26th Annual Visitor Studies Association Conference

July 15 -19, 2013
Milwaukee, Wisconsin

Where Innovation Meets Rigor: Shaping the Next Decade of Visitor Studies

Abstracts

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2013 Conference Abstracts

Introduction

Written by the presenters themselves, the Conference Abstracts provide an overview of the sessions, panels, and posters presented in Milwaukee at this year's Conference. The Abstracts serve a multitude of purposes, from assisting in selecting sessions to attend, serving as a reminder of sessions attended, and providing references. The 2013 Conference Abstracts are exclusively available electronically and past conference abstracts are available online via VSA's website at http://visitorstudies.org/conference-overview/past-conferences.

The 2013 Conference Abstracts were edited by Valerie Grabski.

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Concurrent Session 1
11:00 a.m. - 12:15 p.m.

The Evolution of the Narrative: The Value of Inquiry-Driven Facilitation

Presenter:
Alix Cotumaccio, American Museum of Natural History

Purpose:
This session describes results of an exploratory study on the power of "narratives," facilitated educational tours connecting museum exhibits through thematic storytelling, given in an inquiry-infused model. Participants will discover the importance of having well trained facilitators engaging visitors in conversations stemming from the visitors' prior knowledge, interests and observations.

Perspectives:
One of the informal learning opportunities museums often provide is the facilitated tour. Traditional, lecture-oriented tours have been shown to be ineffective in engaging visitors, impacting learning, and sparking interest in science (Cox-Peterson, Marsh, Kisiel, & Melber, 2003), which is what museums were designed to do. Tours that utilize narratives to put facts into context and connect them to an audience's prior understanding are much more successful. Moreover, museum experiences that emphasize the importance of learners' prior knowledge and choice, while promoting social interaction are the most effective in engaging visitors and generating an interest in science (Griffin & Symington, 1997; Falk & Dierking, 2000). The Museum Education and Employment Program (MEEP) at AMNH does just that. In this program, youth are given in-depth training on the content of the Museum's exhibit halls and in pedagogical skills. The MEEPers use this information to develop their own unique themed tours set in the form of a narrative and infused with inquiry to engage participants in the story. MEEP tours are designed to draw on the audience members' prior knowledge, encourage observations and questions, and pique their desire to learn more, allowing the facilitator to create a richer learning experience.

Methods:
The case studies that will be presented were derived from exploratory research focused on documenting how the narrative of these tours changes based on tour participant's insights and questions. The focus of the study and the structure of the program led to

using video and audio recordings, observations, and follow up interviews and surveys with MEEPers to collect data over the course of two summers, 2011 and 2012. The tour groups observed were selected at random, were informed of the reason for the observations and/or video and audio recordings, and were given a chance to decline being part of the study. For the purposes of this research, we focused on speech acts (Allen, 2002), and in particular, those acts that functioned to show use of prior knowledge, observations and questions that tended to lead the direction of the conversation.

Importance:
This study is important to the field because it gives us insight into how best to design facilitated tours in order to achieve the greatest level of visitor engagement. The case studies presented exemplify the use of inquiry within the narrative, and show how eliciting tour participants' pre-existing understandings provides opportunities to build on or challenge them. By doing so visitors are able to make connections and gain deeper understandings of the topics covered. Thus, reframing how we structure the museum tour experience, by utilizing narratives infused with inquiry, should help museums connect their educational purposes to the real lives of visitors (Vallance, 2004), thereby increasing engagement. This exploratory study offers important insight into how museums can achieve higher engagement levels during tours. The next step will be to determine whether this increased engagement leads to a more relevant and meaningful learning experience.

References:

Allen, S. (2002). Looking for learning in visitor talk: A methodological exploration. Learning Conversations In Museums. G. Leinhardt, K. Crowley and K. Knutson. Mahwah, Lawrence Erlbaum Associates: 259-303.

Bell, P., Lewenstein, B., Shouse, A.W. & Feder, M.A. (2009). Learning science in informal environments: People, places and pursuits. Washington, D.C: National Research Council of the National Academies.

Cox-Peterson, A.M., Marsh, D., Kisiel, J. & Melber, L. (2003). Investigation of Guided School Tours, Student Learning, and Science Reform Recommendations at a Museum of Natural History. *Journal of Research in Science Teaching.* 40, 200-218.

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Griffin, J. & Symington, D. (1997). Moving from task-oriented to learning-oriented strategies on school excursions to museums. *Science Education*, 81, 763–779.

Kos, M. (2005). Who are the explainers? A case study at the House of Experiments. *Journal of Science Communication*, 4, 1-5.

Mott, B., Callaway, C., Zettlemoyer, L., Lee, S., Lester, J. (1999). Towards narrative-centered learning environments. Narrative Intelligence Symposium, In *AAAI Fall Symposium on Narrative Intelligence*. 78-82.

Vallance, E. (2004). Museum education as curriculum: Four models, leading to a fifth. *Studies in Art Education*, 45(4), 343-358.

Additional Links:
American Museum of Natural History Education and Employment Program Webpage
http://www.amnh.org/learn-teach/post-secondary/museum-education-and-employment-program

Bringing Observational Techniques for Visitor Studies into the 21st Century

Presenters:
Ross J. Loomis, Chair and Presenter, Department of Psychology, Colorado State University
Jacob Benfield, Presenter, Psychological and Social Sciences, Pennsylvania State University – Abington
Jennifer Borland, Presenter, Senior Researcher, Rockman, et al
Caren S. Oberg, Presenter, Principal, Oberg Research, LLC
Steven Yalowitz, Discussant, Principal, Audience Viewpoints Consulting

Purpose:
Participants will review innovations in observation methodology. Examples include a visitor self-mapping study and examples of wireless aids for observation using devices like iPads and smartphones. Discussion will focus on how technology is changing, how we observe visitors, and the validity and reliability of the collected data. It will also be noted how observation relates to other methods used in visitor studies.

Panelists' Perspectives:
Although one of the oldest methods in visitor studies (Melton, 1933, 1935, 1936) there are continual efforts to develop innovative ways to observe visitor use of exhibit spaces. This panel will present three contemporary efforts at observing visitors. A theme across the presentations is the need to increase efficiency and accuracy of collecting observational data about visitors. Ross Loomis will introduce the Panel and provide some historical perspectives for applying observation to visitor studies. Jacob Benfield will describe a pilot project for having visitors map their movement in a museum gallery as a cost effective alternative to direct observation (Rainbolt, Benfield, & Loomis, 2012). Included in this work was a validation of visitor mapping outcomes against a random

sample of direct observations. Jennifer Borland will then review how using modern wireless tools like smartphones and tablet computers can collect observational data in concert with surveys and interviews. She will demonstrate with a study of a science exhibit called Brain: The Inside Story. Next, Caren Oberg will present a software system she has developed that is available for Android and iPad Tablets that can facilitate efficient collection of observations. Finally, Steven Yalowitz (Yalowitz and Bronnenkant, 2009) will lead a discussion.

Importance:
Observation of visitors is one basic methodological tool usually combined with others such as interviews and surveys. Use of observation has not been static, but continually modified as a method by researchers and evaluators. Participants in this panel present some of the recent ways observation has been applied to such topics as visitor attention and exploration. This panel session will aid attendees in learning about recent applications of this basic method. Of special interest is the use of new wireless aids in completing observation. However, it is also possible to compare how visitors map their use of an exhibit to learn about patterns of attention and engagement with exhibits.

References:
Melton, A.W. (1933). Studies of installation at the Pennsylvania Museum of Art. *Museum News*, 10(1), 8.

Melton, A. W. (1935). Problems of installation in museums of art. Publications of the American Association of Museums, New Series, Number 14. Washington, DC.

Melton, A. W. (1936). Distribution of attention in galleries in a Museum of Science and Industry. *Museum News*, 14(6), 5-8.

Rainbolt, G.N., Benfield, J.A., & Loomis, R.J. (2012). Visitor self-report behavior mapping as a tool for recording exhibition circulation. *Visitor Studies*, 15(2), 203-216.

Yalowitz, S. S., & Bronnenkant, K. (2009). Timing and tracking: Unlocking visitor behaviour. *Visitor Studies* 12 (1), 47-64.

Pushing Our Boundaries: Teaming Up to Get More Accomplished

Presenters:
Sarah Cohn, Science Museum of Minnesota
Gina Svarovsky, Science Museum of Minnesota
Liz Kollmann, Museum of Science, Boston
Liz Rosino, Oregon Museum of Science and Industry
Chris Cardiel, Oregon Museum of Science and Industry

Purpose:
Over the past two years, the Nanoscale Informal Science Education Network has turned its evaluative lens to larger scale questions. Previously, individual products, relationships, and partnerships within the Network were studied, ranging from small, single demonstration activities to large, nation-wide NanoDays events. These past two years, however, have seen a greater focus on the institutional and public audience impacts of the Network as well as professional impacts for individuals and the field, and particularly on the impact the Network has had on the broader field of informal science education. Presenters will briefly describe system-wide endeavors:

1. developing a Network-wide survey that reflected the needs and interests of over five project teams;
2. getting participation from numerous organizations to allow external evaluators onto their floors;
3. building strategies to surmount department-specific and institution-wide cultural differences to best facilitate cross-organization teamwork.

Everyone will discuss how we frame new studies, relationships, and partnerships from the outset.

Panelists' Perspectives:
Since 2006, the Science Museum of Minnesota, Museum of Science, Boston, and the Oregon Museum of Science and Industry Evaluation and Research Departments have worked in coordinated and collaborative ways to study nearly every element of the Nanoscale Informal Science Education Network. It has been a rare opportunity in the field of informal learning as the project has received ongoing support, the organizations have managed to maintain positive relationships, and evaluation has received ample financial support to conduct its work. Recognizing that seemingly fantastical history, the project has been far from easy. As the evaluation of the Network has transitioned from small group work and smaller scale evaluation projects to system-wide change and reflection over the past two years, the evaluation group, and the Network, have been forced to think and work in new ways.

While the panelists can speak about the NISE Network, there is so much more to be learned from other projects. The session will move to open discussion of other projects that are different in size and scale so that the entire informal learning community can

identify potential practices and models of partnership, cooperation, and collaboration that they could implement in their own work.

Importance:
Collaboration is fast becoming the name of the game. We all know we have to do more with less, but we may not always know how to make that happen. How do you balance and resolve conflicting needs from multiple project stakeholders? What should we do to build and maintain collaborations rather than competition or hierarchy? To explore these and other questions, this session will present different forms of collaborative project participation by evaluation departments, entire institutions, and individuals over the past year. Recognizing that getting people on board with evaluation is not simple, we will engage in a lively discussion about what the Network's evaluation can tell us about how to better set up and facilitate collaborations of all kinds. We will discuss the barriers that exist to collaboratively integrating evaluation into projects, working in cross-institutional teams composed of external and internal evaluators, and encouraging cross-institutional participation in evaluations.

PAPER PRESENTATIONS
Emerging trends in Visitor Studies

Advancing Nature Play Through Evaluation and Training

Presenter:
Jennifer Matiasek , Chicago Zoological Society

Purpose:
Children are inherently inquisitive and learn to understand their world through exploration. For very young children, exploration occurs as play and provides the foundation for mental and physical development. Play in nature, in particular, has been linked to young children's development of characteristics such as curiosity, vocabulary, strength, social skills, and environmental concern. Informal education institutions, such as zoos, museums, and nature centers, are increasingly focused on young children as a core audience and are providing opportunities to play in and with nature. At the Chicago Zoological Society (CZS), we have begun to evaluate the impact of nature play on children and families and explore strategies for helping other organizations create a nature play infrastructure. Here we will share what we have learned regarding the effectiveness of our efforts and ways to leverage organizational support for nature play programs.

Perspectives:
Research shows that many adults who care about the environment spent time playing and exploring in nature as children (Chawla, 2007). The need for childhood opportunities to play in nature is increasingly urgent. At no other time in human history have children been as separated from direct experiences with nature (Charles & Louv,

2009). At the same time, a growing body of research emphasizes the role that direct contact with nature has for children's physical, cognitive, emotional, and social health and development (Faber Taylor & Kuo, 2006). In response to this need for safe and accessible opportunities to experience nature, informal education institutions across the world are actively designing spaces and programs where young children and their families can interact with nature. In 2001, CZS opened the Hamill Family Play Zoo, a hands-on exhibit that welcomes families to explore live animals, plants, and nature through drop-in play and scheduled nature play programs. In 2010, CZS evaluators began implementing a strategy to measure and monitor the impact of Hamill Family Play Zoo on visitors and program participants. Recognizing our success in implementing nature play, we developed NatureStart, an early childhood training program for education professionals across informal education institutions.

Methods:
Until 2010, efforts to assess the impact of the Play Zoo were limited to research conducted by students and CZS staff. In 2010, as part of an ongoing effort to align our education program evaluations with our institutional mission, CZS evaluators worked with Play Zoo staff to develop a strategy to measure parents' satisfaction with the Play Zoo and the immediate impact of the programs and activities. Parent questionnaires were developed based on a logic framework that aligned individual program strategies with measures of desired learning outcomes and key drivers of learning. For drop-in visitors, volunteers randomly intercept parents during a visit and ask them to complete a questionnaire; for program participants, questionnaires are handed out by staff at the end of each program. As we built our educator training, we aligned our evaluation approach with our internal evaluations and included questionnaires, training observations, trainer interviews, and online discussion review.

Data & Analysis:
Surveys were completed at Hamill Family Play Zoo by 895 drop-in visitors and 105 family program participants between January and December 2011. In addition, 55 educators who participated in NatureStart training were invited to evaluate their experiences. All data were analyzed using SPSS version 19.0. Quantitative data were summarized by calculating response frequencies for questionnaire items. Statistical tests were used to compare the responses of visitors based on family play program attendance, frequency of visiting the Play Zoo, and zoo membership. Qualitative data were reviewed and coded according to common themes, which were tallied based on frequency.

Results:
Educator training participants reported positive changes in knowledge, skills, confidence, and practice when they returned to their organizations. While we did not measure the outcome of educator training on audiences within the participants' organizations, evaluation data from CZS provide insights into where we may have an impact. For example, visitors and program participants indicate the Hamill Family Play Zoo provides a good mix of structured activities and open play, that their experiences are a good value for cost, and that both adults and children enjoy provided activities.

Visitors and program participants also report that both adults and children gain something from their experiences, such as awareness of nature, curiosity to explore the outdoors, empathy for animals, and a desire to repeat activities at home. Program participant ratings vary based on a number of characteristics including frequency of zoo visits and program attendance, zoo membership, and the program session being rated.

Importance:
CZS uses evaluation to assess and improve the opportunities we provide for children to experience nature and the training we provide for educators who facilitate these experiences. At CZS, we believe that informal learning institutions are critical to their communities for their efforts to connect children and families with nature. Parents and teachers may need guidance from our organizations to take advantage of all the developmental and educational opportunities we provide for their children and students through unstructured outdoor experiences. How can we convey the value of these experiences and help make our organizations more accessible? Thinking beyond children as customers, what are our institutions' obligations for environmental education in the community and what outcomes can and should we measure? Finally, how can we help policy makers understand that providing families with these nature experiences not only helps create new environmental advocates, but is critical to the future of conservation?

References:

Charles, C., & Louv, R., (2009). Children's nature deficit: What we know – and don't know. Children & Nature Network, September 2009.

Chawla, L. (2007). Childhood experiences associated with care for the natural world: A theoretical framework for empirical results. *Children, Youth and Environments*, 17(4): 144-170.

Faber Taylor, A., & Kuo, F.E. (2006). Is contact with nature important for health child development? State of the evidence. In C. Spencer & M. Blades, (Eds.), *Children and Their Environments*. (124-140). Cambridge, UK: Cambridge University Press.

Additional Links:
Hamill Family Play Zoo
http://www.czs.org/CZS/Educational-Programs/Hamill-Family-Play-Zoo

Hamill Family Play Zoo, Exhibit and Animal Guide
http://www.czs.org/CZS/Brookfield/Exhibit-and-Animal-Guide/Hamill-Family-Play-Zoo

Hamill Play Zoo Celebrates 10 Years at Brookfield Zoo
https://www.youtube.com/watch?v=MNhILsb9P_0

Evaluation Communities and Networks in Zoo and Aquarium Education

Presenter:
Kathayoon Khalil, Stanford University

Purpose:
The purpose of this session is to discuss preliminary findings from a study on the roles of social and professional networks in advancing innovation in educational evaluation. I will focus primarily on education and evaluation in informal settings but the methods I've employed in this research should be applicable to a variety of contexts.

