

Interactive Family Play

Oregon Museum of Science and Industry

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OMSI Engagement Research and Advancement

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Project Background

The National Institutes of Health (NIH) awarded funding to the Oregon Museum of Science and Industry (OMSI) and collaborating neuroscientists at the Oregon Health & Science University (OHSU) to create a mid-size traveling exhibition, an accompanying website, and complementary programming for use at OMSI and tour sites. The exhibition and programs will promote public understanding of neuroscience research; its relevance to healthy brain development in early childhood, with a focus on current research on the developing brain up to age 5; and reach a national audience of adult caregivers of young children and their families, with a special emphasis on Hispanic/Latino families. The project will be developed in collaboration with museum professionals and community partners, to be bicultural and bilingual (English/Spanish) to engage underrepresented Hispanic/Latino audiences more authentically. The project will also support the development of educational materials including an educators' guide for museum staff and preschool teachers and a bilingual take-home guide for parents and caregivers (See Appendix A – Logic Model for Deliverables and Strategies).

This five-year project, entitled *Interactive Family Learning in Support of Early Brain Development*, has four key objectives:

- Foster family engagement with and interest in neurodevelopment during early childhood, especially in adult caregivers;
- Foster awareness of how neuroscience research leads to knowledge about healthy development in early childhood;
- Inform and empower adult caregivers to enrich their children's early learning experiences; and
- Reach diverse family audiences, especially Latino audiences.

A collaborative, multidisciplinary team of neuroscience researchers, experts in early childhood education, museum educators, and OMSI personnel with expertise in informal science education and bilingual exhibit development will work together to ensure that current science is accurately interpreted and effectively presented to reach target audiences. The project will foster public understanding of early brain development and caregiver awareness and confidence in using play to enrich their children's experiences and support healthy brain development. Visitors will explore neuroscience and early childhood development through a variety of forms—multisensory hands-on interactive exhibits, graphic panels, real objects, facilitated experiences, and an accompanying website. Following the five-year development process, the exhibition will begin an eight-year national tour, during which it will reach more than one million people.

Front-End Evaluation Method

The first phase of the project evaluation took place during Year 1 of the project (April and May of 2018) to support the project team's understanding of caregivers' current knowledge, interests, experiences, and attitudes related to exhibit content. The front-end study sought to identify questions and topics that sparked curiosity and conversations among caregivers regarding their children's brain development and

served as an opportunity to hear caregiver reactions to initial creative and conceptual elements (e.g., themes, design, etc.).

Audience

With an aim of developing project deliverables that provide caregivers of young children up to the age of 5 with relevant and practical findings from research in pediatric neuroscience, the front-end evaluation collected feedback from three caregiver audiences:

1. General audience caregivers (i.e. parents, nannies, and caregivers);
2. Hispanic community caregivers (i.e. parents, nannies, and caregivers from the Hispanic community); and
3. Early childhood educators (ECE; i.e. day care providers and pre-kindergarten and kindergarten teachers).

Table 1

Audience	Sample	Number of Participants	Format
General audience caregivers	OMSI members and visitors to Science Playground	<i>n</i> = 7	90 minutes
Hispanic community caregivers	Parents of children enrolled in Ready, Set, Go! program of Metropolitan Family Services	<i>n</i> = 20	90 minutes
ECE	Head Start Educators	<i>n</i> = 50	Two 30 minute sessions with ~25 participants each

Research Questions

The aim of the front-end evaluation was to gather information from community members about the following questions:

1. How do you have fun with your family? Where do you go? What do you do? How do you most often participate? Do you engage along with your child, guide their engagement? Mostly observe?
2. We want messaging in the exhibit to be for caregivers, yet we still want the experience to be for the whole family. What would help you understand this is an exhibit for adults, yet still meant

- for the whole family?
3. Who do you consider experts in childhood development? What/who are your trusted sources of knowledge?
 4. If you could tell the development team at OMSI one thing about how they should design this exhibit, what would it be?

