



# *AlegreMENTE / Happy Brain* Exhibition

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## Summative Evaluation Report

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*All images in this report are courtesy of OMSI.*

# BACKGROUND

## Study Purpose & Methods

*AlegreMENTE: Celebrando Conexiones Tempranas / Happy Brain: Celebrating Early Connections* (hereafter referred to as *AlegreMENTE*) is a traveling exhibition designed for caregivers of children ages 0-5, seeking to convey research-based information that caregivers' playful, loving interactions supports children's brain development and has lifelong benefits. The bilingual, 1,500 square-foot exhibition was developed by the Oregon Museum of Science & Industry (OMSI). For summative evaluation, the exhibition was installed and tested in two locations – OMSI (a science center) and San Jose Children's Discovery Museum (CDM) in 2021-22. Evaluation focused on the use and response of caregivers within the target audience groups to the experience of exploring with their child(ren).





## BACKGROUND

# Exhibition Goals

Caregivers of young children (ages 0-5) were the target audience, with a focus on Latino caregivers. While the experience focused on play for young children, the exhibit messages were meant for their adult caregivers.

The exhibition's big idea reflected that the target audience for the exhibition's messages was adult visitors: **Research shows that your playful, loving interaction builds your child's brain and benefits your child for the rest of their life.** More specifically, the exhibition was designed to inform parents and caregivers about the neuroscience of the developing brain, while engaging families in developmentally appropriate experiences that support brain growth in the first years of life.

The 1,500 square-foot traveling exhibition was designed as a Spanish-first, bilingual exhibition, in collaboration with partners and advisors at Oregon Health & Science University, the Metropolitan Family Service "Ready, Set, Go!" Program, Vroom, and other organizations and experts.

In support of the messaging and experiential goals, *AlegreMENTE* was designed with several key strategies of representation, illustration of play, and inviting environment to promote adult-child engagement in interactive play on-site.

Key strategies that designers used to promote their goals included:

- Inclusive representation of race, gender, and caregiver roles and relationships
- Illustrations that model behaviors of adult-child interaction and connection
- Physically comfortable for both young children and adults
- Activities built to enable back-and-forth interaction and that assign roles for adults in the play
- Visual interest and interaction for both children and adults

# Exhibition Design, Outcomes, & Indicators

The exhibition hoped to prompt adult-child interactive play beyond its walls - that caregivers can keep playing at home.

This objective was lofty, but the designers thought about different ways that their design choices were intentionally building toward that goal. Evaluators used the framework of the Theory of Planned Behavior (TPB), which is a theory focused on what is necessary to shift in an individual to lead to their ongoing behavioral change. The table below illustrates an overview of how the project team felt the exhibition’s design supported future behavior change.

TPB Component	<i>AlegreMENTE</i> Design Strategies	Outcome Caregivers will...	Potential Indicators of Outcomes Caregivers will...
<b>Attitude</b> about the behavior, whether it has value or benefit	Signage for caregivers about play behaviors, child development, and science of the “why” behind specific play behaviors. *Science Boost design elements and intro panels.	Understand that parent-child playful interaction is beneficial for young children and/or for their development.	<ul style="list-style-type: none"> <li>• Be aware that the exhibition was designed to show benefits of play for children. (70%+)</li> <li>• Believe that brain development is one of the top 3 most important reasons why parent-child play is good for young children. (50%+)</li> <li>• Feel they learned something new about play behaviors and/or benefits for children (and can name what was learned). (30%+)</li> <li>• Look/read some signage while in the exhibit w/ child. (30%)</li> </ul>
<b>Normative Beliefs</b> about what others expect of them	Interactive exhibition elements that model interactive play-strategies; reinforced with signage, activity stations, roles for adults, and materials. (Museum “norming” expected behaviors for parents.) *Try This design elements	Feel the exhibit validated or highlighted ways they are experts of their children’s development, and that by connecting/playing with them, parents are helping their children.	<ul style="list-style-type: none"> <li>• Report a sense that the exhibit validated that they are the most influential adult in their child’s development. (50%+)</li> <li>• Report the exhibit reinforced that the play they already do with their child is helping the child. (50%+)</li> </ul>
<b>Perceived Behavioral Control</b> , or the sense of ability to do the behavior	Designed with comfort and safety of <i>both</i> adults and small children in mind, to promote comfortable lingering and doing. Modeling only interactive play activities that any family could do at home.	Demonstrate comfort with a supportive caregiver role in their child’s play. Feel they found at least one interactive play activity that they already do or could try.	<ul style="list-style-type: none"> <li>• In the exhibition, take a supportive adult role at one or more of the interactive stations (e.g., co-player, facilitator, interpreter, supervisor). (70%+)</li> <li>• Able to name/identify specific types of interactive, adult-child play behaviors they encountered in the exhibition. (70%+)</li> <li>• Took one of the Vroom handouts home with them. (5%+)</li> </ul>
<b>Intent to Act → Action</b>	The combination of everything above leads to the desired change. Offering take-home and posted information.	Intend to use (and then do use) one or more interactive play strategies at home.	<ul style="list-style-type: none"> <li>• At the exhibition, can identify 1+ play strategy from the exhibition they plan to keep doing or newly start doing with their child. (50%+)</li> <li>• 4-6 weeks after visiting the exhibition, can identify 1+ play behavior they have done with their child (even if they did it previously) (30%+)</li> </ul>



## Background

### >> Evaluation Questions

The summative evaluation of *AlegreMENTE / Happy Brain* was guided by several overarching evaluation questions, meant to consider the degree to which and ways in which the exhibition achieved its goals with adult caregivers who experienced the exhibition in its two locations.

The evaluation was conducted at the first two locations where the exhibition was installed – a science center (OMSI) and a children’s museum (CDM). For the evaluation at both locations, the institutions made efforts to invite visitors from Latino community groups to come to the museum and explore the exhibition to ensure the inclusion of their perspectives in the summative study.

# 1

**To what extent does the exhibit experience in *AlegreMENTE* achieve its intended impacts with caregivers of young children?** In particular:

- How well does it achieve these goals in a children’s museum environment (compared with a science center)?
- How well does it achieve these goals with Latino caregivers? Is there anything distinct in their response?

# 2

**What are key drivers to action in the exhibition?**

- What exhibit components seem most effective at engaging adult interaction and/or leading to outcomes?
- What outcome area(s) appear to be most activated by the experience (i.e., attitudes, norms, self-efficacy, or intention to act)?

# 3

**How effective is the exhibition at leading to play behaviors by caregivers in the 4-6 weeks after their exhibit experience?**



# Methods: Observation

## Observations: Timing & Tracking

We created an observational protocol for this exhibition that combined elements of exhibit timing and tracking, but more heavily emphasized coding of observable caregiver behaviors using a typology of adult-child interaction in museums (Adult-Child Interaction Inventory; Beaumont, 2010). Each observation focused on one adult caregiver's movement and behaviors, recording:

- Total stay-time;
- Elements the caregiver stopped at;
- Total time caregiver spent at an element;
- Caregiver behaviors interacting with child play at an element (co-player, facilitator, interpreter) and not interacting (supervisor, downtime)

Observations were un-cued and focused on a single caregiver per group. Notably, caregivers did not always stay side-by-side with a child during observations. Because exhibit goals were for the caregiver, observers focused on how the adult used the space and prompting of the adult to engage in playful interaction. Multiple caregiver behaviors were frequently recorded at a given stop, as adults shift between several roles.

## Observation: Data Cleaning & Analysis

A total of 157 adults were observed and recorded during data collection; 89 at OMSI and 68 at CDM.

These data were first reviewed to filter out any tracks that had captured an incomplete exhibition visit. For example, if a caregiver entered the exhibition briefly, looked around a bit, but left very quickly – their observation does not represent the experience of visiting the exhibition (rather, it reflects the experience of passing through and choosing not to engage). Our data set filtered out 8 observations that were shorter than 2 minutes in duration (typically with fewer than 2 stops) and 3 observations where the data collector noted that it was an incomplete observation. This resulted in a final data set of 146 observations, with 79 from OMSI and 68 from CDM.

Remaining data were analyzed descriptively, including average stay-time, counts/percentages of visitors who stopped at each element, and frequencies of behaviors observed when stopped at an element and overall in the exhibition. Data were then compared between OMSI and CDM to look for differences in use by setting.



# Methods: Exit Interview & Follow-up Survey

## Exhibit Exit Interview + Questionnaire

To understand what meaning caregivers took from *AlegreMENTE*, we used a combined exit interview and questionnaire at the exit of the exhibition. We used open-ended questions to allow the caregiver to describe what they recalled or took away from the exhibition. Because exhibition outcomes included intent to engage in specific play behaviors at home, we used a structured questionnaire to present those play behaviors and allow caregivers to select what they already do at home and intend to try in the future. These questions were viewed and answered on a tablet, along with demographic data. Questionnaire data was then paired with interview data for analysis.

**All data were collected by bilingual staff**, who began each interaction by asking families if they preferred to be interviewed in English or Spanish. Questionnaires were presented in the language chosen by the visitor. A total of 157 interviews were collected, with 65 at OMSI and 92 at CDM. 42 interviews were conducted in Spanish. Not all adults completed the questionnaire (due to time and technical issues), so sample sizes vary.

## Follow-up Survey

To explore whether or not caregivers actually followed through on intentions to play with their children following their visit, we used a follow-up online survey, distributed 4-6 weeks following the visitor's experience at *AlegreMENTE*. Caregivers were initially recruited to this study at the end of their exit interview at the museum. They were invited to provide an email address or SMS number to be contacted for a very short (<5 minute) follow-up survey, for which they would receive a \$15 Amazon gift card.

In total, 66 visitors volunteered to be contacted for this portion of the evaluation (31 from OMSI and 35 from CDM). They were contacted on a rolling basis (timed so that the initial invitation was ~4 weeks from the date of their interview) via their preferred contact method, with 1 or 2 reminders. In response to this request, we received 32 caregiver responses about their ongoing play behaviors in the weeks following their visit (a 48% response rate, which is strong for a follow-up email survey).

## Descriptive Analysis

Interview data were reviewed and a set of code books developed for categorizing the themes and ideas present in each caregiver's response to each question. Categories were designed to reflect both the exhibition goals and the words and phrases adults used to answer the questions. Each response was coded into the appropriate theme(s), with coding decisions reviewed and agreed upon by two evaluation team coders. Responses collected in Spanish were translated and coded by our team's bilingual evaluation partner, to ensure that any nuance of meaning in the original language was accurately reflected in the analysis.