Perspectives:
This study draws on social network analysis and communities of practice theory. These theories were chosen because of their application in prior studies in education. My study was inspired by a desire to know more about the barriers and drivers of program evaluation, and to approach the challenges of evaluation from a new perspective.

Importance:
This study will marry several approaches to educational research that can give important information about how and why people in informal education contexts work together on complex tasks like evaluation. It is my hope that the talk will encourage attendees to consider how these trends manifest in their own institutions and how they can further develop community development among their educators.

Concurrent Session 2
2:15 - 3:30 p.m.

Ethnography as R&D: How ethnographic research methods can inform innovation

Presenters:

Karlene Hanko, Research Analyst at Slover Linett Audience Research

Matt Matcuk, Exhibition Development Director at the Field Museum of Natural History

Jane Schaefer, Project Director, Garibay Group

Leah Reisman, Assistant Research Specialist in the Research Group at the University of California, Berkeley's Lawrence Hall of Science

Purpose:

In the commercial sector, research-and-development ("R&D") is often used to help organizations innovate: to take a new look at their customers, explore unmet needs, and experiment with creative new ways of meeting those needs. This session will explore how museums can adopt a similar R&D mindset, by using ethnographic and other anthropological research tools to inform the development of fresh, innovative museum practices. Each panelist will offer their unique perspective on ethnography from their role as a research consultant, museum professional, or anthropologist. Representing both the "R" and the "D" perspectives, the panelists will discuss their experiences using ethnography to explore and develop forward-thinking ideas and practices. The session will also include ample time for audience participation and discussion about innovation, R&D, and the value of ethnography toward those ends.

Panelists' Perspective:

Karlene Hanko will share her experiences conducting ethnographic research with museums that were eager to question long-standing assumptions about how visitors want to experience and engage with cultural institutions. She will share the consultant's perspective on how ethnographic research can inspire and inform ground-breaking museum practices. Matt Matcuk will provide the museum professional's perspective on using ethnographic evaluation findings to inform new practices. Matt will share a recent project he led at the Field Museum, which used an iterative ethnographic research method to explore how new technologies can transform the visitor experience at the museum. Jane Schaefer will discuss video ethnography—widely used in design research—as a method of innovation in informal settings. Sharing an illustrative Garfield Park Conservatory study, she will discuss Garibay Group's application of video ethnography to inform the design of new spaces that move beyond traditional conservatory halls and to "bridge the gap" between researchers and practitioners. Leah Reisman will represent the anthropologist's perspective, discussing her experience using ethnographic research in an independent project at the Museo Textil de Oaxaca, a

textile museum in Oaxaca, Mexico, to understand and inform some of the museum's innovative efforts to engage local weaving communities.

Importance:
As museums face new challenges and constraints in engaging visitors, adaptation and innovation are critical for museums to remain relevant and exciting to their visitors. By taking an open-ended and flexible approach to research in museums, ethnography provides a nimble, R&D-type approach to developing new visitor engagement strategies, one that embeds research and evaluation in the iterative and shifting process of developing new, innovative programs. The vivid, multi-dimensional qualitative data that results from many ethnographic studies forms a strong basis of knowledge practitioners can use to take calculated risks and design experiences that reach and transform their audiences. Ethnographic studies can also serve as inspiration to innovators, providing up-close-and personal looks at the diverse perspectives of current and potential audiences and allowing the voice of the visitor to permeate the development and design process, from beginning to end.

References:
Bonner, J. P. (1991). Anthropology and museum science. *Visitor Studies*, 3, 55-64.

Copeland-Carson, J. (2005). "Theory-building" evaluation anthropology bridging the scholarship-versus-practice divide. *National Association for the Practice of Anthropology Bulletin*, 24(1), 7-16.

Butler, M. O. (2005). Translating Evaluation Anthropology. *National Association for the Practice of Anthropology Bulletin,* 24(1), 17-30.

Schaeffer, J. H. (1995). Videotape: New Techniques of Observation and Analysis in Anthropology. In P. Hockings (Ed.), *Principles of Visual Anthropology* (255). Berlin: Mouton de Gruyter.

Additional Links:
Slover Linett Audience Research
http://www.SLaudienceresearch.com

The Field Museum
http://fieldmuseum.org

Garibay Group
http://www.garibaygroup.com/

Fact or Fiction? Does Reaching Out to Non-traditional Audiences Alienate Core Visitors

Presenters:
Chair/Facilitator:
Laura Huerta Migus, Director, Professional Development and Inclusion, Association of Science-Technology Centers, Inc.

Panelists:
Cecilia Garibay, Principal, Garibay Group
Steven Yalowitz, Principal, Audience Viewpoints Consulting
Bill Watson, Chief of Learning Experiences and Evaluation, Smithsonian Institution, National Museum of Natural History
Jenni Martin, Director of Education, Children's Discovery Museum

Purpose:
In this session, we examine the question of whether reaching out to a new audience means alienating a museums' traditional audiences. Panelists will discuss several initiatives to engage new audiences (e.g., Latino, Vietnamese, cognitive disabilities, families), focusing on how core visitors and staff respond to these institutional efforts.

The objectives of this session will be to:
1. Address important topics around engaging diverse audiences
2. Encourage the audience to consider institutions' assumptions and biases
3. Report on evaluation about how core audiences are impacted (or not) by these efforts
4. Engage in a lively dialogue around this topic

Panelists' Perspectives:
Increasingly, museums and other visitor institutions are focusing on the need to engage a broad audience. Yet there are often perceived tensions and assumptions about these efforts in terms of their impact on core visitors. Each panelist will address these issues by discussing their experiences as evaluators and in-house staff trying to further understand the balance between current and potential visitors' needs and expectations. Cecilia Garibay and Steven Yalowitz have conducted many evaluation and research studies around the topic of institutions reaching out to diverse audiences, and how this impacts both current and future audiences. Bill Watson and Jenni Martin, as in-house staff charged with thinking about and delivering quality experiences to the general audience, have had to address this topic in their own work. We seek to create a dialogue grounded in evaluation data and the experience of institutions who have systematically engaged in cultivating new audiences.

Importance:

The session fits nicely into the theme of Where Innovation Meets Rigor: Shaping the Next Decade of Visitor Studies, as the panel includes studies testing assumptions more rigorously and also how to study the impact of efforts to engage broader audiences. The session includes significant discussion time with the audience, to identify the needs of both the evaluation and institutional communities around this topic, and also to build upon the experiences of the visitor studies community.

Discussion questions will be in part driven by the audience, but they will also cover the following:
- How can evaluations such as these help further address assumptions in the field about engaging audiences?
- How can the visitor studies community work more effectively and collaboratively around this topic – what opportunities are there?
- What are some issues with conducting culturally responsive evaluation?
- What relevance do these studies have on other audiences and topics?

References:
Garibay, C. (2011) Responsive and Accessible: How museums are using research to better engage diverse cultural communities. *ASTC Dimensions*. February 2011. Retrieved from: http://www.astc.org/blog/2011/02/28/responsive-and-accessible-how-museums-are-using-research-to-better-engage-diverse-cultural-communities/

Additional Links:
Bilingual Exhibits Research Initiative (BERI) Project Page:
http://informalscience.org/project/show/2015

Learning from Random Assignment Experiments of School Tours of Museums

Presenters:
Anne Kraybill, Crystal Bridges Museum of American Art
Jay P. Greene, University of Arkansas
Brian Kisida, University of Arkansas
Randi Korn, Randi Korn & Associates, Inc.

Purpose:
During this panel we will present the results of a large-scale random assignment study of school tours of the Crystal Bridges Museum of American Art. The study involves nearly 11,000 students, 489 teachers, and 123 schools. The panel will bring together the diverse perspectives of practitioners and researchers to discuss how this type of study could best advance the goals of visitor studies. This will then launch the panelists and the audience into a group discussion of the potential and pitfalls of large-scale random assignment research. In particular, random assignment research designs tend to address limited questions and often lack the proper contextual analysis to inform

practice. In addition, implementing random assignment research designs can be very costly and pose logistical challenges.

Panelists' Perspectives:
Anne Kraybill, the School Programs Manager at Crystal Bridges, will describe the philosophy behind the design of the museum's school tour program and the methods by which that philosophy was implemented.

University of Arkansas education policy and evaluation experts Jay P. Greene and Brian Kisida will present results from their random assignment evaluation of the school tour program on five types of student outcomes: (1) student recall about school visit themes, (2) the extent to which school tours develop a taste for art museums and cultural institutions, (3) improvement of critical thinking skills, (5) impacts on student measures of tolerance, and (4) impacts on measures of historical empathy.

Randi Korn, the Founding Director of Randi Korn and Associates, will place the University of Arkansas study in the context of prior studies. She will compare the results to prior research using various research designs. She will also consider the ways that this research and other random-assignment studies could change the field of visitor studies.

Methods:
The Crystal Bridges Museum of American Art opened in Bentonville, Arkansas in November of 2011. In March of 2012, the Museum launched a School Visit Program. Because the tour is free to schools and because Crystal Bridges was built in an area that never previously had an art museum, demand for school tours far exceeded available slots—during the first two semesters of the program, the museum received 525 applications from school groups representing 38,347 students. To allocate spots fairly, researchers at the University of Arkansas worked with the staff at Crystal Bridges to assign spots for school tours by lottery. Applicants were organized into matched pairs based on similarity in grade level and other demographic factors. Within each pair applicants were randomly assigned to receive a tour and be in the treatment group, or to receive a deferred tour and be in the control group.

Data & Analysis:
Several weeks after treatment group applicants visited the museum, the research team visited both treatment and control groups in their classrooms and administered surveys. Valid survey results were collected from 174 applicant groups representing 5,194 treatment group students and 5,718 control group students. Students in grades 3-12 also completed a critical thinking component.

Because mere chance determined whether or not a group had been selected for the Museum visit, the treatment and control groups are largely identical except for whether they got to visit the Museum on a school tour. As a result, any outcomes that differed between the treatment and control groups can confidently be attributed to participation in the School Visit Program.

Results:
Students who won the lottery and received a school tour of Crystal Bridges are significantly more likely to: recall school visit themes, develop a taste for art museums and cultural institutions, demonstrate stronger critical thinking skills, display higher tolerance, and exhibit greater historical empathy. Benefits are generally significantly larger for disadvantaged students (minority, low-income, or rural students).

Importance:
Large-scale random assignment experiments are becoming more common in evaluation and policy research, but in the field of visitor studies random assignment research designs are still rare and large-scale random assignment studies virtually non-existent. Random assignment research designs have great potential for advancing visitor studies by allowing researchers to identify causal relationships with high confidence. If we can randomly assign subjects to visiting cultural institutions or not, we can make stronger claims about how those institutions affect visitors. Differences observed between randomly assigned treatment and control groups can be attributed to the causal effect of visiting cultural institutions and not by the pre-existing characteristics of people who choose to visit.

Building Informal Science Education

Presenters:
Kevin Crowley, University of Pittsburgh
Kirsten Ellenbogen, Great Lakes Science Center
Karen Knutson, University of Pittsburgh
Amy Grack Nelson, Science Museum of Minnesota
Sarah Cohn, Science Museum of Minnesota & Visitor Studies Association
Carey Tisdal, Tisdal Consulting
Beverly Serrell, Serrell & Associates
Kris Morrissey, University of Washington

Purpose:
Within the field of evaluation, there are a limited number of repositories of evaluation reports. One such resource is informalscience.org, a place for evaluators to post reports of evaluations in informal learning environments. Informalscience.org provides evaluators access to a rich collection of reports they can use to inform their practice and learn about a wide variety of designs, methods, and measures used in evaluating informal education projects. In what ways might the evaluation and research community use a collection of evaluation reports to generate and share useful new knowledge? The Building Informal Science Education project attempted to answer this question by commissioning five authors to synthesize 431 informal science education evaluation reports on informalscience.org. The authors will share results from their syntheses,

which covered a diverse range of topics in informal learning and evaluation in these settings.

Panelists' Perspectives:
Each of the authors will explore a particular issue within informal science education, looking for general lessons that might be learned by systematically combining or comparing findings across evaluation reports. Amy Grack Nelson will discuss what we can learn about the overall state of evaluation practices in the informal science education field from a snapshot of evaluation reports. Karen Knutson will discuss a review of common methods, practices, and outcomes of media projects and evaluations. Beverly Serrell will share what can be learned through the recommendations evaluators provide for summative evaluations of exhibitions. Carey Tisdal will examine the practice of evaluating websites and how these practices have changed over time. Kris Morrissey will share a review related to the intended impacts of social relevant practices in museums and how those impacts are measured. Together, the syntheses represent a feasibility test for using databases of evaluation reports as a source for field-wide, generalizable knowledge, but the members could then share what they have learned with other employees throughout the organization.

Importance:
In the field of informal science education, evaluation represents a sizeable investment of time, money, and intellectual energy. But despite these hundreds of studies, we often hear the complaint that we don't know much about informal science education. What could we learn about the field of informal science education if we turned back to a large collection of evaluation reports and conducted a secondary analysis of how evaluators have studied the field, what they have found, and what they recommend for future work? What are the limits of what we can learn from evaluation reports? Are there ways we can change our evaluation practices to make them more amenable to cross-project generalization? These are critical questions that will be addressed in this session and thus help inform the work of visitor studies professionals as they reflect on the relevance of the synthesis authors' findings to their own practice.

PAPER PRESENTATIONS
Capturing the Visitor Voice:
Keeping Visitors Relevant

Want to Know the Learning Impacts on Visitors? Ask them!

Presenter:
Amy Henson, Staff Scientist, Science North

Purpose:
The purpose of this session is to open the discussion of how we capture visitor learning by visitors by using their own self-assessments of learning. The question is how do we know if visitors' perception and reports of increased knowledge and understanding are truly indicative of learning? Can visitors genuinely report on changes in their own knowledge and can these self-reported statements be used effectively when evaluating exhibits and experiences in an exhibit or program setting? In several different science-related experiences including exhibits and Science Cafés, Science North has used open-ended visitor comments as complementary to observational and in-depth interview data to evaluate the learning impacts of these exhibits and programs.

Perspectives:
In the past, the methodology used to evaluate the learning impact of exhibits at Science North consisted solely of observational data, using The Visitor-Based Framework of Learning Behaviors (Barriault, 1998 and Barriault & Pearson, 2010). The Visitor Engagement Profiles produced for individual exhibits provide a practical and valuable assessment of the level of visitor engagement with these exhibits. Although learning behaviors are key in assessing impact, seeing the relationship between changes in self-reported knowledge and visitor learning behaviours (Barriault & Henson, 2009). Science North has been using this methodology to determine changes in knowledge and understanding in visitors of key learning goals in several of its exhibitions. In Science North's *Waterworks*, *Creatures of the Abyss* and *Wildlife Rescue* evaluation reports, there is a significant increase in knowledge and understanding as reported by Science North visitors.

Davies *et al.* (2009) suggest that Science Cafés and other science dialogue events should be considered avenues for social learning. While general experience evaluations of these experiences have occurred in conjunction with these programs, learning evaluation of these programs have not occurred in great detail with no evaluation developed for this type of program. These events can be viewed as Lehr *et al.* (2007) suggest the need for identifying these programs as sites of learning and the need to develop methodologies to assess the learning impact of these events.

Methods:
The evaluation methodology used for the exhibitions included observations of visitor interactions, closed-ended survey questions and open-ended visitor comments to determine the effectiveness of the exhibitions at reaching its learning goals. Visitors were video recorded interacting with the exhibits and a computer-based survey kiosk was placed near the exit of the exhibitions to complement the observation data. The survey asked visitors to answer questions related to their understanding of certain key messages of the exhibitions through a close-ended Likert-type scales questionnaire. At the end of the survey, visitors were asked to comment on what they found most interesting in the exhibition. Visitors could type as little or as much as they wanted regarding their experiences.

