



Ciencia Pública
Summative Report

Exploratorium
Fall 2015

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Credits

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p. 11 top: Catherine South;
p. 11 bottom: Wilson, New York Times

Executive Summary

Ciencia Pública is a National Science Foundation (NSF) -funded collaboration between the Exploratorium, the Boys and Girls Club of San Francisco (BGCSF), and Buena Vista Horace Mann School (BVHM). The Parklet houses exhibits focused on the themes of water and sustainable water use and is intended to engage Latino families in its location, the Mission District neighborhood (the Mission). Using a culturally responsive approach, Garibay Group conducted a summative evaluation to assess project outcomes.

Overall, this study found that the *Ciencia Pública* project met its goals. Below, we summarize key findings.

Socio-Political Context

Any project which focuses on and is situated within a specific community will be affected by many contextual forces outside its control. In the case of *Ciencia Pública*, the San Francisco tech boom and accompanying gentrification of the Mission—which has resulted in the displacement of primarily Latino residents—has led to significant tensions and a growing sense of urgency in the Mission to guard against further encroachment.

This situation affected where the *Ciencia Pública* Parklet could be located. There were indications that the current Valencia Street location may have limited the number of Latinos visiting because the street is less frequented by Latino residents. (Based on data from this study, 16% of casual passerby groups identified as Latino/Hispanic.)

The BVHM location, however, provides significant opportunities to engage families through the school; families and school staff responded very positively to the Parklet.

Community Response

All participants in this study saw value in the Parklet, particularly due to its subject matter. They believed the Parklet helped raise awareness about the drought in California and reminded the community of the importance of conserving water. Respondents found the Parklet's topic timely and critical. They appreciated the educational aspect of the Parklet, commenting that this focus set it apart from other parklets in the Mission (which they generally felt only benefited the businesses that sponsored them). Thus, they saw the *Ciencia Pública* Parklet as being for the entire community. Participants noted that it added value to the community because of its subject matter and educational focus. Parents from BVHM also emphasized the educational value for their children and appreciated its hands-on experiential learning.

Participants reported high levels of enjoyment. The majority (98%) of survey respondents rated their enjoyment a “4” or “3” on a 1–4 scale where 1 is “very low” and 4 is “very high.” Of those who lived or worked in the Mission, 90% rated their likelihood of visiting the Parklet again a “4” or “3” on a 1–4 scale (where 1 was “very low” and 4 was “very high”).

Awareness/Understanding

There was strong evidence that families engaged with both the exhibits and the STEM content. While the drought was a familiar topic to all participants, the experiences at the Parklet provided opportunities for participants to explore ideas, reflect on the drought, and consider the importance of conserving water.

We documented positive family interactions and conversations at the Parklet. The four exhibits had their individual strengths and challenges, but overall provided opportunities to engage with different yet complimentary aspects of the topic. The Watering Plants interactive, for example, provided opportunities to explore water-efficient strategies for watering (and growing) plants. We observed significant intergenerational engagement, including conversations about how the component worked and ways participants might create their own systems at home to more efficiently conserve water. The strength of the Salt Water component was in helping visitors explore, in detail, how desalination—an idea many had only heard of previously—actually works. The Rain component, particularly the histogram depicting historic and current rainfall, generated significant conversation and comparison of rainfall levels, the severity of

Executive Summary cont'd.

the drought, and the need to conserve water. The Water Vapor interactive, less successful in comparison to the others, was the most challenging component conceptually.

Bilingual Labels

Bilingual labels were positively received and communicated that everyone in the community was welcome. Respondents noted that given the makeup of the Mission's residents, it was appropriate and important that the Parklet include information accessible to both Spanish and English readers. Both observations and interviews confirmed that the bilingual labels provided families access to information and helped maintain a group's linguistic practices and norms, two things critical both in designing culturally responsive experiences and in ensuring access to the exhibit content.

Although the bilingual labels afforded positive experiences, they did *not* work for Latino families with little formal education. The tone and vocabulary were too academic, scientific, and intimidating for some. In addition, the labels were inaccessible to respondents with low (or no) literacy.

Diversity within the Latino Community

We found important differences in the ways that families with parents who have *more* formal education and those parents with *less* formal education engaged with the Parklet. Families with caregivers having more formal education drew on the learning models they

were socialized into at school, whereby the goal was knowledge acquisition. In this more linear model, learning is one-directional and facilitated by a more knowledgeable individual (usually the parent). In comparison, families where parents had less formal schooling did not focus as narrowly on the science content/process depicted. Instead, these groups introduced a broad range of ideas and experiences to make sense of the information they encountered.

Families including adults with less formal schooling—and who typically were also less familiar with museum-going practices—had more difficulty making sense of the exhibits. These groups, for example, were not clear on what the interactives were, who they were for, or what to do with them. While they were intrigued and generally had good experiences, these groups were much more reluctant to engage with the interactives. Additionally, groups where parents had less formal schooling did not see the Parklet itself as culturally relevant, although they regarded the Parklet as important and completely “issue relevant.”

Community Partnership

Overall, the *Ciencia Pública* partnership accomplished its goals of co-developing a parklet (in this case, with BGCSF youth) and creating experiences that successfully engaged a segment of Latino families in STEM content.

The evaluation also found evidence that each partner brought its expertise to bear on the

project. The BGCSF contributed its expertise in youth programming and knowledge of working with Latino youth. BVHM leveraged its very strong relationships with and knowledge of local Latino families along with hosting the Parklet on its site. The Exploratorium contributed its expertise in designing both Informal Science Environments (ISE) STEM experiences and exhibitions in outdoor spaces.

The primary collaboration challenges centered on differences in organizational culture and communication style. Differences in organizational mission also, at times, colored perspectives on priorities. Results also illuminated ways that collaborations between different organizations are, by nature, affected by power structures and organizational positioning. Partners in initiatives can deepen their relationships and learn from these important “tensions.”

A key outcome from the collaboration was that it developed Exploratorium's staff capacity in authentically engaging community. The process outlined and facilitated by BVHM staff ensured that the local Latino community was involved in vetting and approving the Parklet installation near the school. Exploratorium staff reported that the entire collaboration—the community engagement component in particular—provided many lessons and modeled one way to approach community engagement. While the process took significant staff effort and time and affected timelines, it was critical to the end result.

Overview

Ciencia Pública is a National Science Foundation (NSF) -funded initiative in which the Exploratorium, in collaboration with the Boys and Girls Club of San Francisco (BGCSF), developed a parklet to engage Latino families in STEM content. The Parklet is located in San Francisco's Mission District (the Mission), a historically Latino neighborhood. Buena Vista Horace Mann School (BVHM) is an additional project partner and hosts the Parklet on its site. Garibay Group conducted a summative evaluation of the project outcomes. This report discusses evaluation findings.

Parklets are temporary public spaces which typically extend sidewalks to the width of parking lanes on which they are installed. They are intended to provide more public space and amenities (e.g., seating, green space) for communities (City of San Francisco, 2015).

The *Ciencia Pública* Parklet is a team effort including members of the Exploratorium's Studio for Public Spaces and staff and students from BGCSF. The Parklet, located on Valencia Street between 23rd and 24th streets, sits adjacent to Buena Vista Horace Mann School (BVHM), which serves a high percentage of local Latino families and also partnered in this project.

The Parklet, which occupies two parking spaces, housed exhibits concerning water and sustainable water use. It included four components: a low-evaporation plant watering device (Watering Plants); a desalination pump (Salt Water); an evaporation station measuring salt water (Water Vapor); and a rain gauge (Rain). The Parklet also contained seating and greenery, including edible plants (e.g., kale, cilantro) free for harvesting by community members.

Summative evaluation focused on assessing the overall nature and quality of the visitor experience, particularly the extent to and ways in which the Parklet encouraged families to engage with the exhibits; the extent to and ways in which the Parklet helped build visitors' understanding of the science content; and the ways families connected to the exhibition.

The primary intended outcomes for the *Ciencia Pública* Parklet were the following:

- Intergenerational groups will actively engage with the Parklet exhibits;
- Visiting families will deepen their understandings about STEM content of the Parklet exhibits;
- Intergenerational groups will personally connect with the culturally-relevant exhibits.

It was also expected that the collaboration with the BGCSF would deepen partners' understandings about co-developing STEM exhibits in public spaces.

Summative Evaluation Questions

Families

Engagement: How does the parklet engage intergenerational groups? What are the nature of and level of engagement?

Awareness/Knowledge: To what extent and in what ways do intergenerational groups become aware of or gain any new insights about featured content (water) at the Parklet?

Attitude: To what extent do families see the STEM content (water) as relevant and meaningful to their daily lives? To what extent do they see the Parklet as valuable to their community? To what extent do they find the experience culturally relevant?

Collaboration

Other: To what extent does the partnership successfully leverage each partner's resources/expertise to meet project goals? Do partners perceive that each organization involved receives benefits?

Awareness/Knowledge: To what extent do partners build capacity to engage Latino communities in STEM?