Once qualitative data were coded, quantitative descriptive analysis was conducted, providing frequency counts of ideas that were expressed more and less often to each question. In addition, we further explored data to look for any areas of notable difference in the responses based on two variables: location (children's museum or science center) and ethnic identity (self-identified as Latino or not). Those are explored in sections at the end of this report.



# CUÉNTAME UN CUENTO

Elige una foto y comienza a contar un cuento. Comienza con "Había una vez..." Anima a tu niño a continuar el cuento. Túrnense para ir agregando cosas. No importa si el cuento tiene sentido o no, siempre que ustedes estén divirtiéndose.

TÚRNENSE



# TELL ME A TALE

Pick a picture and start a story with it. Begin with "Once upon a time, there was a..." Ask your child to help you continue the story. Take turns adding to it. It doesn't matter if the story makes sense, as long as you're having fun.

TAKE TURNS

## Science Boost

Making up stories together helps your child to learn and use many different words. Your child is practicing the skills of creativity and of working together. They're also using their working memory to remember what has already happened in the story.

Powered by Vroom

## Ciencia en acción

Inventar cuentos juntos ayuda a tu hijo a aprender y usar muchas palabras diferentes. Tu niño está practicando habilidades de creatividad y de trabajo en conjunto. También está usando su memoria funcional para recordar qué es lo que ya pasó en el cuento.

Impulsado por Vroom

# RESULTS

## Study Participants: Demographics

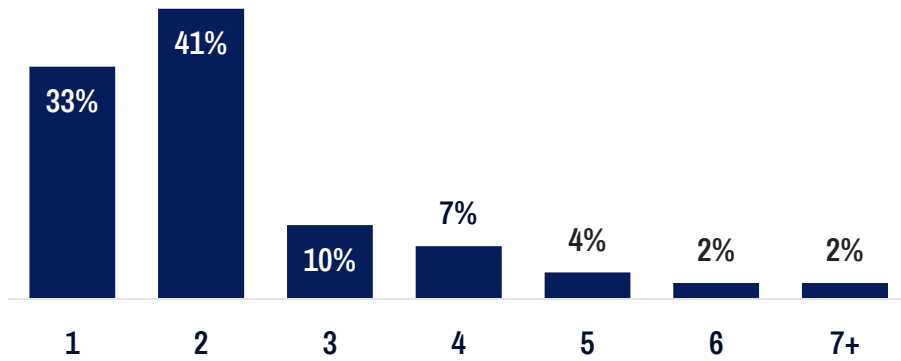


# Group Size & Composition

Groups observed and interviewed typically contained 1 to 2 adults and 1 to 2 children. There were no significant differences in group size or composition between the two museum locations in the evaluation.

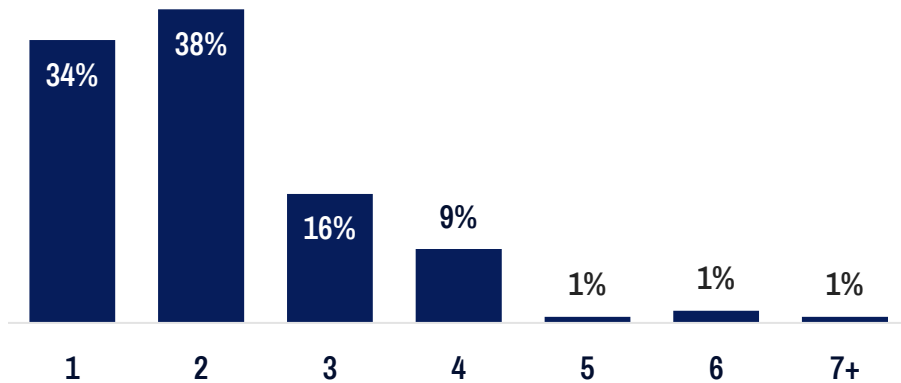
## Exit Interviews – Number of Adults in Group

Self-reported via survey immediately following interview. (n=134)



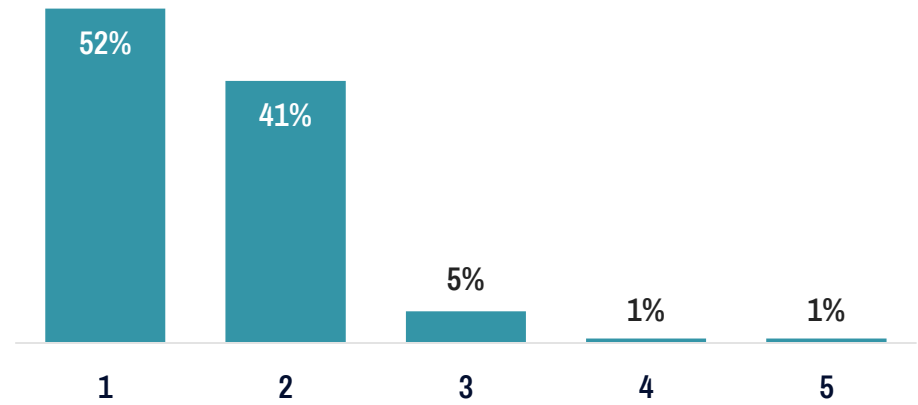
## Exit Interviews – Number of Children in Group

Self-reported via survey immediately following interview. (n=134)



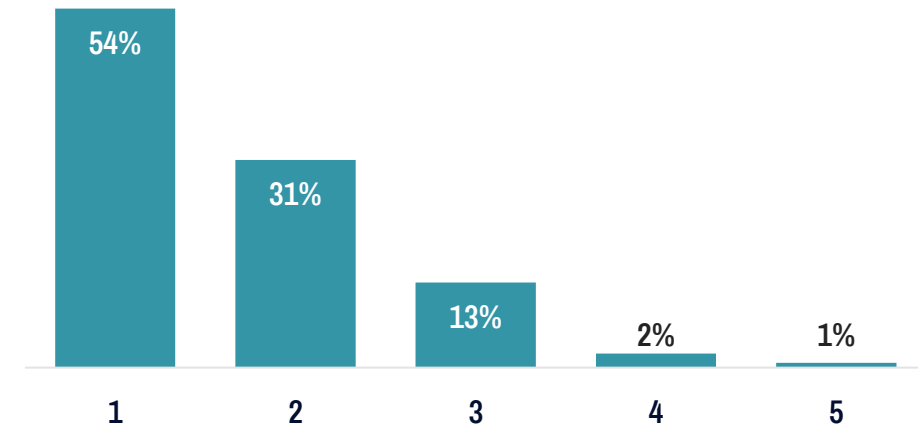
## Observations – Number of Adults in Group

Based on adults present during observation. (n=141)



## Observations – Number of Children in Group

Based on adults present during observation. (n=142)

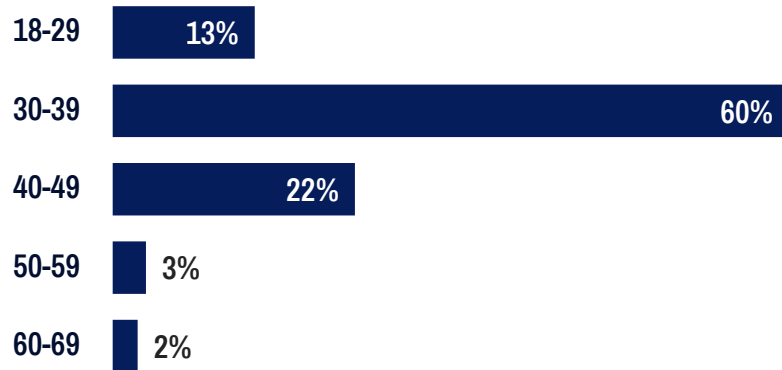


# Ages of Adults & Children

Adults observed and interviewed were largely in their 30s, visiting with children 5 and under. There were no significant differences in ages represented across the two evaluation sites.

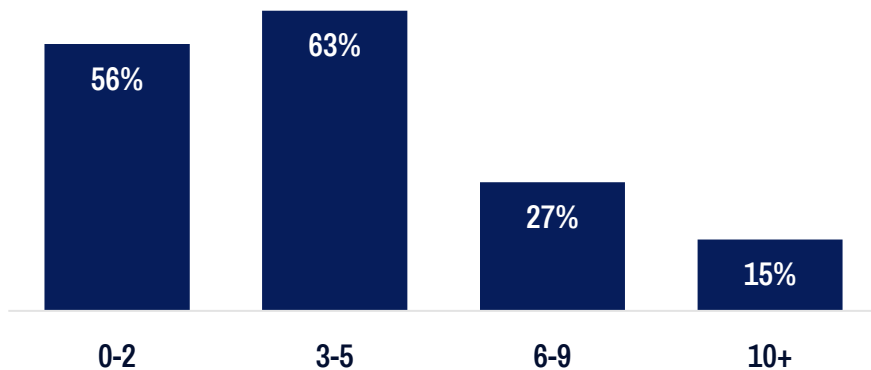
## Exit Interviews – Age Ranges of Adults in Group

Self-reported age of primary adult who completed the interview and survey immediately following interview. (n=134)



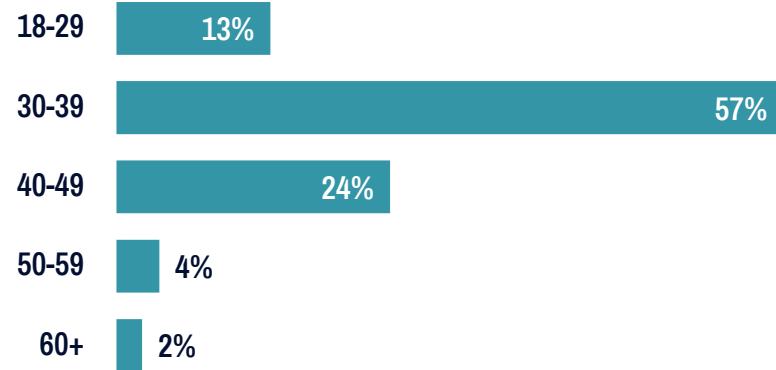
## Exit Interviews – Ages of Children in Group

Self-reported via survey immediately following interview. Participants indicated any ages of children present in their group that day. Percentages show **how many groups contained children of that age**, so they will add up to more than 100%. (n=134)