Similar questions were used for the educators' focus group, but with the caveat that the questions asked participants to frame their answers based on their perception of parents/caregivers, rather than responding for themselves.

Protocol

The evaluation protocol was developed in collaboration with the core team members of the project (Appendix B – Focus Group Protocol). The team brainstormed possible areas of interest which were then compiled, prioritized, and edited to develop discussions prompts for the focus groups. In addition, the team developed four themes and several related messages for the focus group audiences to consider (Appendix C – Big Ideas and Messages). Messages were organized under a theme and these were posted on chart paper. The findings of this evaluation phase will inform concept development, exhibit design, educational program development, and other deliverables related to the project.

Evaluators from OMSI's Research & Evaluation (R&E) team led the front-end study. The evaluators planned to conduct one 90-minute focus group with each of three audience groups. Due to scheduling considerations with early childhood educators, focus groups had to be limited to 30 minutes. Ultimately, two 30-minute focus groups were convened with educators; the list of questions and discussions times were shortened to accommodate. During each focus group, evaluators used a protocol developed from the research questions to facilitate the discussion and gather qualitative data to inform the study and explore front-end evaluation questions.

In addition, focus group participants were asked to place colored stickers on chart papers to identify one of four themes they felt was most important to them, and then to select three messages that most resonated with them, as well as three that they liked the least.

One OMSI staff from the program and education division facilitated the discussion for the Hispanic and general audience caregivers and one evaluator facilitated the ECE focus group. A second OMSI staff supported participants' arrival and check-in and took notes during the focus group discussions. The notes were reviewed by evaluation staff and the comments were grouped into emergent categories.

Data Analysis

Hand-written notes were taken for all the focus groups, and audio recordings were made during the caregiver focus groups. Hand-written notes were transcribed into a Word document by an evaluation team member and hard copies were scanned into digital format; both hard and digital copies were securely stored. Quantitative data from the themes and messages were analyzed to determine frequencies using simple descriptive statistics. Qualitative data in the form of responses to open-ended questions were recorded by question and then categorized into themes. Specific quotations were selected from open-ended responses in the data to illustrate representative ideas and themes in this report.

Limitations

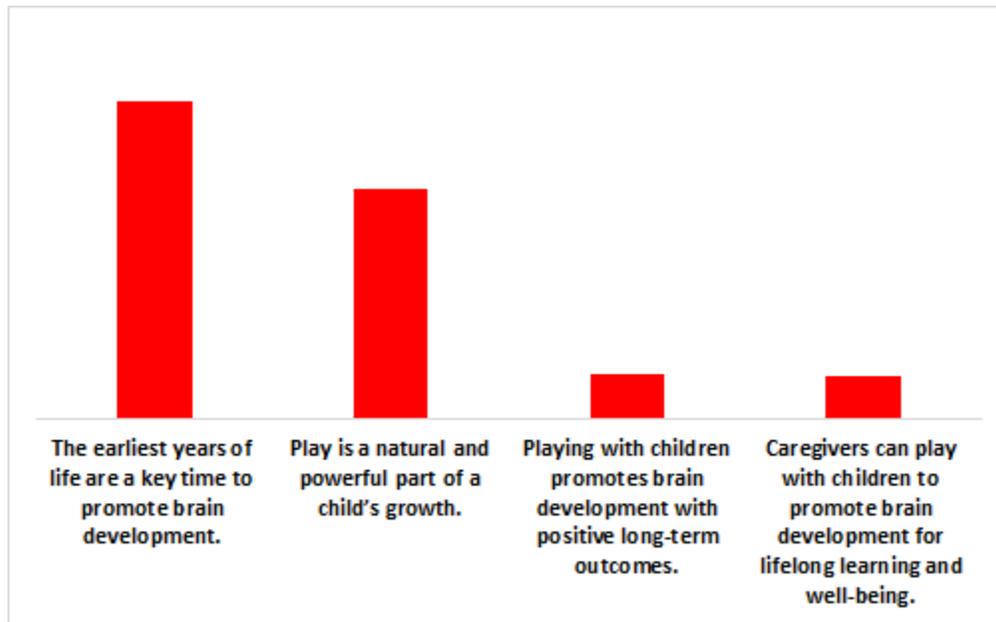
As in any research, the data collected was influenced by the collection method used. A common limitation of focus groups is that answers provided by focus group participants may be influenced by other members of the group, and collected data may also reflect opinions only of the most outgoing, vocal group members. Furthermore, the participants in the focus group do not necessarily represent the whole of their demographic. For example, although the majority of the caregivers who participated in the Ready, Set, Go! focus group were Spanish speakers, it is important to avoid generalizations or attributing themes and messages to a group in the population. The participant's background, program, and location could have had a significant influence on how they voiced their preferences, opinions, and needs. This study was not designed to compare focus group results, but rather, to ensure that voices were being included.

