The Families and Media Project
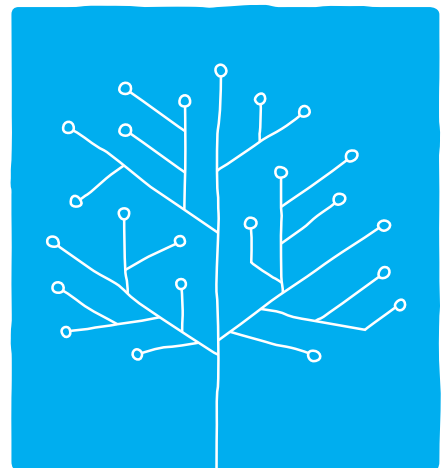
Diverse families and media:

Using research to inspire design

A casebook & design guide

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The Joan Ganz Cooney Center at Sesame Workshop

About the Authors

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Briana Pressey, EdM is Research Manager at the Joan Ganz Cooney Center at Sesame Workshop. She has a strong interest in the intersection of media, education, and equity, and has primarily assisted with the organization's research with Hispanic-Latino families, beginning with its New York-based pilot study in 2012 and continuing her involvement through the Families and Media Project and Aprendiendo Juntos Council. She holds a Master's degree from the Harvard Graduate School of Education's Technology, Innovation, and Education program and a B.A. in Communication, Cinema Studies, and Africana Studies from the University of Pennsylvania.

Katie Headrick Taylor, PhD is an Assistant Professor in the Learning Sciences and Human Development program at the University of Washington's College of Education. She studies children's digital literacy practices, spatial literacy as it pertains to youth mobility and mapping, new ways of teaching spatial literacies, and how to leverage technologies to engage young people in civic processes that drive community change.

The mission of the Joan Ganz Cooney Center is to foster innovation in children's learning through digital media. The Cooney Center catalyzes and supports research, development, and investment in digital media technologies to advance children's learning, and is committed to the timely dissemination of useful research. Working closely with its Fellows, national advisors, media scholars, and practitioners, the Center publishes industry, policy, and research briefs examining key issues in the field of digital media and learning.

A full-text PDF of this report is available as a free download from www.joanganzcooneycenter.org.

contents

foreword

By Lori Takeuchi

"Without research," according to Joan Ganz Cooney, "there would be no *Sesame Street*."[1]

Back in 1967, the idea of teaming researchers with talented producers and education advisors was—again in the words of the founder of Children's Television Workshop—"positively heretical." But Mrs. Cooney persisted in her vision, and 48 years later, the show continues to delight and educate millions of viewers young and old around the world.

I emphasize "young and old" here because another quality of *Sesame Street* too often taken for granted is its intergenerational appeal. Parents are as smitten with the show as their children are, and quite by design. Numerous studies have demonstrated that children whose parents "coview" *Sesame Street* with them learn more than children who watch alone, thanks to all the explaining and extending that parents do, often quite naturally, to enhance the viewing experience for their child. As such, the show's writers have always aimed to tickle the funny bones of adults too, a tactic to entice them to stick around for the duration of the hour-long program[2]. Hence the cameo appearances by Johnny Cash, Richard Pryor, Lily Tomlin, Michelle Obama, Janelle Monáe, and other celebrities with adult appeal over the show's long history. Few programs have so consistently succeeded at genuinely entertaining preschoolers and their parents, year after year, generation after generation.

Clever writing and casting aside, are today's families actually watching *Sesame Street* together? Four decades ago, most households had just one TV set, most mothers were home during *Sesame Street*'s broadcast timeslot, and there weren't hundreds of other kids' shows to choose from. These circumstances favored parent-child viewings of the program. Today, preschoolers are more likely to stream a segment of *Sesame Street* on their tablet devices, strapped in the backseat of the minivan on the way to or from childcare. Their parents, meanwhile, are more likely to catch clips of their favorite vocalists singing Muppet duets via their Facebook feeds.

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[1] Quotes from Joan Ganz Cooney's Foreword in *G Is for Growing*, edited by Shalom Fisch and Rosemarie Truglio (2000). Reprinted with permission.

[2] As of Fall 2015, *Sesame Street* episodes are now 30 minutes long. In its previous 45 seasons, the show was one hour long.

Despite evolving technological, demographic, and economic circumstances that are threatening the 21st century model of coviewing and hurling us toward an "alone together"[3] coexistence, I am hopeful about the roles that these newer platforms can play in fostering meaningful learning and connection in families. In 2011, Reed Stevens (Northwestern) and I coordinated the production of *The New Coviewing*[4], a report featuring the contributions of a diverse set of researchers, e-book designers, video game producers, and TV show consultants[5] on their experiences either investigating or designing for intergenerational *joint media engagement* (JME)—basically the 21st century analog of coviewing. The report also offers a set of principles for designing for JME, which are grounded in the featured cases as well as the extant research on the topic.

## "Without research, there would be no Sesame Street." —Joan Ganz Cooney

The New Coviewing was met with a surprising amount of interest from the broader research and children's media design communities, and has ended up as the founding manifesto of the Families and Media (FAM) Project. Created in 2013, FAM is a consortium of likeminded researchers from the Cooney Center, Stanford, Northwestern, Arizona State University, Rutgers, Sesame Workshop, California State University at San Marcos, and the University of Washington. Together we are using large-scale survey and smaller scale ethnographic methods to study the ways in which new technologies and media platforms are shaping the everyday routines of a diverse cross-section of families living in the U.S., especially families traditionally ignored or underserved by its media and education systems.

What have we been finding so far? Survey figures tell us—and in-home observations confirm—that parents and children aren't huddling around mobile phones all that often, or even tablet devices, for that matter. Rather, TV is still at the center of most intergenerational engagement with media. But parents also recognize the value of the Internet as an infinite learning resource and social connector, and even those from the lowest income brackets are making it a priority to be online—for the sake of their children's edification as well as their own. We've also found that despite healthy rates of consumption of "educational" media by Hispanic-Latino children (i.e., a majority use educational media at least weekly), their parents are less satisfied about how much their children are learning from such content, and less informed about the availability of these resources than their White and Black counterparts.

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[3] A reference to Sherry Turkle's 2012 book, *Alone Together: Why We Expect More from Technology and Less from Each Other.*

[4] The guide was made possible with the generous support of the DML Hub (Macarthur Foundation) and the Corporation for Public Broadcasting.

[5] Too many to list in the text above, contributors include Brigid Barron (Stanford), Erica Branch-Ridley (Sesame Workshop), Mindy Brooks (Sesame Workshop), Hillel Cooperman (A Story Before Bed), Ashley Fenwick-Naditch (Sesame Workshop), Shalom Fisch (MediaKidz), Rebecca Herr-Stephenson (Cooney Center), Carlin Llorente (SRI), Siri Mehus (University of Washington), Shelley Pasnik (EDC), William Penuel (SRI), and Glenda Revelle (Cooney Center).
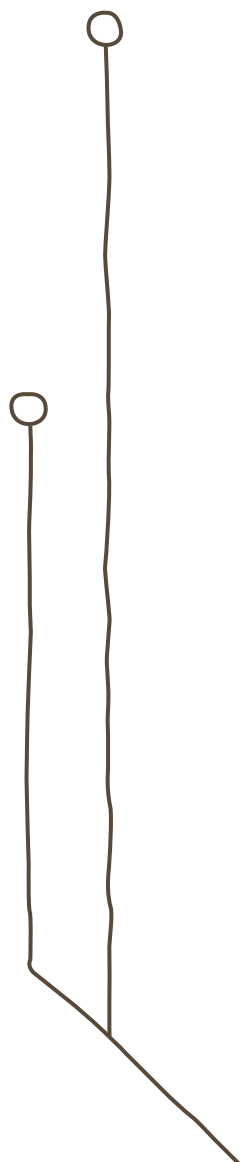
This last finding illustrates the extent to which educational media are not being designed and vetted with all families in mind. Of even greater concern is that a good number of the media producers and designers we have worked with over the years have only confirmed a lack of time and budget to ensure that their products will meet the needs of populations beyond the mainstream. A one-size-fits-all model of product development is all too often the norm in the children's media industry. The implications for equity here are of course, enormous. Which is why we are working so intently on translating findings from our FAM research for use by media designers as well as education practitioners, policymakers, and others creating content, tools, systems, and programs for today's children and their families.

Diverse Families and Media: Using Research to Inspire Design is one such translation piece and, like *The New Coviewing*, it takes a case-based approach to highlighting the potential of intergenerational learning with and around old and new forms of media. However, rather than prescribing for the reader what to extract from each case, authors Amber Levinson, Sinem Siyahhan, Briana Pressey, and Katie Headrick-Taylor have crafted rich portraits of five families that are far more open in nature, leaving room for you to decide what these scenarios mean for your own work. For those seeking a more structured experience with the cases, there are questions to ground discussions and design challenges to tackle with your colleagues. The authors have also updated the design principles we set forth in *The New Coviewing* to reflect what they have been discovering in the field with regards to the strengths and needs of the families they are studying. No matter how you decide to use this guide, I am certain that you will find the format enlightening, inspiring, and rather enjoyable to read.

In sum, the casebook and design guide is an effort on behalf of the FAM team to *extend* Mrs. Cooney's original vision of fostering meaningful intergenerational learning and play—extend it to apply to a greater diversity of devices, to reach a greater diversity of families, and to live on for another 50 years. It is an effort to place valuable research into the hands of talented producers and educators in an era when such partnerships are no longer considered heretical, thanks in large part to the standard *Sesame Street* set so many years ago.

introduction

*"I think a lot of times we get these reports that say what's already out there, but it doesn't really tell me what I still need to do.... I would love if somebody just came to me and said...,
'We really need a show that addresses this, this, and this.'
What are those needs that are still not being fulfilled?"*

— Rachel Kalban, Out of the Blue Enterprises

This resource seeks to help answer questions we've heard from so many education researchers, practitioners, and producers of children's media:

> *How can we learn from the research in order to make better resources for children and families?*
>
> *How can education research be made more relevant to design and practice?*
>
> *What needs do diverse families have that designers and educators might not be aware of?*

As researchers who work in the fields of education and children's media, we hear from many designers and practitioners who care deeply about applying research in their work, but have trouble accessing it. It's true—research can be hard to access, either because it is published in specialized journals that are not freely available, or because it isn't reported with non-academics in mind. At the same time, we know researchers want to contribute their knowledge to media design but often don't know where to start.

Diverse Families and Media: Using Research to Inspire Design was conceived as one way to begin to narrow this gap. Our goal is to share insights from our research with education practitioners and media producers who are at the helm of creating and implementing programs for children and families.