For the Science Café, in order to gauge changes in knowledge and understanding of the audience, a survey was developed in conjunction with the panel of speakers to develop learning goals based on the content of each of the panelist's presentation. Participants were asked to evaluate their knowledge and understanding before and after the café about these particular learning goals through closed-ended Likert-type questions. Participants were also asked to comment on what they found most interesting during the café.

Data & Analysis:
For the exhibitions, visitor behaviors were coded using the Visitor-Based Framework (Barriault, 1998; Barriault & Pearson, 2010) and its list of engagement behaviors to produce observational data and Visitor Engagement Profile graphs for individual exhibits. For both the exhibitions and the Science Café, self-reported changes in knowledge and understanding were compared over the scales between before and after visits. The visitor comments from the open-ended question on the survey were reviewed and coded using an open-ended coding schema.

Results:
The observations of the visitor interactions revealed high levels of learning behaviors in several of the exhibitions' exhibits. The results of the open-ended visitor comments gave us insights into the results of the observational data and provided additional support for our findings. Where observation data suggested high visitor learning, visitors self-reported increased knowledge and understanding and indicated learning in the open-ended questions. Changes in knowledge and understanding at the science café, increased only moderately through most of the science topics discussed. One topic in particular showed a great increase in knowledge and understanding in the Likert-scale questionnaire These results were supported by the open-ended questions where participants specifically mentioned the same particular topic.

Importance:
These results suggest
that self-reporting of knowledge and understanding can give us valuable insights into visitor learning in both exhibitions and programming. Each visitor's learning experience is unique and through the open-ended visitor comments we discovered what the visitors

themselves identified as valuable to their learning experience. We propose that a framework of comment categories can provide a tool for analyzing visitor comments that, combined with observational data, contributes to our understanding of the learning impact of an exhibition or program

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Barriault. C. & Pearson, D. (2010). Assessing Exhibits for Science Center Learning: A Practical Tool. *Visitor Studies Journal, 13* (1), 90-106.

Lehr, J.L., McCallie, E., Davies, S. R., Caron, B.R., Gammon, B. & S. Duensing (2007). The Value of "Dialogue Events" as Sites of Learning: An exploration of research and evaluation frameworks. International Journal of Science Education. 29:12. 1467-1487.

Davies, S.R., McCallie, E., Simonsson, E., Lehr, J.L.and S. Duensing. (2009) Discussing dialogue: perspectives on the value of science dialogue events that do not inform policy. *Public Understanding of Science* 2009 18: 338.

Additional Information:
The Science Centre Learning Experience: A Visitor-Based Framework
http://www.informallearning.com/archive/1999-0304-c.htm

WaterWorks: Soaking Up the Science Evaluation Report
http://staging.sciencenorth.ca/uploadedFiles/Exhibit_Sales_Content/Services/Traveling_Exhibits/WW%20Final%20Evaluation.pdf

Canadian Association Science Centres Conference and Weston Family Artic Science Café Evaluation Report. Available by request from henson@sciencenorth.ca

Interpreting Contemporary Art: A Conversation with Visitors

Presenter:
Lynn Courtney, Museum of Fine Arts, Boston

Purpose:
The Museum of Fine Arts, Boston's (MFA) Linde Family Wing, housing new galleries for the Museum's contemporary art collection, opened in September 2011 and afforded the opportunity to evaluate new directions in the MFA's interpretive texts. Both introductions of gallery themes and object labels employed changes in style that have characterized recent interpretation at the MFA: a more conversational tone, shorter introductory texts, questions for visitors to ponder, and the use of images.

This study was conducted to evaluate the impact of this new approach and to inform future interpretive strategies: How well do interpretive texts meet visitors' expectations and needs? Do they help or hinder visitors' engagement with works of art? Do they go far enough, or too far, in the direction of brevity, simplicity, and conversational tone?

Session participants may reflect on what new strategies museum evaluators can use to help ensure that interpretive materials meet visitor needs.

Panelists' Perspectives:
Ann Rowson Love will provide a short review of literature related to collaborative curatorial teams and interactive exhibition models. Literature addresses interdepartmental collaboration on curatorial teams. What has yet to be more fully examined relates to visitor experience and learning when s/he participates on the curatorial team throughout the exhibition development process.

Pat Villeneuve will introduce theoretical underpinnings and tenets of her SI model. SI represents a visitor-centered approach to curating art exhibitions. Built on a constructivist framework, SI presents free-choice visitors with exhibitions that include different points of view, acknowledge their variety of learning modes, and provides them with flexibility to connect and interact with objects in a comfortable environment, where they can engage freely and according to their own learning preferences. SI moves beyond Hein's (1994; 1998) constructivist museum theory with a set of guidelines for practice.

Alicia Viera and Ann Rowson Love will review evaluation findings from art exhibitions at the Tempe Center for the Arts in Arizona and the Figge Art Museum in Iowa, two exhibitions that recently implemented Villeneuve's SI model. Viera will focus on facilitating meaning-making of visitors and multiplicity of voices/narratives. Love will focus on meaning evidenced in exhibition artifacts – visitor-generated poetry.

Methods:
The evaluation of *Mixing it Up: Building an Identity* used qualitative methods including observations, interviews (in English and Spanish) and document analysis, this

evaluation focused on understanding the multiplicity of interpretations and interactions occurring in the setting as a result of the implementation of the supported interpretation model at this exhibition.

For the exhibition *Waxing Poetic: Exploring Expression in Art* evaluation strategies included the development of a visitor survey, gallery observations, exit interviews and interviews with exhibition team members. A follow-up study examined resulting works of poetry by community writers and exhibition visitors using an arts-based research approach and content analysis.

Data & Analysis:
Data was analyzed using mixed-methods. Surveys were analyzed using quantitative analysis. In both evaluations, interviews and observations were analyzed through qualitative content and narrative analysis. Works of poetry were analyzed using poetic interpretation and aesthetic development strategies.

Results:
Overarching results contribute to the understanding of how SI facilitates meaning-making and advances visitor engagement in the galleries. They also include the need for facilitation of exhibition teams during the curating process underscoring the importance of shared ownership of the exhibition. Visitor surveys demonstrate visitors' desire for a variety of methods for engaging with works of art and exhibitions. Creative artifacts (such as poetry and visitors' responses in general) left in the exhibition can tell many kinds of stories about visitor engagement and learning in art exhibitions. Findings at both sites reveal a need for more intentionality when it comes to signage and invitations to participate in activities as part of the museum experience. Many visitors expressed interest in the interactive components that required active participation from them but would instead prefer to engage in more passive types of activities.

Importance:
The combined visitor studies provide recommendations for implementing Supported Interpretation (SI) in art museums. Conducted in Fall 2011 and Summer 2012 through Spring 2013, studies indicate strengths and challenges for curatorial teams that include visitors/community members as well as findings pertaining to visitor learning and interaction in art museum exhibitions. SI may offer small to mid-size art museums and galleries a user-friendly, low-budget approach for exploring learning on curatorial teams and in resulting exhibitions. Furthermore, exploring new methods for analyzing visitor artifacts, such as arts-based approaches, may offer new innovations for the field. When visitors are asked to create (or use creativity) in art exhibitions, evaluators need to incorporate new or innovative methods for analyzing the visitor experience.

References:
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Serrell, B. (1996) Exhibit Labels: An Interpretive Approach. Walnut Creek, CA: Altamira Press.

Pittman, B. & Hirzy, E. (2010) Ignite the Power of Art: Advancing Visitor Engagement in Museums. New Haven, CT: Yale University Press.

Additional Links:
Linde Family Wing for Contemporary Art, Museum of Fine Arts Boston
http://www.mfa.org/exhibitions/linde-family-wing-contemporary-art

Audience Research in Participation Projects: Ensuring the Visitor Stays Relevant

Presenters:
Kayte McSweeney, Audience Advocate, Science Museum, London
Jen Kavanagh, Audience Engagement Manager: Information Age, Science Museum, London

Purpose:
This paper will look at the idea that using audience research during participation/co-creation projects can allow maximum opportunities for creating a more visitor relevant final experiences while also providing learning about how to more effectively develop, deliver and benefit from these projects.

It will use recent case-studies from participation or co-creation projects at the Science Museum London that have been both evaluated and researched using varied approaches and methodologies

Questions:
- How can the knowledge gained from your participants inform and enhance your visitor offer?
- How do you ensure the final outcome is an engaging and relevant experience for your visitors and not just your participants?
- By conducting rigorous audience research what can participation projects help you learn about public engagement, innovative research methodologies and co-production of exhibitions?
- How can you transfer your knowledge and expertise about your visitors to the participants you are working with?

Importance:
This is the 'Age of Participation' and we see Museums needing to make this part of what they do to stay relevant and responsive to the needs of their publics.

We see this presentation as showing the breath of and usefulness of Audience Research in the development, delivery and impact measurement of participation/co-creation projects.

Beyond measuring the response of the few who partake in these projects we see our work as allowing for more relevant visitor experiences being created by sharing knowledge with participants and ensuring co-created outputs are still evaluated and researched with their target audiences.

Methodologies we use are not overly innovative but are approaches perhaps not usually used in this kind of public engagement. Audience advocacy rather than just evaluation often becomes key.

We see our work as being key to keeping the field relevant in the future and showing the diversity and benefits we all value.

Concurrent Session 3
4:00 - 5:15 p.m.

Enhancing Evaluation of Informal Science Education: A Framework for Value

Presenters:
Alice Fu, SK Partners
Lisa Peterson, SK Partners

Purpose:
How to evaluate an evaluation? During this session, we will discuss our preliminary framework for addressing this question. The three-part framework—(1) Worth of the Intervention, (2) Appropriateness of the Evaluation Study, and (3) Usefulness for Stakeholders—comprises a set of criteria for evaluating summative evaluations. We will also share early impressions from our in-progress work on practical applications of the framework.

We will solicit feedback on the framework and brainstorm ideas for innovative evaluation tools and measures. Potential discussion questions include: In what ways does this framework help facilitate progress toward innovative yet rigorous evaluation in informal science education (ISE)? How might this framework be used in practical ways for decision-making and knowledge building? What are its limitations? What new tools and measures are needed for ISE evaluation?

Perspectives:
Evaluation of ISE projects is a complex endeavor, as is using evaluation findings to inform decisions and build knowledge for the field. The diversity of learning environments and audiences, the choice-based nature of informal learning experiences, and practical and fiscal constraints present challenges to feasibly evaluating outcomes in ways that are authentic, meaningful, and reliable (National Research Council, 2009; Falk et al., 2012; Friedman, 2008). Further, methodological rigor varies greatly across evaluation-based literature in ISE, which includes published, peer-reviewed works and non-peer-reviewed "grey literature" (e.g., reports). This variability—combined with a need to clarify theoretical foundations, shared goals, and common assumptions and terminologies (NRC, 2009; Falk et al., 2012)—makes it difficult to compare findings across studies, generalize about broad impacts, and use current knowledge to guide practice (Falk et al., 2012; NSF, 2008).

We set out to understand these challenges and develop tools and measures to enhance evaluation capacities in ISE. Funded by the Gordon and Betty Moore Foundation, our project activities include collecting and characterizing examples of high-quality

evaluations; conducting mini case studies of exemplary evaluation projects in ISE; and prototyping innovative ISE measures.

Methods:

To address the question of how to define quality or value for summative evaluation projects in ISE, we reviewed literature that included theoretical frameworks, professional research and evaluation standards, research articles, and other key publications in ISE. We also read evaluation reports, using a purposive snowball sampling approach and focusing on those that were recommended to us as exemplary projects by colleagues or cited in other works. We explored a number of relevant websites, which comprise a vast number and array of online resources for ISE and evaluation professionals—articles, reports, guides, assessment tools, databases, virtual communities, and more. As a result of these efforts, we developed a preliminary conceptual framework for evaluating ISE evaluations. We will collect data on the framework's functionality by using it to review evaluation reports and guide case studies of exemplary ISE evaluation projects; findings will inform further refinement of our framework.

Results:

Our framework features three dimensions that contribute to the quality or value of a summative evaluation for decision making and contributing knowledge to the field. The first dimension is Worth of the Intervention: "Should it have been done; was it a worthwhile thing to do when compared to alternatives addressing the same goal(s)?" To address worth of a program, exhibit, experience, or project, the evaluator might draw links to conceptual, empirical, and practical knowledge and perspectives. The second dimension is Appropriateness of the Evaluation Study: "Were the evaluation questions, design, methods, and interpretations linked, justified, and justifiable given the particularities of the informal context?" And, the third dimension is Usefulness for Stakeholders: "Were the evaluation findings clearly communicated; were they relevant for users by, for example, directly addressing their needs and questions, informing decisions to be made, or growing knowledge of the ISE field?"

Importance:

We recognize that evaluation is both an art and a science. With this framework, we have outlined some of the "scientific" principles that underlie a high-quality, rigorous summative evaluation. However, no one approach works in all instances, and designing and conducting an evaluation in messy real-world conditions is an art. It requires innovation and complicated decisions that account for, among other concerns, the needs and interests of stakeholders; financial, logistical, and other practical constraints; and the historical, social, and cultural context.

We propose that our framework—with each of its main components elaborated—supports a decision-making cycle that can help various stakeholders (e.g., practitioners, evaluators, researchers, funders) consider indicators of value when planning, reviewing, or using evaluations. By outlining critical considerations for evaluating evaluations, this framework may help identify future opportunities for enhancing the rigor of visitor studies and encouraging innovation where it is needed.

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Yarbrough, D. B., Shulha, L. M., Hopson, R. K., & Caruthers, F. A. (2011). *The program evaluation standards: Summary form.* Retrieved from http://www.eval.org/evaluationdocuments/progeval.html

Yohalem, N., Devaney, E., Smith, C., & Wilson-Ahlstrom A. (2012). *Building citywide systems for quality: A guide and case studies for afterschool leaders*. Washington, DC: The Forum for Youth Investment. Retrieved from http://www.forumfyi.org/files/building_citywide_systems_guide_print.pdf

Visitor Studies Association. (2008). *Evaluator competencies for professional development.* Retrieved from http://visitorstudies.org/uploads/documents/Evaluator-Competencies.pdf

Additional Links:
Project Description
http://informalscience.org/project/show/2101

Investigating Learning Within Making, Engineering, and Design-Based Activities

Presenter:
Lisa Sindorf, Exploratorium
Nina Hido, Exploratorium
Anna Lindgren-Streicher, Museum of Science
Gina Svarovsky, Science Museum of Minnesota

Purpose:
This session brings together researchers and evaluators from three different institutions who have each worked to better understand and document visitor learning during making, engineering, and design-based experiences. Our goals for the session are to engage the session participants in meaningful conversation about the emerging methods and frameworks for studying learning within multi-faceted design-based learning experiences, the relationships between activity design, facilitation, and learning, and the challenges that researchers and
evaluators face when studying learning in these contexts. By sharing our work and hearing about how others from the Visitor Studies community are examining learning within these settings, we hope to continue and extend the field-wide conversation on this timely topic.

Panelists' Perspectives:
Lisa Sindorf and Nina Hido, Exploratorium: In 2009, the Exploratorium created a maker space called The Tinkering Studio™, where a variety of facilitated, open-ended activities encourage visitors to set goals for themselves, explore materials, and iteratively test their creations. The researchers have analyzed video of 50 visitor groups as they engage in some of the Studio's core activities, and have worked with practitioners to iteratively develop a framework of four broad indicators of learning.

Anna Lindgren-Streicher, Museum of Science: Design Challenges is a staffed, drop-in program at the MOS that engages families and school groups in the engineering design process through challenge-based activities. Multiple studies have assessed the program's impact and investigated aspects of the program. These studies have used

the engineering design cycle and collaborative discussion with educators to define what engagement and learning in these activities looks like.

Gina Svarovsky, Science Museum of Minnesota; The Gender Research on Adult-child Discussions in Informal Engineering Environments (GRADIENT) project closely examines the engineering learning and conversations that occur between adults and female children during three different museum-based design activities. Video observations coded with an emergent coding scheme informed by studies of engineering design and family learning.