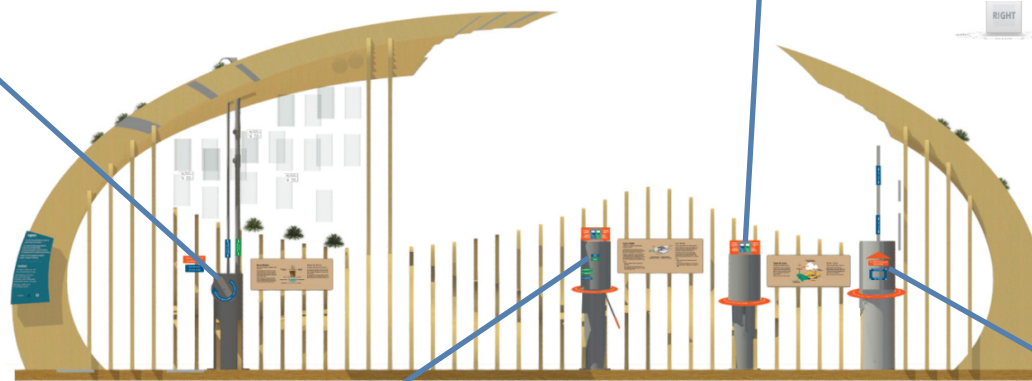
Overview, cont'd.

The *Ciencia Pública* Parklet had four key components and accompanying labels.

Watering Plants



Water Vapor



Salt Water



Rain

Methods

This study was grounded in culturally responsive approaches to evaluation (Frierson, Hood, Hughes, 2010) and used a mixed-methods design (Greene & Caracelli, 2003) which combined quantitative and qualitative data.

Data for this study were collected between April and July 2015. Specific methods used in this study included the following:

Observations and Interviews

The purpose of participant observations and interviews was to understand how families engaged with the Parklet and its STEM content. Researchers systematically observed families and recorded details of their behaviors, interactions, modes of engagement, and conversations (DeWalt and DeWalt, 2002). Immediately following the observation, researchers conducted semi-structured depth interviews with selected groups. The goals of the interviews were to deepen our understanding of participants' experiences and provide additional data about 1) respondents' enjoyment of the exhibition; 2) the ways in which respondents reflected on their experiences in the exhibition; 3) how the experience contributed to families' understanding of the content; and 4) the perceived relevance of the Parklet.

Due to the context of the Parklet, where visitation (i.e. who visits and when) was fairly unpredictable, families were pre-recruited using purposive sampling (Babbie, 1998). Recruiting families ensured that we obtained a robust sample of intergenerational groups. Families were recruited through BVHM, community contacts, and fliers posted at

community-based organizations in the Mission. Selection criteria for this sample included the following: a) family identified as Latino/Hispanic; b) family had at least one child between 8–12 years old; c) family lived in the Mission or had children attending school in the Mission; and d) family could not be Exploratorium members. Beyond these criteria, we strove to include as broad a range of families as possible to ensure educational and linguistic diversity in the sample. Participants received free tickets to the Exploratorium and a \$50 honorarium for their participation. We observed and interviewed 20 families for this portion of the study. Interviews were recorded for analysis. (See Appendix A for respondent details.)

Unobtrusive Observations and Intercept Surveys

To supplement data from pre-recruited groups, researchers conducted 50 unobtrusive observations (recording behaviors, interactions, and conversations) followed by short intercept surveys with groups that stopped at the Parklet. Researchers used a random sample, selecting visitors that stopped at the Parklet for more than 10 seconds regardless of whether they were in intergenerational or adult-only groups. Data were collected on three different weekends. (See Appendix B for respondent details.)

Culturally Responsive Frame

Summative evaluation was grounded in a culturally responsive, contextually relevant evaluation approach. In this approach, the evaluator considers the culture and context of participants and organizations as critical factors through which to examine the project's goals and its impact, which ultimately influence evaluation design, data collection, analysis, and dissemination (Frierson, Hood, and Hughes, 2010).

The data collection team was comprised of a diverse team of bilingual/bicultural researchers, some of who were also familiar with the Mission's Latino community. Data were collected in English and Spanish, as appropriate, based on families' preferences. Data collection instruments were developed simultaneously in English and Spanish to ensure construct equivalence.

Methods, cont'd.

Focus Groups

To obtain additional community feedback, we conducted two focus groups with parents of children attending BVHM. Conversations focused on obtaining feedback about the Parklet, particularly about how respondents perceived the relevance of the STEM content and the extent to which they believed the Parklet contributed to the community. Each hour-long focus group included a visit to the Parklet and a discussion. As the structure of the conversations was highly dependent on school culture/context, these focus groups were more interactive and informal. Thus, the data collected were not as “in-depth” as with more traditional focus groups. These groups did provide rich community perspectives, however.

Given school culture and context, it was not possible to recruit participants in advance. Therefore, respondents were recruited on-site immediately following gatherings in which parents were present. The same sampling criteria was used, however, as for families recruited for observations and interviews. Beyond that, one session included participants generally active in school activities and parent groups. To ensure diversity (socio-economically and general level of involvement in school activities) in the sample, the second session drew from respondents attending BVHM's food bank. All participants received a \$20 honorarium. Twenty-four parents (12 per session) participated in focus groups, which were conducted in Spanish. Discussions were recorded for analysis.

Surveys

Using a QR code system, visitors to the Parklet were invited to complete a brief survey via their mobile devices to provide feedback on their experiences. Surveys focused on respondents' enjoyment, the ways they characterized their experiences at the Parklet, and the perceived value of the Parklet to their community. To encourage participation, respondents received a coupon for a cup of coffee at a coffee house across the street from the Parklet. We received 45 online surveys. (See Appendix C for respondent details.)

To assess the project partnership, we used the following methods:

Partner Interviews

As part of developing an initial understanding of the dimensions of the partnership collaboration, we conducted phone interviews with a staff member from the Exploratorium and BGCSF, both of whom were key contacts in evaluation work. These open-ended and less formal conversations allowed us to identify key activities and topics to pursue in further data collection.

Researchers then conducted group interviews with a larger number of staff from each *Ciencia Pública* partner. These interviews were intended to capture the range of experiences of various team members involved in the project while also allowing us to identify areas of consensus among group



A researcher observes a family discussing the water vapor interactive. Families such as these were pre-recruited to ensure that the sample included sufficient Latino/Hispanic families from the Mission with children between the ages of 8–12.



Parents of BVHM students talk with the facilitator at a focus group. Before their discussion, the group visited the Parklet in order to better understand the experience.

Methods, cont'd.

members and areas in which perspectives differed.

Each interview with Exploratorium and BGCSF included five team members. Participating staff were purposively selected to ensure inclusion of team members involved in different aspects of the project (e.g., Principal Investigators, senior staff, coordinators, educators). Due to end-of-school year calendars, it was not possible to hold a group interview at BVHM. Instead, we conducted a depth interview with the school principal. All interviews were recorded for transcription and analysis.

Document Review

Project meeting notes and reports were reviewed to understand the trajectory and timeline of partner discussion and decisions. These provided further insights into the nature of the collaboration.

Data Analysis

Qualitative data from observations, interviews, and focus groups were coded using inductive coding (Strauss and Corbin, 1990; Patton, 1990), which allowed researchers to identify emergent patterns and themes in the data without the limitations imposed by predetermined categories. As patterns and themes were identified, researchers teased out the strength of these patterns and themes (Miles and Huberman, 1994).

Survey data were analyzed using basic descriptive statistics and summarized in

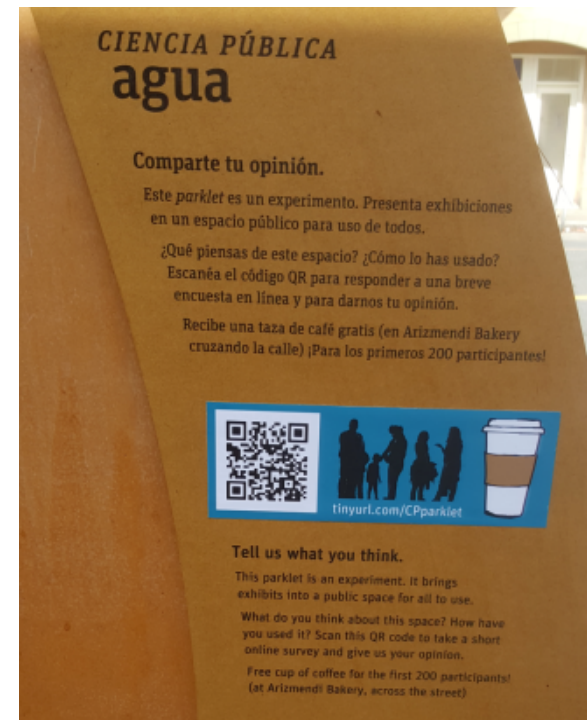
tables and histograms. We present survey responses in percentages (some percentages do not add to 100% due to rounding). Where appropriate, the actual number of responses (n) is provided.

Limitations

As in any study, this evaluation had certain limitations. Due to the low level of walk-by visitation among Latino residents, the primary data for this study was obtained via families specifically recruited for the evaluation. While participants were representative of the target audience, the families interviewed may have stayed at the Parklet longer than most casual visitors and their level of attention was likely higher.