The problem

What opportunities do designers and practitioners have to learn about how families from diverse backgrounds interact and learn at home? Our challenge is to ensure that within today's overwhelming wealth of technology resources there is content that inspires and reflects the wide range of learners that media producers, educators, librarians, after-school providers, and other practitioners serve. We aim to help these professionals discover and understand more about the needs and characteristics of learners.

The opportunity

There is a huge opportunity to design for underserved families. These families (families of color, low-income families, and/or language-minority families) make up a very large audience that is often overlooked in product and program design. Our research focused largely on Latino families, who are the fastest growing group in the U.S. and are projected to make up more than 29% of the nation's population by 2060 (U.S. Census Bureau, 2015). As one example of the opportunity to design for underserved groups, Latino consumers, including immigrants to the U.S., propelled the texting tool WhatsApp to success: nearly half their users in 2014 were Latino (Fetto, 2014). Latino immigrant parents also place a high value on education for their children (e.g., Valdés, 1996), and are adopting digital technologies at particularly rapid rates (Lopez, Gonzalez-Barrera, & Patten, 2013). The *Learning at Home* national survey report revealed that parents, and particularly Latino families, want to know more about how to use media to support their children's learning (Lee & Barron, 2015; Rideout, 2014).

Our approach

When we think about learning with media, or any type of learning for that matter, we need to consider all the contexts in which young people spend time—home, school, after-school programs, community centers, places of worship, relatives' or friends' homes, and many others.

Using media is not just an activity that occurs between a person and a screen—the setting, culture, and especially the people around us have an enormous influence on the experience and the learning that occurs. This can happen in the moment, for instance, via a child interacting with another person while using media, but it can also include the ways in which media relates to other parts of a child's life. Imagine a child who plays a dinosaur game after having visited a natural history museum, or who reads an e-book about a country where her grandmother lives. In these situations the media content can become more meaningful and powerful because of the way it connects to other parts of the child's life.

Research has shown the many ways that culture, language, and day-to-day family practices deeply influence learning. These things do not look the same for all children and families. Our work seeks to highlight particular characteristics, needs, and strengths among the populations we work with to inform educators, policy-makers, practitioners, and designers.

The two sections that follow offer open-ended challenges based on specific cases, as well as general principles for design. The design challenges in the **Casebook** invite designers to *empathize* with families, *imagine* what might offer new and exciting opportunities for these users, and finally *create* new solutions based on their

needs. This human-centered approach is based on the idea that understanding specific needs and practices of particular users can inspire innovative designs that often also speak to a broader audience. The challenges present details of family dynamics, practices, and values that can help designers better understand and meet families' needs and goals for learning. We focus on specific insights and challenges that we see as key opportunity spaces for designers.

The **Design Guide** provides guidelines based on the broader research, which focus on fostering family learning and making designs more inclusive of all families. This Design Guide builds on the one published in Takeuchi and Stevens' 2011 report *The New Coviewing: Designing for Learning Through Joint Media Engagement. The New Coviewing* shares research on how parents, children, and other family members use media together, opportunities for learning, plus design principles for designing for families. Both the 2011 report and this one offer insights from research that can help inform the people who create programs for children and families.

We hope that this casebook will provide opportunities for you and your team to reflect on families in new and illuminating ways.
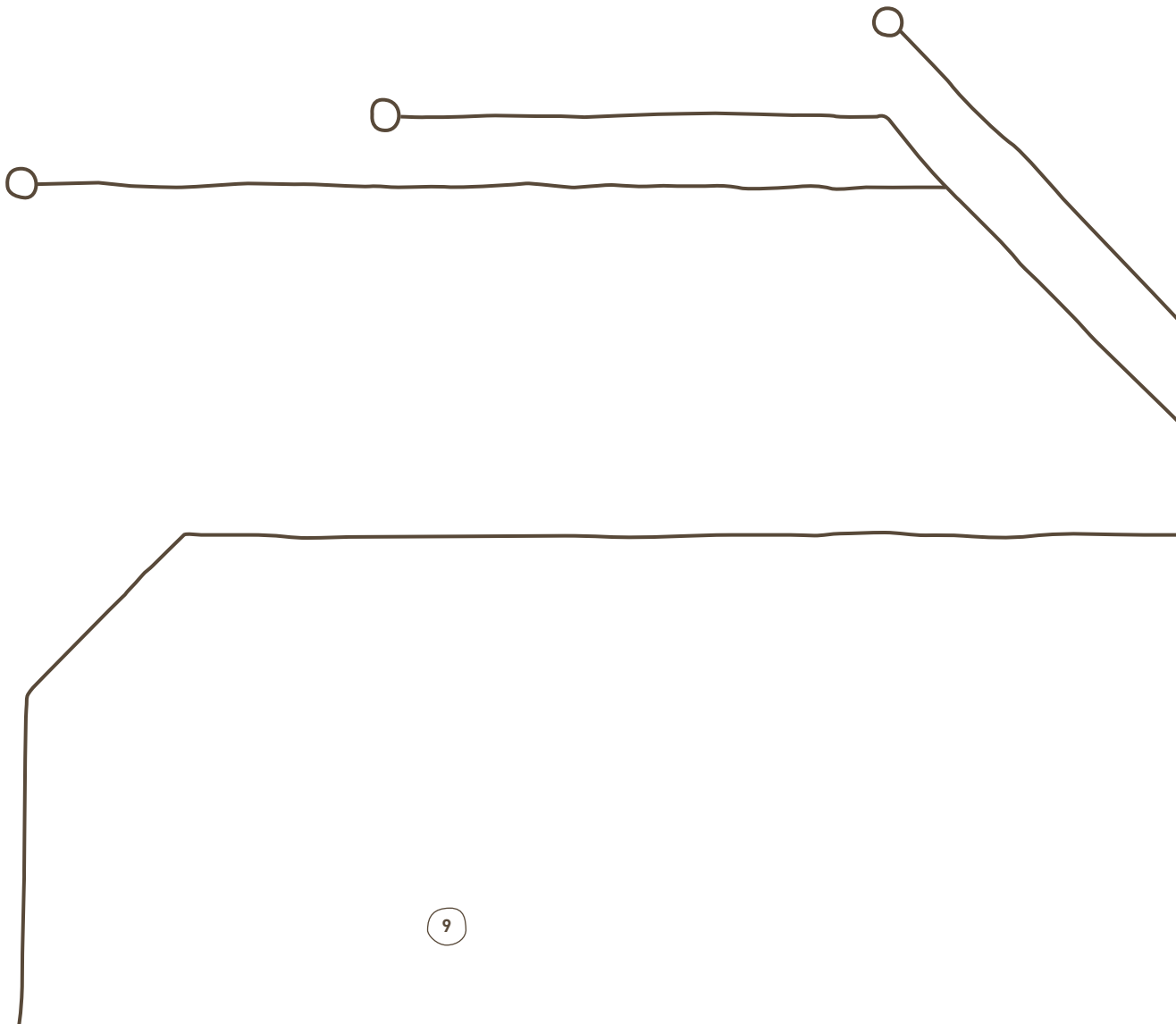
design challenges

how to use the design challenges

Each of the case-based challenges that follow highlights a different opportunity space drawn from our studies of families using media at home. Each one includes:

Problem: A description of an opportunity to improve the experiences families currently have;

Goal: Instructions for what to imagine and design in the challenge;

Family Profile: A portrait of a family that illustrates the opportunities and challenges families face in using media and technology;

Discussion Questions: Prompts to empathize (put oneself "inside" a family), imagine different experiences, and create a new solution.

Here are some of the ways you can use the challenges in your work:

As a basis for a team meeting or discussion about how to serve diverse families.

To conduct hands-on design exercises or charrettes to brainstorm and prototype solutions. (Instructions and resources are included below.)

To gain insights that lead to new features or changes to your existing program or product designs.

If you are new to running design challenges, check out the appendix for resources and additional information.

If you are using the challenges as hands-on design projects to inspire new ideas, here are some guidelines and links for more detailed information to support your work:

1. Team up: Form a small group or groups, ideally three to six people each. (Individuals or pairs can do this too.) Large teams or classes can break up into groups of this size.

2. Choose your challenge: Read each design challenge, then pick one to tackle.

**3. Read the goals and family profile together.**

4. Empathize with the family: After reading the case, discuss each of the Empathize questions in your group. Empathizing—sharing the feelings of another and placing yourself in their shoes—is a key part of solving problems for users in your design. Treat the families in the design challenges as your users: Think carefully about what they are feeling in the situation(s) described and imagine what it would be like. Reflect upon your own biases and apply personal and professional experiences to your interpretations of the family members' needs, strengths, and interests. Focus on the unique assets families may bring, rather than on deficits.

5. Imagine: In your team, use the Imagine questions as prompts for brainstorms. Generate as many different ideas as you can, using sticky notes, whiteboards, or other means to capture your ideas. Encourage and build on ideas from your teammates. The wilder the better!

6. Create: Choose the most promising ideas you came up with in the Imagine exercise and refine them. Then make a prototype–or simple model–of your program or service that you can show to users and receive feedback on. A prototype might be series of drawings or slides that illustrate the experience, a physical object, or a situation that you act out.

# fostering collaborative learning experiences among siblings
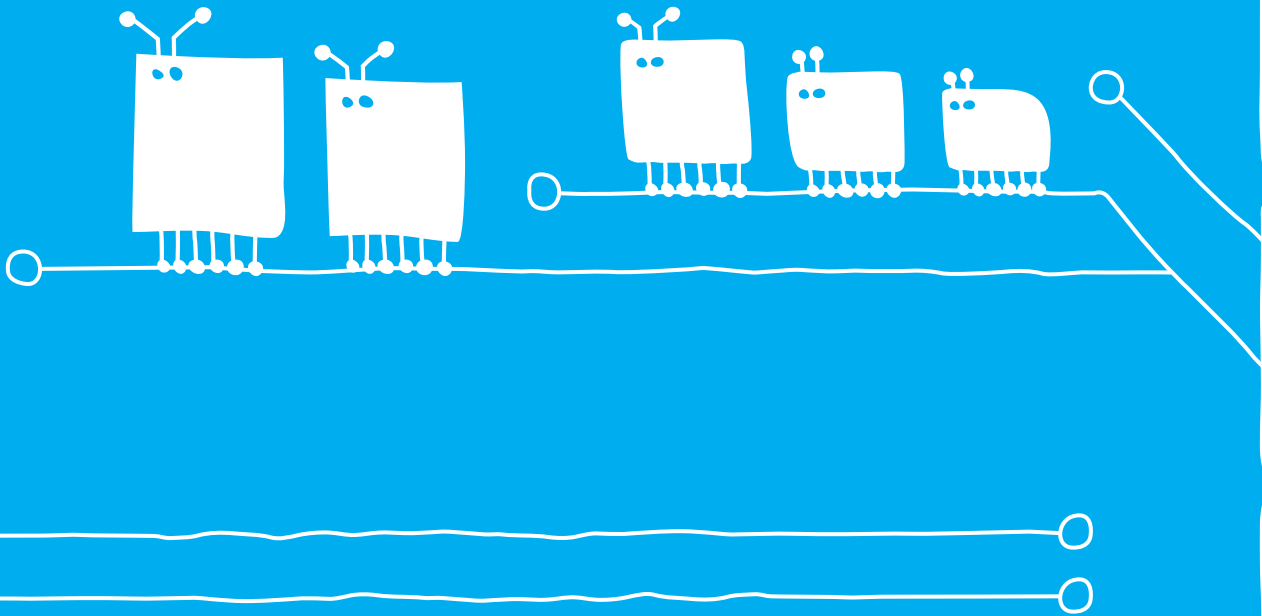
Problem

When we think about supporting children's learning, it is important to consider the role older siblings play in younger children's experiences with technology. Older siblings can be positive role models for their younger siblings, but at the same time, conflict between siblings can get in the way of learning. What kinds of support, structures, and opportunities do we need to provide to encourage collaborative learning experiences among siblings that can benefit all involved?