Importance:
With the rise in engineering-related experiences in informal learning environments and the explosion of the Maker community, visitors increasingly encounter opportunities to engage in design-based activities in informal contexts. While these experiences have been shown to be quite engaging for visitors, few studies have examined visitor learning within these settings. Examining the learning outcomes and processes that occur during these activities can be particularly difficult and complex because of the nuanced learning moments that tend to be embedded within an engaging, interactive, and open-ended design activity. As such, researchers and evaluators in the Visitor Studies community are being called on to develop innovative methods and frameworks to measure and document visitor learning during these experiences. In this session, presenters will describe three projects that have taken on this challenge and engage session participants in discussion about how each project is defining, observing, and analyzing learning within their specific contexts.

References:

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Mannon, S. E., & Schreuders, P. D. (2007). All in the (engineering) family? - The family occupational background of men and women engineering students. *Journal of Women and Minorities in Science in Engineering*, 13(4), 333-351.

Shaw, E.S., Chin, E., & Reich, C. (2005). *Design challenges: Summative evaluation.* Boston, MA: Museum of Science.

Werner-Avidon, M., Castillo, C., Newton, L., Robles, D., Wang, J., & Randol, S. (2010). *Ingenuity in action: Evaluation report. Berkeley*, CA: Center for Research, Evaluation, & Assessment, Lawrence Hall of Science.

Additional Links:
The Tinkering Studio™ at the Exploratorium
http://tinkering.exploratorium.edu/

Design Challenges at the Museum of Science
http://www.mos.org/designchallenges/

The Engineering Studio at the Science Museum of Minnesota
http://www.smm.org/exhibitservices/history/engineeringstudio

PAPER PRESENTATIONS
Innovation in Evaluation: Refining Our Approach

Iterative Testing of Interpretive Content: Something Old, Something New

Presenters:
Marcella Wells, Ph.D., Wells Resources, Inc.
Ross J. Loomis, Ph.D.,   Department of Psychology, Colorado State University

Purpose:
One contribution of Chan Screven was his definition of and encouragement for sequentially test interpretive content in the process of developing effective exhibits (Screven, 1976). Iterative testing can be done during front-end and formative evaluation, but is especially helpful during formative evaluation. In addition to the iterative method, the combined use of quantitative and qualitative methods has emerged since Screven first wrote about iterative evaluation (Yalowitz & Wells, 2000). Recently, Wells (2012) and others (Gullenhaal and Perry, 2004) have developed iterative procedures for doing both front-end and formative evaluations consisting of naturalistic and open ended inquiry approaches of interactive interviews, talk-alouds, and small group discussions. The procedures are iterative in the fact that they employ sequential assessment protocols and testing materials over the course of an evaluation project. While innovative current methods may seem far from Screven's original work, we will suggest there is an important continuity at work.

Panelists' Perspectives:
Ross Loomis will review how Chan Screven proposed and used an iterative process to do exhibit and program evaluation studies. Included in Screven's approach was the importance of repeated testing of mock up materials prepared to improve visitor participation with exhibits and understanding. Such testing was especially important for formative evaluation. Marcella Wells will demonstrate three examples of developing

basic iterative testing with additional methodological tools to perform formative assessment.

Importance:

Iterating in formative evaluation, as illustrated here, is questioned by some who suggest that the findings may be distorted by lack of exact comparability between groups. However, it is worth reminding ourselves about the uses of front-end and formative evaluation – that is, to inform decision-making in subsequent stages of design and development. If iterating the process and/or the materials used in testing can elicit clearer, deeper, or more reasonable responses from respondents the evaluation at-large then, is more meaningful. What is lost with potentially shallow data of early (pre-iterative) discussion is gained in later data from more targeted, specific, and clear questioning.

References:

Screven, C. G. (1967). Exhibit evaluation: A goal referenced approach. *Curator: The Museum Journal*, 19(4), 271-290.

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Risk and Responsibility: What can we learn when a method fails?

Presenters:

Claire Thoma, Evaluation & Research Coordinator , The Children's Museum of Indianapolis

Elee Wood, PhD, Public Scholar of Museums, Families, and Learning, The Children's Museum of Indianapolis, Associate Professor of Museum Studies and Teacher Education , Indiana University Purdue University Indianapolis

Purpose:

This presentation addresses the challenges of developing a new method of program evaluation for a summer camp—portfolio-style "memory books"—and what we learned when our innovation failed to return the desired information. Following the completion of the summer camp, the evaluators undertook a meta-evaluation to assess the viability of this method for future program evaluation by understanding further what worked, what didn't work and why, and what could be done to improve the method.

Perspectives:

The Children's Museum of Indianapolis performs an annual evaluation of StarPoint, its summer camp for youth ages 6-12. The evaluation is designed to measure program quality and the extent to which participant outcomes are met. In addition to surveys, observations, and interviews, the project evaluators recognized the value of using "organic" or naturalistic methods to incorporate participant perceptions into the evaluation. The evaluators hoped that including youth-designed "memory books" would shed light on deeper or long-term effects of camp participation by soliciting more personal reflections from campers.

The concept of the memory books emerged as a natural extension of the program's emphasis on arts and summer enrichment. Building on published methods (Evans & Reilly, 1996; PhotoVoice, 2012), the memory books included predetermined drawing prompts, which referenced the themes of camp but also elicited campers' personal connections to the topics and experiences, and photographs campers selected to represent their camp experience. The team planned to examine the books for references to particular types of camp activities—exhibit visits, guest speakers, field trips, and classroom projects—to better understand the camper experience, including personal connections the campers were making inside and outside the museum.

Methods:

The meta-evaluation examined the method's transition from theory to implementation from all levels in order to identify any and all factors that contributed to its failure to consistently return the anticipated information. The goal of the meta-evaluation was ultimately to determine whether the challenges to the method's success could be overcome in the future or if the method was intrinsically flawed (Stufflebeam, 2001).

In this process, the evaluators again reviewed the data set and reflected on every step of the implementation process and every decision that affected the memory books. The evaluators relied on classroom observations and written feedback from camp administrators and classroom staff to understand the extent of staff and camper buy-in to the process. The evaluators also examined attendance records and schedules for other factors that could have affected the memory books.

Data & Analysis:

The desired format for each response included a drawing or photograph accompanied by a written description. The descriptions were necessary for more accurate interpretation of the drawings and better understanding of the reasoning behind photograph choice. Most (89%) of the 75 memory books yielded usable results from the photo selections; however, the majority of campers (63%) completed four or fewer drawings, and nearly half (43%) of those lacked written descriptions. The variation in number of drawings completed and the lack of descriptions significantly limited the scope of the analysis.

All camp staff commented on the difficulty of implementing the memory books, citing inadequate time and campers' characterization of the activities as "schoolwork." Examination of camp schedules revealed that only 30 minutes per week were dedicated to the memory books, and classroom observations indicated that campers were often required to complete drawing prompts before being allowed to do a "fun" activity.

Results:
Overall the meta-evaluation revealed challenges including camper and teacher buy-in, prompt wording, and time constraints.

What worked:
1) The photo selection process allowed for comparison of the frequency of photos selected and provided some rich camper reflection in the descriptions.
2) Four drawing prompts were useful in the content assessment aspect of the program evaluation.

What didn't work and why:
1) Insufficient detail in camper drawings and descriptions as a result of unapproved changes to the instrument and inadequate time to complete.
2) Drawing prompts targeted at content assessment were perceived as test-like and negatively affected camper motivation.

What can be done to improve:
1) More testing and redesign of prompts; separation of content assessments and personal reflection.
2) Continued coaching of staff to cultivate an "assessment" attitude among front line "data collectors" (e.g. the teachers themselves).
3) Collaboration between evaluators and staff to integrate evaluation activities into camp curriculum.

Importance:
In the field of evaluation, there is a constant need to balance the essentials of rigor with efficiency, creative problem-solving, and staff/participant buy-in. Through the discussion of this particular method's merits and flaws, members of the field can consider the risks and responsibilities for evaluators trying new methods. When evaluators take risks in employing new methods, they also take on the responsibility of reflecting on that method to better understand its merits, draw-backs, and potential for future use. As we have seen in this case, even a method that "failed"—in that it did not return the anticipated data—still provided a lot of information about the participant experience and the program evaluation. It is through the sharing of these insights and experiences that new methods will continue to be developed and refined.

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Nimble Evaluation: Evolving VIsitor Studies

Nimble Evaluation: Evolving VIsitor Studies
Nimble Evaluation: Evolving VIsitor Studies
, Audience Viewpoints Consulting

Purpose:
The goal for this session is to reflect on the barriers and opportunities to making evaluation a tighter collaboration between the evaluator and the project team, encouraging a more flexible and widespread use of evaluation. There has always existed a disconnect between evaluators and their intended audience. Too often evaluations are under utilized, if conducted at all.

While formative evaluation has long utilized nimble techniques, the utility problem is exacerbated within the technology design arena of informal learning environments, where standard development processes and common paradigms such as design thinking and agile software development preclude traditional evaluation techniques.

How can evaluation remain relevant and move in synchronicity with cultural practices that prize just-in-time information and divergent thinking? How can the timing of evaluation be adapted to fit within a highly-iterative model?

Perspectives:
My perspective has been influenced by a movement called Design Thinking. Design thinking emerges from the need to design for amorphous problems by using empathy, creativity, and rational analysis and user feedback for refining. Design thinking aims to be solutions-oriented, so that project has a defined goal, and then to work backwards from that stage. While it has a strong component of evaluation, especially formative evaluation, the process and timeline for design thinking as it emerges here is dramatically quicker than the typical museum process, both in exhibition design and in evaluation. Design thinking does not follow the scientific method, it relies heavily on

synthesis and iteration rather than on analysis. Unlike analytical thinking, design thinking is a creative process based around the "building up" of ideas.
In a critique against the lack of deep analysis as to the problems, some feel design thinking to perpetuate Solutionism. As quoted in this article, Evgeny Morozov defines solutionism as "Solutionism presumes rather than investigates the problem it is trying to solve, reaching for the answer before the questions have been fully asked." This perspective invites discussion about the different goals of museum products, varying from exhibit creation to problem-solving to measuring of impact.

Importance:
In keeping with this year's conference theme on innovation and rigor, the session is designed to foster conversation about what the next phase of evaluation looks like, as the process of design and development changes in the world at large and within the walls of the museum.

The session will begin with a background description of the difficulties in timing rapidly moving evaluations. Delving into the techniques of software design, and the tensions between design thinking and the scientific method, it will outline where some of the tensions arise between developers and evaluators, and how we can better support designers and developers. At the end of the session, the room will engage in a discussion on evaluation innovation and how to further nimbleness and responsiveness without sacrificing depth. Finally, it will advocate for an expanded tool set to provide more meaningful evaluation for the changing world of informal learning.

References:
Mitroff Silver, D., Rogers, M., & M. Wilson, M. (2013) Design Thinking for Visitor Engagement: Tackling One Museum's Big Challenge through Human-centered Design Museum and the Web, Selected papers from Museums and the Web 2013 Portland: Museums and the Web Inc. Retrieved from http://mw2013.museumsandtheweb.com/paper/design-thinking/

Additional Links:
Design Thinking and Design Sprints at Google:
http://www.designstaff.org/articles/product-design-sprint-2012-10-02.html

Audience Viewpoints
http://www.audienceviewpoints.com

Thursday, July 18

Concurrent Session 4
10:30 - 11:45 a.m.

What Have we Learned from Our Experiences in Visitor Studies?

Presenters:
Steve Bitgood, Jacksonville State University
Alan Friedman, Friedman Consults
Beverly Serrell, Serrell & Associates

Purpose:
The purpose of this session is to describe lessons learned by three seasoned professionals who have years of experience in the field of visitor studies. Each panelist will take one of the following perspectives: (1) researcher/designer, (2) museum director/manager, and (3) evaluator/educator. In addition to the lessons offered by the panelists, lessons obtained from other professionals will be categorized and described. This session is a follow-up to past publications that discussed some of the political and practical problems that arise in a museum environment. [For example, see the references below from a special issue of *Visitor Behavior* published in 1996].

Perspectives:
Alan Friedman: Alan summarizes the lessons learned from the perspective of directors and managers. He will contribute experiences from 22 years as director of the New York Hall of Science. He describes projects that gave him new insight into what it means to be a director and how to be more effective given the new knowledge of the role of director.

Beverly Serrell: Beverly discusses the lessons learned from the perspective of evaluators and educators. As an evaluator for over 30 years, Beverly has extensive experience dealing with professionals from other disciplines. The lessons included are those learned trying to convince content specialists, exhibit developers, designers, marketers, and educators to apply the empirical findings from the visitor studies literature.

Steve Bitgood: Steve describes the lessons learned from the view of researchers, exhibit designers, and visitor service personnel. Researchers often have difficulty understanding why their evidence is not immediately accepted and applied; designers

may ignore the evidence presented because they lack an understanding of research; and visitor service personnel are often frustrated because, although they have the most contact with visitors, their input is often ignored.

Importance:
Political savvy as well as application of professional knowledge and skills develop with years of experience. Since it is difficult to make this knowledge part of formal education, it is helpful to learn from those who have worked in visitor studies for years. In addition, even if these "lessons" were taught in formal education, visitor studies lacks the formal educational programs common to other fields.

The current session attempts to increase and/or revive concern for institutional acceptance of visitor research and evaluation in museums (see references).

References:
Bitgood, S. (1996). Institutional acceptance of evaluation: Review and overview. *Visitor Behavior*, 11(2), 4-5.

Friedman, A. (1996). Why museums don't evaluate. *Visitor Behavior*, 11(2), 6—8.

Hood, M. (1996). Institutional acceptance of audience research. *Visitor Behavior*, 11(3), 4-5.

Socolofsky, K. (1996). Institutional acceptance of visitor evaluation. *Visitor Behavior*, 11(2), 14

Wagner, K. (1996). Acceptance or excuses?: The institutionalization of evaluation. *Visitor Behavior* (11(2), 11-13.

Bilingual Exhibits Research Initiative: Current Practices and Visitor Engagement

Presenters:
Chair/Facilitator:
Laura Huerta Migus, Association of Science-Technology Centers, Inc.

Panelists:
Cecilia Garibay, Garibay Group
Steven Yalowitz, Audience Viewpoints Consulting
Veronica Garcia Luis, Exploratorium

Purpose:
This session presents preliminary findings from the NSF-funded Bilingual Exhibit Research Initiative (BERI), a multi-institution study on Spanish-speaking groups' experiences with bilingual exhibitions. It also investigates current practices in bilingual exhibits efforts in informal science institutions. Findings from ASTC's Multilingual Survey of professionals in science centers and museums will provide an overarching perspective of the field and frame the session.

Panelists' Perspectives:
ASTC Multilingual Study Perspective:
The study, a collaboration between ASTC and the Exploratorium, was conducted because: a) little information exists on the topic to advance knowledge and awareness about multilingual practices, b) to inspire additional studies aimed at enhancing our understanding; and c) advance the capacity to better serve a multitude of audiences. The main goal of the study was to establish a baseline understanding of global multilingual offerings, processes, and motivations.

BERI perspective:
Many museums currently produce bilingual exhibits, but little research exists to inform practice. The Bilingual Exhibits Research Initiative (BERI), an NSF-funded exploratory project. Investigates: 1) current professional approaches to producing bilingual exhibitions, and 2) the ways in which Spanish-speaking Latino families, engage with bilingual exhibits.

BERI's research with museum and science center staff documents the concerns, opportunities, and constraints faced by professionals as they deliberate about and create bilingual exhibits. BERI's research with visitors explores ways bilingual content and design affords and/or constrains visitors' engagement. This work will inform professionals about the relevant factors and potential implications of their decisions related to bilingual exhibits.

Methods:
ASTC Multilingual Study:
An on-line survey with ASTC membership was conducted in October 2009, with 143 individuals in the United States representing 111 institutions and 38 international individuals representing 33 institutions. Response rates were 20% for the U.S. and 23% for the international respondents.

BERI:
Two audiences were included in this study. Phone interviews were conducted with 32 Informal Science Education (ISE) professionals from 22 different institutions working in the creation of bilingual exhibits. On-site research was conducted with Latino families at four institutions: San Diego Natural History Museum, Miami Science Museum, Children's Museum of Houston, and the Oregon Museum of Science and Industry. Latino intergenerational groups were recruited and these families visited a fully bilingual exhibit at the institution. Groups were observed and audiotaped in the exhibit and specific behaviors were recorded. Groups also participated in an in-depth follow up interview immediately following their time in the exhibit.