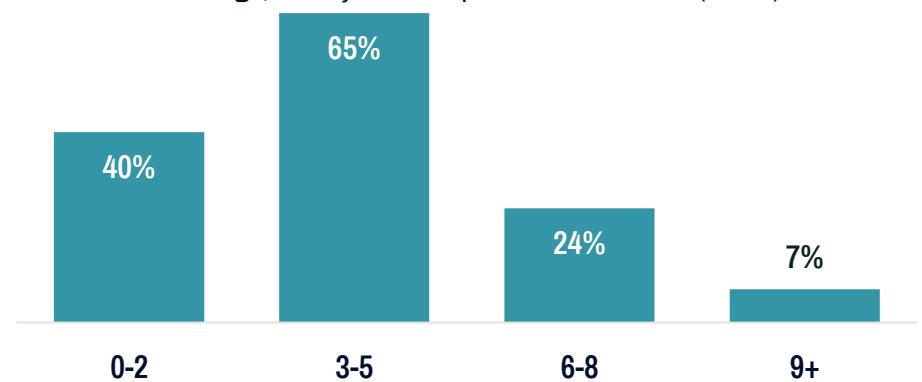
## Observations – Approximate Age of Tracked Adults

Based on visual observation of the primary adult tracked in the observation. (n=141 tracked adults)



## Observations – Approx. Age of Children with Tracked Adults

Based on visual observation and best guess of the ages of any children accompanying the adult being observed. Percentages show **how many tracked adults were visiting with children of that age**, so they will add up to more than 100%. (n=146)



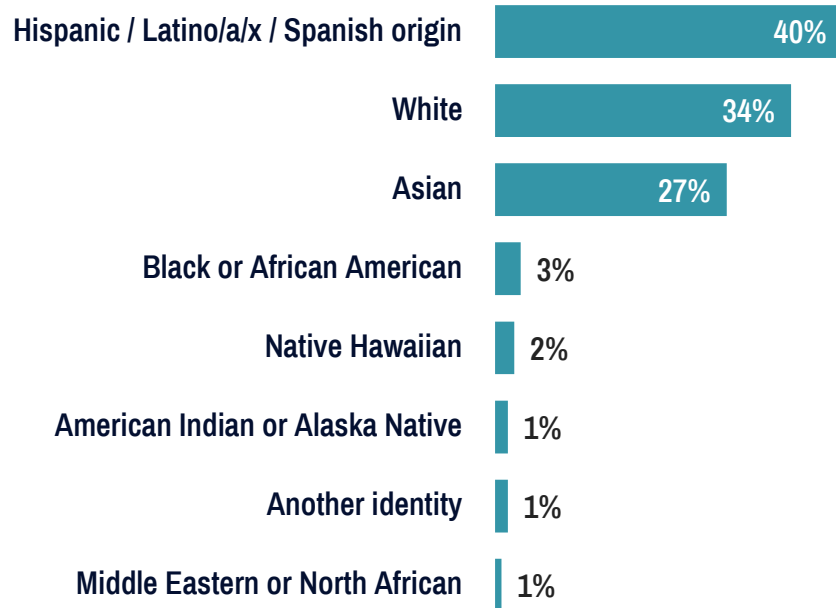


# Race, Ethnicity, Gender, & Languages Spoken

Forty percent of the sampled visitors identified as Latino and 37% reported that Spanish is spoken in the home.

## Exit Interviews – Race & Ethnicity

Self-reported via survey immediately following interview. (n=134)



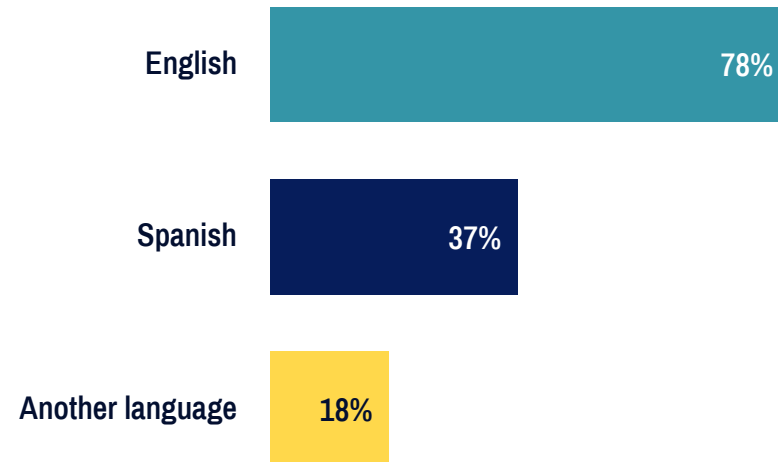
## Exit Interviews – Gender of Primary Respondent

Self-reported via survey immediately following interview. (n=134)



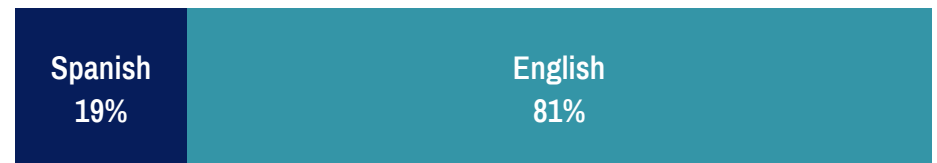
## Exit Interviews - Languages spoken at home

Participants were asked via survey immediately following their exit interview which languages they spoke at home. Other reported languages included Chinese, Mandarin, Japanese, Cantonese, Tagalog, Turkish, and Irish, among others. (n=134)



## Chosen language for Follow-Up Survey

Participants had the option to take the Follow-Up Survey in English or Spanish. The survey sent to participants defaulted to the language they did their exit interview in, with the option to switch between English and Spanish. (n=32)

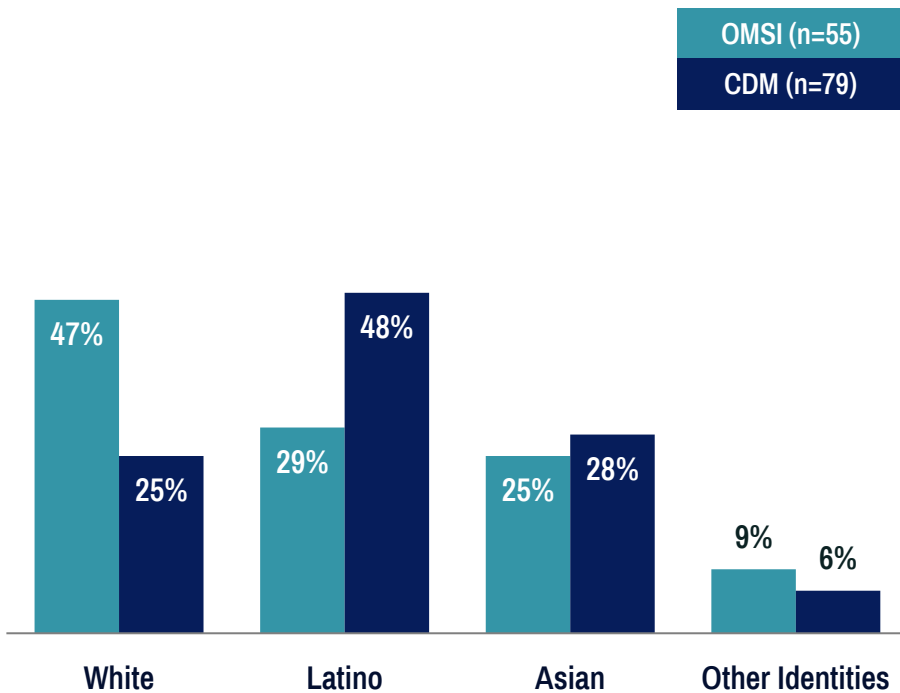


# Differences by Museum: Race/Ethnicity & Languages

Visitors included in the study at CDM tended to represent a greater diversity of racial/ethnic identities; they were also more likely to speak Spanish at home. Beyond these factors, the samples from the two sites were demographically very similar, including the rate at which they opted to have the exit interview conducted in Spanish.

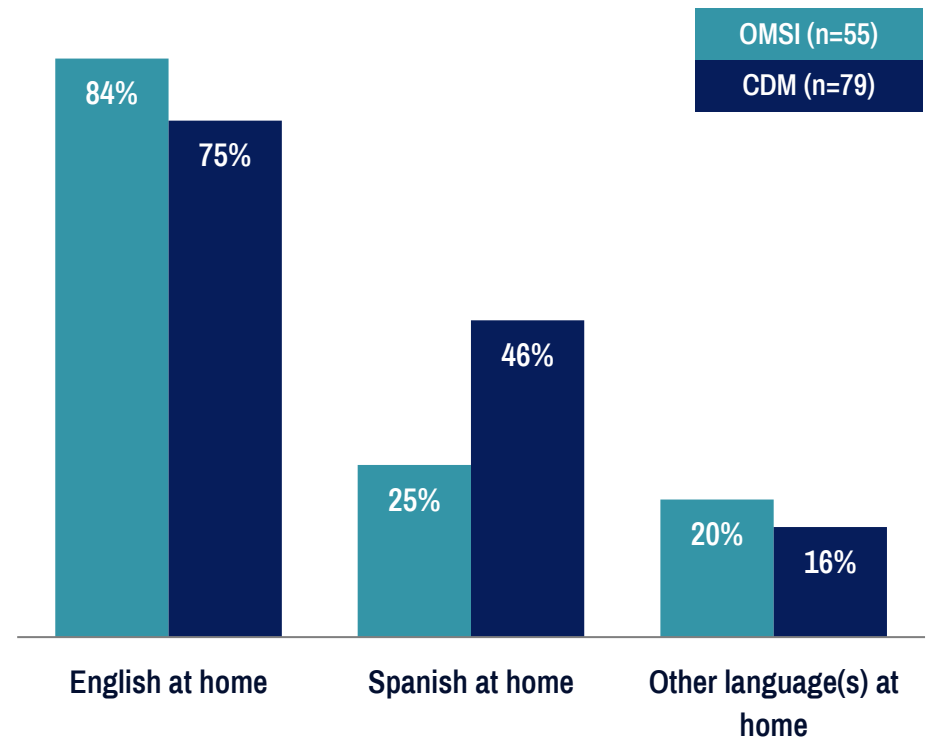
## Self-Reported Race & Ethnicity, by Museum Site

Race/ethnicity categories self-reported via survey immediately following interview; for this graph, any visitor who selected an identity other than Asian, Latino, or white are combined (as there were very few in the other categories). Respondents could choose multiple identities that applied to them; percentages total more than 100%.



## Languages Spoken at Home, by Museum Site

Self-reported language(s) spoken at home reported via survey immediately following their exit interview. Due to households that spoke multiple languages at home, percentages total more than 100%.