Findings

Themes and Messages

Each participant placed a red dot on one of the four themes they felt was most important (See Appendix B – Focus Group Protocol). In the Ready, Set, Go! and Head Start groups, the most red dots were placed on *The earliest years of life are a key time to promote brain development* while the OMSI parents gave the most red dots to *Play is a natural and powerful part of a child's growth*.

Figure 1 - Themes



Participants were then given three green dots to put on the messages that resonated most with them and three yellow dots for the messages that they did not like as much.

The message that received the greatest number of positive green dots was ***You are your child's first teacher.*** This message received a total of thirty-nine positive green dots and only one negative yellow dot. This means that 22 percent of the positive green dots across all three focus groups were given to this message.

Three messages received only positive green dots:

- *Play builds social, emotional, and mental skills.*
- *Talking, singing, and reading all boost learning.*
- *Play can happen anywhere.*

Two messages were split by group. *You have everything you need to play with your child,* and *There are no special requirements for play,* received generally positive votes from OMSI and Head Start audiences and negative votes from the Ready, Set, Go! group.

The message that resonated least across the three focus groups was, *There is a limited window for early childhood development.*

Figure 2 – Messages Received



- Developmental stages (stages are not ages)
- Learning styles
- Chemistry changes in brain during play
- History of childhood development
- Categories of play
- Ideas about early development across cultures
- The exhibition as a place to see development content happening live

Caregiver Considerations

Caregivers have some very specific ideas about how the exhibition could help them. They wanted suggestions and examples, but not pressure. They wanted ideas for things they could do at home. Considerations for helping them manage their children were also important, such as a single entrance and exit and easy line of sight throughout the exhibition. Additional ideas that participants mentioned include:

- Examples for parents:
 - How to interact with kids
 - How to engage without toys
 - Video examples: push here to see how to do this at home
 - Ideas for activities that contribute to development
- Not too much reading
- Suggestions for questions or prompts for children right then and there
- Empower without pressure
 - You're not doing anything wrong; here are some ideas
 - It's normal even if it is driving you crazy
- Easily replicable
- One entrance/exit

- Line of sight

Engaging Children

Participants wanted interactive, hands-on and stimulating activities for children with an area for quieter play as well. Some would like to see opportunities for children to lead activities or play independently. The role of parents was another aspect that differed by group. Ready, Set, Go! parents wanted more opportunities to engage with their children while OMSI parents seemed more comfortable doing their own thing while the children played nearby. Some ideas participants mentioned about how to engage their children are:

- Independence for kids
- Activities, hands-on, touching, building
- Engage all senses
- Lots of color
- Have a quiet area

Exhibit Elements

Many participants mentioned using materials and activities that children are familiar with and those that can be replicated at home. Parallel activities for children and adults were also suggested. For example, providing an activity for kids to do and information for adults that explains what the kids are doing, as well as how it contributes to development, is an effective parallel activity. Staff presence in the exhibition was also mentioned, to provide demonstrations of how to interact and to answer questions. Other elements mentioned by participants were:

- Use household/everyday items
 - Natural elements
 - Recycled items
- Things to build together – work as a family
- Bilingual
- Have facilitators available to demonstrate or explain
- Tiered information for adult and child
- Graffiti wall to share experiences

General Advice

Advice to developers included being inclusive and to make considerations for all types of families and children. Ideas about who qualifies as an expert on childhood development ranged widely; caregivers look to many sources for inspiration and information. Experts can be anyone from friends, other parents and family to Google, pediatricians and authors/researchers. In general, participants noted that the exhibition should:

- Be inclusive
- Be careful about language and representations of “family”
- Consider ‘atypical’ children

Conclusions

Based on the data gathered, the following conclusions have been drawn related to the specific topics discussed in the focus groups.

Play

Focus group responses varied regarding special requirements for play and having everything needed to play with their child. Counts from the theme and messages selections suggest that focus group participants feel that play is important for young children, but not necessarily that caregivers ‘play with’ children. It has been noted that the two themes that include the phrase “play with” are similar and may have split the vote; however, other comments support this difference. As noted in the findings, the focus group participants differed on their approach to children and how they value engaging with children versus observing children engaging with others. While some caregivers wanted experiences within the exhibition to engage together with their family, others sought opportunities for their child to engage with others their own age. This was particularly true of the Ready Set Go! focus group in which participants stressed the importance of playing with their children and providing activities that include the whole family. One participant said: *“A nuestros hijos les gusta que juguemos con ellos. Les gusta jugar a la lotería, a imitar (tarjetita) mímica”* (Our kids like when we play with them. They like to play a game “lottery” and charades). Participants from the OMSI families were also interested in providing activities for their children, but respondents pointed out that they preferred to allow their children to play more independently and with other children. One participant mentioned her interest in providing opportunities where her child can run around independently because he doesn’t want to be following her.

Empowering Caregivers

Empowering without pressure was something that most of the participants were interested in; caregivers expressed their need for information and advice, but do not want to feel they are being lectured to or criticized. They are seeking an environment where it is acknowledged that they all are learning (how to care for young children) and seeking opportunities where they can share experiences, advice and tips with each another. In this regard, caregivers noted that they consider a wide range of resources and people, ranging from the Internet and their pediatrician to other caregivers, including their own parents, as “experts”. One of the most selected messages was one that highlighted that caregivers are their child’s first teacher. By providing information about current research, examples of how to interact in positive ways and the opportunity to share diverse experiences, the exhibition has the potential to build caregiver confidence in the role they play in their children’s development.

Exhibition Content

Another important consideration is the exhibition content and elements. An exhibition geared for caregivers of young children (without children present) would likely include different and/or additional information and approaches than one geared for caregivers with young children. In particular, caregivers with children expressed their interest in having an exhibition that incorporates both stimulating hands-on activities and a quieter play area for children. Participants from the Ready, Set, Go! focus group

mentioned the importance of an exhibition that is interesting and engaging for their children. One respondent mentioned: *“Has to be something to catch everybody’s interest. So kids stay.”* In this regard, the exhibition could serve as a venue that provides activities for children while allowing caregivers the opportunity to observe and get information that explains the type of activities that kids are doing, how they contribute to development and how they, as caregivers, can foster productive engagement. Finally, focus group respondents mentioned their interest in incorporating the use of everyday items in the exhibition, so that experiences are seen as a safe and welcoming space, and could also be replicated at home.

Considerations

Based on the findings of this study and the project logic model, it is recommended that the core team pay special attention to the following considerations.

The primary audience of the exhibition is caregivers with young children; this is interpreted by the team to mean caregivers with children present at the exhibition. Therefore, the exhibition content and design should focus on caregivers as the primary audience while providing accommodation for others, in particular children of diverse ages and abilities, as well as bilingual families.