Results:
ASTC Multilingual Study:
The study provided baseline information on the prevalence and methods of multilingual interpretation in science centers around the world to enable field-wide benchmarking. Despite significant differences between U.S. and non-U.S.-based institutions with respect to the rate of multilingual offerings, there were no significant differences between motivations and challenges for offering multilingual interpretations.

BERI:
The research showed that well-developed bilingual text was not perceived as visually overwhelming and that labels provided access for bilingual groups' understanding of exhibit content. Parents were able to support children's learning and bilingual content was seen as a potential motivator for future visits. This study also illuminated how language factored into visitors' social dynamics and mediated their experiences. Results show the utility of viewing language use on a continuum: many groups included family members on a spectrum of Spanish or English proficiency, with many switching between Spanish and English during observed interactions.

Importance:
Museums have increased their focus on engaging diverse communities; one approach has been to develop bi-/multi-lingual exhibits. Yet, while many museums produce bilingual exhibits, as a field, we have little understanding of current approaches and know even less about their effectiveness. ASTC's survey findings will provide a broad view of multilingual offerings related to bilingual exhibits. BERI will deepen our understanding of both practices and bilingual exhibit visitor impacts. This study, however, is not simply about adding Spanish text and solving the graphic design

dilemmas. Rather, it takes an integrated look at social, physical, and conceptual engagement within bilingual exhibits. Participants will have a greater understanding of the field's thinking about and approaches to bilingual exhibits and their impact on visitor engagement.

Additional Links:
Bilingual Exhibits Research Initiative (BERI): http://informalscience.org/projects/ic-000-000-001-774/Bilingual_Exhibits_Research_Initiative_(BERI)

ASTC Multilingual Study:
http://www.astc.org/resource/equity/Multilingualism%20Report_Final.pdf

PAPER PRESENTATIONS
Exploring the Spectrum of Visitor Investigation:
From Formative Engagement to Unobtrusive Observations

Value-Added Front End/Formative Evaluation on a Native American Exhibition

Presenter:
Marjorie Bequette, Science Museum of Minnesota
Zdanna Tranby, Science Museum of Minnesota

Purpose:
How do we add to a visitor's experience while collecting data that helps to shape a cultural exhibition? Join us as we explore visitor engagement with artifacts and ideas at a prototype exhibition featuring Minnesota's Dakota and Ojibwe communities, called, "We Move and We Stay". The exhibition covers just 700 square feet, but includes 7 distinct places for feedback where visitors can react to the objects and ideas in the exhibition in an on-going conversation with the museum and each other. The number of comments and the personal stories that visitors share suggest that visitors enjoy this dialog. Visitors may also benefit by having the opportunity to explore their personal connections to the content. We will share some of the stories, questions and reactions that visitors have shared with us, as well as our process for creating questions that spark discussions.

Importance:
Evaluators in informal education regularly discuss two challenges at the center of this project:
   • how to make the experience of participating in an evaluation one that is valuable and not onerous to visitors who have come to our institutions for diverse purposes that rarely involve participating in an evaluation, and
   • how to create safe spaces for visitors to discuss controversial topics.

Engineering Conversations Between Preschool Girls and Their Parents

Presenters:
Gina Navoa Svarovsky, Science Museum of Minnesota
Monica Cardella, Purdue University

Purpose:
The purpose of the Gender Research on Adult-child Discussions within Informal ENgineering environmenTs (GRADIENT) study is to explore gender differences in the development of early engineering interest and understanding. In particular, the project closely examines parent-child conversation within a range of informal engineering contexts that exist at the intersection of parents, children, and meaningful STEM learning. In this study we examine a preschool program where parents and children can play with engineering-focused toys, a family-oriented engineering event for elementary students and their parents, and an engineering exhibit within a science museum. This paper focuses on the first setting, the pre-school program where parents and children play with toys to engage in engineering-related activities.

Perspectives:
The GRADIENT project explores gender differences in the development of engineering interest and expertise by examining the number, richness, and range of engineering-focused behaviors observed during parent-child conversation within three informal engineering learning environments: a pre-school program where parents and children can play with engineering-focused toys, a family-oriented engineering event for elementary students and their parents, and an engineering exhibit within a science museum. We build on prior work that extended the Islands of Expertise framework beyond parent–child interactions and applied it to groups of 5th and 6th grade students working on engineering design challenges.

Finally, the GRADIENT study connects to the broader literature on girls and women in engineering by examining the extent to which girls' development of engineering interest and understanding can be impacted by connecting informal learning activities more intentionally to societal issues and problems. Drawing on the occupational choice theories, girls and women tend to place a high value on helping others in their work but do not often realize that careers in engineering can lead to these types of endeavors. Adding layers of this type of context may lead to increased development of girls' engineering interest and understanding.

Methods:
The meta-evaluation examined the method's transition from theory to implementation from all levels in order to identify This paper focuses on data from the "Preschool Playdates" program, which is facilitated once a week at a science museum and is designed for children aged 3-6 years old. Within this context, we set up an engineering station, where children and adults are invited to engage in engineering design-build

activities with the understanding that participating in these activities also entails participation in the research study. The child(ren) and adult(s) attend to two different engineering challenges ("design a tower as tall as this plant out of foam blocks" and "design as tall a tower as you can using the Dado Squares"), working on each task until the child is ready to be done, while video-recorders capture the family's interactions. Once both challenges are finished, the child is interviewed using a puppet methodology while the adult completes the short-version of the Parents Engineering Awareness Survey.

Data & Analysis:
Video observations of 35 family groups with at least one female child between the ages of four and six were transcribed and analyzed with a grounded theory framework. Influenced by studies of design experiences from engineering education (Adams, 2001; Atman et. al 2007; Cross & Clayburn Cross, 1998), the theory of Islands of Expertise (Crowley and Jacobs, 2002), and the Adult-Child Interaction Inventory (Beaumont, 2010), we coded conversational turns of talk using a coding scheme that focused on three main areas: engineering learning, adult-child interactions, and interest and engagement. The coded data was then further analyzed to uncover patterns of activity and conversation that tended to promote the interest and engagement for the child. The findings from the baseline data collection in all three settings will be used to inform small changes within each environment, after which another round of data collection will commence.

Results:
The 33 transcripts for the Playdates Baseline were reviewed for terminology relating to engineering and science concepts uttered by either the adult or child participant and a range of science and engineering vocabulary was identified. Adult males and females differed in the number of instances and level of vocabulary used. Early analysis of seven cases also indicates that adults move between roles across the engineering activity, and that both adults and children introduced additional context during the fairly generic design problem. Lastly, early analysis of 5 cases suggests that adult males may be more directive in their utterances and actions than adult females. Ultimately, we hope to explore relationships between different types of interaction (such as "directing"), notable events during the activity (such as the occurrence of barriers or the clear expression of excitement by the child), and of course, engineering content and behaviors.

Importance:
Sharing findings from the GRADIENT project will foster discussion on key questions for the VSA field related to informal engineering and design-based activities, including how to measure learning within these environments, how we can use our findings to help provide additional support to parents who may have less familiarity with engineering and design, and how these types of informal engineering experiences can broaden participation in STEM overall.

References:

Adams, R. S. (2002). "Understanding design iteration: Representations from an empirical study." In D. Durling & J. Shackleton (Eds)*, Common Ground: Proceedings of the Design Research Society International Conference at Brunel University* (1151-1161). Staffordshire University Press: UK.

Beaumont, L. (2010). *Developing the Adult Child Interaction Inventory – A methodological study*. Evergreene Research and Evaluation. Accessed on July 17th, 2012 at http://informalscience.org/research/show/5387.

Crowley, K., & Jacobs, M. (2002). Building Islands of Expertise in Everyday Family Activity. In G. Leinhardt, K. Crowley & K. Knutson (Eds.), *Learning Conversations in Museums* (333-356). Mahwah, NJ: Lawrence Earlbaum Associates Inc.

Development and Evaluation of an Innovative Visitor Guidance System

Presenter:
Alexandra Schautz, University of Hildesheim, Institute of Biology, and Science Center phæno

Purpose:
Our study focuses on learning in a hands-on science center exhibition. The approach is based on the assumption that the orientation and choice behavior of a visitor is one of the crucial factors for learning in exhibitions determining visitors experience during an exhibition visit. Therefore we offered visitors tour maps through an exhibition about biotechnology based on two well-known preconditions for learning: corresponding prior concept knowledge and current area of interest (Rennie & McClafferty, 1996). The main hypothesis of our study is then that individual tour proposals offer a high potential towards intensifying the visitors' learning experiences of a biotechnology exhibition. The presentation will focus on our first research question with regards to the orientation and choice behavior of the visitors: Is there a difference in the paths visitors from the experimental group (with tour proposal) take through the exhibition area in comparison with the control group (without tour proposal)?

Perspectives:
With respect to the visitors' behavior in exhibitions, two findings are of special importance. First, visitors see only a part of the exhibits because different exhibits within one exhibition compete for their attention (cf. Serrell, 1998). This is problematic if an exhibition is aimed at a specific learning outcome in the form of key concepts of a specific topic. Secondly, research has revealed general visitor circulation patterns, i.e. tendencies to move towards large or animated landmark objects, keeping to main

pathways and to one side of the exhibition (Bitgood, 2006). These patterns thus show a generalized spatial orientation instead of an orientation to the exhibit content. However, in order to acquire an understanding of the ideas and messages of the exhibition, a conceptual orientation is often required. In our study we try to achieve a conceptual orientation that is based on the prior knowledge and interest of the visitors.

Methods:
The study was conducted as an intervention study with a control vs. experimental group design. Visitors of the experimental group were assigned to one of nine different category based tour proposals by means of a computer based questionnaire. Data collection for timing and tracking of the individual visitors' paths was carried out by the hardware of an audio guide system. In order to process the audio guide data, new software for graphical representation and analysis of the individual paths has been developed.The program allows for investigation of individual tours (attraction and holding power of the exhibits in the exhibition), comparison of actual tours with the proposed tour and for analysis of main pathways (overlay of several tours).

Data & Analysis:
In total we collected 285 data sets (143 under experimental conditions, 142 for the control group). Our target group consisted of free time visitors age 14 and older on weekends, public holidays and school vacations. Relevant previous knowledge and interest of the visitors was collected by means of a pre-questionnaire. Audio guides were then used for timing and tracking during the exhibition visit. Visitor data was grouped according to their prior knowledge level and their current interest in order to compare the moving patterns of the different groups.

Results:
With respect to the first research question we found substantial differences in the general movement patterns between the two groups. While the control group displayed a cost effective way of moving through the exhibition (orientation along the outer walls), the experimental group chose significantly longer ways between exhibits, regardless of their prior knowledge level. These results suggest that general visitor movement patterns through an exhibition space can be altered by means of category based tour proposals. Further analyses have to qualify these differences more precisely with regard to the visitors' experienced growth of knowledge and skills.

One additional outcome of the study is the development of a reliable automated timing and tracking instrument for the analysis of individual visitors' paths. The instrument consists of an audio guide system and special analysis software. Movement patterns can be used for comparative quantification of individual visitor behavior as well as of visitor groups.

Importance:
Learning is an important goal of science centers and museums. But how can this goal be achieved? We hypothesize that individualization of exhibition visits offers a great potential towards optimization of the visitors' learning paths. One way to individualize

exhibition visits is to offer tours fitting to the visitors' learning preconditions and other personal characteristics such as their interest. Our approach provides insights into innovative visitor guidance systems that focus on the single visitor. Further research is needed that focuses on the chances and limitations of individualized exhibition visits in praxis.

References:

Bitgood, S. (2006). An Analysis of Visitor Circulation: Movement Patterns and the General Value Principle. *Curator: The Museum Journal* 49 (4), 463-475.

Rennie, L. J. &. McClafferty T. P. (1996). Science Centres and Science Learning. *Studies in Science Education* 27 (1), 53-98.

Serrell, B. (1998). *Paying attention. Visitors and museum exhibitions*. Washington D.C., USA: American Association of Museums (Professional practice series).

Concurrent Session 5
1:45 - 3:00 p.m.

25+ Low-cost/No-cost Tech Tools for Data Visualization and Reporting

Presenters:
Kathleen Tinworth, ExposeYourMuseum LLC
Troy Livingston, Museum of Life & Science

Purpose:
Communication is essential in evaluation use. The focus of this session is to share over 20 low-cost/no-cost tech tools (largely websites, mobile apps, and social media) that assist with and improve data visualization and reporting. This will add to attendees' evaluation tool kits, providing useful and user-friendly ways to ensure smart data communication is a top priority.

Panelists' Perspectives:
As former Director of Audience Insights at the Denver Museum of Nature & Science and now Principal at ExposeYourMuseum LLC, a consultancy committed to actionable audience research and evaluation, Kathleen Tinworth will present these tools as vital to her evaluation practice.

Troy Livingston, Vice President for Innovation and Learning at Museum of Life and Science in Durham, North Carolina will present these tools from a museum practitioner/ senior leadership perspective, demonstrating their utility in conveying compelling information to make data driven decisions.

Importance:
The classic evaluator's dilemma is not seeing valuable data gleaned through sound evaluation translate into program, exhibit, or service changes. As an evaluator, your ability to convey findings clearly and concisely through compelling products increases the likelihood that senior leaders and decision-makers can digest what's being presented and turn the data into usable information to help guide, change, and transform institutions. Clear, accessible data communication and direct, clean reporting are arguably two of the most important factors in moving research into practice.

Evaluating Supported Interpretation Model (SI) for Community-Based Interactive Art Exhibitions

Presenters:
Ann Rowson Love, Director, Museum Studies, Western Illinois University-Quad Cities/ Figge Art Museum
Pat Villeneuve, Professor, Department of Art Education, Florida State University
Alicia Viera, Doctoral Candidate, Department of Art Education, Florida State University

Purpose:
This panel will introduce Villeneuve's Supported Interpretation Model (SI) and two visitor studies conducted at art exhibitions in the Midwest and Southwest. The SI model includes community representation on museum exhibition development teams throughout the curating process and interactive visitor experiences in the resulting art exhibitions. Evaluation questions included:

- Does Villeneuve's model of supported interpretation (SI) facilitate the process of meaning-making of visitors through social interaction and how?
- What is the visitor experience for those who participate on the exhibition curatorial teams?
- What can we learn about visitor experience during the exhibition?

For more than a decade the field of visitor studies addressed informal learning experiences in exhibitions, particularly interactive exhibitions across museum types. Recent studies in art museums include Denver Art Museum, Detroit Institute of Arts, Dallas Museum of Art, and the Oakland Museum. Like the latter, SI may offer a viable option for small to midsize art institutions.

Perspectives:
In previous MFA studies visitors indicated that understanding or speculating about the artist's motivation and intent is of paramount importance in mediating their engagement with contemporary art and helping them to make meaning from it. This study and a preceding front-end evaluation represent the first time that the MFA has consulted visitors about its interpretive texts.

A 2009 MFA exhibition, "The Secrets of Tomb 10A," introduced a new approach to interpretive texts with its more conversational style and the inclusion of guidelines for how to navigate the exhibition. For the first time, exhibition comment books contained numerous comments about interpretive texts and the majority were positive. Interpretive texts in the MFA's Art of the Americas wing, opened in 2010, built on this approach. When introductory gallery texts in the contemporary galleries were even briefer and simpler, speaking directly to visitors, however, there was skepticism from critics and some Museum patrons and staff, concerned that we were talking down to visitors and failing to provide adequate information about the art. It has long been posited that

effective interpretive texts must be brief, free of jargon, and visually accessible. (Serrell, 1996). Yet resistance to creating such interpretive texts persists.

Methods:
Semi-structured interviews were conducted in which visitors were invited to look at two different galleries, then to read and respond to both the introductory text panel that is on view, and a previous, somewhat more traditional version. Visitors were also invited to view one of three artworks and respond to its label. Visitors rated the overall effectiveness of the introductory text on view, indicated their preference for one version over the other and rated each along several dimensions designed to elicit visitors' opinions about the tone and writing style of the text. Open-ended questions probed visitors' opinions and attitudes regarding interpretive texts and asked them to explain their preferences. The interview was followed with a brief demographic survey that visitors completed.