Additionally, respondents to the QR code survey had to have smart phones to participate. While Latinos own smart phones and access the Internet from mobile devices at similar rates as other groups of Americans (Lopez, Gonzalez-Barrera, and Patten, 2013), respondents were self-selected. Additionally, the sample size is small; this should be considered when interpreting overall results.

Because of when the Parklet was installed, most of the data collection took place after BVHM had closed for the summer. We were, therefore, unable to document patterns of use by families during the school year and were unable to observe families who might use the Parklet before or after school.



One of several signs in the Parklet describing the online survey with a QR code linking to the survey. This information was posted in Spanish and English.

Results



Socio-Political Context

Any project that focuses on (and is situated in) a specific community will be affected by many contextual forces outside the administrators' control. Such broader political, economic, and cultural environments influence a project from development to implementation. *Ciencia Pública* was no exception.

Over the past decade, San Francisco has undergone tremendous change, in large part due to the boom in the technology industry. The Mission, in particular, has experienced an increase in residents from the technology industry. This has resulted in shifting demographics, soaring housing costs, and the displacement of residents, primarily Latinos. For example, although the 2010 Census indicated that San Francisco's Latino population grew by 11 percent, the Mission saw a 22% decrease in Latino residents from 2000 to 2010 (Hernandez, 2011). Median home prices in the Mission, once among the more affordable areas of San Francisco, have now surpassed those of the rest of San Francisco (Garofoli and Said, 2014).

Concerns about gentrification and potential displacement have created significant tensions. Growing urgency exists within segments of the Latino community—including local businesses—of the need to vigilantly guard against further gentrification and encroachment. Spurred in part by the current situation (Garo, 2014), several community groups and individuals worked to introduce and pass a resolution to designate Calle 24 (a section of the Mission spanning 12 blocks) as a "Latino Cultural District" that would, in part, "stabilize the displacement of Latino businesses and residents, [and] preserve

Calle 24 as the center of Latino culture and commerce" (San Francisco Heritage, 2014). In addition, the local street merchants and neighbors association (also known as Calle 24) has established policies consistent with this vision. Of particular relevance for *Ciencia Pública* was an Association policy that does not permit parklets on 24th Street (a major thoroughfare and base of Latino businesses in the Mission). Parklets, in fact, have been viewed with suspicion by some community members because they are seen as a sign of gentrification in the Mission or because most parklets—commercially-sponsored and located outside those specific businesses—are seen as primarily benefitting commercial interests rather than the community (see, for example, Mark, 2015).

Given this context, the Exploratorium team was challenged to identify a site for the Parklet that was acceptable to community partners. Initial efforts to locate the parklet adjacent to the BGCSF Clubhouse on 21st street were unsuccessful. Several concerns, including preserving neighborhood parking, safety considerations for BGCSF youth, and a general lack of community support necessitated finding a different site. During its four-month search for a secondary site, Exploratorium staff talked with many community organizations, including Calle 24.



Top: Graffiti attributes rising housing costs in the Mission on the influx of highly-paid tech workers such as Google employees. Bottom: A family walks by graffiti depicting a funeral procession for the death of the Mission. Such street art reveals the contentious nature of the economic and social changes taking place in the Mission neighborhood.

Socio-Political Context, cont'd.

While situating the Parklet on a site that would be heavily trafficked by local Latino residents was desirable, it was not possible. The final site, located on Valencia Street adjacent to BVHM K-8 school (which serves predominantly Latino families) met with support from the school and parents.

There were indications that the Parklet's location may have limited the number of Latino groups who visited. While it was not feasible, given the scope of this study, to systematically track visitation of casual passerby groups to the Parklet by race/ethnicity, QR code-initiated surveys collected, as well as intercept interviews of casual passerby groups, indicated that only 16% of respondents identified as Latino/Hispanic. In fact, numerous Latino families specifically recruited for this evaluation noted the very real divide in the Mission due to gentrification; they commented that they and other local Latino families do not often frequent Valencia Street.

Nonetheless, the Parklet being located adjacent to BVHM and the relationship the Exploratorium team had established with school administration created the potential to draw an audience from Latino families who are part of the school community. (Since the majority of data were collected after school was out of session, however, we were unable to determine visitation patterns during the school session.) It is worth noting that in focus groups, parents from BVHM were enthusiastic about the Parklet.

Community Response to the Parklet

Overall, participants in this study saw significant value in the *Ciencia Pública* Parklet and believed it to be important to the community. The most commonly cited positive aspects of the Parklet were its focus on a critical and timely topic and its educational component. In addition, 98% of survey respondents reported high enjoyment levels.

Responses to the Parklet from participants in this study were overwhelmingly positive. Given the current drought in California, it is perhaps not surprising that a primary reason participants gave for the Parklet's importance was its focus on the subject of water. Respondents often discussed the timeliness of the topic, noting the importance of raising awareness of the drought and the need to conserve. They also commented that a Parklet with this focus provided value to the entire community.

In addition to noting the importance of the topic, parents—especially those directly affiliated with BVHM—placed great importance on the educational value of the Parklet for their children. They appreciated an outdoor space that provided opportunities for youth to learn in a hands-on, experiential way (some specifically mentioned science learning, although most mentioned learning in a more general sense). BVHM parents saw the Parklet as a resource for the school (e.g., something teachers could use with students), but some did recognize that anyone in the community could access the space.

Respondents often contrasted the *Ciencia Pública* Parklet with other parklets in the Mission. They commented that other parklets were essentially commercial enterprises that they believed only benefitted the local business who sponsored them (and took up valuable parking spaces). On the other hand, they saw the *Ciencia Pública* Parklet adding value to the community because of its educational focus and subject matter.

Additionally, while some respondents questioned why the Parklet was located on Valencia Street as opposed to other places in the Mission with a larger Latino concentration, nearly every participant in this study commented that they appreciated the inclusion of both Spanish and English labels in the Parklet. They felt this signaled a sincere effort to be inclusive of the diverse population in the Mission.

[It's] great that in a ten feet by two [space] you bring learning out into the community. You don't have to be a five-story building.

Yeah, [it's inviting]. I think having the benches—if you want to take a break and learn while you're relaxing...I've only seen the ones like at the coffee shops...in the private space you have to pay to use it. Here it's for everybody.

Community Response to the Parklet, cont'd.

The graphic below is a compilation of key words that Latino parents (at focus groups convened at BVHM) used to describe the value of the Parklet. The size of the word represents how often the word appeared in the responses. Note the strong emphasis on the educational dimension of the Parklet for youth.



Community Response to the Parklet, cont'd.

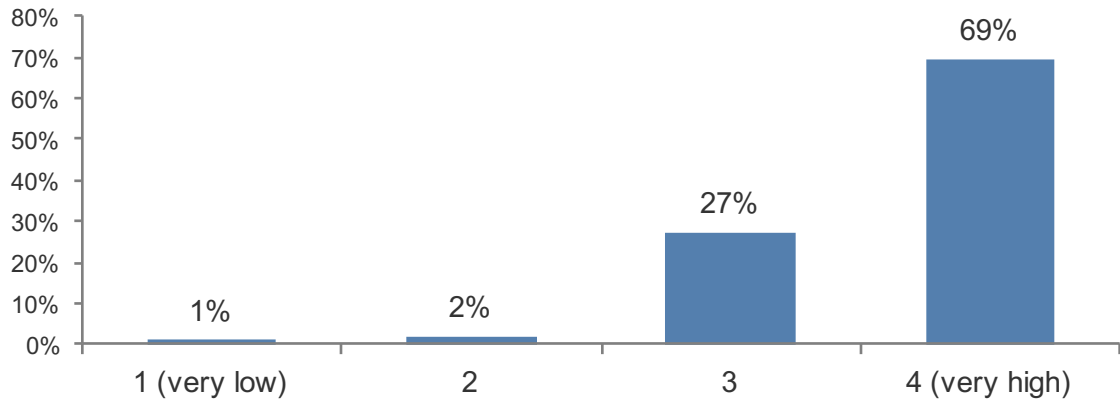
Participants reported high levels of enjoyment at the Parklet. A heavy majority of survey respondents (97%) rated their enjoyment a “4” or a “3” on a 1–4 scale where 1 was “very low” and 4 was “very high.” (There were no discernable differences between respondents by race/ethnicity.)

Participants also shared that they found the Parklet comfortable and inviting. The Parklet’s seating was often mentioned by respondents as a key reason for finding the space inviting. They also felt the space was inviting due to its overall look and feel as well as the fact that it allowed them to relax outdoors. Some respondents also specifically mentioned feeling good that anyone in the community could visit it. (A few respondents, however, said they were initially not sure if it was part of the school and for its use only.)

Survey respondents had similar reactions. When asked to rate on a 1–4 scale (1 being “very low” and 4 being “very high”) how inviting the Parklet was, 91% provided ratings of “4” or “3.”