# RESULTS

## Exhibition Use & Behaviors





# Where Caregivers Stopped: Observation Data

Element	OMSI % Stopped (n=79)	CDM % Stopped (n=67)
 Happy Dance	68%	69%
 Lighting Up the Brain	48%	66%
 Infant Pool	46%	63%
 Stack It Up	43%	61%
 Fount of Wisdom	33%	54%
 Tell Me a Tale	33%	52%
 Vroom Resources	24%	39%
 Story Nook	22%	27%
 Show Me Happy	32%	21%
 A Space to Share	16%	39%

The higher-energy exhibit elements, which included physical and tactile interactive elements, were the most well-attended at both institutions.

The four elements most frequented by caregivers at both institutions (where over 40% of tracked visitors stopped), included Happy Dance, Lighting Up the Brain, the Infant Pool, and Stack It Up. Happy Dance, in particular, was very attractive at both installations. Each of these elements provided physical interactions, tactile materials, and movement, that were likely highly stimulating for young children.

Elements where we saw lower attention tended to be those that focused on quieter or lower-energy activities such as drawing, reading, and looking in mirrors. These elements also frequently had smaller footprints or were tucked in a corner of the exhibition.

Exhibit elements at CDM tended to be more well-visited, compared to OMSI; this may be due to the exhibition having fewer entrance/exits and a quieter, more enclosed space at CDM. At both sites, the most frequented stops were highly-visible elements with the largest footprints in the exhibition.

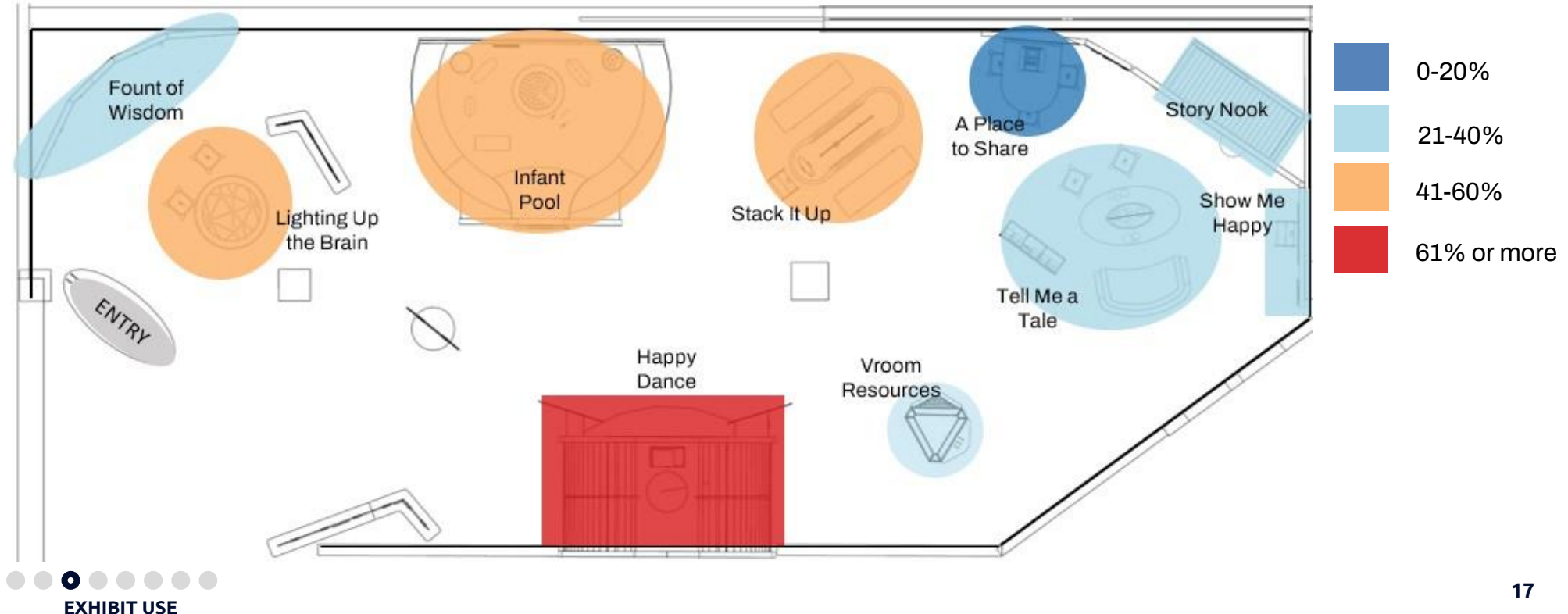
# Where Visitors Stopped: OMSI

Caregivers at OMSI most frequently stopped at the large, central, and high-energy exhibit elements, such as Happy Dance and the Infant Pool.

Groups may have been drawn to Happy Dance due to its large footprint, proximity to the entrance, sound, and the inherent fun of dancing as a play activity. Other exhibit elements that had high attraction were also in proximity to Happy Dance and provided opportunities to interact physically with materials or an interactive. These central elements also provided a line of sight throughout the exhibition, making them attractive places to dwell for caregivers who were playing a more supervisory role.

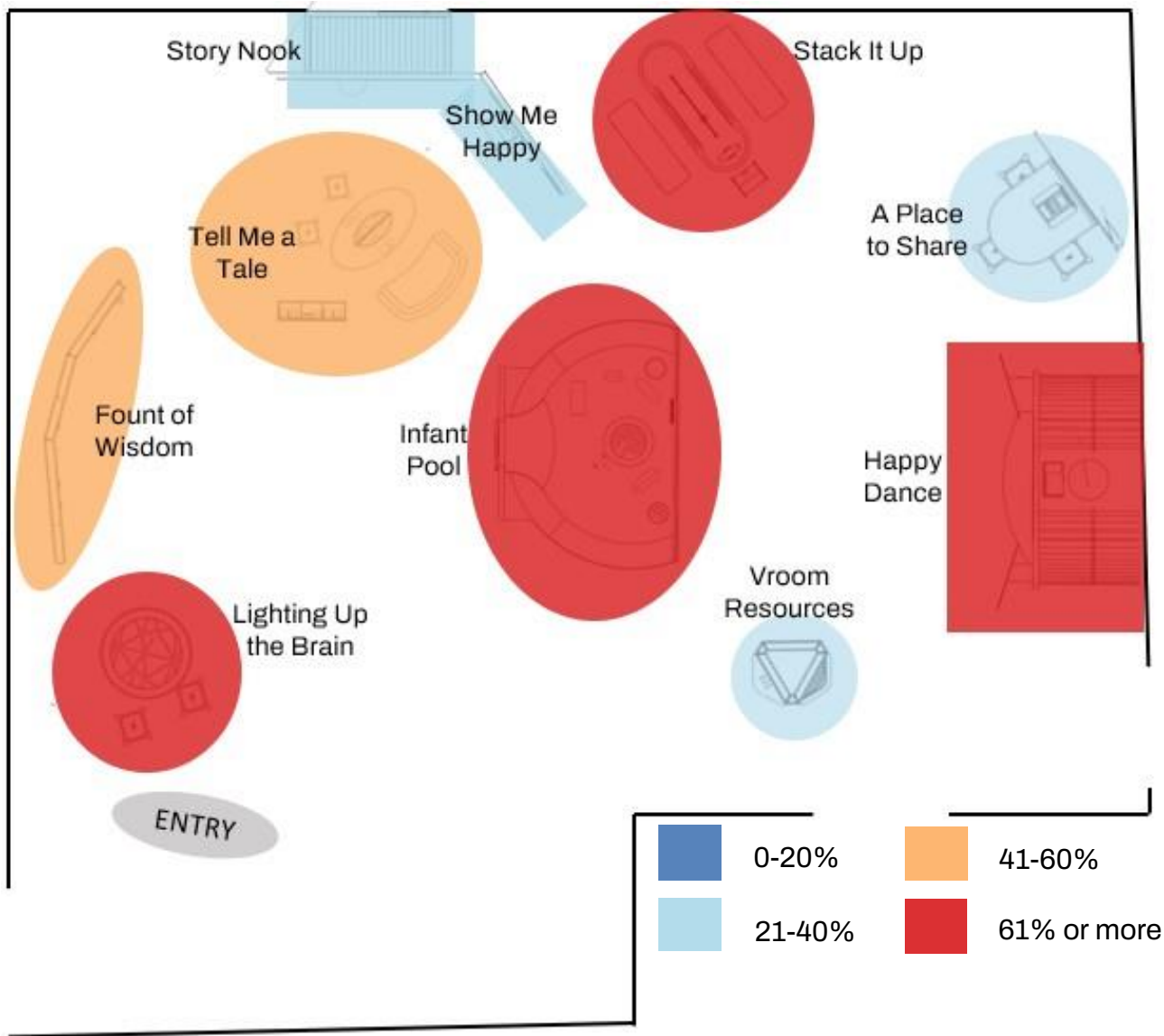
The elongated shape of the exhibition footprint, which caused elements to be spaced farther apart than they were at CDM, may have contributed to lower rates of use among the quieter, lower-energy activities, which also tended to be located further back from the main exhibition entrance.

For example, visitors may have seen the four elements set together in the far corner (A Place to Share, Tell Me a Tale, Story Nook, and Show Me Happy) as a single experience rather than individual elements. This clustering may have contributed to groups engaging with fewer elements overall in this area. A Place to Share had the lowest rate of attention among all elements at OMSI.





# Where Visitors Stopped: CDM



**Overall, exhibit elements were much more frequently used at CDM, possibly due to differences in the size and layout of the exhibition space.**

Similar to element use at OMSI, caregivers seemed to be attracted to the larger, more interactive elements, which were again positioned centrally in the exhibition space at CDM. Happy Dance, Stack It Up, and the Infant Pool were all high attractors.

A Place to Share was positioned away from Tell Me a Tale and Story Nook at CDM, which may have contributed to higher rates of use among groups (compared to OMSI's installation). Nearly 40% of groups stopped at A Place to Share at CDM, compared to only 16% at OMSI. Similarly, the Vroom Resources were positioned between two high-traffic elements, which may have contributed to higher rates of use at CDM – 39% of groups stopped there, compared to 24% at OMSI.

The only element that had less use at CDM than at OMSI was Show Me Happy. This element, which is attached to Story Nook, is one of the quietest and least materials-based in the exhibition, which may contribute to its relatively low attraction factor.

# Caregiver Roles by Exhibit Element

**Observations focused on four roles that adults could take during interactions with children in the exhibit, described below.**

This table summarizes how often each behavior was observed at each element. The rest of this section explores these data in detail.

**Co-Player:** Adult actively played with the child and participated in the activity at an exhibit element. This included the adult dancing, building, reading, drawing, and more.










**Facilitator:** Adult provided non-verbal scaffolding and/or reinforcement to support the child’s play at an exhibit element. This included the adult physically showing the child how to do a task, smiling or nodding to encourage play, and more.