Data & Analysis:
A total of 88 interviews were conducted, collecting both quantitative and qualitative data. Visitor preferences were tested for statistical significance and were correlated with self-ratings of interest in and knowledge of contemporary art. Responses to open-ended questions were categorized and, for some questions, also coded as having a positive or negative valence.

Demographic information was also collected in order to compare the visitor sample with the overall MFA visitor population, and to look for predictors of visitor preferences.looked for patterns across the data to better understand how youth's interests manifest in everyday activities.

Results:
Across galleries, 64% of visitors preferred the introductory texts on view; 36% preferred the more traditional alternative. Significantly more visitors preferred the text on view at least once. Only 16% preferred the more traditional text in both galleries.

Visitors who preferred the introductory text on view cited its conversational tone, shorter length and "sharp, crisp sentences." Visitors who preferred the alternative version cited its use of specific examples, more information, and greater detail.

Visitor ratings of dimensions measuring tone and style supported these findings, and their average rating of the texts on view fell just under the middle on a scale between too simplistic and too complex, with little variability in ratings.

Whether visitors' expectations about labels were met varied among works of art, but a majority of visitors responded positively to the labels and said that the labels made them think about the work in new ways.

Importance:
These findings suggest that future introductory texts and labels modelled on those currently on view will work well for most, but not all, visitors. The challenge is to consider how to provide more in-depth interpretive material for those who want it without compromising the concise, open-ended and conversational texts that a majority of visitors prefer. As art museums continue to acquire an increasing body of contemporary art, providing interpretive options that serve the broadest possible audience, and demonstrating their effectiveness, will be ever more important.

References:
Hein, G. E. (1998) *Learning in the Museum.* New York, NY: Routledge.

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Knowles, M. S. (1955) Informal Adult Education: A Guide for Administrators, Leaders, and Teachers. New York, NY: Association Press.

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Van Mensch, P. (1990) Methodological Museology, or towards a Theory of Museum Practice. In Sue Pearce (Ed.), *Objects of Knowledge (*141-157). London, UK: Athlone.

Villeneuve, P. & Erickson, M. (2011) La Lotería: Guided Interaction through a Visitor-Exhibition Interface. In Katy Beale (Ed.), *Museums at Play: Games, Interaction and Learning* (358-371) Edinburgh, UK: Museums, Etc.

Creating Pathways for Diversity in Visitor Studies Professions (Part 1)

Presenter:
Andy Aichele, COSI
Marcie Benne, Oregon Museum of Science and Industry
Marjorie Bequette, Science Museum of Minnesota
Laura Huerta Migus, Association of Science-Technology Centers, Inc.
Shelly Valdez, Native Pathways

Purpose:
Professional fields and communities of practice often step back and reflect on who is involved in their field, how they entered, and who isn't involved in the field, and why they haven't entered. For this type of reflection, many fields have adopted metaphors of pathways or pipelines to describe how talent travels into and out of the field. Building on the results of a 2008 survey of the VSA membership, this session will introduce the challenges we face in the visitor studies field to attracting and retaining individuals from minority backgrounds, and review best practices from the talent management sector that can be used to overcome these issues. Participants will be introduced to a new model for thinking about professional pathways into visitor studies that support invitation to candidates from diverse backgrounds.

Panelists' Perspectives:
In 2008, VSA implemented a membership survey to gather descriptive data on VSA members, including organizational affiliation, location, job role, and demographics. Significant findings from this study include the demographics of VSA's membership: 91% White and 79% female. These statistics present a challenge for the visitor studies sector: how do we improve the cultural competence of our practice when practitioners are a relatively homogenous group?

Panelists will present a number of perspectives in response to this challenge, including:

- Current trends that can be motivators for diversifying the visitor studies sector
- Introduction of a new model of pathways into the visitor studies profession, grounded in a multicultural worldview
- The structural challenges those in positions of hiring/management and recruitment of new talent face in diversifying their teams
- Strategies implemented in representative institutions to address this challenge
- Best practices from the talent management and development field that can be leveraged in the visitor studies sector

Importance:
Diversification of the informal learning field is a more pressing issue than ever – changes in visitor demographics that were projected a decade ago are now reality, and informal learning organizations are now being held accountable by external and internal

stakeholders to report on how they are planning for and serving more diverse audiences. In order to meet these expectations, it is critical that visitor studies teams have the diversity of skill sets and experiences to support and guide the practice of informal learning organizations, especially with respect to racial/ethnic and language diversity. In this session, we will come together as a field to develop a model for pathways into the visitor studies profession that is designed intentionally to nurture diversity of our workforce.

PAPER PRESENTATIONS
Understanding the Visitor: Exploring Visitor Types, Traits, and Environments

Exploring the Variables that Affect Online Museum Visitor Experiences

Presenters:
Silvia Filippini-Fantoni, Indianapolis Museum of Art
Tiffany Leason, Indianapolis Museum of Art

Purpose:
This presentation will cover the methods and findings of a series of studies that the Indianapolis Museum of Art has undertaken to identify which demographic and psychographic variables affect the way online visitors interact with museum websites. The aim is to provide a replicable model for other museums that are interested in better understanding their online audience.

Perspectives:
In the past few years, most museums have witnessed a growing number of visitors to their websites and other online platforms. However, very little is known about these museum audiences.

Information about online users is available to museums via powerful and easy-to-use web statistics tools like Google Analytics. Recent work by Finnis, Chan, and Clements (2011) describes a set of best-practices and analytical approaches for evaluating online success. However, many of these techniques tend to focus on the technical details of visits, and—used in isolation—do not provide a deep understanding of who visits and why.

Inspired by segmentation methods used by museums to better understand their physical audience, the IMA has been conducting a series of studies aimed at identifying which demographic and psychographic variables have an impact on the way visitors interact with its website.

Methods:
In order to establish whether variables such as age, gender, location, context of access, familiarity with the website and/or the museum, modality of access to the site, etc., have an impact on the way people engage online, the IMA has posted a series of one question surveys on its website covering the different variables mentioned above.

To track survey results and the behavior of the visitors across the responses, we have used the Custom Variables functionality of Google Analytics and a small amount of JavaScript, enabling the administrator to study the patterns of users who answered in a particular way.

Data & Analysis:
While we have completed a study addressing visitors' motivation for coming to the IMA website, with those results being presented at the 2012 Museums and the Web Conference in San Diego (Filippini Fantoni & Stein, 2012), data related to the other variables is currently being collected.

Importance:
By comparing the behavior of online visitors with various demographics and psychographic variables, we will be able to identify which ones have an impact on determining the online user experience, and possibly identify visitor segments. The hope is that these results will provide a reference dataset, and a replicable model for other museums that are interested in conducting similar studies for their own web efforts. This is particularly important at a time when the number of online museum visitors is often higher than that of physical visitors, but no clear methods have been identified yet that allow us to better understand this audience.

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Visitors' Restorative Experiences in Museum and Botanic Garden Environments

Presenter:
Jan Packer, The University of Queensland

Purpose:
The need or desire for restoration has been found to be an important motivation for engaging in tourism and leisure experiences. Significant numbers of people visit

museums, galleries and botanic gardens because they provide opportunities for restorative experiences that facilitate recovery from mental fatigue and help visitors meet the demands of everyday life (Packer and Ballantyne, 2002; Packer and Bond, 2010). This qualitative analysis identifies aspects of the museum environment that facilitate restorative experiences, and recommends design features to meet visitors' needs in this regard.

Perspectives:
Restorative experiences are those that facilitate recovery from mental fatigue and help us continue to meet the demands of everyday life. Such experiences have the potential to contribute to the well-being and satisfaction of those who engage in them. Most of the existing research in this area has been conducted within the framework of Attention Restoration Theory (Kaplan, 1995; Kaplan & Kaplan, 1989). According to this theory, mental fatigue reduces the capacity to focus attention on a particular activity. In order to fully recover, it is important that the individual's attention is engaged involuntarily or effortlessly, rather than intentionally. Fascination (being engaged without effort) is thus one of four components that have been identified as integral to a restorative experience. The other three components are a sense of being away (being physically or mentally removed from one's everyday environment); the perception of extent (the environment provides enough to see, experience and think about to sufficiently engage the mind); and compatibility (providing a good fit with one's purposes or inclinations). Research suggests that even short periods of time spent in a restorative environment can have significant effects on both cognitive capacity and quality of life.

Methods:
This paper explores restorative experiences at a museum and a botanic garden using qualitative analyses of forty semi-structured interviews. The aim was to identify, from the visitors' perspective, the circumstances that facilitate and enhance restorative experiences in these contexts, and the ways in which visitors experience restorative processes. Aspects contributing to restorative experiences were extracted by thematic analysis of participants' responses.

Results:
"To relax and recover" was selected as the main reason for visiting by 16% of museum visitors and 43% of gardens visitors. Most interviewees agreed that their visit had been relaxing and identified a range of environmental features that they felt had contributed to (or in some cases detracted from) their ability to experience various aspects of restoration, including feeling relaxed, calm, engaged, absorbed and refreshed. These included aspects of the Physical Environment (e.g., prospect and refuge; ease of movement), Sensory Environment (e.g., aesthetics, colours, sounds, lighting, and motion), Social Environment (e.g., belonging, security, positive presence), Cognitive Environment (content, structure and variety), and Temporal Environment (making time, forgetting time, self-pacing). Visitors' accounts shed light on the ways in which processes of fascination, being away, extent and compatibility are embedded within museum and botanic gardens environments, and illustrate the restorative outcomes they experienced.

Importance:
It is not the intention of this paper to suggest that all visitors should be expected to seek or to attain a restorative experience. However, even in the midst of more intense and stimulating experiences, many visitors feel the need for times of respite and recovery. Museums that make provision for these needs convey to their visitors that they care about them and take their needs seriously. They also play an essential role in our increasingly urbanised and fast-paced world, with positive effects on the health of both individuals and communities. This paper suggests ways in which museums and botanic gardens can incorporate design features in order to meet visitors' needs for restoration. By understanding and managing the environmental factors that support or encourage restorative experiences, museum managers and designers can better ensure that these needs are met.

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Poster Session
3:15 - 4:15 p.m.

Using Communities of Practice: An Innovative Tool to Inform Evaluations

Presenter:
Stephen Ashton, Ph.D., Thanksgiving Point Institute

Purpose:
Communities of Practice (CoPs) have become an increasingly popular and innovative means for organizations to manage and share knowledge. This poster session will showcase how CoPs can also be used as an innovative tool to inform the evaluation process, including collecting evaluative data, analyzing it, and sharing the results within the organization.

Perspectives:
Consider the following rudimentary evaluation process:

- Within an organization, a small team of individuals identifies a need then applies for and receives a grant to meet that need.
- A program is implemented/an exhibition is developed.
- The program/exhibition is evaluated.
- The results of the evaluation are reported both externally and internally.

As is often the case within an organization, only a select few individuals learn about the results of the evaluation. Therefore, only a few people within the organization benefit from the evaluation.

This entire evaluation process could be enhanced through the implementation of innovative Communities of Practice (CoPs). Suppose an organization had a CoP of a diverse set of individuals who were all committed to improving their organization. That community of employees could more easily identify the needs of the organization and its guests because of its broad swath of insights and experiences. When the evaluation is conducted, the CoP would be one of the main audiences that would benefit from the learning the results of the evaluation. Sharing the results with this CoP would not only educate its members, but the members could then share what they have learned with other employees throughout the organization.

Importance:
Communities of Practice (CoPs) can be used to influence the evaluation process. Members of CoPs can help identify what needs the organization has, consider what

should be evaluated, assist with the evaluation, and participate in the dissemination process.

One of the major challenges we face within the evaluation community is taking the results of an evaluation and using them to better the organization. When CoPs are intertwined with the evaluation process, they can be one of the main audiences that learns of the results of the evaluation. They can then take what they have learned and share it with their individual departments, thus helping improve the organization.

This idea of using CoPs in the evaluation process fits with the theme, "Where Innovation Meets Rigor: Shaping the Next Decade of Visitor Studies" because CoPs are an innovative tool that can be used to improve and learn from evaluations.

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The Leadership Practice of Museum Educators

Presenter:
Tina Nolan, Ed.D.

Purpose:
In 2011, Tina Nolan completed her doctoral dissertation: "The Leadership Practice of Museum Educators." This grounded theory study examines the culture, context, conditions and competencies of museum education leaders from a large city in the United States. Out of this research grew the Nolan framework: Domains of Professional Practice. Dr. Nolan articulated a framework that includes four domains of leadership practice: The Teaching and Learning Domain, the Political Domain, the Financial Domain and the Operations Domain. Dr. Nolan's research also suggests that the

participants in this study share a common lens through which all their work is done, which is that of the visitor as a learner.

Perspectives:

Who better to lead museums to achieving a more relevant public dimension than museum educators? According to Munley, "Museum educators are best positioned to lead their institutions in defining, achieving, and documenting public value." (Munley 2006) Nolan argues that there is still work to be done to raise the professional bar before educators can lead museums toward increase public value: "Museum educators can measure impact on visitor learning, impact on communities, and impact on the financial bottom line. We are collaborators by our very nature and can connect the curatorial scholarship easily to the narrative. So, what are we missing? We lack in ourselves the authority to do so." (Nolan 2010). Museum educators will require better prepared educational leaders to shape the future of museums in America. What is an educational leader in a museum? An educational leader is one who understands the practice and pedagogy of museum educators; they understand organizational culture, change leadership and systems thinking; they know how to mobilize others to lead. They understand the political ramifications of their decisions, and know how to leverage their institution's strengths They endeavor to be the lead learner and are unafraid of taking risks and leading change.

Methods:

This grounded theory study is the culmination of six years of informal data collection from hundreds of participants across the United States as well as a formal examination of the culture, context, conditions and competencies of a set of six museum educators from a large city in the United States. Participants were education department leaders from a variety of museum types, including: A science museum, ethnic arts museum, settlement house museum, children's museum, an aquarium, and a zoo.

Data & Analysis:

Analysis of data points to an emerging framework that codifies particular leadership settings and domains of practice for leaders of museum educators. An array of data collection strategies were employed in the study, including: Semi-structured interviews, unstructured observations, written reflections to assigned readings, and professional development workshops. Primary source documents and survey data were also analyzed as part of this study.

Results:

Dr. Nolan's research suggests that highly skilled leaders of museum educators possess an ability to lead in a variety of settings, including: Leading IN their departments, UP the institutional hierarchy, ACROSS the institution and OUTside the institution. Dr. Nolan articulated a framework that includes four domains of leadership practice: The Teaching and Learning Domain, the Political Domain, the Financial Domain and the Operations Domain. Dr. Nolan's research also suggests that the participants in this study share a common lens through which all their work is done, which is that of the visitor as a learner.

Importance:
The urgency for museums to measure their impact in communities grows louder every year. "As economic issues plague communities globally, nonprofits are appropriately being asked to concretely demonstrate their public value. No longer is it enough to say that one's institution is integral to the community. Institutions must increasingly demonstrate that they are strategically connected and supporting public good to ensure funding and sustainability over time." (Dierking, 2010) Dierking urges museums not just to connect to communities, but rather to connect for and with communities to help make communities better. Silverman echoes this notion when she states, "Perhaps most frequently [museums] are responding by promoting social change through exhibits, educational programs, special events, and other efforts that raise public awareness of social issues and encourage effective action. When successful on a collective level, relative to a social issue, a museum operates as an agent of social change." (Silverman, 2010).

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Getting a Sense for the Place: A Summative Evaluation of Visitor Use of and Reaction to the Underwater Dome Exhibit at the Seattle Aquarium

Presenters:
Hal Kramer, Museology Graduate Program at the University of Washington
Andrea Michelbach, Museology Graduate Program at the University of Washington
Carrie Plank, Museology Graduate Program at the University of Washington
Justine Berk, Seattle Aquarium

In Absentia: Katharine Canning, Museology Graduate Program at the University of Washington

Purpose:
This poster reports on a nine-month exhibit evaluation at the Seattle Aquarium. The evaluation sought to develop a baseline understanding of how visitors use and react to the Underwater Dome Exhibit using three separate instruments: a timing and behavior observation map, an administered survey, and a fill-in-the-blank survey. Findings from this evaluation will help the Aquarium begin to determine short-term, cost-effective updates to improve visitors' satisfaction and experience, while connecting them to the Aquarium's mission of "inspiring conservation of our marine environment."