Goal

In this challenge, your task is to design a program or experience for siblings to engage in learning experiences together around media. Your design should consider the age difference between siblings as well as the maturity of the older sibling(s).

Family profile: The Vega family

Julian ——— **Victoria**

Santiago
(11 years old)

Leon
(6 years old)
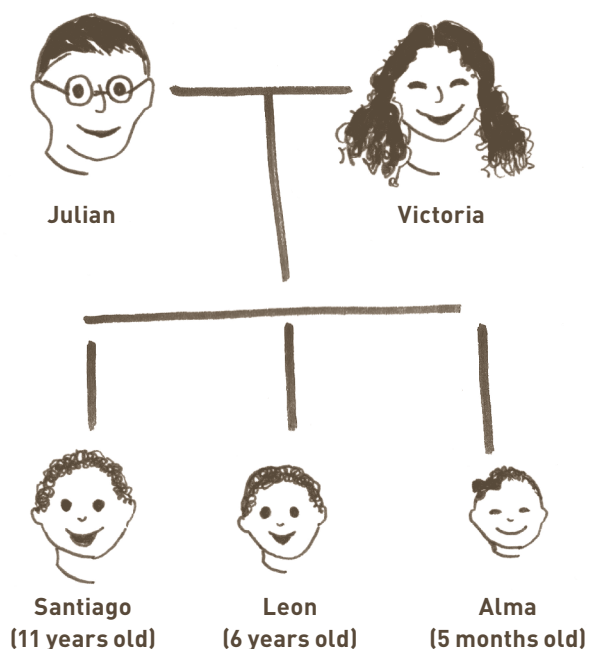
Alma
(5 months old)

Leon (age 6), a first grader, is Victoria and Julian Vega's middle child. He lives with his older brother Santiago (age 11) and his newborn sister Alma (5 months) in a four-bedroom house in an urban neighborhood. The family owns four TV sets, one gaming console, one tablet, and two smartphones. The majority of these devices were initially purchased for Santiago, who spends a significant amount of time playing video games. The television in the secondary living room and the attached gaming console belong to him. He spends every day before and after school, and during weekends, playing video games. Santiago

also has a television in his room that he watches before he goes to bed. The tablet also belongs to him. He uses it mostly for watching YouTube and Netflix.

Leon does not own a device but uses the tablet whenever Santiago lets him. This usually happens while Santiago is playing games on the console. Leon plays video games, searches online, and listens to music on the tablet. Recently, he downloaded an app to learn Japanese because one of his schoolmates cannot speak English and he wanted to learn Japanese to communicate with

his friend. He also downloaded an app about numbers and colors for his sister Alma with the hope that she can eventually use the tablet to practice and learn. Despite the "rules" determining when Leon can use the tablet, Leon and Santiago often get into conflicts over sharing it. As Victoria puts it, Santiago can be impatient to get his tablet back and likes to reinforce his rules to regulate Leon's access and use of the device. For example, Santiago created separate folders for the games he and Leon play on the tablet to ensure that Leon does not play the same games he plays. Santiago also uses the tablet as a way to punish Leon, for example, by deleting Leon's games when he is mad at him. Sometimes the conflict between the siblings becomes so intense that Victoria takes the tablet away to stop them from arguing.

Despite the frequent arguments, Santiago and Leon spend most of their out-of-school time together playing video games. The brothers have different tastes in games: Santiago loves shooting and racing games, and spends most of his time playing *Call of Duty*, which Leon finds too violent to play. There are no household rules against kids playing games that involve shooting or killing. Santiago is open to negotiating and coming to an agreement with his younger brother about which game to play together. They like playing *Flappy Bird*, *Squishy Bird*, *Smash It*, and *Sonic Dash* together. These racing-type games have simple game mechanics with players controlling an avatar to dodge obstacles and collect points. While designed as a single-player experience, these games allow Santiago and Leon to take turns, as the game episodes are short and players have to restart the game once they lose all their health or run out of time. Leon also enjoys the time he spends hanging out with Santiago and his friends, when dance and building games like *Minecraft* bring Santiago, Leon, and their friends together. These games allow for at least two people to simultaneously play on the gaming console.

According to all family members, Santiago is the person in the family most knowledgeable and skilled about gaming. In fact, it is his persistent interest and continued improvement while playing video games that drives the purchases of new devices in the family. At least once a week, Santiago watches Leon play games and reads instructions to Leon who is just starting to learn to read. Santiago also coaches him, solves problems for him, and plays with or competes against him. Additionally, he talks with Leon about his performance, what makes a game fun, how to score better, topics related to games that come up in other contexts, and the games that he himself plays. A few times a month, he explains a game's storyline to Leon, describes to his brother why he doesn't want him to play certain games, and asks about what Leon has learned from games. Santiago usually initiates these interactions around games without Leon's prompting. Although he recognizes that Santiago is probably the best resource when it comes to improving his skills, Leon prefers not to ask for help from Santiago when he finds things difficult; he instead likes to engage in trial-and-error by pushing buttons and seeing what they do in the game.

Empathize: What are the needs?

1. How would you describe the relationship between Leon and Santiago?
2. What are the specific age-related developmental needs of Leon and Santiago? How are they similar or different?
3. What role does Santiago play in Leon's use of technology?

Imagine: How might we meet those needs?

1. Other than playing games, what other activities could Santiago and Leon do together around different devices at home?
2. What kind of support does Santiago need to be able to better facilitate his brother's learning (school related or otherwise) using the tablet?
3. What game features might make it easier for the brothers to share and build on one another's participation?

Create: Design a solution

1. What basic features does a "collaborative play" activity need to support learning between young children and adolescents?
2. What characteristics might be useful in an experience that supports collaboration between siblings? How should the siblings interact with it? What kinds of activities or sections would it include?

Recommended reading

Go, J., Ballagas, T., & Spasojevic, M. (2012). Brothers and sisters at play: exploring game play with siblings. *Proceedings of ACM CSCW12 Conference on Computer-Supported Cooperative Work 2012* (pp. 739-748).

Stevens, R., Satwicz, T., & McCarthy, L. (2008). In-game, in-room, in-world: Reconnecting video game play to the rest of kids' lives. *The ecology of games: Connecting youth, games, and learning* (pp. 41-66): MIT Press.

Notes

# designing for family language learning
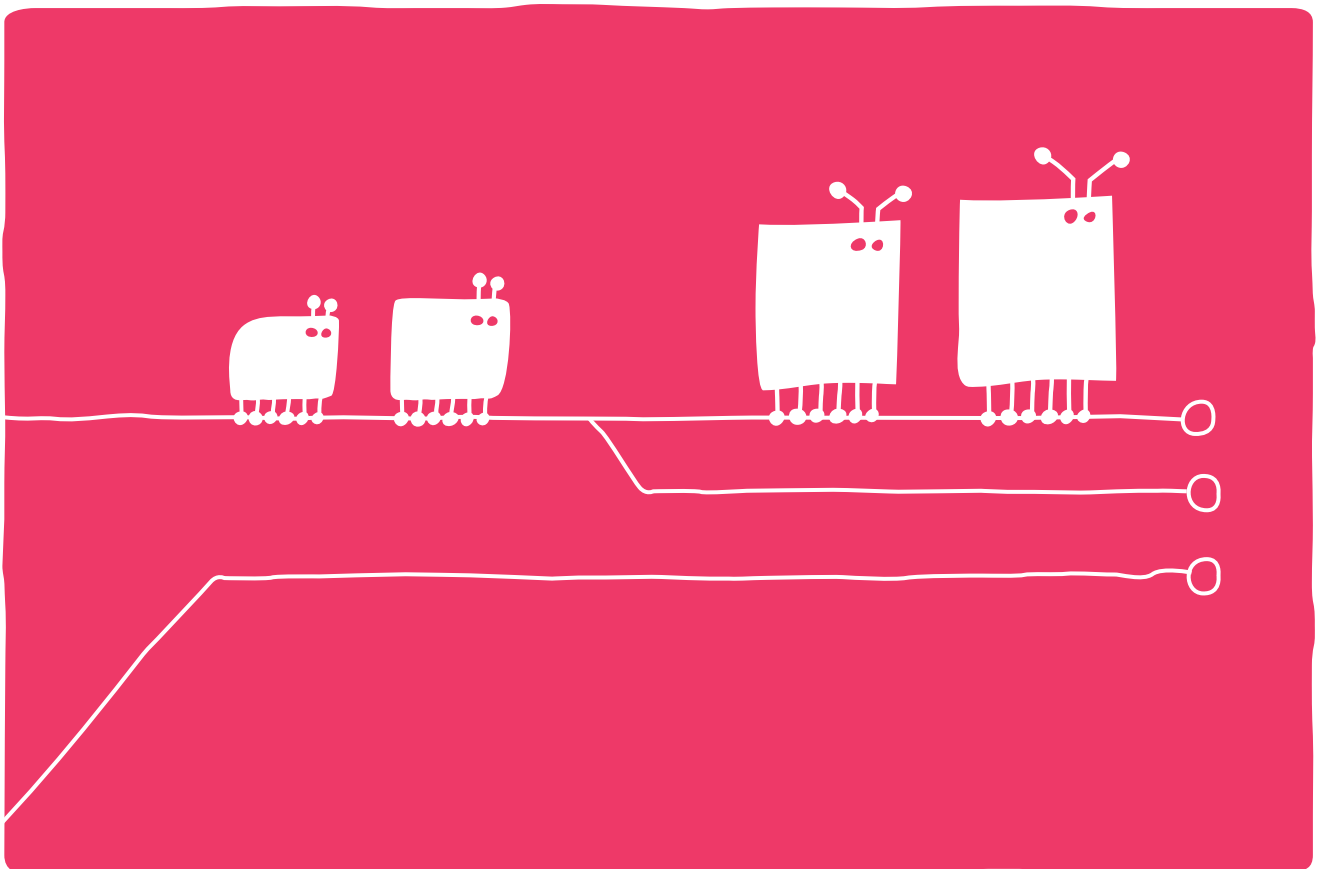
Problem

In families where both parents and children are learning a new language, unique dynamics can emerge. In our research with Latino immigrant families, we found that parents we studied used media (such as children's TV programs and movies) intentionally to help expose children to English, as well as Spanish-language media to maintain their Spanish. At the same time, parents also used technology to improve their own English skills. It is possible that technology that offered a chance to learn individually at home was an attractive alternative to in-person classes, which can be difficult to fit into busy schedules and are sometimes anxiety-producing to parents who feel uncomfortable speaking English. There are few tools that provide opportunities for both adults and children to learn a language. Also, children studied were often more competent in English than their parents, which can create discomfort for adults who value their position as authority figures in the family.