**Interpreter:** Adult provided verbal scaffolding and/or reinforcement to support the child’s play at an exhibit element. This includes the adult giving praise, narrating the child’s actions, answering questions, and more.

**Supervisor:** Adult was attentive to child, but played a behavior/safety monitoring role, rather than directly supporting the child’s play. This includes keeping an eye on the child, intervening to solve conflict, taking photos, and more.

## Observed play-supporting roles by caregivers at each exhibit element

At each stop, observers noted play-supporting caregiver behaviors; each role is described in the narrative to the left. Percentages represent the proportion of caregivers who stopped at that element and were observed taking a given role. Caregivers often exhibited multiple behaviors at one stop, so percentages total more than 100%.

Element	Co-Player % Observed	Facilitator % Observed	Interpreter % Observed	Supervisor % Observed
 <b>Story Nook</b>	54%	9%	46%	40%
 <b>A Place to Share</b>	51%	41%	49%	64%
 <b>Happy Dance</b>	51%	22%	35%	54%
 <b>Stack It Up</b>	41%	29%	37%	75%
 <b>Lighting Up the Brain</b>	41%	18%	33%	44%
 <b>Fount of Wisdom</b>	32%	21%	40%	44%
 <b>Tell Me a Tale</b>	26%	16%	46%	52%
 <b>Infant Pool</b>	21%	13%	35%	79%
 <b>Show Me Happy</b>	21%	13%	31%	41%











# Stack It Up: Behaviors Observed

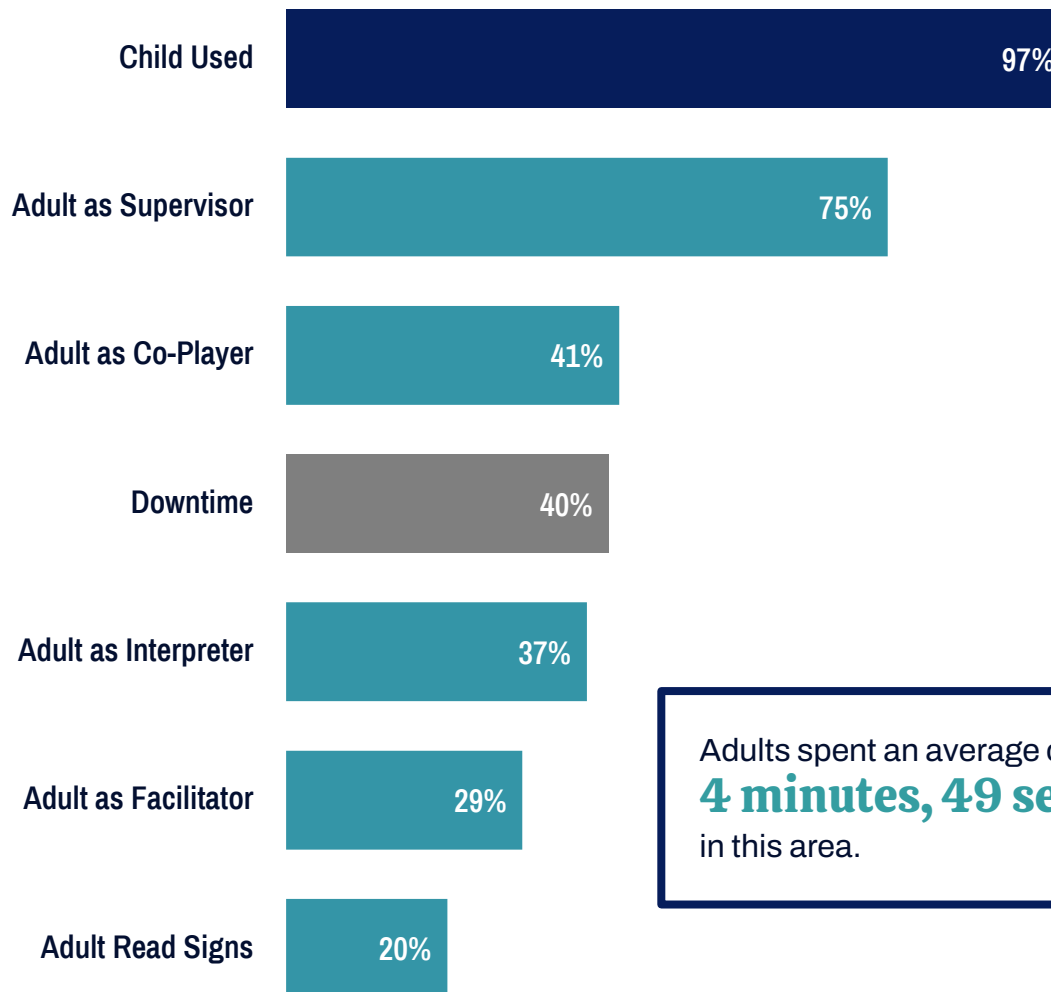
**Stack It Up was an element where caregivers engaged for a long period of time, with average stay-times of around 5 minutes. While there, around 40% of caregivers acted as co-player.**

Another element that strongly encouraged adults to become co-players with their child was the Stack It Up area. Forty-one percent of caregivers who stopped at this element played with the materials with their child, 37% acted as an interpreter, verbally supporting their child’s exploration, and 29% acted as a facilitator, physically supporting the child’s use of the materials (e.g., moving materials within reach, pointing or demonstrating what to do, etc.)

This was an area where caregivers were also often observed engaging in downtime, disconnecting (even if briefly) from watching the children. This was another area with adult seating and was positioned at both sites in a way that parents could be stationed as a “base” while children explored at this element or at other elements in the surrounding area.

## Frequency of types of caregiver behaviors recorded at Stack It Up

Percentage of caregiver observations where each behavior category was observed, among those groups where the observed caregiver stopped at this exhibit element. (n=75)



Adults spent an average of **4 minutes, 49 seconds** in this area.



# Lighting Up the Brain: Behaviors Observed

## Adults most often acted as Supervisor or Co-Player at Lighting Up the Brain.

Caregivers who stopped at the Lighting Up the Brain interactive were most often observed taking on a supervisory role, a very similar number also acted as a co-player, helping to tilt the table and connect the neurons with their child.

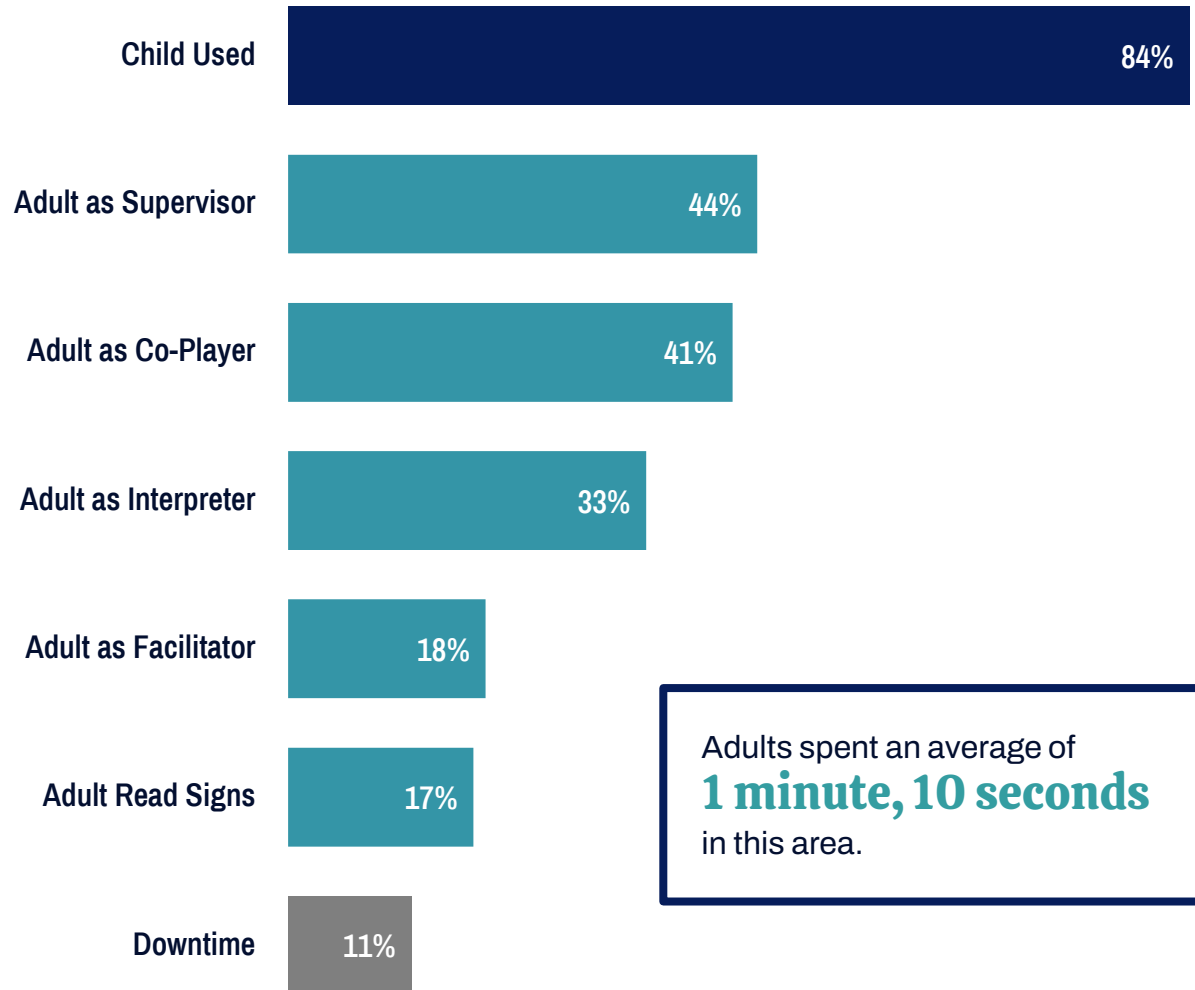
One-third of observed adults acted as interpreter at this element, by verbally guiding their child's play, explaining the activity, or answering questions. Non-verbal facilitation was less common at this element, with fewer than 1 in 5 adults displaying physical cues to guide or support the child in their play.

While there was ample written content on a sign next to the activity, only 17% of observed adults were observed reading signage at Lighting Up the Brain. Finally, about 1 in 10 observed adults were observed taking downtime at Lighting Up the Brain; these adults spent some or all of their time at the station sitting or standing back, talking with other adults, using their phone, or zoning out.

Caregivers spent between 8 seconds and 10 minutes at this stop, with an average time spent of 1 minute and 10 seconds.