Perspective:
Since opening in 1977, the Seattle Aquarium has provided marine exhibits and education from the waterfront district of Seattle, Washington. The Aquarium serves roughly 800,000 visitors a year through six major exhibits, including the Underwater Dome.

The Aquarium's strategic plan for 2011–2030 addresses the need for the Aquarium to "refresh" its exhibits to help increase attendance, be recognized as a global leader in marine education, and be a core economic contributor to Seattle. The Underwater Dome, which has never been evaluated before, is one of the exhibits the Aquarium wants to update. Built as part of the original structure in 1977, the Dome is housed within a 400,000-gallon tank filled with Puget Sound fish and marine life.

In planning our evaluation, we reviewed several summative evaluations in aquariums and zoos that, like ours, aimed to examine visitors' use of and reactions to an exhibition. These included Randi Korn's 2003 Summative Evaluation of Vanishing Wildlife and 2011 Summative Evaluation of California Condor Rescue Zone, as well as Steve Yalowitz's 2004 Jellies: Living Art Summative Evaluation (for links, see references below). This primarily informed the development of our methods and instruments.

Importance:

Immersive underwater exhibits, such as the Underwater Dome at the Seattle Aquarium, are popular attractions at many aquariums. None of these exhibits are exactly alike. However, their purpose is similar enough that findings regarding visitor experience in one exhibit can enhance the field's understanding of the purpose of these exhibits in general. Our findings not only provide baseline data for the Seattle Aquarium, but can also contribute to the field by providing insight into visitor experiences of immersive exhibits. This may guide future evaluations in this area.

Our methods and instruments for this evaluation may also be of interest to VSA members or the field. In addition to more traditional instruments (timing and behavior observation behavior map and administered survey) we developed a fun, mad-lib-like, fill-in-the-blank survey to get at visitor engagement and affective experience in a less traditional way—making data collection itself more interactive and engaging for visitors.

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Additional Links
Seattle Aquarium
http://www.seattleaquarium.org/

InformalScience (Final evaluation report will be published by June 14, 2013.)
http://informalscience.org/

New Directions in Audience Research Initiative through the Museology Graduate Program at the University of Washington http://depts.washington.edu/uwmuse/about/initiatives/newdirections

Measuring Learning in Youth Development Programs Using Personal Meaning Maps

Presenters:
Amy Grack Nelson, Science Museum of Minnesota
Gayra Ostgaard, Science Museum of Minnesota

Purpose:
Many youth development programs have content-related outcomes. Evaluators often attempt to measure these outcomes using methods that fit the nature of an informal learning environment. Evaluators at the Science Museum of Minnesota have found success using an adaptation of the Personal Meaning Maps (PMM) method (Falk, Moussouri, & Coulson, 1998). They have used PMMs as an interview prompt to increase the depth and breadth of information gathered about a youth's experience. This poster will provide an overview of the PMM method, its strengths and weaknesses, and how the SMM adapted the method to measure change over time as part of formative evaluation efforts.

Perspectives:
Personal Meaning Maps is a method that allows evaluators to measure individual levels of change based on the experiences and knowledge youth bring to a program (Falk, n.d.). The method can also gather data that helps increase utility of the evaluation results. The Science Museum of Minnesota's evaluation staff found that traditional methods of interviewing and surveying youth were not adequately capturing what program managers felt the youth were learning through their experiences. In an effort to be responsive to stakeholders' concerns and increase utility of the results, evaluation staff began utilizing PMMs to provide a different perspective and information about the breadth and depth of youth learning. The PMM data ended up being extremely valuable and reflective of the learning Museum staff saw happening during the program. Specifically, this method allowed youth who may have difficulty fully articulating a concept through traditional interviews to illustrate the extent of their knowledge and understanding in multiple ways. As a result, the PMMs provided a more accurate representation of the learning happening in the program, thus providing the client with more useful findings.

Importance:
The contents of the poster will be valuable to evaluators looking to measure change in knowledge when evaluating youth programs. Some youth programs have content outcomes that are more general in nature (e.g. "Youth will increase their knowledge of climate change and how it affects their community"). There is no one correct answer or standard the program is trying to address. PMMs allow evaluators to measure learning based on a youth's individual change in knowledge, not on providing a correct or incorrect response. PMMs also allow youth to express what they know in multiple ways;

they have time to reflect on what they know about a topic, write down words or phrases, draw images, and then describe their map during the interview. This poster will allow evaluators to reflect on the use of PMMs in their own practice for measuring learning in youth programs.

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Engagement All Around: Science on a Sphere at the Pacific Science Center

Presenters:
Danielle Acheampong, University of Washington
Dylan High, University of Washington
Ellie Kleinwort, University of Washington
Travis Windleharth, University of Washington

Purpose:
This evaluation examines visitor engagement at the Science on a Sphere exhibit in the Pacific Science Center, Seattle, WA. In the exhibit, Earth and space science data sets are projected onto a large sphere to creatively present and communicate science concepts to visitors. Evaluators varied characteristics of the data presentation—such as topic presented, presence of a question prompt, and image rotation—and measured the resulting visitor engagement for each of the different treatments. Furthermore, the evaluation examined visitors' interest in the SOS exhibit, as well as the extent to which visitors connect the exhibit to surrounding exhibits.

Methods:
The team collected observational data during presentation of twelve playlists on the sphere, each created with different combinations of the variables listed above. Follow-up interviews were used to determine visitors' reported engagement and interest. The reflective map and interviews were used to explore possible connections made by visitors between the SOS exhibit and surround exhibits.

Importance:
The Science on a Sphere exhibit is appearing in an increasing number of places, and it is important to understand how to optimize the unfacilitated experience for institutions that cannot maintain an interpreter at the sphere at all times.

Children's Conceptual Understandings of Multimodal Historic Site Sources

Presenter:
Denice J. Blair, Ph.D., Michigan State University

Purpose:
Historic sites include buildings, landscapes, objects, and many other types of sources for learning about the past. Millions of elementary school students in the United States visit historic sites each year as part of history and social studies education, and expectations exists in federal and state curriculum standards that students will use sources such as these for historical inquiry (Boland, 2002). Despite the rich opportunities for using historic site sources, knowledge is limited about how learners, particularly elementary school students who comprise a large visitor population of historic sites, make sense of the multiple source types in these environments. What are children's conceptual understandings of these multimodal sources? How do they believe people learn from sources? What sources do they think are most reliable? This study examined fourth- and fifth-grade students' experiences with historic site sources and whether providing focused instruction developed their conceptual understandings.

Perspectives:
Learners' concepts are the foundations of their knowledge. *Concept* has been defined as "*a perceived regularity in events or objects, or records of events or objects, designated by a label*" (Novak & Cañas, 2008, p. 1, emphasis original), essentially what people know or believe about particular things or ideas. Conceptual development occurs when learners adapt or reorganize their concepts (Carey & Spelke, 1994; Vosniadou, Vamvakoussi, & Skopeliti, 2008). Instruction to help produce conceptual change should identify and acknowledge learners' existing concepts (Brewer, 2008).

Accessing primary information through the physicality of objects and places provides opportunities for learning about the past not possible with other types of primary sources, such as documents (Schlereth, 1985). Current state and national standards in social studies education support and encourage this type of teaching from the earliest grades. Students' understanding of what constitutes sources and when and how to use them, however, present challenges for educators (Goldman, 2004). Mismatches between educators' and children's concepts about the characteristics of historic site sources or the use of sources for historical inquiry may potentially limit or negatively impact children's learning when teachers use visits to historic sites as learning experiences (Barton, 2001).

Methods:
Survey methodology was employed in this study. The participants were 95 fourth- and fifth-grade students who were part of a larger research study. The students were grouped by classrooms into an "instruction group" and "non-instruction group." Instruction students participated in four classroom instruction sessions facilitated by the

researcher, focused on helping them understand different types of multimodal historic site sources, including objects, buildings, labels/signs, and tour guide's words.

A 26-item questionnaire, including multiple-choice and open-ended items, was administered to all the participants in pencil and paper format before any instruction was given to the instruction group. After the instructional sessions, all students in the study participated in a half-day field trip to a local historic site. Following the visit, the same questionnaire was administered to all participants. To address equity issues, the researcher provided the same instructional sessions for the non-instruction group after the field trip.

Data & Analysis:
The participants' responses to the items on the questionnaire were grouped into three areas. In *identification of historic site sources*, students selected the type of things they believed to be sources available at a historic site to help someone learn about history. In *learning from historic site sources*, participants' responses showed what they believed about ways people might learn from sources, including ask someone who knows about history, use the senses, carefully study the source, and compare the source to other sources. In *reliability of historic site sources*, participants described how much they trusted each type of source to provide "the best information about history."

Descriptive analyses and paired t-tests were conducted ($\alpha = .05$).

Results:
On the pre-test, sources for learning about the past that were chosen by about half or more of the participants included objects and photographs (each selected by 74.7% of participants), written documents (58.9%), and signs (49.5%). Buildings, tour guide's words, videos, outdoor spaces, and hands-on activities were selected by less than 49% of participants. Post-test results showed differences in participants' beliefs about the source types available at a historic site.

Ways people might learn from sources included ask someone who knows about history, use senses, carefully study source, and compare source to other sources. Between pre- and post-test, the methods selected for learning changed in similar ways for both groups.

On the post-test, levels of trust changed in various ways for both instruction and non-instruction students. Notably, paired t-tests showed three significant changes in instruction students' levels of trust of objects, buildings, and signs, which figured largely in their instruction.

Importance:
The most significant outcome of this study was increased information about fourth- and fifth-grade students' understanding of multimodal historic site sources, including identification, learning methods, and reliability. Additionally, this study adds to literature

on children's primary source use (Barton, 2001; Foster & Yeager, 1999; VanSledright & Afflerbach, 2005).

In contrast to many types of pre-visit preparation students often receive, this preparation was focused on teaching students about each of the main historic site sources, evaluating sources, and providing guided practice in source use. Understanding what students at these grades believed about particular source types before and after instruction may provide classroom and historic site educators useful starting points for designing historical inquiry experiences for students that allow in-depth exploration of multiple types of sources.

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Faculty Interest in University Museums as Teaching and Research Resources

Presenters
Denice J. Blair, Ph.D., Michigan State University
Megan Stanford, Western Kentucky University
Gregory W. Hudson, Western Kentucky University

Purpose
University museums (UMs) occupy a unique position, with many striving to engage both university and general public audiences. Meeting needs of faculty members and students is still a priority, but reduced funding means that, as MacDonald observed, "Unless [university] museums have embedded well, they could be at risk of being cut or merged" (Atkinson, 2010, para. 3). In response, UMs need to understand faculty members as a museum visitor population.

This descriptive study began with surveying faculty members at one university about their expectations and interests related to using UM resources for teaching and research and then repeating the study at a second university. Interesting similarities in the two data sets were observed, prompting comparison. Various use and interest in UM resources by faculty members were found, with little difference between the two populations. The results will be used to inform development of resources to support faculty engagement with UMs.

Perspectives
University museums have a particular history and needs related to their institutional missions and goals for serving diverse audiences. Although supporting university teaching and research is not the exclusive focus it once was (Mack, 2001), many university museums are searching for new ways to engage the university community. Identifying educational and participation needs of museum audiences is key to engagement (Leinhardt & Knutson, 2004; Simon, 2010). Since university communities include scholars from diverse disciplines and since collections differ by museum, it may be difficult to address varied needs and expectations (Kim, 2007).

Additionally, university museums occupy a unique position, since one of their primary audiences is professional educators, who know how to teach but may not use museum resources or object based learning in their work (Duhs, 2010). Options for accessing museum resources in person or online have expanded (Massé & Massé, 2010), and visitor expectations have changed in response. Faculty members may appreciate resources to help them learn about museum contexts (Hein, 2000), learning through objects (van Kraayenoord & Paris, 2002), and creating activities using museum resources (e.g., Basu & Coleman, 2010). Resources about research possibilities and opportunities to work with museum professionals also may be of interest.

Methods
Survey methodology was employed for this study, providing means to collect information quickly from a large sample and allow generalizing based on statistical reliability.

Participants were recruited from a large research university (University A) and a large master's college/university (University B), as classified by Carnegie. The institutions have similar museums housing art, history, culture, and science collections. To control for potential disciplinary-related differences reflected in participants' responses, random stratified sampling was conducted to reflect participant percentages from various college categories (e.g., Science, Medicine, etc.). The final sample included 123 participants (University A = 49, University B = 74).

Data & Analysis
Data were collected using a self-administered questionnaire via Internet. The questionnaire included 34 multiple choice, Likert-type, and open-ended items. Participants provided demographic information about their teaching experience (years teaching at the university and the university level) and practice (commonly used teaching methods). They rated their interest levels in resources, services, and collaborative outreach activities or programs currently/potentially offered by the university museum on a five-point scale, ranging from "not interested" to "very interested." For analysis, the participants' responses were collapsed into two categories: low interest (1, 2, or 3 on the scale) and high interest (4 or 5). Descriptive analyses and Pearson's chi-square tests (two-sided) to examine potential correlations among demographic data and other variables were conducted (α = .05).

Results
Support for teaching: Just over half of participants at both universities agreed, about 20.0% disagreed, and about 30.0% were not sure. Fewer than 20.0% of participants used the museum as a teaching resource during the past 12 months. No statistically significant differences existed by university.

Support for research: About 14.0% of participants at University A agreed and 45.9% at University B agreed, a significant difference. About 30.0% at both universities disagreed. At University A 53.0% and University B 28.4% were not sure. Fewer than 20.0% of participants used the museum for research during the past 12 months.

Participants showed most interest in these resources: museum collections lists relevant to disciplines, prepared collections-based lessons, and online collections. None of the service-related or collaborative activity items garnered high interest by more than 50% participants.

No correlations existed by university with participants' demographic characteristics and expectations about UM support for teaching and research.

Importance
The results showed faculty members had varying levels of interest in the UM as a resource for teaching and research. Participants' beliefs about UM resources are interesting, especially uncertainty about what the UM might offer. Comparisons of results from both universities revealed the faculty members had similar beliefs and interests, despite university size and amount of institutional focus on research. This may indicate that faculty members in general have particular interests/needs related to the practice of university teaching, of which museums need to be aware. Inevitably, some disciplines will find fewer appropriate UM resources. More systematic study of faculties, university museum types, and what university museums are doing to address faculty needs is required. Studies like these can open opportunities for dialogue about faculty member and museum professionals' expectations and inform development of resources, programs, and practice to support engagement with the university museum by the faculty.

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Connecting Science Museum Programs to Youth's Interests Using Audience Research

Presenters:
Michele Crowl, Penn State University
Heather Zimmerman, Penn State University

Purpose:
As museums develop high-quality programming, questions arise about the best way to connect museum programs to youth's interests—especially in ways that encourage youth to engage deeply in learning activities. While conversation analyses (Ash, 2003; Crowley et al., 2001), time-and-tracking studies (Grack Nelson, 2006; Yalowitz, & Bronnenkant, 2009), and focus group research are methodologies used to study current audiences, museums need additional research tools to focus on learners' interests and identities (Bell, Lewenstein, Shouse, & Feder, 2009). Our research project investigates one research tool, Science Activity Task, to help museum professionals identify youth's interests that are relevant to science learning. We ask three research questions: (1) In what activities do children participate?; (2) How do the youth see that these activities are related to science?; (3) How do the youth's interests and definitions of science match to the programming offered by a local museum in their community?