Goal

Design a tool or experience that will engage both parents and children, build language skills, and also allow both to feel knowledgeable and secure. How might we create tools that invite multiple generations (parents, kids, etc.) to learn language together, in ways that respect existing adult-child relationships? How might collaborative tools draw on the strengths that both parents and children bring?

Family profile: The Rivera family

Cesar — Rebeca
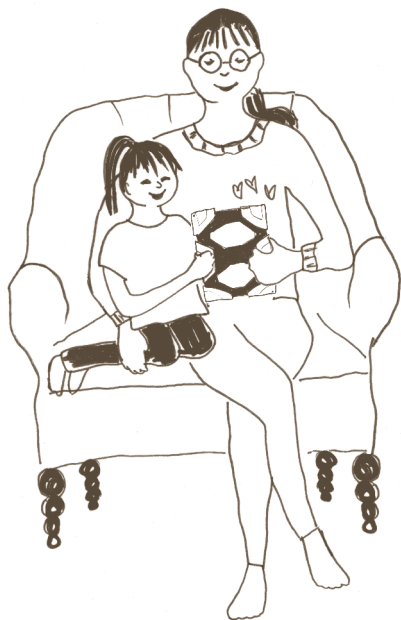
Jessica
(7 years old)
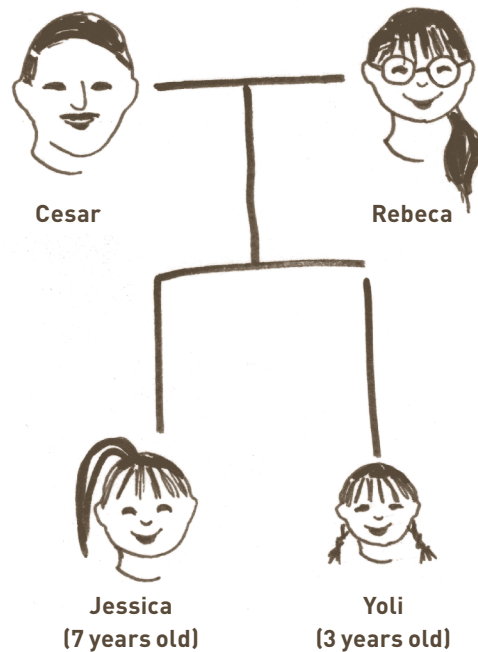
Yoli
(3 years old)

Jessica is 7 years old and lives with her mother Rebeca and her 3-year-old sister Yoli. Jessica likes to hula-hoop, play games, and watch animated shows such as *Monster High*. She is interested in science; she and her mom get science-related books from the public library or school, which sometimes have instructions from home science experiments that Jessica likes to try out.

Jessica and Yoli are U.S.-born and raised; their mother, Rebeca, and father, César, immigrated together as young adults to the U.S. from Mexico

about 10 years ago. After their second daughter Yoli was born, the couple separated. The girls' father sees them several times a week; he works during the day, and comes over to take care of Jessica and Yoli when Rebeca has to work evenings and weekends.

To Rebeca, it's very important that her daughters are able to speak both English and Spanish well. She speaks only Spanish with them at home. She is proud of how Jessica, now in second grade, is very competent in both Spanish and English. She is a little more concerned about Yoli, who usually prefers to speak in English.

Rebeca is very engaged in furthering her education despite a busy schedule working and taking care of her daughters. She is completing her GED, which includes classes in English and in Spanish. The family doesn't have a computer at home, but Rebeca hopes to get one so that she can acquire more English language software tools for learning at home. The family has Wi-Fi and two iPhones— one Rebeca uses herself, and an older model that the girls use mostly to watch YouTube videos or play games.

Rebeca uses Duolingo, an app for English language practice, which she discovered because it had been installed on the iPad the family received as part of participating in Levinson's (2014) study. Rebeca enjoyed doing the exercises, completing levels, and earning the heart icons for each level completed. Jessica also enjoyed using the app. She is more proficient in English than her mother, which makes Rebeca feel a bit competitive. "I tell her not to advance past the levels I'm at," Rebeca explained, "to wait until I've passed them [myself]." The app activities are mostly based on completing or translating sentences, and do not require or offer any particular content knowledge.

With the English learning app, mother and daughter usually play separately, but when Jessica watched her mother play during one session, some tensions arose. Jessica attempted to use her (more advanced) knowledge of English to correct her mother's answers or suggest things over her shoulder. Jessica's input was irritating to Rebeca; she kept asking Jessica to please go play elsewhere and let her finish—because the app itself would correct her.
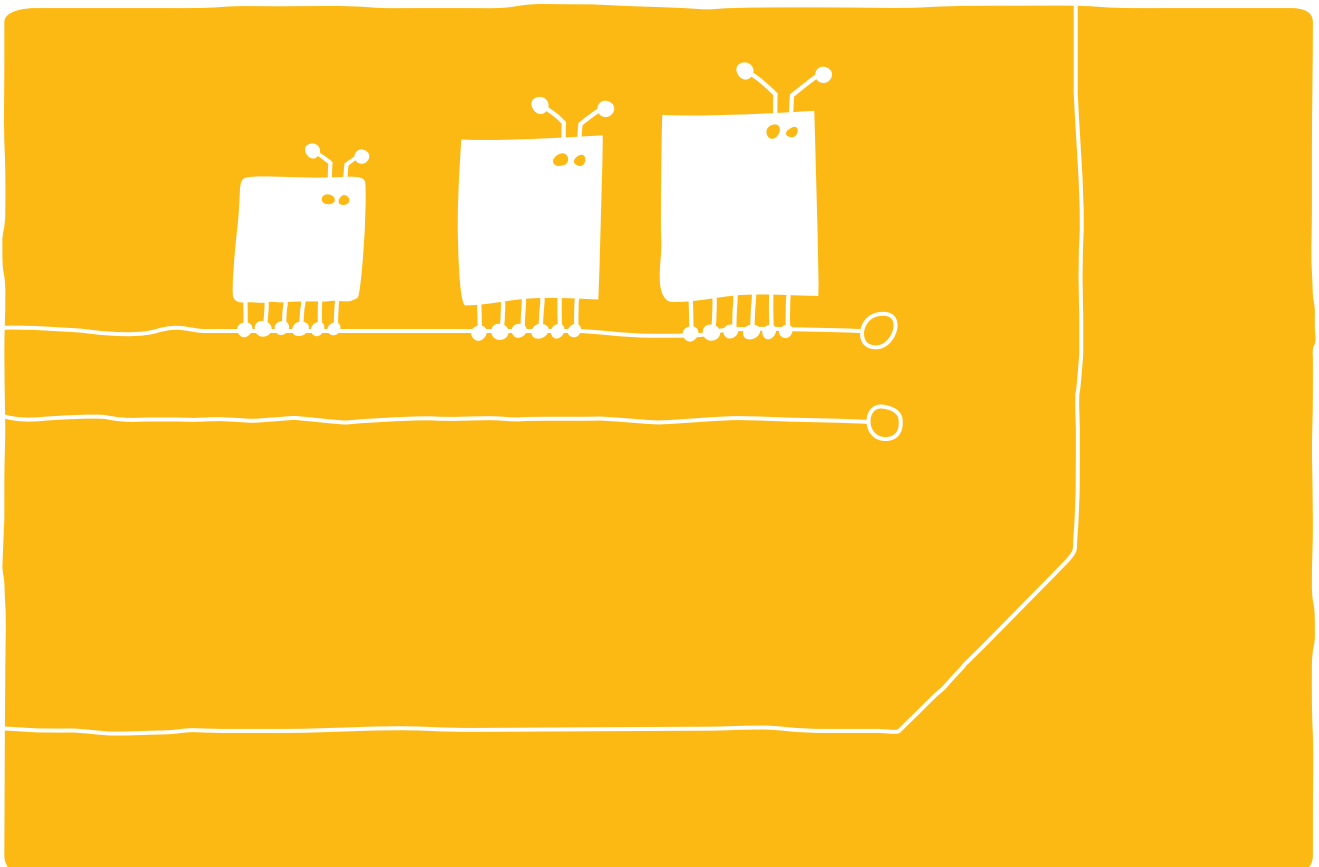
Discussion questions

For tips on running a design challenge, see p.11

Empathize: What are the needs?

1. How might Jessica have felt as she watched her mother trying to find the answers to the English exercises, and knew the correct responses herself?
2. What might Rebeca have felt when her daughter was offering help with answers? How might parents feel when trying to learn something their children are further along at mastering?
3. Consider the interactions that take place around language learning in this family. How might parent-child interactions look around learning in other domains, such as math?

Imagine: How might we meet those needs?

1. What are the challenges to engaging both parent and child in language learning, particularly if the child is a more competent user of the target language?
2. What features might allow family members or co-players at different levels of language fluency to use the same program or activity?
3. How might players' experiences change if the language-learning tool is used together, or separately?

Create: Design a solution

1. What kind of experience might allow both parents and children to use and show their knowledge (whether it be in the target language or in other areas)?
2. How could a collaborative activity that involves both parents and children also help build language skills?

Recommended reading

Lee, J., & Barron, B. (2015). *Aprendiendo en casa: Media as a resource for learning among Hispanic-Latino Families*. A report of the Families and Media Project. New York: The Joan Ganz Cooney Center at Sesame Workshop.

Levinson, A. M. (2014). *Tapping In: Understanding how Hispanic-Latino families engage and learn with broadcast and digital media* (doctoral dissertation). Retrieved from Stanford Digital Repository, http://purl.stanford.edu/bb550sh8053.

Valdés, G. (1996). *Con Respeto: Bridging the distances between culturally diverse families and schools: an ethnographic portrait*. New York: Teachers College Press.