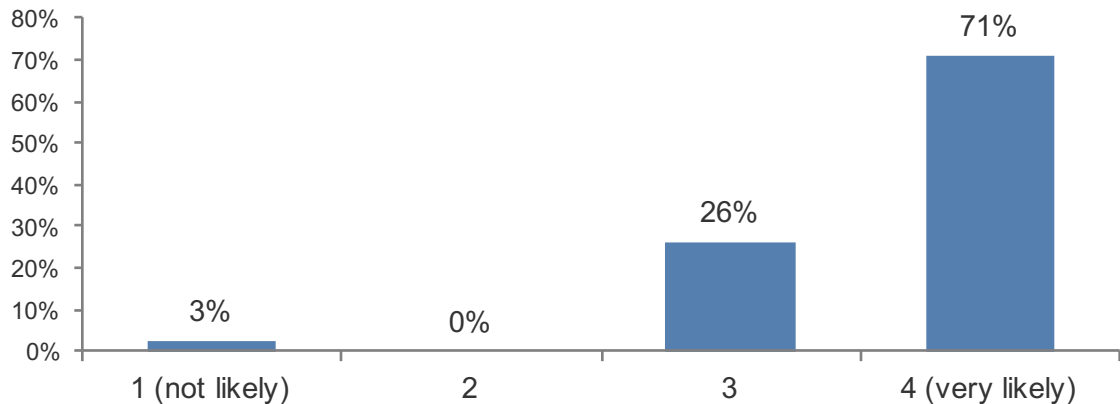
Furthermore, using the same 1–4 rating scale, the majority of survey respondents (97%) who said they lived or worked in the Mission rated their likelihood of visiting the Parklet again as a “4” or “3.”

How much did you enjoy this space?



N = 95

How likely are you to stop at this space again?
(respondents who live or work in the Mission)



N = 38

Awareness/Understanding of Featured Content

Overall, participants described the current drought in California and the need to conserve water as the “main ideas” communicated by the Parklet. While the issue of water shortage was not new, participants shared that the Parklet served as an important reminder to everyone.

Families who participated in our study readily understood that the Parklet focused on water. They said the Parklet provided interesting information that helped them reflect on the drought and reminded them of how important it is to conserve water. A few participants, in fact, commented that they wished for more tips and ideas on how individuals can save water.

At the individual component level, each of the four interactives had significant strengths as well as challenges. Overall, all four of them engaged visitors with their different content. Interactions also varied at each component based on topic, the nature of the information provided, and the specifics of what there was to do and see. Collectively, however, the Parklet provided families with opportunities to engage with different yet complimentary aspects of the topic.

In the following pages we discuss each component in detail.

It makes people conscious of being in the drought. Seeing things—we might have to take into action eventually and not being wasteful.

I think it's for people to learn about water and how to take care of it. Not waste it.

It's so we don't waste water. To help us be more conscious of it. It's a great idea. Excellent.

We're in a drought right now. People need to try harder to conserve it—to not waste it. This [parklet] is about that. It's good and well explained.

[The topic of] water is super important right now because of the drought. The more it can be explained the more awareness it can raise in people so we can all take care of it.

Awareness/Understanding of Featured Content: Watering Plants

Strengths

The primary idea that participants gained from the Watering Plants interactive was that good, water-efficient strategies do exist for watering plants. The relationship between the explanation on the label, the action that could be done (i.e., turning the crank), and what happened when one did it was strong and clearly conveyed the concept. The diagram, which was key in communicating the content, succeeded with all participants because it visually illustrated the mechanism by which water was absorbed through the wick.

This component had the most opportunity for intergenerational engagement. The activity could be done together, and it was easy for families to understand what was happening and then discuss it. As a result, most of the conversation at this component focused on the watering system.

Visitors noticed the plants and some recognized those familiar to them (e.g., cilantro), thereby making strong personal connections at this component.

Finally, this component spurred participants to think more about how they could conserve water at home—for instance, in their own gardens or in watering their own plants.

Challenges

While the Watering Plants interactive engaged families to explore the idea of water-efficient watering strategies, visitors did not find it readily apparent how to reproduce such a system at home. As a result, there is an opportunity for the Exploratorium to provide guidance for people to replicate the system at home—this would also extend the experience for visitors.

Another challenge of this component was that families had difficulty seeing where the water went after they had pumped it.



I want to learn about how to irrigate my plants the same way.

I think the main one [new idea] for us is the recycling water for the plants....I think as the drought goes on, I think that would be the way to go. Instead of having the plants in the front yard, when or if those plants eventually die, I would go with a system like that.

Awareness/Understanding of Featured Content: Salt Water

Strengths

Respondents said that they learned how desalination works at the Salt Water component. Many respondents said they had previously heard of desalination but that they had not understood the process; this interactive, they noted, helped them understand. Not only did the component help respondents explore the desalination process, it also provided them, through the interactive pump, an opportunity to remove salt from water themselves.

The Salt Water interactive was often the first one respondents approached, because it was in the middle of the Parklet, it looked intriguing, and it had a pump that clearly invited interaction.

This component encouraged social interaction. Families discussed California's drought issues, the mechanics of desalination, and the cost/benefit of desalination. The Salt Water interactive also offered opportunities for critical thinking; respondents used deductive reasoning to understand the worth of the process if you were to pump too much, how much energy was used during the process, and the cost versus benefit of desalination.

Challenges

The Salt Water component was less successful, however, in communicating to all respondents the implications of a desalination system that takes a significant amount of energy. While some understood the energy requirements, a few respondents walked away with the notion that desalination of ocean water was a good solution to water shortages.

In addition, the red box could become fogged inside, making the numbers displayed difficult to read.



I remember watching something on the news saying they were going to try to make ocean water into drinking water or sewer water into drinking water. After I saw this, now I can see how that happens.

[It's] not a cost-effective means of purifying water...This [the desalination pump] shows that it can be done, but it is not cost-effective because you have to spend too much energy to maintain it.

Awareness/Understanding of Featured Content: Water Vapor

Strengths

The Water Vapor interactive elicited some conversations, most of which focused on the evaporation cycle depicted on the label. While the diagram seemed complicated to many respondents, it nonetheless engaged some of them, who tried to understand how evaporation works. The label allowed respondents to use their imaginations to better understand the process. For instance, one person was observed explaining it to another group by referring to condensation that took place on the windows inside of a car.

Those participants who reported learning something from this interactive often noted that they had not known that evaporation left salt behind.

Challenges

The Water Vapor component was more passive than the Watering Plants and Salt Water interactives and, in contrast to those two components, gave families few opportunities for engaging interaction. The focus of the Water Vapor component was obtained primarily by reading the display or the label.

While some visitors used the label to understand the water evaporation cycle, its similarity to illustrations in school textbooks tended to make it more intimidating than the Parklet's other labels to people with less formal education.

Moreover, some were not able to see the implication of the "before and after" display.

Finally, this component was the least connected to other interactives in the Parklet, which resulted in respondents struggling to fit its message into the overall message of the Parklet.



That's the key! If they can get fog to turn into water.

This pump is different [than the desalination pump] because it de-saltifies [sic] the rainwater..it de-saltifies [sic] water after the evaporation and condensation.

Awareness/Understanding of Featured Content: Rain

Strengths

Respondents were most drawn to the data displayed by the histogram in the Rain component. We observed many groups comparing recent rainfall data to historical data and discussing the differences.

Respondents felt that this component was important because it raised awareness of the need to conserve water. Not only did respondents say that the histogram impacted them because it so clearly showed the severity of the current drought, but some of them also had “aha” moments about the reason for the drought while looking at this component.

Children approximately 8 years old and up could use this interactive on their own and understand the information that the histogram conveyed.

Challenges

It was not clear to all respondents how the rain gauge in the Rain component worked.

Some respondents said that they wished the Parklet provided more suggestions of actions they could take to conserve water. This is another opportunity for the Exploratorium to extend the experience to visitors' homes and have more impact on them.



I thought the barometer [rain gauge] was interesting. To see how much water we're getting—it's not a whole lot. In a four-month period, only three inches.

Bilingual Labels

The bilingual labels were very well received. Participants in this study unanimously commented that they were delighted to see that the Parklet provided information in Spanish and English. All noted that this signaled that everyone was welcome at the Parklet.

Respondents often pointed out that since the Parklet was in the Mission, it was important to provide information in both English and Spanish.

Many also commented that they were happily surprised to see the Spanish placed *first* on the label and found it wholly appropriate. Latino participants affirmed that the bilingual signage made them feel welcome and that it signaled that Latino community had clearly been considered in the development of the Parklet. They noted that it provided access to non-English speaking residents as well as for the bilingual. Some shared, for example, that in their family they had members who were more Spanish-dominant and others that were more English-dominant so that having information in both languages made it accessible to everyone.

Both observations and interviews confirmed that the bilingual labels provided families access to information and helped maintain a group's linguistic practices and norms. For example, some individuals in groups used Spanish labels while others in the group used English labels. In other cases, families used *both* Spanish and English labels regardless of self-reported language dominance. These findings were similar to results from prior research on bilingual exhibits (Yalowitz, Garibay, Renner, and Plaza, 2015).

A few respondents also commented on the high quality of the translation and noted their appreciation of the effort. In contrasting the bilingual *Ciencia Pública* signage to other experiences, these participants also noted that sometimes the Spanish they see on other informational signs is poorly translated and seems like an afterthought. Participants, were overall, highly complementary!

