

This document outlines the culturally responsive research (CRR) framework developed to guide planning, data collection and analysis, and dissemination throughout the *Researching the Value of Educator Actions for Learning* (REVEAL) project. REVEAL was a National Science Foundation-funded initiative that studied the impact of staff facilitation by museum educators on family learning at interactive exhibits in a science center. Led by the Oregon Museum of Science and Industry, the project was conducted in partnership with Oregon State University and TERC. The project included a design-based research phase to develop a model of expert staff facilitation, an experimental phase to rigorously test the impact of the facilitation model and strategies developed during phase one, and a variety of dissemination products for educators and researchers.

Integral to this project was the incorporation of CRR approaches and practices. From the outset of the project, the team committed to conducting CRR that (a) was respectful to and inclusive of the diversity of OMSI's visitors and (b) provided findings that were applicable and useful to a diversity of communities. The project was also an opportunity to further develop the cultural competency habits of mind and the CRR practices of the researchers and partner organizations. The team built on recommended practices in CRR (Frechtling, 2002; Allen et al., 2007; Gutierrez & Rogoff, 2003; Okazaki & Sue, 1995) and sought out the guidance of two external experts, Cecilia Garibay and Laura Huerta-Migus. These two consultants facilitated training and reflective discussions with the team throughout the three years of the project and conducted a process evaluation to monitor the project team's evolving cultural competencies and provide suggestions for improvement.

Introducing the Framework

The framework described in this document was a critical tool in guiding the team's CRR approach and holding the team accountable to the goals and commitments related to CRR practices. This framework helped the team assess and think through different aspects of research, including designing instruments and rubrics, conducting data collection, analyzing the data, and determining appropriate dissemination venues. It is organized around the five types of validity Kirkhart and Hopson (2010) identified as crucial to culturally responsive evaluation: methodological, interpersonal, theoretical, experimental, and consequential. Applying Kirkhart and Hopson's framework to REVEAL, the team identified particular practices, reflective questions, and tactics associated with each of the five types of validity that were relevant, aspirational, and attainable (see Table 1). The table also outlines questions that the team grappled with through different stages in the project, along with prompt questions that the team used to reflect on how to be responsive in each of the dimensions.

The framework uses a number of terms that were initially confusing or ambiguous to project team members. Guided by the external consultants, the team developed working definitions for each of these in order to support shared understandings and expectations within the research team:

- **Cultural competence** is the "commitment to the process of lifelong learning that results in knowledge, skills, behaviors, and attitudes that allow one to: work effectively across cultural differences, maximize the benefits of diversity, and improve services offered to stakeholders" (Hofstede, 1993). Or, "a set of congruent behaviors, attitudes, and policies that come together in a system, agency, or among professionals and enables that system, agency, or those professionals to work effectively in cross-cultural situations" (Cross, Bazron, Dennis, & Isaacs, 1989).
- **Culturally responsive research** recognizes "culture as central to the research process" and uses "the cultural standpoints of both the researcher and the researched as a framework for research design, data collection and data interpretation" (Obamehinti, 2010).
- **Multicultural validity** "refers to our ability to capture... multiple cultural perspectives accurately, soundly, and appropriately" (Kirkhart, 1995, p. 2). It "focuses attention on how well evaluation captures meaning across dimensions of cultural diversity, and it scrutinizes the accuracy or trustworthiness of the ensuing judgments of merit and worth" (p. 13).

Overarching Philosophies

The framework below provides very specific strategies and goals used by the REVEAL team and associated with each aspect of multicultural validity. More broadly, the team's approach was guided by several key assumptions and philosophical stances related to CRR:

- Treat others as they would like to be treated (Alessandra & O'Connor, 1996).
- Project participants bring many assets and funds of knowledge to their experiences (Gonzalez, Moll & Amanti, 2005).
- Our interpretations and understandings of the world are influenced by our own assumptions, perspectives, and cultural backgrounds (Kirkhart & Hopson, 2010).
- An understanding of particular cultural norms and values requires first-hand knowledge and experience with that culture (Gonzalez et al., 2005).
- Power dynamics associated with research and education should be acknowledged and leveraged with empathy and compassion.