Notes

# connecting and learning across different physical settings

Problem

Children benefit when there are strong connections, continuity of learning, and communication between home and school (e.g., Mapp & Kuttner, 2013; Henderson & Mapp, 2002). How might technology facilitate those connections? Schools want families to know more about what children are learning at school, and kids also learn better if their classroom instruction is relevant to their home lives (e.g., educators know what their home lives are like). Technology has the potential to make connections between home and school, and let families expand on topics at home to which they may have been introduced at school.

Goal

Create a tool or experience that helps connect the worlds of home and school (either home-to-school, school-to-home, or both). For example, this could mean providing ways for children's interests and activities at home to become possible at school, or for topics of interest at school to become more available to children at home. It could also be a way to involve parents in children's school experiences, or connect educators to children's home lives.

Family profile: The Orozco family

José Luis

Angela
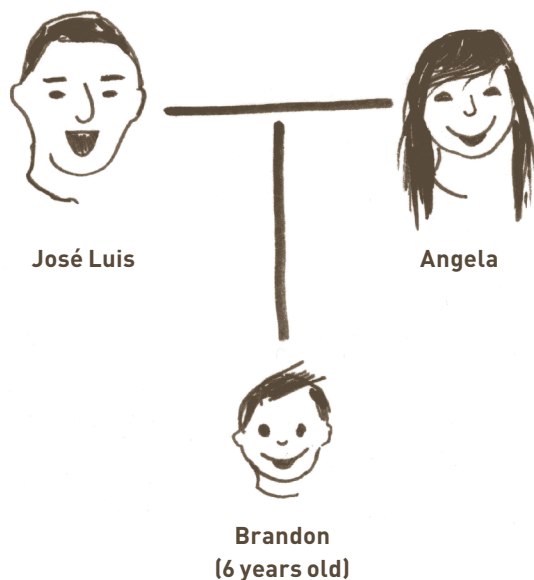
**Brandon
(6 years old)**

Brandon is 6 years old and in the first grade; his parents are from El Salvador and met in the U.S. where Brandon was born. He and his family speak mostly Spanish, although Brandon is learning English at school. Brandon has four older half-siblings in El Salvador; he has only met them and his grandparents at a distance (some by phone and some via videoconference). The family also subscribes to Latin American news and entertainment channels to stay connected to what is happening in El Salvador, as well as TV programs and music from there. Brandon's parents work opposite schedules—his mom in a fast food restaurant during the day, and his dad at a supermarket at night—so the little time all three get to spend together is precious. When they are not at work or school, the family enjoys going out to the local park and playground where Brandon plays, visiting friends and Angela's cousin, watching TV and videos, and playing games (both video games and board games).

The times when Brandon uses technology with his father are usually in the late afternoon after school, when the two of them are at home. Brandon also sometimes watches TV or plays video games on his own, especially if his dad is still resting after his all-night shift.

Brandon is a very inquisitive and active child, and comes home with a lot of questions about the things he hears and learns about in school. He loves history, particularly famous people he's been introduced to at school like Martin Luther King, Jr., César Chávez, and Helen Keller. At home he asks his parents (who grew up in El Salvador and aren't necessarily familiar with the figures Brandon learns about here) detailed questions about their lives, such as, "Did Martin Luther King have children?" Brandon's father turns to YouTube to help him learn more. The videos on YouTube include documentaries and even archival footage where Brandon can see some of these historical figures in action (e.g., Martin Luther King, Jr.'s famous speeches).

Brandon is learning English at school, where he often hears words he doesn't understand. When he comes home, he asks his father what these words mean. Brandon's father uses the Google Translate app to help Brandon figure out the meanings of words; he has Brandon speak the words into the app, and the two of them explore different meanings and use the audio feature to hear the word pronounced aloud. Brandon's parents also use Google Translate when they want to support Brandon with his homework but don't understand some or all of the instructions.

Brandon reads e-books at school via an online e-book library the school subscribes to called MyOn.com, and he can log in at home to read more or return to books that he has used in school. One challenge with these online books is that Brandon is interested in topics like superheroes and fossils, but the reading materials on those topics are at a higher level of difficulty than he can understand as a beginning reader who is also developing his English. So sometimes he and his family end up looking at toddler storybooks, which are more manageable to read but feature "babyish" topics such as going to the potty. It can be hard to find books that are both interesting to Brandon and at an appropriate reading and language level.

Brandon's family also likes to record important moments in their lives, and Brandon enjoys watching these videos at home—for example, the video of his preschool graduation ceremony.
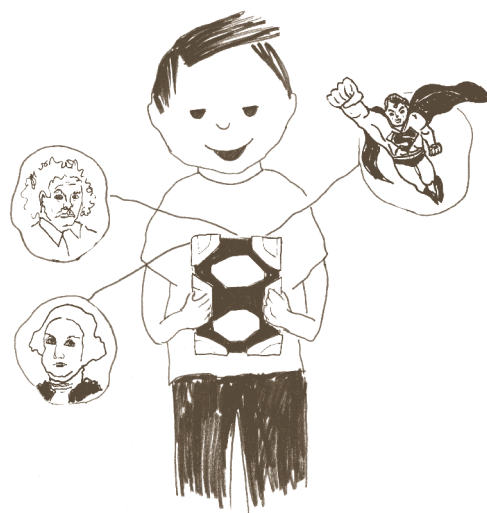
Empathize: What are the needs?

1. What needs does technology help address in Brandon and his family's lives? What can you infer about what's important for Brandon and his family?
2. Why do you think Brandon's parents might choose to search YouTube to help answer Brandon's questions instead of using Google or another search engine? What advantages does video offer for exploring with a 6-year-old?
3. How do you think Brandon might feel when he is not able to read the materials that he is interested in because of his English and/or reading level?

Imagine: How might we meet those needs?

1. What challenges did Brandon and his family encounter, and how did they solve them?
2. How might we innovate on existing video, translation, or reading tools to support Brandon and his family?

Create: Design a solution

1. Brandon himself actively brings information and questions—such as those about famous people he has studied—home from school. How else might his parents find out what he's interested in at school?
2. What kinds of resources might let Brandon explore content that aligns with his interests but also with his own language and literacy levels, which will change over time?
3. Google Translate is a translator tool designed to work in any number of contexts. What other kinds of tools, or what design changes, might provide more customized support for families like Brandon's?

Recommended reading

Edutopia. (2007). Home-to-School Connections Guide: Tips, Tech Tools and Strategies. [Downloadable resource]. Retrieved from: http://www.edutopia.org/pdfs/edutopia-home-to-school-guide.pdf

Mapp, K. L., and Kuttner, P. J. (2013). Partners in Education: A Dual Capacity-Building Framework for Family–School Partnerships. SEDL. Retrieved from: http://www.sedl.org/pubs/framework/FE-Cap-Building.pdf

Penuel, W. R., Kim, D., Michalchik, V., Lewis, S., Means, B., Murphy, R., Korbak, C., Whaley, A., & Allen, J. E. (2002). *Using technology to enhance connections between home and school: A research synthesis*. Prepared for the Planning and Evaluation Services, U.S. Department of Education. Menlo Park: SRI International. Retrieved from: http://www.sri.com/work/publications/using-technology-enhance-connections-between-home-and-school-research-synthesis

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Notes

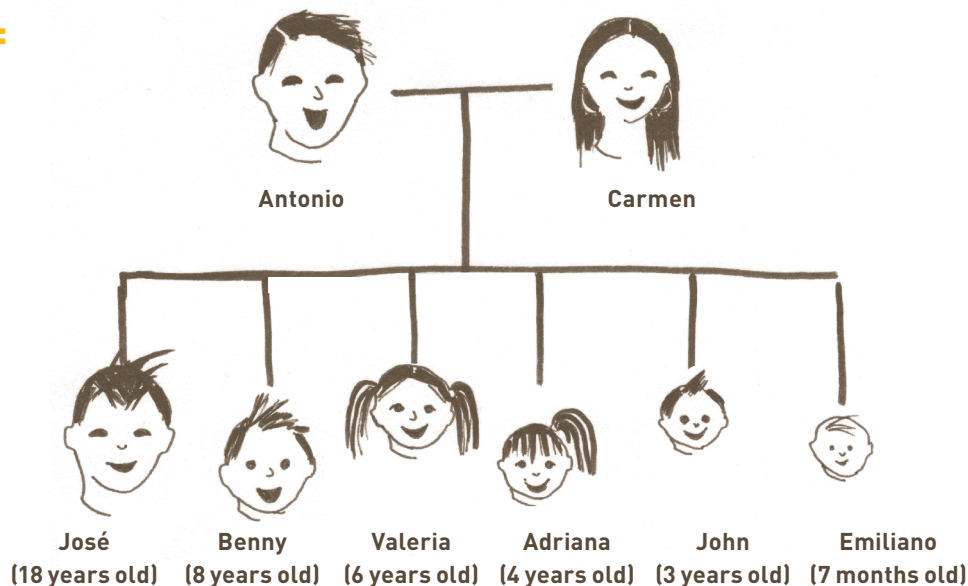# engaging the whole family by connecting to heritage culture
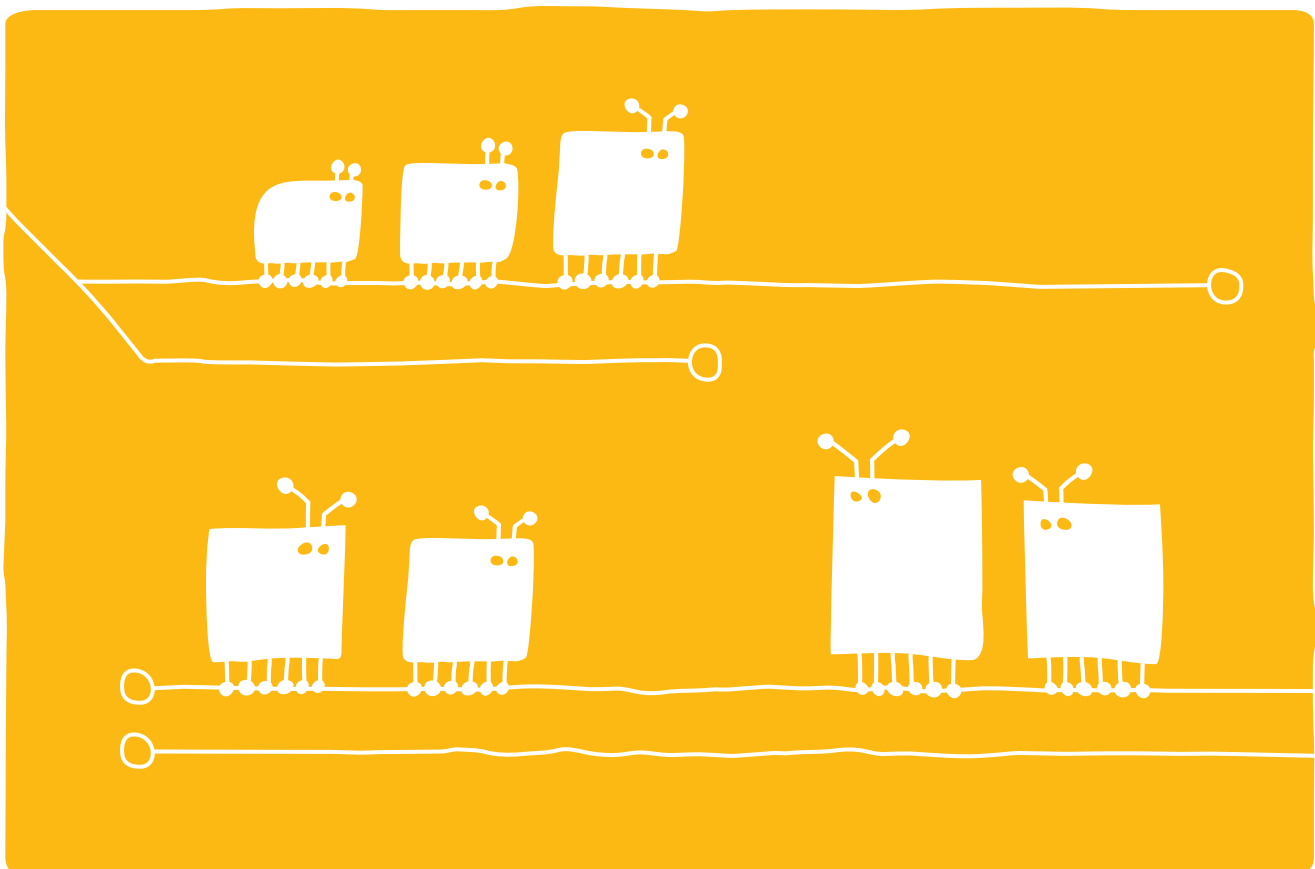
Problem