While all participants welcomed the labels, we did note a number of issues when Latino families with lower levels of formal education engaged with the Parklet.

- The vocabulary and tone were considered too academic and difficult to understand. The Spanish, while very well translated, seemed disconnected to the colloquial, everyday Spanish typically used.
- Some respondents were initially intimidated by some of the labels because they appeared very scientific or academic.
- We observed some groups who had difficulty reading and understanding the label content but who initially did not want to admit this due to their feelings that it signaled a personal deficiency.

Since labels were the main conveyance of information, people in these groups found the content more difficult to access. Participants with low literacy levels had significant difficulty with the labels.

It's great [to have bilingual labels] because sometimes you don't understand [English] and you feel separated. This way because it's in Spanish and English, people can understand.

I think it's a good translation.

For me to read, either [language] is helpful. Even though nowadays, I read English. But from the type of community that we're in, I think it's helpful.

You want to put it in layman's terms.

Bilingual Labels: A Closer Look

The component labels worked well for visitors when they 1) used everyday language, 2) provided directions about what visitors should do or notice at the component, and 3) posed questions that sparked conversation. Some *Ciencia Pública* labels worked better than others. Below we highlight aspects of the Salt Water label that worked well and those that could be improved.

The pairing of the Spanish and English translations gives a sense of balance and indicates that the languages are equally important

The image helps visitors visualize the system that they cannot otherwise see

The image is shared by the Spanish and English translations

An easily understood and intriguing question

Vocabulary, such as "molecular," perceived as academic and not accessible

A friendly invitation to engage with the component

Agua salada

¿Pueden los océanos proveernos de agua potable?

Este dispositivo convierte el agua salada en agua dulce. Cuando bombas, empujas el agua salada a través de un filtro muy fino que funciona a nivel molecular para atrapar la sal y otros minerales.

California se encuentra junto a una vasta fuente de agua; si tan solo pudiéramos extraer la sal... Algunas ciudades han construido grandes plantas de desalinización para obtener agua potable del océano. Sin embargo, es un proceso costoso que utiliza una gran cantidad de energía.

Intenta hacer lo siguiente:

- Bombea con la manija blanca para separar el agua dulce del agua salada.
- Observa el agua dulce que cae a gotas dentro de la taza. ¿Cuántas veces deberás bombear para obtener una taza de agua para beber?

ingreso de agua salada

capas de filtro

salida de agua muy salada

salida de agua dulce

When you pump, salty water is forced through many layers of special filters.

Salt Water

Can oceans provide our drinking water?

This device makes fresh water from salty. By pumping, you push salt water through a very fine filter that works at a molecular level to trap salt and other minerals.

California lies next to a vast source of water—if only we could remove the salt. Some cities have built large desalination plants to get drinking water from the ocean. However, it's an expensive process that uses a lot of energy.

Try this:

- Pump the white handle to separate fresh water from salty water.
- Notice the fresh water dripping into the cup. How many strokes would you have to pump to get a cup of water to drink?

The description of the filter process is lost at bottom of sign

The information about the filter appears in two places

A clear explanation of what a visitor can do at the component

The discussion of the cost of desalination is buried beneath the explanation of the filter, causing many visitors to overlook it

Diversity within Latino Family Groups

The Parklet successfully engaged all the families that participated in this study. As described earlier in this report, families enjoyed their experiences and found the Parklet to be valuable. The study also revealed interesting nuances in the ways that families with more and less formal education engaged with the Parklet and made meaning of their experiences.

We found that among families with caregivers who had higher levels of education, interactions between group members closely followed the types of interactions previously documented in studies of families visiting museums (for example, Briseño-Garzón, Anderson and Anderson, 2007; Moussouri, 2003). Children typically engaged with “hands-on” features (e.g., pushing buttons, moving levers) while adults tended to observe their children and read accompanying labels. Caregivers typically took on a guide/teacher role, focusing on scaffolding their children’s learning. Adults often tried to focus children’s attention, pointing things out, asking questions related to the component they were exploring, and trying to make sense of the information presented analytically. (Occasionally, we also observed older children acting as facilitators for younger siblings.) Interactions for these families tended to focus on the children and on helping them understand specific content.

The following example depicts an interaction among a Latino family with parents who had more formal education. The family group consisted of two parents (mom and dad) and their 10-year-old son.

As the mother and boy approach the watering plant pump, the mom notices the sign with information about the Boys and Girls Club youth involved in the project. She reads the sign aloud to her son. The boy nods, and shifts his attention to the Watering Plants component and he proceeded to turn the wheel. The mom follows and watches him for a moment. The mother briefly notices the plants and directs the boy’s attention to them. She points to the ones she can easily identify and names these for him: “Chiles.” “Kale.” The boy looks up and notices the sign that reads “peppers” as he continues to turn the wheel. The mom then points her finger up toward the top of the parklet and remarks, “Look, the water gets filtered through the pipe and into the planters!” The boy notices this and looks at the illustration near the wheel. His mom encourages him to read it and he focuses on the illustration, reading each description, “Water flows in. Water flows out.” He then says, “So they’re plants that are watered through the pipes.” The mom responds “Yup, pretty much,” then reads part of the larger label to him: “The water system has many advantages. It delivers just the right amount of water directly to the plants’ roots while reducing evaporation and nutrient loss from the soil.”

Select Mission Demographics

- 41% of Mission residents identify as Latino (San Francisco Planning Dept., 2012).
- 37% of Mission residents speak Spanish at home (San Francisco Planning Dept., 2012).
- 42% of Spanish-speaking households in the Mission speak English “not well or not at all.” (San Francisco Planning Dept., 2012).
- The Mission population is less educated than San Francisco as a whole, with the rates of high-school graduates among the lowest in city: 78% for the Mission District compared to 86% citywide (Mission Economic Development Agency, 2011).
- Of Mission residents 25 and older, 35% have a high-school education or less (San Francisco Planning Dept., 2012).

Diversity within Latino Family Groups, cont'd.

She asks if he has learned about “evaporation” in school. The boy nods and the mom adds, “so this means you can get just the right amount of water to the plants without wasting any and it’s better for the plants because keeping the nutrients in means they [the plants] stay healthy.” The boy seems to think about this for a second and nods then shifts his attention to another component and moves on.

On the other hand, families with less formal schooling had more fluid, dynamic, and exploratory interactions. Furthermore, adults and youth in these families tended to explore together as co-learners. Children and adults engaged with the hands-on components (though youth still tended to gravitate more to hands-on aspects than did adults) and the group explored together, often shifting between “doing” and “directing.”

Interactions, in general, involved the group collectively trying to understand what was happening at the component without the overt “learning/teaching” interactions observed in groups in which adults had more formal education. Additionally, we also found that families with less formal schooling tended to draw on or bring in their previous experiences to make meaning of the Parklet content.

The following example depicts an interaction among a Latino family with parents who had less formal education. This group included one female parent, a grandmother, and two

children (a girl about 9 years old and a boy about 6).

At first, the group was a bit hesitant, but with some encouragement from the researcher, began exploring the Parklet. The group walked up to the Watering Plants component and stood for a minute taking it in. The mom began to turn the wheel to pump water and then invited her daughter to try it. The girl began to move the handle and called out to her brother; she showed him how to turn it. She asked her mother what it was. The mother looked through the planters and pots and mentioned that it seemed that water was being pumped.

The grandparents stood back watching, but soon joined in with conversation. The grandmother chimed in, offering that in Mexico they found novel ways to conserve water by reusing both rainwater and dishwater to water plants. She then joked that “poor people have always innovated lots of ways to save water.” The mom chuckled and said, “Yes, out of necessity.” The mom then looked a bit longer and commented, “look at how the water goes up. It’s kind of like an eye dropper.”

The girl continued to turn the wheel and said she was “watering the plants.” The boy seemed to lose a bit of interest at this point and started climbing on the seat next to the component. As they left to move to another component, the mom said, “it’s ingenious, but



A boy and woman discuss the Water Vapor interactive. This family is an example of one where the caregiver took on the role of guide to help her son explore the concept of evaporation.

Diversity within Latino Family Groups, cont'd.

it looks pretty hard to try at home.” Before they moved on, the grandmother commented that, “we’re all connected to Mother Earth and we should take care of it, but we often forget.”

In both examples, families clearly had positive interactions at the exhibit component. But the nature of the interactions is quite different.

Those families with caregivers having more formal education tended, at the Parklet, to draw on the learning model they were socialized into at school. We might characterize this as a more linear model, whereby the goal is knowledge acquisition and where learning is one-directional and often “taught,” or facilitated, by a more knowledgeable individual. These families, for example, tended to focus primarily on the STEM content (e.g., water vapor cycle) and process (e.g., “If this happens, then that is the result”). Keep in mind that these families also tended to have more experience in visiting museums.

In contrast, groups with parents having less formal education certainly engaged with the topic at hand but did not focus as narrowly on the science content or process depicted. Instead, group members might have introduced a range of ideas spurred by their interactions and tried to draw on a range of past experiences to make sense of the information they were encountering. The conversations, for example, often involved storytelling or bringing in ideas they were

reminded of as they engaged with a component. Additionally, they tended to work together to interpret the content, rather than having one person take on a facilitator-like role.