## Frequency of types of caregiver behaviors recorded at Lighting Up the Brain

Percentage of caregiver observations where each behavior category was observed, among those groups where the observed caregiver stopped at this exhibit element. (n=82)



Adults spent an average of **1 minute, 10 seconds** in this area.



# Tell Me a Tale: Behaviors Observed

**Nearly half of caregivers at Tell Me a Tale were observed acting as an interpreter by providing verbal scaffolding, praise, or other spoken support to their child.**

This element seemed to most lead adults to taking that interpreter role, to support a child’s play. With, as was common, adults also acting in a supervisory role, keeping a close eye on their children for some or all of their time in this area.

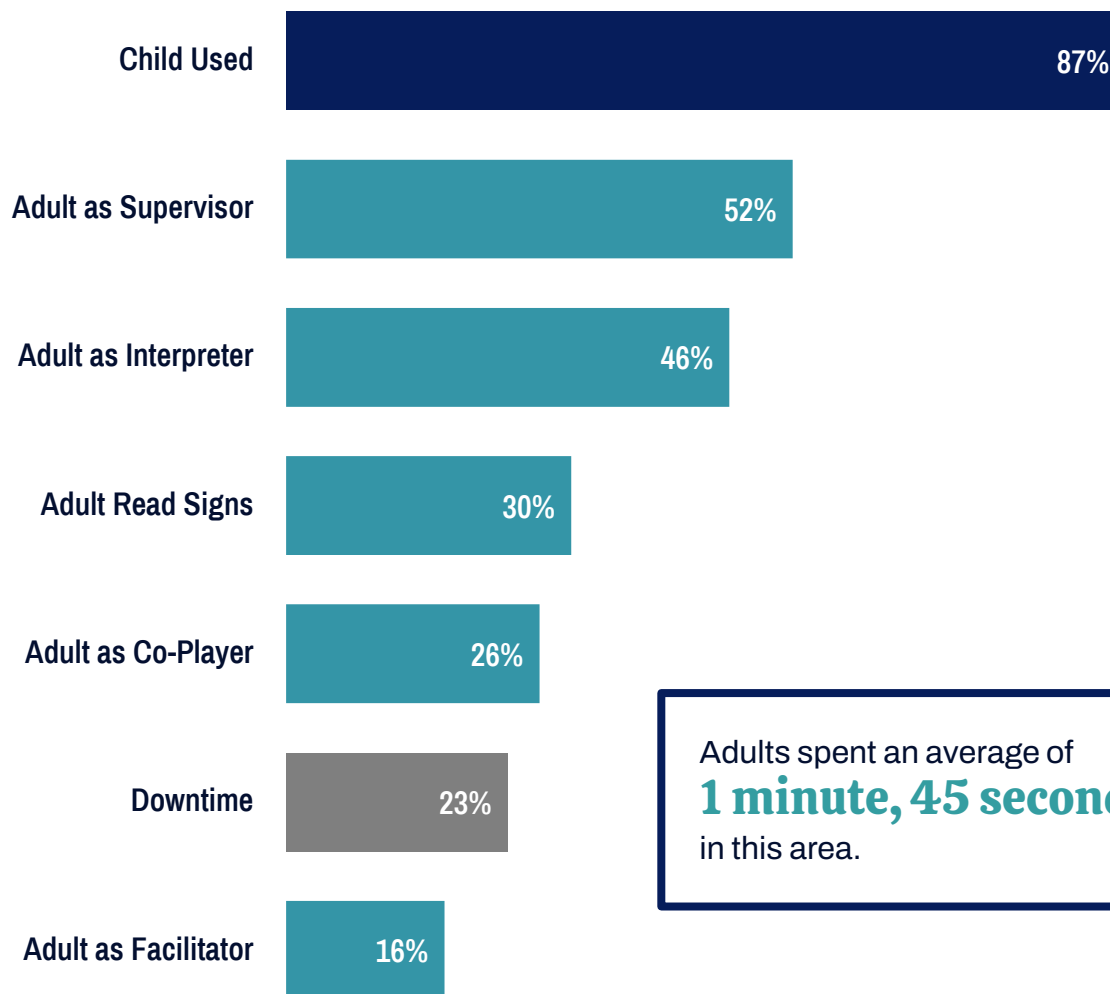
Thirty percent of adults in this area were observed reading signs. This is a relatively high rate of reading compared to the other exhibit elements.

This element did not seem to prompt co-play as much as others in the exhibition, with only about a quarter of adults actively playing with their child in the Story Stones area. This was among the lowest rates of co-playing in the exhibition, even though children played at this station at quite a high rate.

Adults acting as non-verbal facilitators were uncommon, likely due to the verbal nature of storytelling and story stones. Nearly a quarter of adults spent some or all of their time at Tell Me a Tale in downtime, in which they stepped away or checked out from the exhibit.

## Frequency of types of caregiver behaviors recorded at Tell Me a Tale

Percentage of caregiver observations where each behavior category was observed, among those groups where the observed caregiver stopped at this exhibit element. (n=61)



Adults spent an average of **1 minute, 45 seconds** in this area.





# Show Me Happy: Behaviors Observed

Show Me Happy was generally less used, and caregivers spent very little time at this exhibit element. With that, there were also relatively few observations of caregivers engaging in interactive roles.

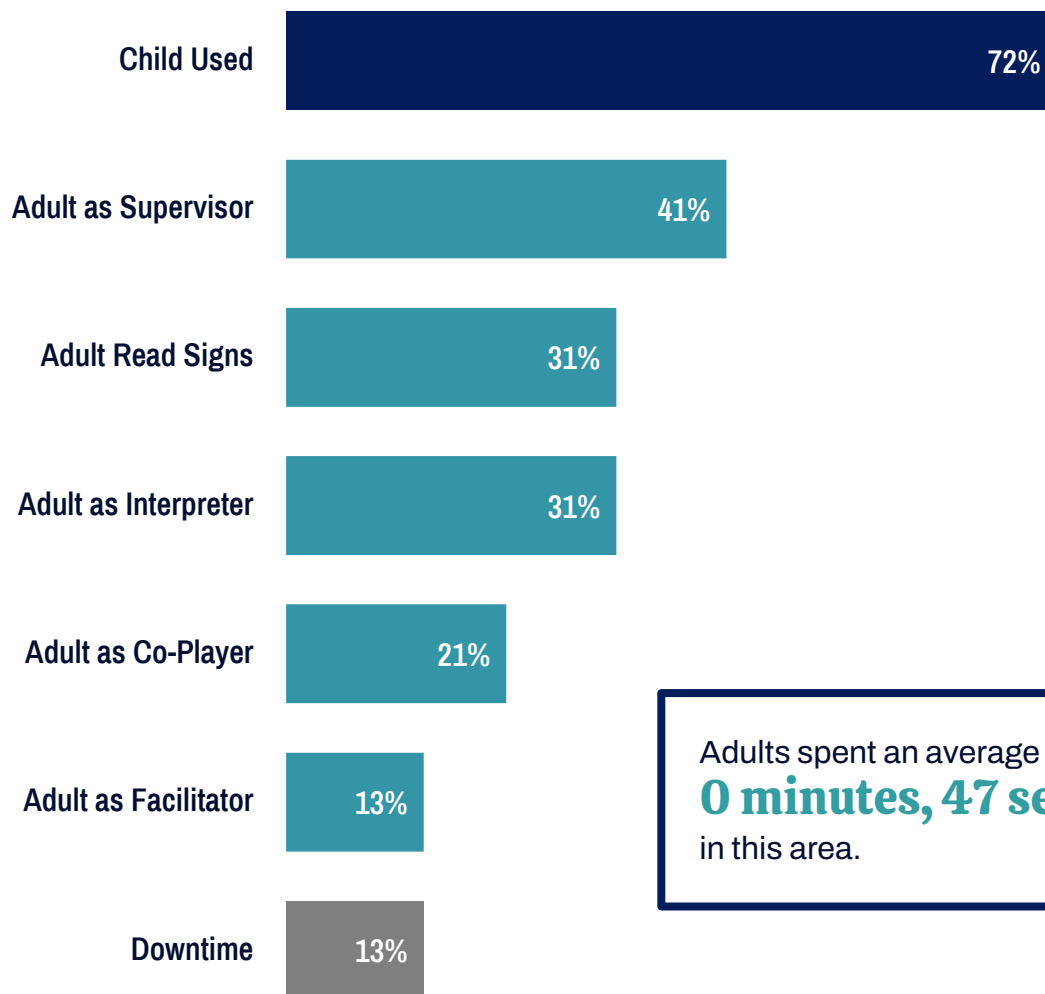
Observed adults tended to act as supervisors most often at Show Me Happy, rather than co-playing or providing scaffolding for the activity. This may be due in part to the short time, on average, that groups spent at this exhibit element. Most groups spent less than a minute here.

Adults who stopped at this element rarely acted as facilitator, co-player, or interpreter. Around 30% were observed attending to the signage at this station.

Just under a third of caregivers read interpretive signage in this area, and 13% spent some time disengaged from the exhibit.

## Frequency of types of caregiver behaviors recorded at Show Me Happy

Percentage of caregiver observations where each behavior category was observed, among those groups where the observed caregiver stopped at this exhibit element. (n=39)



Adults spent an average of **0 minutes, 47 seconds** in this area.

# Vroom Resources: Observed Behaviors

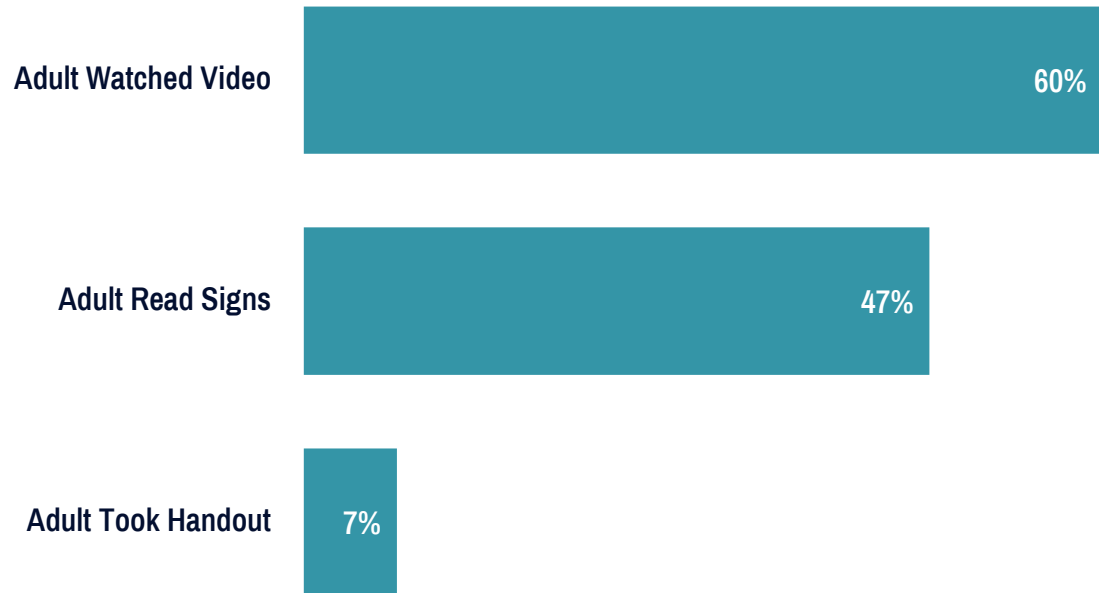
Vroom Resources were an element in the exhibition that mainly provided information for adults without major interactive components for children. Of the caregivers who stopped at the kiosk, most watched video material and about half attended to the signage.

