be truncated and in-depth interviews would be possible with audiences that have a larger capacity for focus (i.e. adults).

Moreover, while our studies focused on the feedback from children, we do not know whether the protocol used for young children would spur the same type of feedback from adults. Next steps can determine whether there are attributes that adults are sensitive to that were not considered when testing children. What are characteristics that adults find critical when seeing themselves reflected in the design of characters?

Overall, our experiences testing with diverse children has demonstrated the importance of testing the character designs with the target audience. The feedback provided by the kindergarten through second graders uniquely reflected their perceptions and preferences of the character's attributes which were not considered by the adults involved in the development of the character designs.

Our findings are based on static art and therefore may need further investigation with animation. Developing and testing characters represented in movement adds an additional layer of complexity to game design. For example, the clothes that have a lot of movement (e.g. cape, light skirt) may complicate animation when characters are dancing, flying, etc. Also, different embellishments on an outfit (e.g. parts that move, shine, etc.) can provide complexity to the animation (especially in games). However, the findings from the present set of studies and the resulting recommendations inform the protocol that the researchers should consider implementing when testing for the appeal of moving and movement in character designs.

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