These different patterns of engagement demonstrate the varied approaches in the Latino community to engaging with informal learning exhibits (at least within the Parklet context) based on education levels.

We also found that some families in which adults had less formal schooling (and were less familiar with museum-going practices) had more difficulty initially making sense of the Parklet. The rather traditional science museum interactives, for example, were not readily familiar to these families.

Some adults were puzzled by these components. What were they? Were these devices put there by the school or the City? Were they demonstrating something? In fact, some families were unsure as to whether it was acceptable even to touch or interact with these components. The researcher often had to encourage these groups to explore and engage with the Parklet and the interactives. We also found that members of these groups—particularly adults—often looked to the researcher for information about what they were supposed to do or to explain the content in question.



Two siblings explore an interactive. In some families, members collectively explored to make sense of the ideas presented without anyone in the group taking on specific learner/teacher roles.

Diversity within Latino Family Groups, cont'd.

As previously discussed, all participants in this study said they thought the Parklet was relevant because of its focus on water. They all emphasized that given the current drought, the topic was relevant not just to them personally but to all San Franciscans and, more broadly, all Californians. (Some added that the topic actually had global relevance.) Thus, the Parklet was “issue relevant” because of the topic on which it focused.

A subset of Latino families, however—those with less formal education (often immigrants who had less experience with museums)—did not see the Parklet itself as necessarily culturally relevant. These families saw its relevance purely in the fact that the content was about something important.

These groups tended to have some difficulty with the abstract nature of some of the content. Even the Watering Plants component, which was readily recognizable (plants!) and the easiest conceptually to grasp, seemed to some a bit “techie” (and fancy); some found it challenging to figure out how to reproduce the idea at home.

The materials, for example, seemed out of reach compared to something more familiar, such as a clay pot. That is not to say that these groups were unable to personally connect with the ideas presented, but simply that they sometimes had to work harder to connect more concretely the ideas presented at the Parklet to examples from their own lived experiences that might help them better understand the concepts.

These groups could have used more entry points into the content. One participant, for example, commented that information connecting the content with stories or examples from the rich agricultural history of California might have been interesting. This respondent pointed out that many California Latinos have family members who worked as fieldworkers (or had done so themselves).



A respondent looks at the Water Vapor interactive. Some participants who were not museum-goers found the exhibits puzzling and were unclear about what they were or if they were supposed to interact with them.

Community Partnership

One goal of *Ciencia Pública* was to partner with a local community organization to co-develop the Parklet and to increase capacity-building for staff and each partner organization. Overall, the partnership met its principal goal of developing and installing a Parklet in the Mission; as previously described, the Parklet was well received by community members. We also documented a number of ways in which the three organizations benefited from the partnership. While partners reported some level of deepened capacity-building, the Exploratorium team was the most positively impacted.

A significant and growing body of literature exists about partnerships and collaborations; this literature is important to consider in understanding and assessing a partnership. The research indicates that partnerships evolve through stages of development and maturity (Jemigan, 2010). A partnership established between organizations that have never worked together, for example, would be characterized as a “young” initiative with particular needs and work that must be done (e.g., building trust, establishing communication norms), which differs from the work of a long-term partnership focused on sustainability (e.g., leveraging additional funding, developing core sustained programming). Additionally, the stages of maturity in a partnership directly influence what outcomes are feasible and realistic. A newer partnership, for example, will likely have less impact in influencing core organizational practices than would a more mature partnership (Bailey and Koney, 2000).

In *Ciencia Pública*, the partnership involved three organizations—The Exploratorium, BGCSF, and BVHM—that had not worked

together before. (While BGCSF and the Exploratorium had partnered previously, this relationship involved an entirely different department in the Exploratorium; no one on the “Studio for Public Spaces” staff had worked with BGCSF.) Thus, this partnership would be characterized as being at the developmental stage—where processes of working together, norms of communication, and refining the specifics of the partnership are still being established.

For a project-specific partnership (Jemigan, 2010) such as *Ciencia Pública*, then, the main outcomes most appropriate to assess are that:

- the specific project deliverables were completed;
- the partnership leveraged resources and expertise; and
- each partner received some perceived benefits.

From this perspective, the *Ciencia Pública* partnership met all three criteria; the extent to which partners perceived benefits and that their expertise was leveraged, however, varied.

On the positive side, the Exploratorium and BGCSF staff worked together to successfully develop and implement programming for youth as part of the co-development of the Parklet.

The Parklet, co-developed with youth from BGCSF, was completed and installed in the Mission. As described earlier in this report, summative evaluation found that, overall, the Parklet met its goals in engaging intergenerational families.

Additionally, the Exploratorium team's evaluation (Garcia-Luis, 2014) documented that youth felt confident and gained a range of skills (e.g., sketching, making models) and would recommend the experience to their peers.

We also documented ways partners' expertise was leveraged and perceived benefits from the project. (See next page.)

Community Partnership, cont'd.

There was evidence that the project leveraged each partner's assets and expertise and that the partnership, in turn, benefitted each organization involved. The table below outlines the primary contribution from and benefit to each partner.

Partner	Primary Contribution	Primary Benefit
Boys and Girls Club of San Francisco	<ul style="list-style-type: none"> • Expertise in youth programming • Knowledge in working with Latino youth 	<ul style="list-style-type: none"> • Ability to offer participating BGCSF youth strong, hands-on design programming • Increase in participating BGCSF youth skill development • Gained insights into working with external partners
Buena Vista Horace Mann	<ul style="list-style-type: none"> • Provided Parklet site • Strong relationships with and knowledge of local Latino families 	<ul style="list-style-type: none"> • Increased visibility in neighborhood via the Parklet • Use of Parklet by teachers for STEM classes
Exploratorium	<ul style="list-style-type: none"> • Expertise in designing exhibitions (including outdoor spaces) • Knowledge of developing successful ISE STEM experiences 	<ul style="list-style-type: none"> • Increased knowledge of working with community youth in co-design projects • Increased knowledge of processes for engaging Latino communities • Insights into working with external partners

Community Partnership, cont'd.

It would be unrealistic, of course, for new partnerships to not experience challenges. This evaluation identified several challenges.

Differences in organizational mission colored understandings of the project as a whole. Given the focus of BGCSF, staff saw this project primarily as a youth development initiative. Exploratorium staff, on the other hand, considered the primary goal to be the design and development of a Parklet.

While both partners worked sincerely toward accomplishing the overarching vision of the project, and both believed youth engagement and Parklet development were important components, the differences in focus illuminated different philosophical starting points that colored perspectives and priorities; these differences likely were not obvious early in the partnership.

This issue also played out in the site selection for the Parklet and final decision-making. For instance, a major value for BGCSF is providing a safe space for its youth members at the Club. A parklet which intends to engage the general public is, by its very nature, at odds with that value. This created tensions between partners and it became clear that partners had different assumptions and expectations about where the Parklet would be situated and what process should be used for making a final decision.

Other challenges included:

- Differing perceptions between BGCSF and Exploratorium staff about the extent to which their expertise was or could be leveraged given program structures, budgets, and timelines;
- Lack of clarity of what was meant by a “co-designed” project. Was it primarily input into content or was it collaborating on the actual design at every level, including what interactives looked like and the aesthetics of the Parklet? This raises interesting questions about how partners negotiate a co-design process so that it feels authentic to everyone.
- The workload was heavier than expected, which stretched both the Exploratorium and BGCSF. The Exploratorium was able to leverage their volunteers to accomplish certain aspects of the work, but BGCSF did not have that resource on which they could draw.

Collaborations between different types of organizations are, by nature, affected by power structures. One organization can hold the purse strings or simply have more power by virtue of its organizational positioning. Domhoff (2005), for example, notes that this “inter-organizational environment” itself

Recommended Steps for Future Partnerships

- Involve all partners more integrally in the grant development process, including in collaboratively determining goals. Explicitly have each partner identify anticipated benefits from the project for each organization.
- Establish systems for ongoing communication between partners and ensure that these systems include communication across all levels of the organizations.
- Find a safe and inclusive way to hold difficult conversations about differences in perspectives, how the project is progressing, and what is working and not working. This will require building trust and honest communication.
- Develop some formal structures to assess project progress and success along the way. Mutually establish what counts as success to gauge progress. Consider developing written progress summaries for review to foster dialogue about successes and challenges.
- Ensure funding levels or all partners are equitable. This includes ensuring that funds provide multiple staff members from all partner organizations to be deeply engaged in the project. Having contingency funds are especially important to cover time of bringing in additional community stakeholders not originally anticipated.

Community Partnership, cont'd.

reflects existing power structures.

It emphasizes that the necessary resources—whether money, expertise, or raw materials—are properties of the power structure as a whole as well as assets and needs of individual organizations within it. (para. 56).