The kiosk was a very different element than the others in the exhibition, and, as expected, caregivers spent far less time at this station (39 seconds, on average) than the more play-centered areas. Those who did stop at the kiosk tended to either attend to the video material and/or the printed material while they were at the kiosk.

Notably, very few (only about 7% of those who stopped, or 3 observed caregivers) were seen to take one of the handouts from the kiosk with them.

## Frequency of types of caregiver behaviors recorded at the Vroom Resources

Rates of observed behaviors of adults. (n=45)



Adults spent an average of **0 minutes, 39 seconds** in this area.





# RESULTS

## Caregiver Takeaways about Play





# Key Ideas Caregivers Took Away

In exit interviews, the core message about brain development was the most frequently mentioned takeaway from *AlegreMENTE*. Sixty-three percent of caregivers named one or more of the various interaction-related categories.

The awareness of the brain development message was quite strong; many of these comments referenced specific activities caregivers can do to foster healthy development in children. Named actions most often included playing, telling stories, and spending meaningful time together.

Other key takeaways related to the exhibit's main ideas included naming specific play activities they had seen, done, or remembered; positive adult-child interactions; and family relationships. These comments sometimes overlapped; and overall, **63% of interviewed caregivers named one or more of the play/interaction takeaways as coming from *AlegreMENTE*** (in teal in the table).

In addition, **20% of visitors felt the exhibit was about language and culture**, drawing on the Spanish-first bilingual approach to the exhibition. Although this was not the intended main message, it was clearly an important theme for visitors.

## What caregivers described as the key message of *AlegreMENTE*

Categories represent common themes in adult responses to the question, "What would you say is the main message of this exhibit?" in the exit interview (n=157). **Categories listed in teal** represent themes that align with the intended objectives of the exhibition.

(of 157 adults)	Response Category	Example Quotes
<b>32%</b>	<b>Brain Development</b>	<i>"Simple ideas to do with children to inspire their brain to develop."</i>  <i>"Optimized for brain development. Storytelling. Interactions, making this... Outside it's more physically driven, here it's more mentally driven."</i>
<b>20%</b>	<b>Language &amp; Culture</b>	<i>"El bilingüismo es algo que podemos uplift. ... Para mis hijos bilingües es una manera de comunicarse con sus familiares que no hablan el idioma."</i> [Bilingualism is something we can "uplift." ... For my bilingual children it's a way to communicate with their relatives that don't speak the language.]
<b>15%</b>	<b>Specific Play Activities</b>	<i>"Creative storytelling, expressing yourself, relaxing, reading, it was screenless."</i>
<b>15%</b>	<b>Adult-Child Interactions</b>	<i>"Interacciones y bonding con los niños."</i> [Interactions and bonding with children.]
<b>11%</b>	<b>Family Connections</b>	<i>"Healthy relationships, family relationships."</i>
<b>14%</b>	<b>Don't Know / Unsure / Vague</b>	<i>"I'm not sure. I haven't read the signs."</i>
<b>6%</b>	<b>Other Comments</b>	Other miscellaneous comments that did not fit into the codes above.











# RESULTS

## Intent & Play Actions at Home

### STACK IT UP

Give your child something to stack (like the discs). Show them how to stack things on top of each other so they stand in a line. As they begin to build, chat about their work and ask questions like, "I wonder how tall we can make this?"











# What Happened at Home: Other Post-Visit Play

In addition to the provided list of play activities, nearly all caregivers indicated other types of interactive play they had engaged in with their child in the 4-6 weeks after their visit. Physical activities and creative play were most common.

While we provided a list of play activities that were of interest to the exhibition, we allowed caregivers space to describe any other type of play that they had done with their child. Nearly all caregivers indicated they had done some other type of play (beyond the list on the prior page). When describing that play, about half included physical play, such as sports and playground games.

Other descriptors of play fell into line with ideas and themes that were included in the exhibition, including creative play (activities with connections to the arts); imaginative play (make-believe or storytelling); and sensory play (with materials).

Caregivers also noted play that dovetailed with everyday life and activities, including play while helping with things like cooking or cleaning. A few also specifically noted school readiness play, with a goal of learning numbers, letters, shapes, and STEM concepts.

## Other activities caregivers engaged with their child in after visiting *AlegreMENTE*

In the follow-up survey, adults were asked whether they engaged in other types of play with their child since their visit. For those who answered “Yes”, these categories represent the types of play they reported participating in. (n=28)

	Response Code	Description
	50%	<b>Physical Play</b> Sports, playing on playgrounds, running, walking, hide and seek, and other physical activities
	36%	<b>Creative Play</b> Singing, listening to or playing music, drawing, crafting, and other creative or artistic activities
	25%	<b>Imaginative Play</b> Playing pretend or make-believe, telling stories, and other types of open-ended mental or imaginative play
	21%	<b>Sensory Play</b> Exploring touch and textures through sensory play with water, play doh, dirt, and other materials
	14%	<b>Practical / Life Skills Play</b> Helping with or play involving cooking, baking, cleaning, and other everyday tasks
	14%	<b>School Readiness Play</b> Play activities considered traditionally educational such as learning numbers and shapes, STEM activities, and other play activities centered around school readiness
	21%	<b>Other Types of Play</b> Other miscellaneous comments that did not fit into the codes above

# RESULTS

## Latino Families





# Distinctive Outcomes: Latino Families

There were extremely few differences in responses between caregivers who identified as Latino and those who did not. Both audience segments seemed to connect with the exhibition’s main ideas in very similar ways.

Latino caregivers did not appear to differ from non-Latino visitors in how they responded about the exhibit’s main message, awareness of its play-focused content, reinforcing of prior knowledge, or belief about why play matters. Interestingly, there was also **not a significant difference in the rate at which Latino respondents noted the bilingual signage or depiction of culture** as what they enjoyed or the main idea; this was mentioned fairly evenly by caregivers across identity groups.

There were a few significant differences (shown right). Latino respondents were less likely to name a specific element of the exhibit as what they enjoyed, and less often reported engaging in several at-home play activities. They also reported a higher likelihood of intention to start or continue playing peek-a-boo with objects at home; but other than that item, intentions to play at home were consistent across groups. Results were similar for those who speak Spanish at home.

## Significant differences between Latino and non-Latino caregivers’ responses

Areas of significant difference across all data based on Pearson’s Chi-squared test, comparing presence or absence of a theme in responses.

What Caregivers Liked (n=157)	Non-Latino	Latino Caregivers
Latino families were <b>less likely to name a specific exhibit area when asked what they liked most</b> about <i>AlegreMENTE</i> during their exit interview. Other than this, answers to this question did not differ significantly.*	72%	54%
Prior Play Activities (n=144)	Non-Latino	Latino Caregivers
Latino families were slightly <b>less likely to report dancing as a play activity prior to their visit</b> in their exit survey.*	88%	74%
Latino families were slightly <b>less likely to report counting as a play activity prior to their visit</b> in their exit survey.*	86%	72%
Latino families were slightly <b>less likely to report looking in mirrors as a play activity prior to their visit</b> in their exit survey.*	69%	48%
Continued/Planned Play Activities (n=144)	Non-Latino	Latino Caregivers
Latino families were <b>more likely to intend to start or continue playing peek-a-boo</b> with their children in their exit survey. There were no other significant differences in continued or planned play activities.*	65%	83%

\*p-value < 0.05



# Distinctive Outcomes: Interviews in Spanish

**While there were few differences based on ethnic identity, caregivers who chose to be interviewed in Spanish showed they had connected with several of the exhibit’s key ideas better than those interviewed in English.**

The language of the interview seemed to have a much stronger relationship to how a caregiver thought about the bilingual/cultural approach than did ethnic identity. Specifically, **caregivers interviewed in Spanish were more likely to mention the bilingual elements as what they liked** about the exhibition, but were *less* likely to identify the language/cultural elements as the main idea. Those who were interviewed in English, regardless of ethnicity, seemed to note the bilingual design and more often interpret that the language itself was part of the main message.

Moreover, **those interviewed in Spanish were more likely to identify one of the exhibit’s themes of play and adult-child interaction** as the main idea. They also more often selected “brain development” as one of their most important benefits of adult-child play, but with the relatively small Spanish-speaking sample this difference did not reach statistical significance.

## Significant differences between responses based on the interview language

Areas of significant difference across all data based on Pearson’s Chi-squared test, comparing presence or absence of a theme in responses. Where noted differences showed a p-value between 0.05 and 0.01.

What Caregivers Liked (n=157)	Interviews in English (n=115)	Interviews in Spanish (n=42)
Caregivers who chose to be interviewed in Spanish were <b>more likely to mention that language or cultural elements as what they liked most</b> the exhibition. Other than this, answers to this question did not differ significantly.*	9%	24%
Main Takeaway from Exhibit (n=157)	Interviews in English	Interviews in Spanish
Caregivers who were <b>interviewed in Spanish were more likely to name one of the big idea themes (about play or adult-child interactions)</b> as the exhibit’s main idea.*	58%	76%
Caregivers who were <b>interviewed in English were more likely to name the language or cultural elements</b> as the exhibit’s main idea.*	23%	10%
Beliefs about Value of Play (n=144)	Interviews in English	Interviews in Spanish
Caregivers who were <b>interviewed in Spanish slightly more often selected “brain development”</b> as one of their three most important reasons for adult-child play. (ns)	67%	83%
*p-value < 0.05		





# RESULTS

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## Differences for Children's Museum Visitors



# Differences in Exhibition Use by Museum-Type

The main difference between the science center and children's museum audiences was in how they used the exhibition.