Coaching Model

The REVEAL research team had the opportunity to participate in cultural competency training sessions with two external advisors. The team participated in a total of four sessions, with the content for the sessions developed based on the team's needs and issues at each phase of the

project. In these sessions the team was able to get an outside perspective from experienced CRR professionals. The team found having access to seasoned professionals and a safe space to discuss questions and issues to be invaluable in the development of this framework and the research instruments and measures.

Table 1. REVEAL culturally responsive research approach (adapted from Kirkhart, 2010).

Dimension of Validity	Goals for REVEAL research practices	Reflective Questions	Research Strategies	Acknowledged Limitations
<p>Methodological validity is supported by the “cultural appropriateness of measurement tools and cultural congruence of design configurations” (p. 13).</p>	<p>➤ Sampling is inclusive of diverse audiences representative of the local community and exhibit labels and educators will be linguistically accessible to target audiences.</p> <p><i>“The sampling frame ensures inclusion of diverse cultural perspectives appropriate to the program being studied and its context” (p. 14).</i></p>	<p>How is the actual sample comparing to intended sampling goals?</p> <p>What barriers to participation exist for different populations?</p>	<ul style="list-style-type: none"> • Tracking participant demographics—The team tracked participant demographics in order to determine the extent that participants reflected OMSI visitor racial-ethnic representation, socioeconomic diversity, and range of educational attainment. • Increasing participant diversity—The team worked to collect data on days when the diversity of OMSI visitors was likely to be higher, such as on special promotion “\$2 Sundays.” • Focusing on Spanish-speaking families—Given that Spanish is the second most common language in the Portland Metro region, research participation was accessible in English and Spanish through multi-modal interactives, bilingual text labels, and bilingual data collection support. Also, the team followed OMSI internal guidelines for handling data in two languages. • Understanding the museum culture—Family participants included in the sample were museum visitors. The research team included museum educators, museum research and evaluation staff, and mathematical thinking academics. 	<ul style="list-style-type: none"> • Recruitment of families of color proved to be challenging in our study because of existing visitor demographic patterns. • On-the-floor facilitators were English-only speakers, and may not have seemed approachable to speakers of other languages. • The research set-up may have been intimidating to visitors unaccustomed to research settings (e.g. cordoned-off area, cameras, consent signs).
	<p>➤ Instruments and measures developed and used by the team take into account</p>	<p>What is the process for creating study measures?</p> <p>What assumptions are embedded in</p>	<ul style="list-style-type: none"> • Analyzing video data bilingually—Video was analyzed and coded by at least one bilingual/bicultural (English/Spanish) team member. 	<ul style="list-style-type: none"> • Measures were language dependent, thus measure development could not be inclusive of different types of communication

	<p>the diverse cultures and backgrounds of participants and are validated with a diversity of visitors.</p> <p><i>“Measurement tools have been developed for a particular ethnic group and validated for a particular group” (p.14).</i></p>	<p>the measures and instruments?</p> <p>Who and what do the instruments and measures privilege?</p>	<ul style="list-style-type: none"> • Considering our measure development— Researchers considered, discussed, and documented assumptions that were made during the development of research instruments, coding rubrics, and measures. 	<p>like non-verbal or languages that were not English or Spanish.</p> <ul style="list-style-type: none"> • Cross-cultural assessment of mathematical reasoning posed a challenge for the research team which was representative of only two cultures. • Even though there were multiple languages reflected in the final data set, the data analysis was limited to Spanish/English only. • Not all visitors completed the survey; as a result there was some missed data on recorded interactions.
<p>Interpersonal validity is supported by the “quality of the interactions between and among participants” (p. 13) in the research process.</p>	<p>➤ Researchers participate in reflective workshops to think more deeply about how their presence impacts floor facilitation and how their own cultural</p>	<p>How did the personal appearance, characteristics, and backgrounds of staff facilitators and researchers impact the collection, analysis, and interpretation of data?</p>	<ul style="list-style-type: none"> • Developing a responsive theory of action— Researchers and facilitators developed and situated themselves in a theory of action for family math learning in museums and continuously reflected on and revised their understanding of how their presence and perspectives influences data collection, analysis, and interpretation. • Creating accessible data collection environments— During data collection, researchers and facilitators 	<ul style="list-style-type: none"> • Visitor were not accustomed to “critiquing” facilitation, which influenced their perspectives on “match” in the visitor survey. • Despite efforts made, the team was not able to recruit a