Our research in a diverse group of Latino households[6] showed that families used a wide range of media together, from math videos on YouTube, to the local news, to Disney's ubiquitous *Frozen*. We also noticed a special spark of interest and parent-child interaction around media that connected to families' country of origin (often either the parents' or grandparents' native country), as well as aspects of heritage language and culture. Especially for those who had immigrated to the U.S., these media served many purposes. They gave families a small glimpse of life in the country of origin, a means to reminisce or share stories and experiences, and a possible tool to sharpen children's Spanish skills. Living in the U.S., media acted as a "window" to another place to which families wanted to stay connected, a place that parents wanted to share with their children, who often had never been there themselves. Given the richness of these interactions, we encourage you to consider the aspects of these media that make them potential tools for connecting across generations, and even cultures. How can we harness this media's power to convene the family, and use it in other contexts such as interactive technologies, community settings, and school curricula and outreach?

Goal

Design (or redesign) an experience that engages multiple generations and takes advantage of families' desire to connect to countries of origin or heritage cultures. Consider the differing interests of adults and children, and where they might converge. Also keep in mind families in which parents and children prefer media in different languages, or might have had different experiences growing up. How can the strength of differing interests or languages, etc., be used as an opportunity for growth, connection, and learning? How might it be a challenge to create for both viewers? Reflect upon the qualities of the media-based experiences featured in the case that both the adults and children find appealing.

Family profile: The Almeida family

Antonio   Carmen

José
(18 years old)

Benny
(8 years old)

Valeria
(6 years old)

Adriana
(4 years old)

John
(3 years old)

Emiliano
(7 months old)

[6] The families in the study represented several different countries of origin, including Puerto Rico, Mexico and Ecuador, and spanned varied income levels, parent educational backgrounds, neighborhoods, and family sizes.

Benny Almeida is 8 years old and lives in a three-bedroom, two-story home in New York with his parents, half brother, younger brothers, and younger sisters. Benny loves to watch Nickelodeon, look for *Minecraft* tutorials on YouTube, and create math "tests" for his little sister using Microsoft Word.

Carmen, Benny's mother, was born in Ecuador and immigrated to the U.S., where she also has a few family members such as her sister, mother, nieces, and nephews. Carmen's days can get very busy, from shuttling the kids to and from school and appointments, to helping with homework and mediating sibling squabbles. In addition to managing such a large family's daily to-dos, she is intent on improving her English, improving her children's Spanish (they all speak English primarily), visiting extended family, and finding time to relax. Benny's father, Antonio—a born-and-raised Puerto Rican New Yorker—works long days as a lawyer in a family court. When he returns home from work, Benny and his siblings are always eager to catch him up on the day's events at dinnertime and watch funny videos with him on YouTube.

Benny sometimes wishes that Carmen could enjoy some of his favorite kid shows with him. He thinks that one reason she doesn't find them entertaining is because his favorite shows are in English and she might not know how funny the jokes are. One day as Benny sits in the kitchen watching Disney Channel's *Austin & Ally*, he tinkers with the remote control and eventually presses a green button, which activates the Secondary Audio Programming. This causes his favorite characters—who are busily bantering on screen—to start doing so in Spanish. In his excitement, Benny calls Carmen over to watch with him, and she's touched that Benny is so eager to share his favorite show with her in Spanish. Seeing his mother laugh at the show's jokes makes Benny laugh even harder. It could be that this SAP discovery is an opportunity for Benny and Carmen to watch even more of his favorite shows together, and maybe Benny can even improve his Spanish while he's at it.

During the 2014 World Cup season, bars and restaurants across New York City are packed with soccer viewers and neighborhood streets are lined with flags from around the world, representing team pride. The same excitement is visible in the Almeida household, where the family, including Carmen's sisters, in-laws, mother, nieces, and nephews, gather around a large flat screen TV to watch their home country, Ecuador, play France. The voice of Orvañanos—formerly a narrator in Latin America before joining Fox Sports—booms through the speakers. Though Benny and his siblings prefer most media in English, they enjoy watching the game in Spanish with their family. Benny and his cousins often move to his bedroom to play some *Minecraft* on the Xbox while streaming the soccer game on Carmen's phone. But whenever they hear their family members get excited or frustrated by a play, the kids sprint back to the living room to join them, reconnecting with the swirling enthusiasm and patriotism in the room. While the family anxiously waits for the play that will make their team victorious, it never comes, and they are forced to accept Ecuador's devastating loss to France. After most of the guests leave, Benny and Antonio step out into their small fenced-in backyard to kick a soccer ball back and forth while they talk about what the team could have done better.

To wind down from the day, Carmen and Antonio watch Spanish-language evening television, which, according to Benny, is one of their favorite things to do together. Because Carmen wants her children to be able to speak her native language fluently, she and Antonio call the kids to watch with them. While Benny was hoping to watch Nickelodeon's *Henry Danger* in the living room, he perceives that sharing this time together and learning Spanish are really important to his parents, so he willingly joins them. He wedges himself into a spot between his dad and baby sister, and his mom translates some of the words to help him better understand and enjoy the shows.

Empathize: What are the needs?

1. What types of interactions between adults and children occurred around Spanish-language media in this case? How were they impacted by content and language?
2. What motivates the parent(s) to participate in the event? What motives the child(ren)? Do they hold common or different motivations?
3. While the media mentioned in the case are not intentionally "educational," how might the broader context in which they are viewed be beneficial to the children's learning and healthy development?

Imagine: How might we meet those needs?

1. How could these media activities offer more opportunities for parents and children to bond or learn together?
2. How might the features of the Almeida family's television sets (i.e., size or placement in the home) shape how family members view shows together? What types of interactions do these features support? What interactions might they prohibit?
3. In addition to language, what aspects of the media Benny's family enjoyed might spark interest from the parents to join in?

Create: Design a solution

1. If you could design a product, program, or curriculum based on this family's interactions around media to support learning and connection, what would it look like? How would it engage parents and children in meaningful ways?
2. How could an experience offer users one or both of the following: new content in a familiar language, or familiar content in a new language?
3. How can the core elements of the TV-based content featured here be applied to different forms of media, such as interactive apps, books, or board games?

Recommended reading

Diaz-Wionczek, M., Lovlace, V., Cortés, C. E. (2009). Dora the Explorer: Behind the scenes of a social phenomenon. *Review and Commentary, Journal of Children and Media*, 3(2), 204-216.

Matsaganis, M. D., Katz, V. S., Ball-Rokeach, S. J. (2011). *Understanding ethnic media: producers, consumers, and societies*. Thousand Oaks: Sage.

Takeuchi, L., & Stevens, R. (2011). *The new coviewing: designing for learning through joint media engagement*. New York: The Joan Ganz Cooney Center at Sesame Workshop.

creating opportunities for on-the-go family learning experiences with mobile technology
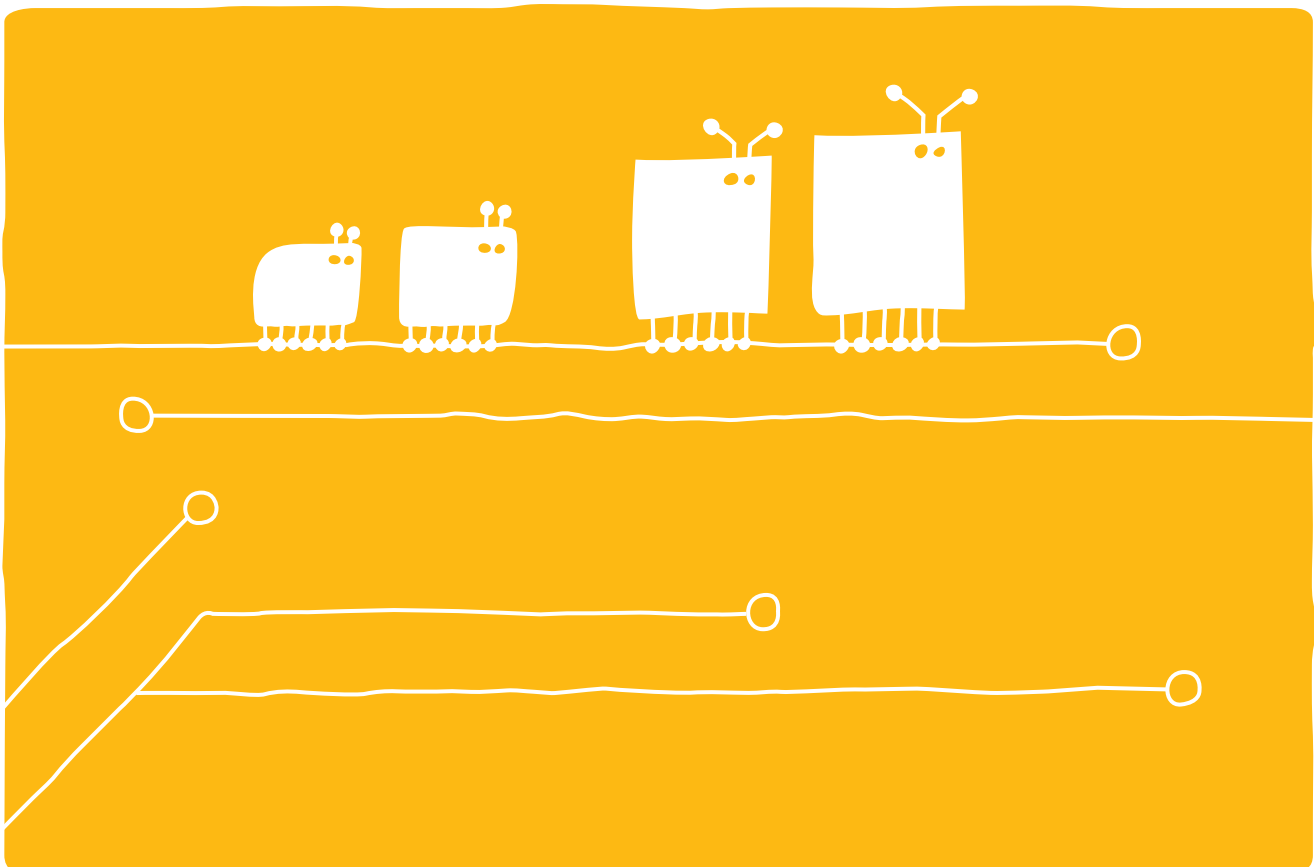
Problem