Visitors at the children's museum spent longer and visited more of the exhibition.

The observational data revealed that, on average, caregivers at CDM spent more than 6 minutes longer in *AlegreMENTE*, compared to caregivers at OMSI. In this extra time, caregivers also stopped at 1 or 2 more of the exhibit elements. The comparison of where caregivers stopped (p. 15 of this report) reiterates this finding, with more elements having more visitation at CDM.

One reason is likely the layout of each installation. OMSI's exhibition was slightly more spread out and had half-height walls; inside, caregivers and children could see the rest of the busy museum floor. At CDM, the exhibition was in an enclosed gallery, with only one exit. Once inside, the lack of distractions and a single exit seemed to promote lingering. This could also reflect differences in visitation patterns between children's and science museums, with children's museum visitors often more inclined to stay in a single exhibit for as long as the child is engaged, without trying to see everything in the museum in a single day.

Significant differences in exhibition use between caregivers at OMSI and CDM.

Areas of significant difference across all data based on Welch Two Sample t-test for average time spent and total stops.

Total Time Spent (n=141)	OMSI	CDM
Caregivers at CDM spent significantly longer in the whole exhibition compared to those observed at OMSI, on average.**	<b>9 minutes 44 seconds</b>	<b>16 minutes 8 seconds</b>
Total Stops (n=146)	OMSI	CDM
Caregivers at CDM stopped at significantly more exhibit elements compared to those observed at OMSI, on average.***	<b>3.6 stops</b>	<b>4.9 stops</b>

\*\*\*p-value below 0.01  
 \*\*\*p-value below 0.001

# Differences in Preferences by Museum-Type

**There were no significant differences in any of the outcome areas explored between these two museum types. In terms of takeaways and intention to play at home, caregivers from the two institutions were very similar.**

Only two other areas of difference were observed in the data. One was in the observational data, where it appeared that caregivers at the children's museum were more likely to engage in the interpreter role to support their child's play. This is the role in which the adult supports a child's play and learning through verbal scaffolding, support, and encouragement. This behavior was exhibited by more than three-quarters of caregivers at CDM, but by just around half of OMSI caregivers. But all other play-supporting behaviors were similar.

The only other difference was that OMSI visitors were significantly more likely to describe liking that it was hands-on or tactile. This may reflect a difference in expectations of the museum-types; science centers may not have as many tactile experiences for very young children, and families appreciated this addition. In contrast, in children's museums those types of tactile experiences for young children are more often the norm in exhibits.

## Significant differences in caregiver behavior and preferences at OMSI and CDM.

Areas of significant difference across all data based on Pearson's Chi-squared test about the frequency with which adult were observed taking particular roles and what categories they mentioned in their interviews.

Adult Roles (n=146)	OMSI	CDM
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Caregivers at CDM were observed serving in an Interpreter role significantly more often than caregivers at OMSI. All other roles (Co-Player, Facilitator, and Supervisor) did not differ significantly between sites.\*\*\*

52%

79%

What Caregivers Liked (n=157)	OMSI	CDM
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Caregivers at CDM were significantly less likely to report liking tactile or hands-on experiences as compared to caregivers at OMSI.\*\*\*

31%

10%

\*\*\*p-value below 0.001



# CONCLUSIONS

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# Summary of Goals & Actual Results

The table below presents a high-level overview of the summative evaluation results with respect to the goals set for *AlegreMENTE*, which were presented in greater detail on page 5 of the report. Detailed takeaways about these outcomes are presented on the pages that follow.

<b>Outcome</b> Caregivers will...	<b>Goal: Planned Indicators of Outcomes</b> Caregivers will...	<b>Achievement: Key Indicators from Evaluation Data</b>
Demonstrate comfort with a supportive caregiver role in their child's play.  Feel they found at least one interactive play activity that they already do or could try.	<ul style="list-style-type: none"> <li>Take a supportive adult role at one or more of the interactive elements (co-player, facilitator, interpreter, supervisor) (70%+)</li> <li>Able to name/identify specific types of interactive, adult-child play behaviors they encountered in the exhibition. (70%+)</li> <li>Took one of the Vroom handouts home with them. (5%+)</li> </ul>	<ul style="list-style-type: none"> <li>77% of caregivers engaged as a co-player while in <i>AlegreMENTE</i></li> <li>Every caregiver except one engaged in one of the supportive adult roles at least once.</li> <li>78% spoke in their interview about types of play from the exhibition</li> <li>7% of caregivers took one of the Vroom kiosk handouts about play</li> </ul>
Understand that parent-child playful interaction is beneficial for young children and/or for their development.	<ul style="list-style-type: none"> <li>Believe that brain development is one of the top 3 most important reasons why parent-child play is good for young children. (50%+)</li> <li>Be aware that the exhibition was designed to show benefits of play for children. (70%+)</li> <li>Feel they learned something new about play behaviors and/or benefits for children (and can name what was learned). (30%+)</li> <li>Look/read some signage while in the exhibit w/ child. (30%)</li> </ul>	<ul style="list-style-type: none"> <li>71% believed that supporting brain development is one of the three most important reasons for adult-child play</li> <li>63% felt that the exhibit showed themes of play benefits or brain development</li> <li>41% could identify specific play-related content they encountered; fewer than 20% felt they were new ideas</li> <li>60% of adults were observed looking at exhibit signage</li> </ul>
Feel the exhibition validated or highlighted ways they are experts of their child's development, and that by connecting/playing with them, parents are helping their child.	<ul style="list-style-type: none"> <li>Report the exhibition reinforced that the play they already do with their child is helping the child. (50%+)</li> <li>Report a sense that the exhibit validated that they are the most influential adult in their child's development. (50%+)</li> </ul>	<ul style="list-style-type: none"> <li>45% could identify a specific idea, related to their children, that they felt had been confirmed or reinforced in <i>AlegreMENTE</i></li> <li>Caregivers generally did not articulate the higher-level idea of being the most influential adult to their children</li> </ul>
Intend to use (and then do use) one or more interactive play strategies at home.	<ul style="list-style-type: none"> <li>At the exhibition, can identify 1+ play strategy from the exhibition they plan to keep doing or newly start doing with their child. (50%+)</li> <li>4-6 weeks after visiting, can identify 1+ play behavior they have done with their child (even if they did it previously) (30%+)</li> </ul>	<ul style="list-style-type: none"> <li>100% of caregivers interviewed already did at least one of the play behaviors, and all intended to continue playing at home</li> <li>100% of caregivers surveyed 4-6 weeks post-visit continued engaging in interactive play with their children in multiple ways</li> </ul>









# Behavioral Outcomes

Visitors were committed to engaging in play behaviors with their children, before, during, and after the visit. The exhibition may have reinforced this commitment, but there was already a strong culture of play among visitors beforehand.

At its core, *AlegreMENTE* was intended to encourage a variety of at-home play behaviors between caregivers and their children. Through the modeling, information, and encouragement of the exhibition, it was hoped that families would start or continue to engage in specific play activities. The exhibition goals focused on two indicators, one focused on intent (while at the exhibition) and one examining what happened in the weeks after a visit:

1. At the exhibition, can identify 1+ play strategy from the exhibition they plan to keep doing or newly start doing with their child. (50%+)
2. Four to six weeks after visiting the exhibition, can identify 1+ play behavior they have done with their child (even if they did it previously). (30%+)

To the right, we highlight key data that illustrate the degree to which each of these indicators was met in the summative evaluation; **the numbers above and in the takeaways to the right correspond.**

1

**100% of caregivers interviewed at *AlegreMENTE* already did at least one of the play behaviors, and all intended to continue playing at home**

Most of the play behaviors presented in the evaluation were already in the at-home play repertoire of caregivers who came to this exhibition. In collecting data at the exhibition, we learned that they typically do most of the activities, intend to continue doing them, and are likely to try any of the ones they don't already do regularly.

2

**100% of caregivers surveyed 4-6 weeks post-visit continued engaging in interactive play with their children in multiple ways**

Again, the parents who responded to the follow-up survey universally reported playing with their children in multiple ways in the weeks since visiting the exhibition. Notably, nearly all of them also volunteered a range of other ways that they played with their children – with many examples of play that were not on the constrained list of options we'd shown in the survey.



## CONCLUSIONS

# Bilingual & Spanish-First Interpretation



### Impact for Everyone

Attention to the bilingual approach and design elements occurred evenly across caregivers, not just among those who identified as Latino. In fact, there were very few differences in outcomes between Latino and non-Latino caregivers. For primarily English-speaking caregivers, the bilingual / Spanish-first design was so striking that they interpreted the language to be part of the exhibition's main idea.

### Supporting Spanish Speakers

While there were no differences in content outcomes for Latino caregivers, in a few areas, visitors who were more comfortable in Spanish better connected with the exhibit content – recognizing its ideas about play, play activities, adult-child interaction, and the importance to the developing brain at a higher rate. For them, language wasn't the *point* of the exhibition, but it facilitated their understanding in ways that are likely more difficult in English-only exhibitions.

### Success with Design

In addition to the language, the design used to deliver the bilingual and multi-cultural interpretation also stood out to visitors; 22% of the follow-up survey respondents mentioned the color, characters, and happy tone of the exhibition as memorable. Recall of design and tone is not common for exhibition visitors, and this speaks to the resonance of the overall exhibition design.





# Exhibition Design for Families with Young Children



## Attraction to High Energy Elements

The timing and tracking data showed that families were drawn most often to the particularly high-energy and movement-centered elements in both institutions, with Happy Dance being broadly popular, enjoyed, and memorable. Physical, active, and developmentally appropriate play opportunities seem an important addition to any exhibit targeted to this group. While co-play was seen at these elements, in some cases adults seemed to take more of a supervisory role, managing safety and other concerns that accompany high-energy physical exploration.

## Quieter Elements Supported Co-Play

The Drawing Area and Story Nook, two quieter elements, showed high rates of adult-child interaction, particularly the role of co-player. The Drawing Area, in particular, was underutilized at OMSI, perhaps due to the draw of the higher-energy elements or its location somewhat tucked away on the side of the gallery. Less physically active elements could get more attention when intermixed with higher-energy elements. Avoiding the creation of a “quiet zone,” which can easily be accidentally overlooked, may help families discover the potential for play in lower-energy, but highly interactive, areas.



*Acknowledgements: We would like to thank the data collectors from OMSI who contributed to this summative evaluation. Their skill at collecting data using multiple methods, bilingually, and using culturally responsive approaches was instrumental to this study and its findings. We would also like to thank Kirsten Buchner of Insight Evaluation Services for her consultation and support in the instrument development and analysis of all of the bilingual/bicultural elements of this study.*



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