Research on early childhood development should serve as a support for the practical and helpful information that adult caregivers seek. On this point, focus group participants expressed the need for experiential activities that are backed by theory—in particular, activities according to age and development. The exhibition experiences should not only help caregivers understand their children’s development and play, it should provide examples and tips for how they can foster positive growth.

Another important element for a traveling exhibition that will reach diverse spaces and audiences is that the content and the components of the exhibition need to be able to stand alone and provide enough information, but at the same time should allow opportunities for facilitation and interpretation.

Finally, as mentioned by focus group participants, the exhibition might benefit from including a social space for caregivers to share experiences, commiserate, and communicate to each other. Features such as a graffiti board, on-site discussion thread and/or opportunities to report on what they see their child(ren) doing could facilitate interactions across visitor groups.

Appendix A: Logic Model

Logic Model

<p>Big Idea: <i>Research shows that play, something my family loves to do, is important for building my child's long-term brain development.</i></p>				
<p>Need: Caregivers need to understand the early childhood education window is a critical time for long-term brain development, and that they can play a role in supporting this development (Center on the Developing Child at Harvard University, 2016).</p>				
Target Audience	Deliverables	Strategies	Intended Outcomes	Intended Impacts
<p>Visitors to OMSI and tour venues at small and mid-sized museums</p> <p>Focus Audience: <i>Adult caregivers with young children up to age 5, families with young children, and Latino families with young children</i></p>	<ul style="list-style-type: none"> 1,500 to 2,000sq.-ft., bilingual traveling exhibition for Oregon and national audiences Visitor programing to support and extend exhibit experiences Resources to support exhibit and program experiences (such as an educator or parent guide) Project webpage Dissemination of results through conference presentations and journal article(s) 	<p>Exhibit Content</p> <ul style="list-style-type: none"> Informed by partnerships with neuroscientists and experts in the field Highlights use of current and foundational research; specifically, will be informed by Head Start Learning Outcomes Framework <p>Exhibit Design</p> <ul style="list-style-type: none"> Bilingual (Spanish/English) and bicultural co-development of exhibit Guided by Universal Design frameworks Promotes family learning through family-friendly exhibit design <ul style="list-style-type: none"> Multi-sided, multi-user, accessible, multi-outcome, multi-modal, readable and relevant Uses successful approaches for informal learning environments <ul style="list-style-type: none"> Social learning <p>Programmatic Support</p> <ul style="list-style-type: none"> Creation of resources caregivers can use during visit and at home Provide staff at OMSI and touring venues resources to facilitate meaningful experiences Dedicated exhibit website to support venues and caregivers long-term <p>Research-supported, bilingual and bicultural evaluation throughout the project</p> <ul style="list-style-type: none"> Such as approaches, procedures, and tools adapted from Adult Child Interaction Inventory 	<p>The majority of our target audience will:</p> <ul style="list-style-type: none"> Engage in activities that demonstrate how the brain grows and changes, and the role of interactive play in childhood brain development and learning. Engage in playful activities together to learn about brain-research-based practices that enhance early childhood learning. 	<ul style="list-style-type: none"> Caregivers will understand the importance of family interaction and play in the development of their children Caregivers will be aware that scientific research has shown the benefits of rich, play-based interactions Caregivers will feel more confident and comfortable in their ability to support their children's development through interactive play Caregivers will use or plan to use one or more interactive play strategies outlined in the exhibition

Appendix B: Focus Group Protocol

Interactive Family Learning Focus Group Protocol

Hello and welcome to our session. Thanks for taking the time to join us to talk about play and brain development. My name is _____ and this is _____ who will be helping out and taking notes. _____, one of OMSI's exhibit developers is also here to listen in. OMSI recently received a Science Education Partnership Award from National Institutes for Health to develop an exhibit on how play contributes to brain development in young children. We want to know how we can best communicate with and serve the people who are spending time with kids as they develop. We are having discussions like this with several groups around the area; you were invited because you _____.