Busy schedules often keep parents and children from having quality face-to-face time at home during which they can explore new information or activities. Parents and children have many digital and mobile interactions, particularly during the workweek, and these may involve a back-and-forth over the course of hours or days (e.g., texting to one another). How can we support family learning when parents and children have little discretionary time together? How can we design tools, experiences, and activities that leverage mobile technology and digital communication practices that already exist in the family?

Goal

In this challenge, your task is to design an app or an experience that leverages mobile technology to help parents and children to stay connected with each other and engage in learning experiences throughout a busy day.

Family profile: The Carson family

Bob

Catie

Leah
(12 years old)
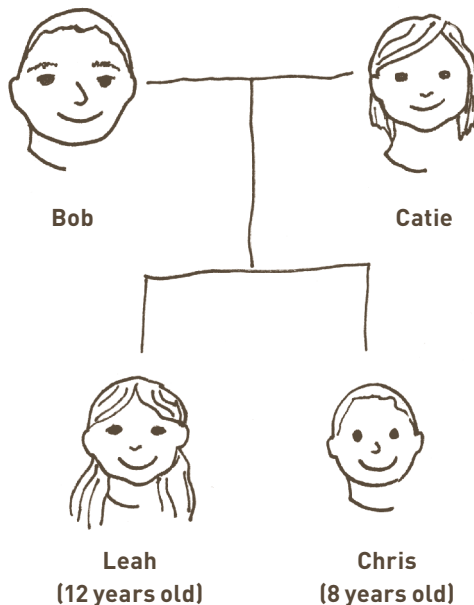
Chris
(8 years old)

The Carsons are a family of four who live in the northwest suburbs of Chicago. Catie and Bob are the parents of Leah (age 12) and Chris (age 8). Both parents work full time, though Catie's transition to full time work is a new development for the Carson household. Leah and Chris attend the public school in their neighborhood and often participate in afterschool activities.

Catie and Bob like seeing their children use technology for entertainment and/or learning. Leah and her brother spend much of their afterschool time before Catie and Bob return home from work with digital media. They read books on a Kindle, play *Minecraft* together across two devices (i.e., the Kindle and an iPad), play *Words with Friends* on Leah's smartphone, and play other games on Leah's laptop. Leah also films and broadcasts videos of her pet snake on a dedicated channel after Catie introduced her to a webcam and helped her set up a YouTube account.

Related to the "snake cam," Leah has been interested in science for several years and has

been cultivating a future identity around being an exotic animal veterinarian. Catie has played an active and concerted role in supporting this interest, especially before she began working full time. For example, Leah and Catie enjoy finding and reading science articles together from the newspaper. They often read and discuss the content of the stories around the kitchen table. Now that Catie is working however, they have much less face-to-face time to do this activity, though they both express in interviews how much they value it.

Catie is often gone in the morning before the children are awake and returns home as the family is sitting down for dinner. So she uses her one-hour each way commute from the northwest suburbs to downtown to connect with her children as they begin their mornings at home. Catie communicates most with Leah, since she is the child with the smartphone, which gives her texting capabilities and easy email access. Leah and Catie communicate extensively about chores, daily plans, and what train Catie will be taking home in the evening. Their communications continue in bursts interspersed throughout the day. Leah has limited access to her phone once she is in the school building (but finds time to check it between classes), and uses it on her walk to and from school. Catie checks her phone between works tasks.
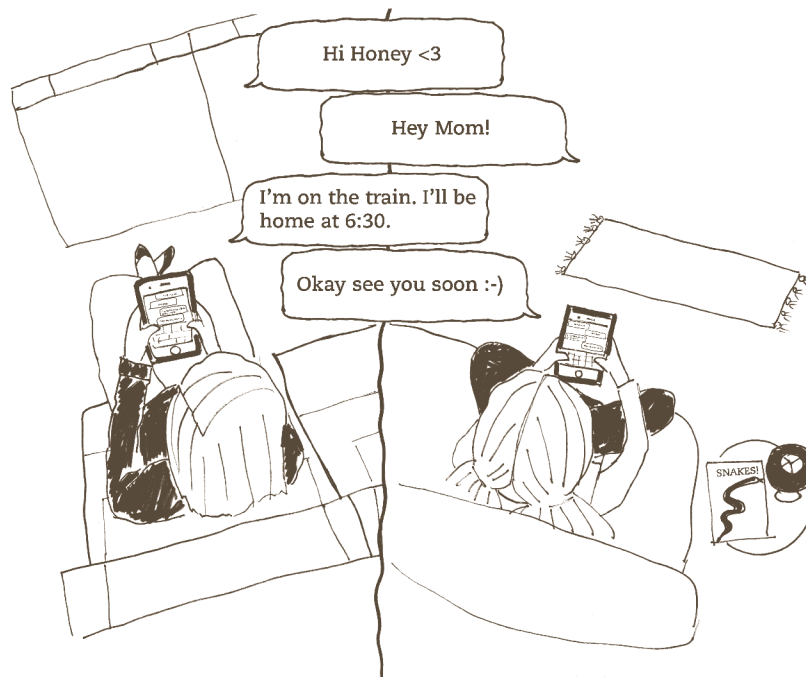
Discussion questions

Empathize: What are the needs?

1. How would you describe the family's relationship with technology?
2. What is the role of mobile technology in the Carson family?
3. How do Catie and Leah's values and interests shape the way they use mobile technology?

Imagine: How might we meet those needs?

1. Other than sharing science articles, what other ways can Catie and Leah use their phones to learn about popular science together, even when they are not doing things at the same place or the same time?
2. What activities can parents and children engage in with mobile technology that are mutually interesting and rewarding?

Create: Design a solution

1. What are some of the essential characteristics of the technologies families use that allow them to interact over a period of time (rather than in real time), and/or provide quick bursts of engagement between parents and children?
2. What features of a design might help both parents and children find, sort, link to, and share resources?

Recommended reading

Leander, K. M., Phillips, N. C. & Taylor, K. H. (2010). The changing social spaces of learning: Mapping new mobilities. *Review of Research in Education*, 34, 329-394.

Raffle, H., Revelle, G., Mori, K., Ballagas, T., Buza, K., Horii, H., & Spasojevic, M. (2011). Hello, is grandma there? Let's read! Storyvisit: family video chat and connected e-books. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, 2011. 1195-1204.

Notes

design guide

What are the ingredients for designing tools and experiences for families with diverse backgrounds to support engagement and learning around digital media? Here, we share the lessons we have learned through our own research and the research of others. New recommendations are shared first, followed by design principles from *The New Coviewing: Designing for Learning through Joint Media Engagement* (Takeuchi & Stevens, 2011). The report illustrates, through cases drawn from research, the importance of using media together in order to unlock its potential to support learning and development. We hope that these guidelines can help designers, educators, and other practitioners who work with diverse populations foster family engagement and learning around media, and inform future research in this area.

Design recommendations

1. **Represent a variety of backgrounds.** Instead of using generic characters or settings, try to represent a diverse range of people, so that many types of families see themselves reflected in your work. This applies to creating media but also to curricular programs—think about the types of people who appear in the books, images, or other materials you use. The families in our research were engaged when they saw characters and situations they identified with. For example, an e-book about artist Diego Rivera engaged Mexican mothers reading with their children. Families also often enjoyed watching *Dora the Explorer* together, and spoke about how they felt it reflected aspects of their language and background. Existing research shows that people of color are vastly underrepresented in media. Children of color are main characters in less than nine percent of children's books, and only five percent of middle grade and young adult fiction (Horning, 2013). People of color both young and old are underrepresented in feature films (Smith, Choueiti, & Pieper, 2013) and in video games (Williams, Martins, Consalvo, & Ivory, 2009).

2. **Address language diversity.** Consider the diversity of languages spoken by families today to engage and benefit more families. Many families in our field studies used translation apps to help their children with school-related tasks like homework. Families in our studies also valued transmitting their native culture and language to their children and used media to do so. Of course, Spanish is only one of the many languages spoken by large immigrant communities in the U.S. A broader adaptation of translation tools and dual language options could make experiences more accessible to both parents and children, drawing in more families. There is room to innovate in this space and create more content to meet the needs of our multi-lingual society.

3. **Support adults to guide and participate.** Adults, including parents, relatives, teachers, and out-of-school educators may wish to use educational resources with children, but may not feel confident or may need guidance to do so. In *Learning at Home,* parents expressed a desire for more information on how to support their children's learning with media (Rideout, 2014). Subtle supports that help guide adults—and don't require a big investment of extra time—can help, without making the experience too heavy on instructions. For example, a short intro video can model how a family might engage with your program, or a children's e-book can suggest helpful questions for parents to ask at a few key points in the story.

4. **Take advantage of mobility.** When creating experiences that use mobile devices, designs need to focus on the particular value mobility can offer for learning. Mobile media is particularly powerful in that it rides along with families when they are on the go, allowing for "anytime, anywhere" learning. Also, many people in the U.S.—particularly young adults, non-whites, and people earning low incomes—use mobile devices as their primary means of

communication and Internet access (Smith, 2015). Instead of creating a mobile version of existing content, designers should consider ways to build on family routines and leverage mobile platforms to help families sustain interactions across multiple places and times. Similarly, when designing in-person experiences or curricula, practitioners need to consider what a mobile device can add to the family learning experience. For instance, mobile devices can be used to look up topics of interest that come up at a museum or on a nature walk; or a scavenger hunt might require families to take pictures and find information along the way.