	<p>perspective influences data collection.</p> <p>➤ Researchers will seek out community partner perspectives on museum facilitation and data collection with diverse audiences.</p> <p><i>Researchers “reflect on their own cultural positions and positions of authority with respect to other participants in the evaluation process” (p. 14).</i></p>		<p>dressed in casual attire, and efforts were made to create a welcoming space for visitors.</p> <ul style="list-style-type: none"> • Incorporating local communities—Invitational data collection sessions were arranged to provide respectful and relaxed opportunities to meet with Hispanic/Latino families and converse freely about research goals, questions, and measures and to have two-way conversations about family math learning in museums. • Documenting researcher involvement—The data collectors and facilitators are identified for each data collection session so that their relevant demographics and psychographics can be taken into account in the analysis of data. • Leveraging partnerships—Researchers collaborated with Adelante Chicas (a local Hispanic/Latino community-serving organization) to gather input on how to engage with and respectfully gather data from Hispanic/Latino families in culturally appropriate and respectful ways. • Including multiple perspectives in data interpretation—The project researchers (including facilitators) are situated within the context of the study so that their relevant demographics, psychographics, and power dynamics may be included in interpretation of the findings. 	<p>bilingual/bicultural facilitator.</p>
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<p>Theoretical validity is supported by “the cultural congruence of theoretical perspectives” (p. 13) underlying the research and assumptions of validity.</p>	<p>➤ Research is grounded in theoretical perspectives that acknowledge and value diverse backgrounds and ways of knowing.</p> <p><i>Researchers “select culturally appropriate research theory to frame their epistemology, methods, and procedures” (p. 14).</i></p>	<p>Did the research theories and frameworks take culture into account?</p> <p>Whose values are represented in the research theories and frameworks?</p> <p>Have procedures been used to gather multiple perspectives on the research?</p>	<ul style="list-style-type: none"> • Grounding in theory—The project is building on extensive research on museums, families and out-of-school math that demonstrates the importance of family values, agendas and goals, social relationships, and funds of knowledge (Civil, 2002; Ellenbogen, 2002; Goldman & Booker, 2009; Hood, 1983; Martin, Goldman, & Jimenez, 2009; Moll et al., 1990; Moussouri, 1997; Nunes et al., 1998; Sandford et al., 2007; Satwicz & Stevens, 2008; Saxe, 1990). These perspectives serve as a foundation for the development of the REVEAL theory of action and associated data collection and analysis processes. • Explicitly placing value on families’ backgrounds—The research team adopted an asset-based perspective on learning and education (Gonzalez et al., 2005), emphasizing the skills, experiences, and funds of knowledge families bring with them to the museum. • Documenting the decision-making process—The research team, when possible, explicitly articulated and discussed theoretical assumptions and perspectives, such as through the use of “position statements,” in order to make these assumptions transparent and create opportunities for reflection. 	<ul style="list-style-type: none"> • Research questions were not co-developed with the community, so they may not have been fully representative of the community needs. • Research within a quantitative paradigm privileges certain ways of looking at the world. • Research questions were developed in an academic context, which made them harder to situate in facilitator practice.
<p>Experiential validity is supported by “congruence with the lived experience of participants” (p.</p>	<p>➤ Researchers incorporate community partners’ perspectives in</p>	<p>Under what conditions and contexts and for what population are these findings useful and valid?</p>	<ul style="list-style-type: none"> • Employing a diverse team—An additional bilingual/bicultural evaluation staff member was hired onto the project and included in the data collection, analysis, and interpretation process. 	<ul style="list-style-type: none"> • Many of the Hispanic/Latino families that visited the museum to play with the exhibits and give the team their impressions did not have