In the case of this partnership, BGCSF had an established and ongoing relationship with a different department at the Exploratorium (not involved in *Ciencia Pública*) that had provided curricular and programming resources for youth programs at the BGCSF. Given the importance of the existing collaboration to BGCSF, their staff were cognizant that they did not want to do anything that could potentially put that existing relationship at risk. (In this sense, the Exploratorium held more power by virtue of its organizational positioning.)

As a result, this sometimes led to lack of clarity about each partners' needs. For example, significant time was put into determining whether the Parklet could be on Club premises which meant the project ran off-schedule, required more staff time to select an alternate location, and strained relationships.

It is important to understand that power dynamics are inherent in organizational endeavors, and it would be unrealistic to deny that such power structures exist. It is not that

power structures themselves are negative, but rather that being *cognizant* of power positioning can help inform a partnership's processes. Ultimately, the partnership worked through some of the challenges.

As a contrast, it is interesting to examine the power positioning in terms of BVHM. The school had little to lose from the process of final site selection, while the Exploratorium felt some urgency to finalize the location of the Parklet.

BVHM held to a specific process that partners needed to adhere to and the school's community had final say over whether to install the Parklet on the school site. In this sense, BVHM was in a different power position as a partner.

BVHM has historically engaged, in an authentic way, Latino families who are part of the school in decision-making at all levels. As a result, BVHM has developed clear processes for seeking input and approval from community members. From their perspective, the bottom line is that the community ultimately decides on whether a specific project or issue is "a go" or not. The Parklet was no exception. Briefly outlined, the process involved the following:

- Developing a clear description of the Parklet and the specifics of what was being asked of BVHM and the community.

- Establishing communications with a broad range of parents and school leaders who served as liaisons to families (e.g., PTA lead, parent coordinator).
- Receiving direct input from parents through surveys and both formal and informal discussions and meetings. This involved, for example, going to PTA and school council meetings, sending parents surveys, and even physically attending certain events that parents also attended to ensure that everyone was included in the process.
- BVHM's process for community input was not negotiable, meaning that timelines needed to be revised in order to adhere to their established practices for engaging their community members.

Ultimately, the process ensured that Exploratorium staff successfully involved this community in approving the installation of the Parklet. As a result, there was significant community knowledge of and buy-in for the Parklet, not only at the organizational level but also at the community level via families involved with BVHM.

Overall, *Ciencia Pública* partnerships yielded important insights and learning. Part of deepening practice is learning from those "turning points" or areas where rising tensions can inform the future structuring of partnerships (Fawcett, 1995).

Conclusions and Insights



Conclusions and Insights

This study found that overall, the *Ciencia Pública* project met its goals. In this section, we provide a brief overview of key outcomes with a focus on illuminating the insights and lessons learned that may assist others in the informal learning field.

Socio-Political Context

Any initiative taking place in a community setting, by nature, confronts social and political issues that may affect various aspects of a project, and *Ciencia Pública* was no exception. The tech boom in San Francisco and its negative effects on the Mission (e.g., displacement of Latino residents) has created an environment in which many Latino community members are skeptical of any initiative or organization coming from outside the Mission. As a result, there was resistance to placing the Parklet on one of the streets most frequented by Latino residents. The fact that the Parklet could not be located adjacent to the BGCSF created a major unanticipated challenge. The Exploratorium team was responsive to these concerns and worked to address challenges, including adding a partner that facilitated an extensive process for engaging community members in the decision to locate the Parklet adjacent to BVHM. The key insight is that community engagement efforts must very carefully consider the larger socio-political context and community issues at play and determine, early in the effort's conception, the implications of how an initiative may be viewed and received. Stepping into a community setting can put greater onus on organizations from outside the community to understand the socio-political context and establish solid community relationships

(preferably well in advance of a major initiative) while remaining humble, flexible, and patient.

Community Response

The *Ciencia Pública* Parklet was well received. Participants valued the Parklet as an educational space that focused on a timely and critical topic and was relevant to the entire community. Latino parents, particularly those affiliated with BVHM, strongly emphasized the educational value of the Parklet and appreciated that it provided children with opportunities for hands-on learning. Respondents also found the Parklet comfortable and inviting and appreciated the general “look and feel,” which afforded not only opportunities to explore the topic of water and water conservation but also provided outdoor space in which anyone from the community could sit and relax. Additionally, the bilingual labels (with Spanish labels placed first) signaled that the Parklet was for everyone. Many Latino families noted that they felt welcomed.

The positive community response, an important goal for the partners, was clearly met. An interesting insight is that the educational aspect of the Parklet and the focus on a topic that affects everyone in the community were key reasons why this parklet was well received and considered especially relevant.

In addition, recalling the socio-political context, this Parklet stood apart from other parklets in the Mission because it was viewed as accessible to and benefiting everyone rather than a specific business or a subset of the community (e.g., those who can afford to patronize a trendy café).

Awareness/Understanding

Overall, the *Ciencia Pública* Parklet successfully engaged families with its exhibits and in exploring the related STEM content. Although the drought was a familiar topic, the experiences at the Parklet provided opportunities for participants to explore ideas and consider the importance of conserving water. Participants described the Parklet's main concepts as 1) the current drought in California and 2) the need to conserve water.

As previously noted in discussing community response to the Parklet, the focus on water was a key reason that participants were motivated to engage with the Parklet. One insight, therefore, is that the “issue relevance” of the Parklet played an important role in engaging the public. Additionally, the four exhibits had their individual strengths and challenges but provided opportunities to engage with different yet complimentary aspects of the topic.

Conclusions and Insights, cont'd.

Labels

Bilingual labels were critical to the Parklet experience—not only in signaling inclusion, but also in providing access to content so that families could engage with the ideas presented. Equally important was that using bilingual labels allowed groups to maintain their families' linguistic practices and norms, which in some cases included both Spanish and English. Thus, providing bilingual interpretation provided a more comfortable and seamless experience for many families.

This study also highlighted, however, the need to take into account the range of education levels and literacy skills of any group. While bilingual labels afforded positive experiences, they did not work for Latino families with parents with less formal education. For some, the tone and vocabulary were too academic, scientific, and/or intimidating. The Water Vapor graphic's similarity to illustrations in school textbooks tended to make it difficult for some residents to approach. Additionally, some noted that while the Spanish was correct, it felt more formal than the "everyday" Spanish one might use. Those participants with very low literacy skills found the information inaccessible.

It is possible that encountering the exhibits in a community setting—as opposed to within the walls of a museum—sets up different expectations about the tone and formality of what type of language to use. In a community

setting, it appears that there is a need for a more informal approach in language and tone, and perhaps less reliance on text in general.

Diversity within the Latino Community

This study also found differences in how families engaged with the Parklet and content based on parents' levels of formal education. Families with caregivers who had more formal education tended to draw on the learning models they were socialized into at school; a primary goal for these groups was knowledge acquisition. In contrast, groups with parents having less formal schooling did not focus as narrowly on the science content or the processes depicted. These groups introduced a broad range of ideas and experiences to collectively make sense of the information they encountered; conversations often involved storytelling or bringing in ideas as they engaged with a component.

This study also found that families in which adults had less formal schooling—and who typically were less familiar with museum-going practices—had more difficulty making sense of the exhibit components and were somewhat reluctant to engage. Some, for example, were not sure of what the components were and whether it was even acceptable to interact with them. Additionally, while these groups could personally connect with the concepts and saw the topic as relevant to everyone, they sometimes had to work to more concretely connect the ideas

presented at the Parklet to their own lived experiences. In these cases, the exhibits could have provided more entry points.

These different patterns of engagement illuminate the diversity in the Latino community (in any cultural group, really) and the importance of considering not only linguistic practices, but also factors such as education levels and museum-going habits. Although the exhibits, overall, were successful, findings also suggest that for some non-museum-goers, traditional science museum interactives are not necessarily intuitive and can feel quite foreign. It is interesting to consider how one might design exhibits for community spaces that move away from traditional museum interactives toward designs that might be more accessible to diverse cultural communities.

Community Partnership

Overall, the *Ciencia Pública* partnership accomplished its major goal in successfully developing and installing the Parklet in the Mission. As with any partnership, especially a relatively new one, the collaboration experienced challenges, often concerning differences in organizational culture, communication styles, and organizational priorities. The process of engaging Latino community members in vetting and approving the parklet site—outlined and facilitated by BVHM—was critical to ensuring buy-in.

Conclusions and Insights, cont'd.

It also built Exploratorium staff's capacity in more authentically engaging community and provided a potential model to draw on in the future.

A number of insights emerged from these evaluation findings.

First, collaborations have varied stages of maturity, and establishing goals and outcomes must be realistic to the stage of the collaboration.

Second, collaborations between different types of organizations are inherently affected by a range of power dynamics. One organization can hold the purse strings, for example, or may have more power by virtue of its organizational positioning. Being cognizant of one's own power positioning can help inform partnership processes, which then can provide all members of a partnership with opportunities to learn.

Finally, even when well-established organizations with significant expertise collaborate on a project, the fit is not always perfect. These situations require partners to be responsive and to persist in finding ways to accomplish an initiative's goals.