5. **Help families find and choose media.** In today's overwhelming media marketplaces, many families across the income spectrum find it difficult to find high-quality media content. This is particularly relevant for librarians, educators, and other practitioners serving families, who can play a role in helping connect families with recommended content for children and resources to help parents. The *Learning at Home* national survey data shows that parents want to know more about how to find media for their children. Latino parents showed a particularly strong desire for this information (Lee & Barron, 2015; Rideout, 2014).

Design principles from *The New Coviewing: Designing for Learning through Joint Media Engagement* (Takeuchi & Stevens, 2011)

These principles were developed to help media designers create joint experiences for young children and adults. To add to the recommendations above, we have reprised them here to further support your efforts to engage families.

Kid-driven

Children naturally take initiative when it comes to learning with media, whether by asking questions about a TV show they're watching, or pursuing a tech-based hobby. Adults can help them achieve the goals they set for themselves, but only if they're aware of what those goals are. Build tools and experiences that revolve around a child's existing interests, not just prescribed topics. To do so, producers and practitioners need to design mechanisms that make children's interests visible and can assist adults in responding to them.
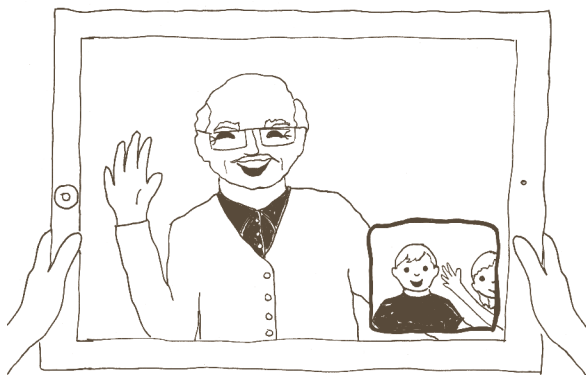
Multiple planes of engagement

With vast developmental differences between co-participants, one size simply cannot fit all. All too often, activities and products are designed for the lowest common denominator to the exclusion of all partners' developmental abilities and interests—which merely patronizes and alienates. Keep everyone engaged by offering content that suitably entertains and sufficiently challenges. *Sesame Street* has been using this strategy for over four decades with proven success (Fisch & Truglio, 2001). Children love Elmo and the cartoons, but parents are drawn to sit down beside them, knowing that Jimmy Kimmel or Kobe Bryant may make a cameo appearance. *Sesame Street*'s humorous allusions to popular culture may fly right over preschoolers' heads, but they still learn from the show, and learn even more when an adult watches with them (Reiser, Tessmer, & Phelps, 1984).

Differentiation of roles

Assigning roles to participants so that tasks and content match up to individual maturity is another way of ensuring that everyone is suitably challenged and/or entertained. This can also minimize confusion over who's in charge of what and mitigate the negative, controlling language that usually accompanies such confusion. Have partners work toward a common goal together, and force them to talk to coordinate their efforts. Interaction often needs to be engineered this way; less structure may fail to elicit dialogic inquiry. Distinct roles, especially in team situations, can also motivate individuals to try their best and not let their partners down.

Previous/next

Consider how an activity or product can build upon a child's past experiences and existing curiosities—revealing these experiences and curiosities to adult partners in the process—and how it can motivate interest in or offer knowledge for subsequent experiences. Design narratives that span time and setting, and involve people from across a child's day (e.g., teachers, parents, siblings, peers). Also consider using a variety of platforms (print, video, games) to tell a single story. Transmedia storytelling, as this strategy is often called, can deepen interest on focused topics, and help children apply their knowledge across settings.

Co-creation

Give partners opportunities to make things together. Consuming content together entails little interaction, but creating a movie, story, game, or other artifact requires quite a bit of dialog and coordination between partners. Building upon the Previous/Next principle, afterward, partners have something to share with others who were not involved in the creation process, such as siblings or grandparents. The literacy, technical, expressive, and collaboration skills children develop through these activities will prepare them for school and work even further into their futures.

Fit

To get families to use a new platform with any regularity, it should easily slot into existing routines, parent work schedules, and classroom practices. There are, after all, only so many hours in the day to accommodate new practices. This may explain why mobile devices are finding pick-up in households with young children: e-books on tablet PCs can be taken to bed for story time and kids can play games on handheld gaming devices in the back seats of cars and supermarket checkout lines. If you want a particular population (e.g., preschool teachers, Latino families) to adopt a new platform, investigate their norms, values, and practices. Don't underestimate the importance of cultural factors in getting people to embrace your resource.

Both sets of guidelines above were developed based on Families and Media (FAM) Project and prior research. While not comprehensive lists, they are intended to help designers and practitioners benefit from what we've learned. As our research and the broader field continue to develop, we will expand and add dimensions to these guidelines. In the meantime, we hope that these will help you create a strong foundation for your work.

appendix

More about the Families and Media Project studies

Families and Media (FAM) Project research documents learning with media as part of family life in several contexts around the country. Researchers investigate how families with children ages 2 to 12 and their families are using media today—amidst the many changes occurring in family lifestyles and in digital media. Researchers from Arizona State University, California State University San Marcos, Northwestern University, Rutgers University, Sesame Workshop, Stanford University, the University of Washington, and the Joan Ganz Cooney Center are learning how families interact with and around various forms of media and technology, particularly among underserved families, whose needs and experiences are too often misunderstood by practitioners and policymakers and overlooked by hardware and content producers. The project postulates that if we can better understand how diverse groups use media, we will be better prepared to ensure equity, taking advantage of the unique capacity of human beings to work, learn, think, and make things together.

Joint Media Engagement, Play, Literacy, and Learning among Mexican-American Families (Phoenix, Arizona)
Principal Investigators: Elisabeth Gee & Sinem Siyahhan

This study examined how Mexican-American families use digital media technologies, in particular video games, in the physical context of their home and in the socio-cultural context of family practices and routines. A total of 16 families with at least one child ("focal child") between the ages of 4 and 6, and at least one child 7 years and older, who owned at least one platform for gaming (e.g., console, computer, cell phone, tablet) participated in this study. Fourteen families were first generation immigrants, primarily spoke Spanish, and had low-income. Two families were second-generation immigrants, primarily spoke English, and had mid-to high-income. We visited families every two months over a six-month period. The study involved interviews and surveys with parents and children about the content and the context of their digital media use. We also observed family interactions around playing digital and non-digital games to capture family interaction patterns and learning in the context of play. Additionally, parents kept a photo diary of play and media activities of the focal child between home visits.

Tapping In: Understanding how Hispanic-Latino immigrant families engage and learn with broadcast and digital media (San Francisco Bay Area)
Principal Investigator: Amber Maria Levinson

This study focused on Hispanic-Latino immigrant families' language and literacy experiences with media and technology at home. For six months, Stanford researcher Amber Levinson visited seven Hispanic-Latino immigrant families with children 2 to 9 years old, living in urban Northern California. The families all spoke mainly Spanish at home; parents were born and raised in Latin America (Mexico, El Salvador, Nicaragua, and Perú), and most of the children were born in the U.S. The study involved conducting interviews and home observations with families, and for the last three months of the study families were given a new iPad with language and literacy apps installed. (Design Challenge 3 shows how one family used a language app that they received with their iPad.) The idea was to uncover how families were already using broadcast and digital media for learning (particularly language and literacy learning), as well as what could be if they had access to a new device with specially chosen content. The research focused on families' practices at home, but also looked at how technology was connecting families across different settings (home, school, community, etc.).

Learning with Media in Modern Families (New York City & New Jersey)
Principal Investigator: Lori Takeuchi

Due to current trends in immigration, divorce, and job relocation, media are playing different roles in family routines and functions than ever before. The aim of this study was to understand how media are being used for learning in modern families—a catch-all to describe families in which children spend significant stretches of time physically apart from at least one parent as a result of divorce, staggered immigration, demanding work schedules, or any other reason. Researchers sought to uncover the ways in which family characteristics (i.e., parent nativity, marital status, language spoken at home), environmental characteristics (i.e., size of home, surrounding neighborhood), and technology (i.e., mobility, connectivity) shape media use and learning in Hispanic-Latino households with at least one child between the ages of 6 and 9 in New York and New Jersey. In all, researchers visited 15 families representing a mix of marital status, generations, and ethnicities, including Mexican, Ecuadorian, Puerto Rican, and Dominican. They conducted parent and child interviews, daily "experience sampling" phone calls, an inventory of technology devices in the home, and observed participants in their homes and communities interacting with and around media and technology over the course of six to eight weeks per family.

Learning Across Networked Spaces (Chicago area)
Principal Investigators: Reed Stevens and Katie Headrick Taylor

This study focused on the digital media use of children and families in and around their homes. Researchers followed children between 9 and 13 years old in the Chicago area for approximately four months to observe their digital media use in the hours after school. In addition to video-based observations, researchers used interviews, mapping exercises, and "experience sampling" over the phone to construct a picture of how and what kinds of digital media young people and their families used in and around the home. The inquiry focused on mobile technologies and how the mobility of devices influenced daily activities that are typically considered "unplugged," such as cooking and practicing musical instruments. The study also looked at how the mobility of technology extended families' interactions outside of the home.

Additional resources

Resources to support hands-on design challenges from the Hasso Plattner Institute of Design (Stanford d.school)

Introduction to Design Thinking Process Guide
https://dschool.stanford.edu/sandbox/groups/designresources/wiki/36873/attachments/74b3d/ModeGuideBOOTCAMP2010L.pdf?sessionID=9a5d0a2a0cd5fb6c26a567b2636b19513b76d0f4

Virtual Crash Course in Design Thinking
http://dschool.stanford.edu/dgift/

Additional Resources and Design Challenges for Further Work
http://dschool.stanford.edu/use-our-methods/

Creating Your Own Design Challenges
https://dschool.stanford.edu/groups/k12/wiki/613e8/Creating_Design_Challenges.html

Guides for designers

Hirsh-Pasek K., Zosh J.M., Golinkoff R.M., Gray J.H., Robb M.B., Kaufman J. (2015). Putting education in "educational" apps: lessons from the science of learning. *Psychological Science in the Public Interest*, 16(1), 3-34.
This set of criteria for designers of educational technologies translates a long history of research in the learning sciences to create tangible goals.
http://psi.sagepub.com/content/16/1/3.abstract

U.S. Department of Education (2015). Ed Tech Developer's Guide.
http://tech.ed.gov/developers-guide/
"A primer for software developers, startups, and entrepreneurs," this guide identifies a series of ten opportunity spaces for designers to tackle, and offers research-based tips on characteristics they should include.

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