I am passing around a consent form. By signing these forms, you are agreeing to participate in the focus group and to keep our discussion confidential. If you feel uncomfortable for any reason signing these forms, you are free to leave at any time. Please take a moment to read them over.

You've probably noticed the microphone. We're tape recording the session because we don't want to miss any of your comments. People often say very helpful things in these discussions and we can't write fast enough to get them all down. We will be on a first name basis today, but we won't use any names in our reports. You may be assured of complete confidentiality. The reports will go back to OMSI's exhibit developers to help them plan this exhibition.

There are no wrong answers but rather differing points of view. Please feel free to share your point of view even if it differs from what others have said. Keep in mind that we're just as interested in negative comments as positive comments, and at times the negative comments are the most helpful.

Before we begin, I would like to go over a few ground rules for the focus group. These are in place to ensure that all of you feel comfortable sharing your experiences and opinions.

Ground Rules:

1. *Confidentiality* – As per the non-disclosure form, please respect the confidentiality of your peers. The moderator will only be sharing the information anonymously with relevant staff members.
2. *Cell Phones* – We ask that you turn off your phones. If you cannot and if you must respond to a call, please do so as quietly as possible and rejoin us as quickly as you can.
3. *One Speaker at a Time* – Only one person should speak at a time in order to make sure that we can all hear what everyone is saying.
4. *Use Respectful Language* – In order to facilitate an open discussion, please avoid any statements or words that may be offensive to other members of the group.
5. *Open Discussion* – This is a time for everyone to feel free to express their opinions and viewpoints. You will not be asked to reach consensus on the topics discussed. There will be no right or wrong answers.

6. *Participation is Important* – It is important that everyone’s voice is shared and heard in order to make this the most productive focus group possible. Please speak up if you have something to add to the conversation!

The whole process will take about 90 minutes and we will be taking a couple of breaks, but if you need snacks, or to step out for a moment, please feel free to do so. Bathrooms are

_____.

Well, let's begin. We've placed name tags on the table in front of you to help us remember each other's names. Let's find out some more about you. Tell us your name, and your favorite game or activity as a kid.

1. How do you like to have fun with your family? Where do you go? What do you do? How do you most often participate? Do you engage along with your child, guide their engagement? Mostly observe?
2. We want messaging in the exhibit to be for caregivers, yet we still want the experiences to be for the whole family. What would help you understand that this is an exhibit for adults, yet still meant for the whole family?*
3. Who do you consider experts in childhood development? What/who are your trusted sources of knowledge?
4. What do you want to know about: how kids learn? Brain development? Play?***
5. Would you rather get information through case studies or stories about other people and families, or more directly through text, audio or video?
6. We would like to run some possible big ideas and key messages about play and brain development past you. Tell us which you like and which you don't like.*
7. Please share a story about a time you have observed or taken part in playful moments with a child that you recognized as part of the child's growth.
8. If you could tell the development team at OMSI one thing about how they should design this exhibit, what would it be?
9. Have we missed anything?

Thank you all for your time. We value your input and the ideas you have shared with us today. Please look forward to our exhibit on the Brain and Play!

* Due to limited time, only three items were used during the educators focus group.

Appendix C: Big Ideas and Messages

Interactive Family Learning Big Ideas and Messages Brainstorm

The earliest years of life are a key time to promote brain development.

Play now: there's no time like the present.

There is a limited window for early childhood development.

Young minds have the greatest potential to grow.

Caregivers can play with children to promote brain development for lifelong learning and well-being.

You have the power to help build your child's brain.

You are your child's first teacher.

Lay the foundations for lifelong learning.

Play is a natural and powerful part of a child's growth.

Play can happen anywhere.

You have everything you need to play with your child.

There are no special requirements for play.

Playing with children promotes brain development with positive long-term outcomes.

Play is an opportunity to make connections and learn.

Play builds social, emotional, and mental skills.

Talking, singing, reading all boost learning.

Play is uniquely powerful.