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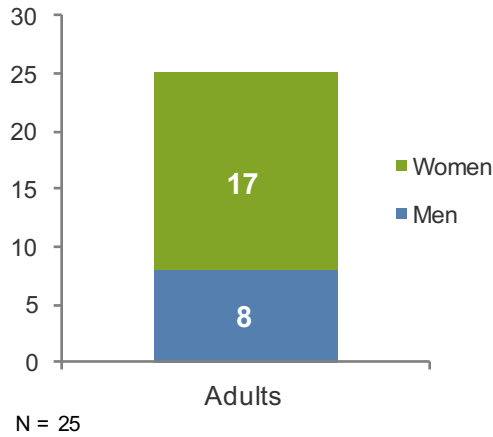
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Appendices

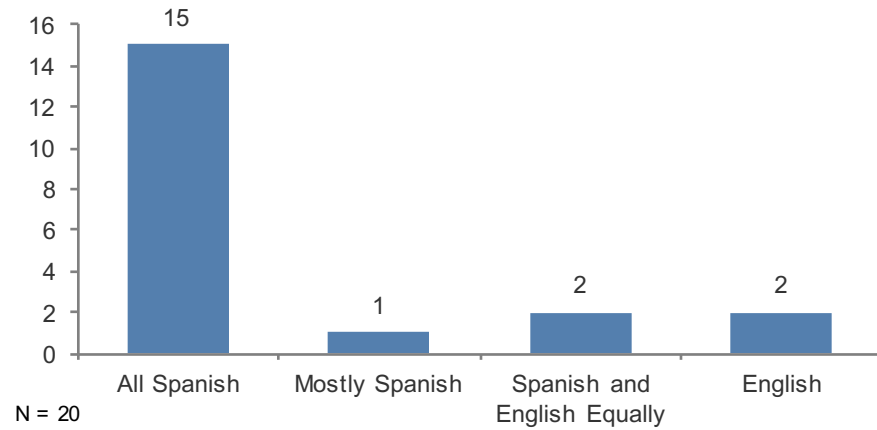


Appendix A: Observation and Interview Respondent Profile (Recruited Families)

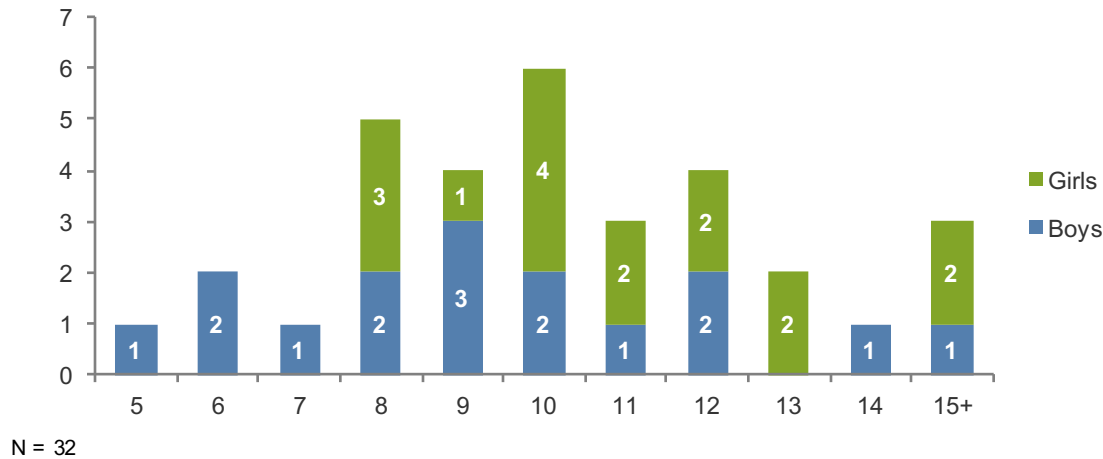
Gender of Adults



Language Interview was Conducted in:

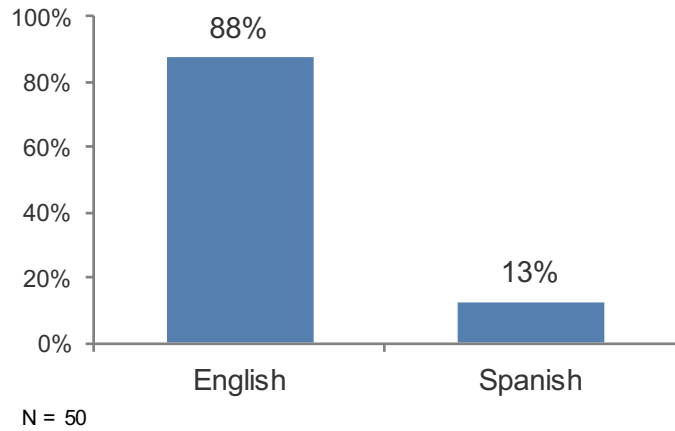


Ages of Children

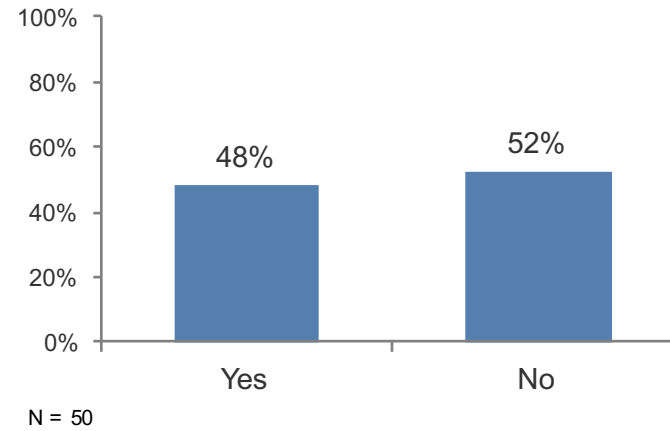


Appendix B: Unobtrusive Observation and Intercept Survey Respondent Profile (stop-by)

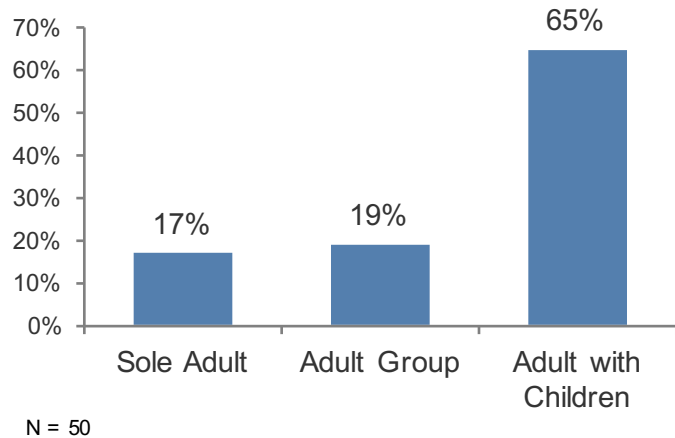
Language of Respondent



Do you live or work in the Mission District?

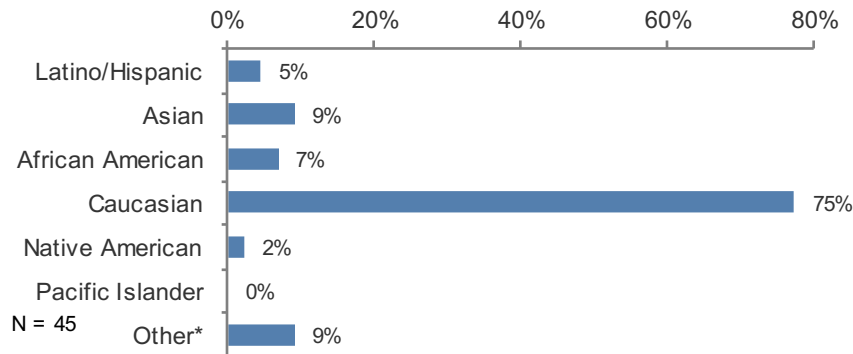


Type of Group



Appendix C: QR Code Survey Respondent Profile

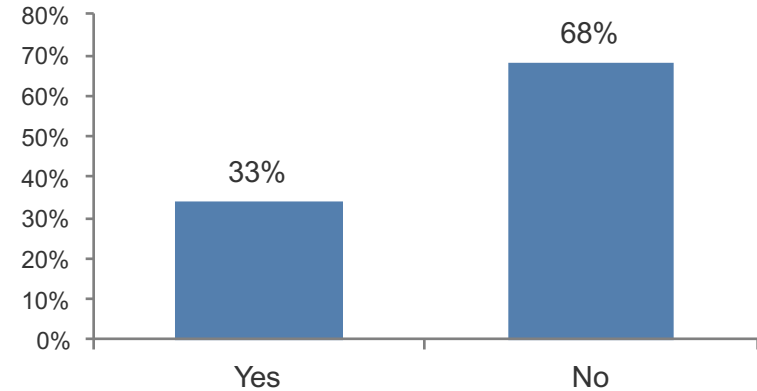
**What is your ethnic background?
(Check all that apply)**



* Other: East Indian, Indian, Iranian, Middle Eastern

Participants could choose multiple categories. Hence, percentages add up to more than 100%

Do you live in the Mission District?



N = 45

**Who did you visit with today?
(Check all that apply)**