<p>13) in the research (including with experience of both educators and participants).</p>	<p>the analysis process.</p> <ul style="list-style-type: none"> ➤ Researchers employ an external cultural competency coach to help them reflect on their own biases; these are documented and revisited throughout the process. ➤ Researchers will ensure diverse community perspectives are represented in the data by incorporating an additional data collection effort with a specific audience. <p><i>“Research data are understood in terms of the realities of the</i></p>	<p>How did the experiences and procedures in this study relate to those of participants and their communities?</p>	<ul style="list-style-type: none"> • Ensuring inclusive data collection—Invitational data collection sessions were arranged to provide respectful and relaxed opportunities to meet with families and converse freely about research goals, questions, and measures and to have two-way conversations about family math learning in museums. • Co-leading data collection and interpretation—The research team partnered with Adelante Chicas to conduct community conversations to deepen the team's understanding of issues related to facilitating informal math learning for Hispanic/Latino families. • Facilitating multi-disciplinary data interpretation—Educators were an integral part of the process, both data collection and theory development. The REVEAL team attended OMSI educator meetings to present work and get feedback from OMSI educators. 	<p>“museum experience,” which made it difficult for them to critique the experience because they didn’t have anything to compare it to.</p> <ul style="list-style-type: none"> • Despite efforts made, the team was not able to recruit a bilingual/bicultural facilitator. • The research team valued certain ways of knowing/doing over others, e.g. “getting an answer right” and facilitator’s notions of what to look for in a good experience.
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	<p><i>people they represent” (p. 15).</i></p> <p><i>Researchers “employ a cultural guide to increase their understanding and appreciation of local culture” (p. 15).</i></p> <p><i>“How did participants and/or providers of the program contribute to the interpretation of the data? Were findings ‘checked’ with them?” (p. 15).</i></p>			
<p>Consequential validity is supported by the “social consequences of understandings and judgments and the actions taken based upon them” (p. 13).</p>	<ul style="list-style-type: none"> ➤ Researchers employ a variety of methods to disseminate findings to community stakeholders. ➤ Researchers disseminate findings in a way that takes community partners’ voices into account, and 	<p>How are findings useful and relevant to participants and their communities?</p> <p>How has the team planned to give back to participants and their communities?</p>	<ul style="list-style-type: none"> • Incorporating diverse dissemination strategies—The research team drafted a dissemination plan which identified several topic and audience strands, including dissemination of findings to public community members and professional community members, including OMSI practitioners. • Disseminating in an inclusive way—The research team worked with Adelante Chicas to identify strategies for disseminating information to their staff members and parents. • Spreading the wealth internally—The dissemination plan was mindful of including co-developed 	<ul style="list-style-type: none"> • As a science museum-based study, the results for this study will only be applicable in those types of settings. • Identifying appropriate community dissemination strategies was challenging, partially because the goals were not co-developed with community partner organizations from the proposal development stage.

	<p>incorporates suggestions on dissemination type and formats.</p> <p>➤ Research findings are made accessible and useful to community members and partners.</p> <p><i>“Mechanisms are identified and negotiated by which research will give back to the community” (p. 15).</i></p>		<p>strategies for giving back to the museum education department.</p>	<ul style="list-style-type: none"> • Funder and community priorities are not always aligned; it was not always possible to reconcile this in authentic ways. • The topic of mathematics does not always receive as much attention in the informal STEM education field, which has presented challenges for dissemination on this project. • We used a one-way communication model, which had limitations that other models don't (e.g. co-development).
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