Panelists' Perspective:
Findings from a scholarly literature review (Bell, Lewenstein, Shouse, & Feder, 2009) suggests museum designers should create learning experiences that build on youth's prior experiences and interests. Research (Crowley & Jacobs, 2001; Falk & Dierking, 2000) has established that youth develop science interests through hobbies, informal institutions, and family activities; however, given the nature of interest development (Hidi & Renninger, 2006; Renninger, 2009), informal sites struggle to match programs to youth's divergent, specialized interests. Our poster presents a tool that museums could

adapt, when conducting audience evaluation or program development. The Science Activity Task (SAT) can analyze the interests of visitors and potential visitors to inform science programming. Building on the work of Zimmerman and Bell (2013), our study examines the definitions and interests in science of youth in two rural communities to understand how one museum's can best serve its community.

Methods:
Findings from a scholarly literature review (Bell, Lewenstein, Shouse, & Feder, 2009) suggests museum designers should create learning experiences that build on youth's prior experiences and interests. Research (Crowley & Jacobs, 2001; Falk & Dierking, 2000) has established that youth develop science interests through hobbies, informal institutions, and family activities; however, given the nature of interest development (Hidi & Renninger, 2006; Renninger, 2009), informal sites struggle to match programs to youth's divergent, specialized interests. Our poster presents a tool that museums could adapt, when conducting audience evaluation or program development. The Science Activity Task (SAT) can analyze the interests of visitors and potential visitors to inform science programming. Building on the work of Zimmerman and Bell (2013), our study examines the definitions and interests in science of youth in two rural communities to understand how one museum's can best serve its community.

Data & Analysis:
The SAT interview task was designed to elicit youth's activities and interests related to science to inform museum programming. Consequently, the analytical goal was to create a rich, qualitative picture of the youth's divergent activities, interests, and their relations to science. Prior to analysis, the interviews were transcribed. Given the collective case study methodological, the photographic data of the results of the task were analyzed to create one representation of each of the 22 learners—looking for commonalities and difference. Next, a thematic analysis looked for patterns in the students' SAT interview responses to better understand how youth's interests manifest in everyday activities and how the youth saw science (or not) in their interests and activities. Finally, the youth's individual qualitative representations and the collective themes were compared to existing (and planned) museum programming to identify strengths, weaknesses, and future opportunities.

Results:
First, youth's interests in everyday life related to science included a mixture of activities across school and home settings including: participating in school science, petcare, playing games, reading books, using Internet, and going to a museum or related organization. Second, when asked about science, participants most often solely referred to things they did in school, even when they described rich science activity in their homes and communities. For example, of the participants who own a pet, about half did not see what they do to take care of the pet as related to science even if they could articulate science-related understandings of the care. Finally, when the individual responses and collective themes were compared to the museum programs, opportunities were identified for new museum programming in the physical sciences

area that would match youth's interests and activities but that were currently unmet by local cultural institutions.

Importance:

The SAT interview tool is a resource for research and evaluation to inform programming at science museums and similar cultural institutions. This information can be used to inform designers and educators of potential directions for public programs that will connect with youth and families in meaning ways, that are sensitive to local cultural contexts. By understanding the way in which learners engage with science, educators can tailor programming to their audiences' interests in ways that are currently unmet within the local community.

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Too Much Temptation, Not Enough Value: Why Visitors Lack Commitment

Presenter:
Stephen Bitgood, Jacksonville State University

Purpose:
The purpose of this poster is to review evidence demonstrating that the concepts of *value*, *temptation*, and *commitment* explain the patterns of engaged attention to museum exhibitions. The attention-value model (Bitgood, 2010; 2011; 2013) proposes that *value* (defined as a ratio of benefits to cost) is the major motivator for the decision of what and where to pay attention. *Temptation* occurs when available, alternative exhibit objects successfully compete for attention with an exhibit element. *Commitment* involves deep and persistent processing of exhibit content. A lack of commitment occurs when an alternative exhibit object is perceived to have higher value and the visitor prematurely shifts attention to this object. Fortunately, there are ways to design exhibit experiences that reduce temptation and encourage visitors to commit engaged attention to exhibit elements.

Perspectives:
Designing effective museum exhibitions is an exercise in managing visitor attention such that exhibit objects and supporting interpretation are given an adequate chance to engage attention. Unfortunately, few exhibitions are designed with an understanding of the psychological processes involved in attention and decision making. The outcome, when design lacks this understanding, is a pattern of "hot-and-cold" attention that generally fails to communicate the intent of the designers. Commitment to engage attention can be improved: (1) by reducing the cost (time and effort) required to process exhibit content, (2) by reducing the temptation (i.e., minimizing competition among exhibit elements), and (3) by increasing the perceived benefit-satisfaction of the experience.

The poster will (1) give examples of studies illustrating the role of value, temptation, and commitment and (2) describe practical methods of increasing commitment (e.g., visually isolating exhibit elements, reducing time and effort to process information) and consequently improving engaged attention and learning.

Results:
The findings from a number of studies are summarized showing evidence of: (1) *temptation* (visitors frequently shift attention to new exhibit objects without the degree of engaged attention necessary to extract meaning); (2) *value*, a ratio of utility (interest level, perceived satisfaction, etc.) divided by cost (time, effort, money) of each available exhibit element strongly influences how visitors shift attention from one object to another; and (3) *commitment* (deep, persistent engaging with exhibit content) occurs if the value is high and the temptation is low.

Evidence for the current analysis comes from museum studies (e.g., Bitgood, 2013), from museum simulation studies (e.g., Bitgood, 2011; 2013), and from literature reviews (e.g., Serrell, 2002).

Importance:
Increasing visitor commitment to engage attention to exhibits in an orderly and persistent manner is essential to improve the visitor experience from both the museum and the visitor perspectives. By understanding and applying a few design principles, visitors can be guided in a way that increases their engagement with exhibit content and provides a more satisfying experience. These design principles are part of a model of visitor reactions and provide a rationale that can be applied to a variety of exhibit content and to visitors of differing ages and incoming knowledge.

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Exploring Spaces: Evaluating Visitor Experiences at the Henry Art Gallery

Presenters:
Erin Bailey, Museology Graduate Program at the University of Washington
Melissa Beseda, Museology Graduate Program at the University of Washington
Mary Bond, Museology Graduate Program at the University of Washington
Anna Braden, Museology Graduate Program at the University of Washington
Colleen Lenahan, Museology Graduate Program at the University of Washington
Kaylan Petrie, Museology Graduate Program at the University of Washington

Purpose:
Our purpose is to determine what physical and perceptual barriers affect visitors' use of the Henry, and how visitors currently interact with museum spaces and staff. These findings will support guest service training and changes in the museum's physical infrastructure. This study utilized three main questions for exploring the visitor experience at the museum:

1.) Are there barriers affecting visitors' use of the Henry?
2.) What motivates visitors to use certain spaces at the Henry?
3.) What experiences are visitors having with Henry staff?

Perspectives or Panelists' Perspectives:
The Henry Art Gallery is an internationally recognized center for the exploration of visual culture. Founded in 1927, the Henry serves the Pacific Northwest as its premier museum of contemporary art and offers the only Collection Study Center in the region. The museum attracts more than 50,000 visitors on-site and provides educational resources online to over 115,000 unique users annually.

Over the next several years the Henry will initiate changes to its facilities creating a welcoming and comfortable atmosphere that will foster creativity among the visitors. The Henry strives to become a "HUB" where visitors feel they can come often and stay for extended periods of time – to view art, attend an event, engage in conversation, hang out, meet up, learn, explore, create, and experiment.

This year's New Directions project at the Henry Art Gallery will focus on visitor services. The Henry faces several structural (architecture and gallery layout) and perceptual (reputation and internal practices) challenges that may impede the museum's ability to create a welcoming environment.

Methods:
For this study, we employed three separate but interrelated instruments: an observation of staff-visitor interactions in the lobby and two gallery spaces, an exit survey for visitors in the galleries, and surveys of the visitors inside Molly's Cafe.

Results:
The majority of verbal interactions between visitors and Guest Service Representatives (GSRs) occur in the lobby, and visitors who have longer exchanges with GSRs discuss directions, art, and gallery events. Visitors rarely talk to GSRs in the gallery, but when they do it is generally about the art on display or about guidelines for behavior in the gallery. Visitors who did interact with GSRs were satisfied with their interactions.

Most visitors who come to the Henry do so to see art, and more than half of the visitors to Molly's Cafe indicated they have seen the art on display before. General interest in art, events, and exhibitions were the main motivations for participants to view the art on display. The leading inhibitor for viewing the art was time constraints. Data from the cafe and exit surveys showed that confusion about museum information also detracted from the visitor experience.

Importance:
The Henry Art Gallery has existed for 86 years and in 2012 the Henry began evaluating visitor experiences at the museum. The 2012 evaluation provides the Henry with a baseline understanding of their audience leading this evaluation to explore how the Henry can improve the overall operations of the museums, as well gain to build an

understanding of the visitor experiences in the galleries. The results from this research will inform the Henry in designing, developing, and instituting changes in order to become a "HUB" for contemporary art.

A Multi-Site Comparison of Dimensions of the Visitor Experience

Presenter:
Jan Packer, The University of Queensland

Purpose:
This poster will present a comparison, in graphical format, of dimensions of the visitor experience across multiple institutions and exhibitions. Fifteen dimensions of the visitor experience have been identified that can be used to describe the nature of visitor experiences at cultural attractions. Each site has a unique "personality" that privileges some types of experiences rather than others. The comparison will illustrate these distinctive characteristics of each site, as well as the capacity of the Visitor Experiences Checklist to detect differences between and within sites.

Perspectives:
We define experience as "an individual's immediate subjective and personal response to an activity, setting or event." It refers to what the individual feels or senses, how they engage with or respond to an exhibition or museum environment. The experience is the core product that a museum or other cultural institution offers to its visitors. An adjective checklist has been developed to capture visitors' perceptions of their experience. This has an advantage over an open-ended approach, in that everyone is responding to the same set of words, and has an advantage over a rating scale approach in that a large number of items can be included without making the task too onerous. A total of 75 words or phrases are presented and visitors are requested to tick those that best describe what they have experienced in their visit. Responses are scored according to 15 dimensions of the visitor experience which have been identified through previous research. The 15 dimensions represent visitors' aesthetic, cognitive, introspective, social, emotional, physical and spiritual responses to an exhibition, or to their visit as a whole.

Methods:
The adjective checklist has been completed by visitors to a number of different exhibition areas within four different institutions as well four different sites at a festival. The poster will graphically compare visitor experiences within and across these institutions and thus illustrate the distinctive characteristics of each site.

Importance:
Being able to measure the experiential qualities elicited by different exhibitions or institutions will enable further research to be undertaken regarding the kinds of experiences that different groups of visitors prefer, the factors that facilitate different

types of experiences, and the impact of visitor experiences on other desired outcomes. It will enable exhibits to be evaluated and compared, and changes resulting from various interventions to be measured. It will thus contribute to improving the design of visitor experiences (our core product) and will inform the marketing of visitor experiences. The tool has been applied in a range of environments, including museums, zoos and cultural festivals. Other institutions are invited to participate in the ongoing development and use of this instrument.

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Who's Not Responding? Survey Response Rates and the Nonresponse Bias

Presenter:
Liz Rosino, Oregon Museum of Science and Industry

Purpose:
A survey is a widely used and potentially powerful data collection tool. But much of its value is dependent on individuals from your target population agreeing to participate in the effort. This poster discusses strategies to increase survey response rate, techniques for understanding the magnitude and direction of bias in study findings caused by nonresponse, and how to provide a more illuminating picture of a survey's response rate.

Perspectives:
The information presented is based on a literature review about these topics and also what was learned from implementing these strategies while conducting a recent large national online survey. Key elements from these sources include considerations in survey design and participant recruitment and follow-up, analysis techniques for conducting a nonresponse bias impact assessment, and the use of disposition codes to classify survey cases.

Importance:
Surveys are often used in informal learning settings to gather program feedback, measure project impacts, and provide input for future decisions. Typical concerns with the survey method relate to how a low response rate can potentially limit the types of statistical techniques that can effectively be applied to the data and also how it may undermine the perceived credibility of the collected data in the eyes of key stakeholders. Most importantly, a low response rate could indicate the presence of nonresponse bias which can produce misleading findings that do not generalize to the entire population.

So it is important when implementing a survey to incorporate strategies to increase participation and response and then to also try to understand what the resulting response rate may mean for the validity of the data.

Revisiting Timing and Tracking

Presenter:
Gayra Ostgaard, Science Museum of Minnesota
Gina Svarovsky, Science Museum of Minnesota

Purpose:
Timing and tracking of visitors is a tried and true method of evaluation and research in informal learning environments. It is typically used to collect individual level data. This may not be appropriate for particular projects. This poster examines how timing and tracking was adapted to collect group level data.

Perspectives:
Unobtrusive timing and tracking of visitors can be used to uncover visitor orientation, time spent in an exhibition, use of exhibit components, and circulation. Traditionally, timing and tracking has focused on one visitor at a time allowing for a rich description of individual level behavior and engagement. However, this approach can require a high investment of resources as it requires one data collector to focus on one visitor's behavior. Modification to timing and tracking are often cost prohibitive as well and include the use of counting devices attached to exhibit components as well as the use of monitoring equipment such as cameras, smart-phone applications, etc. Moreover, individual level data is not always the most useful information for all studies. For example, the Nano Informal Science Education (NISE) Network designed the Nano mini-exhibition to be engaging for both individuals and groups. The team wanted to create a space in which visitors interacted with each other and the exhibition as a group. To capture this type of group level data in the summative evaluation, we adapted traditional unobtrusive tracking and developed an innovative group tracking method.

Importance:
This approach draws off of a rigorous and tested method and is promising when evaluators and researchers are interested in broader group-based use of an exhibition. However, it must be noted that it has both strengths and weaknesses. The strengths and weaknesses will be further examined in the poster.

Combining Your Institution's Reservation Data With Surveys

Presenter:
Al Onkka, Science Museum of Minnesota

Purpose:
Find out how I used field trip reservation data from my museum's call center to create timely and relevant surveys that encouraged high teacher participation. Discuss how reservation data that is already collected by your institution could be or has been used in your evaluations and research

Importance:
This work is innovative in a number of ways that are important to the museum field. Most museums use ticketing software, but the power of this data source and computer system can be unrealized or underused by museums and their evaluators. Data is already collected about visitors when they book and sophisticated ticketing software can automate the task of sending emails. By designing highly relevant online surveys around ticketing events (booking date and visit date) museums can partially automate the chore of identifying and connecting with visitors. In return, visitors participate in highly relevant surveys at a time that makes sense for them; this encourages useful and cheerful responses.

Adapting Falk's Museum Visitor Experience Model

Presenters:
Tiffany Leason, Indianapolis Museum of Art
Silvia Filippini-Fantoni, Indianapolis Museum of Art

Purpose:
Like most museums, the IMA was interested in finding out why visitors were choosing to come to the museum and to see if we were offering the kinds of experiences that these different segments of our audience were seeking. IMA staff decided to adopt John Falk's museum visitor experience model as a way to segment its audiences, incorporated this method into several studies, and further adapted the model so that it could be integrated into surveys without the use of cards with images as originally designed. This presentation will cover the methods and findings of the various studies incorporating and adapting Falk's visitor experience model. Some questions for our colleagues to consider: Does altering the model have potential use for your institution? Are there other ways that you can envision this model being implemented? How could the results be shared and used among staff and the public?

Perspectives:
In fall 2011, the IMA began exploring the use of John Falk's museum visitor experience model (Falk 2009) to gain a better understanding of why people were visiting the IMA campus. The research and evaluation team spoke with several other museums and aquaria that had used the model to see what their experiences had been with implementation, practice, and benefits of using this model. Although there has been much dialogue (Jensen, Dawson, Falk 2011) about Falk's model and its strengths (Falk 2011) and limitations (Dawson and Jensen 2011), the colleagues with whom we talked were supporters of the model. Prior to deciding to adopt this approach IMA staff also explored the Framework for Engaging with Art put forth by the Dallas Museum of Art and Randi Korn & Associates, Inc., but we felt that Falk's model was appropriate for our purposes at that point in time.

Methods:
The IMA team was in communication with John Falk about customizing his model of five identity-related motivations with images from the IMA campus so that visitors could better place themselves in these predetermined types. The original phrases accompanied the images. The team also wanted to include Falk's model in existing studies (e.g., exit survey, public programs survey, exhibition surveys, Miller House and Garden survey), but the format of the cards with numerous images proved challenging. Staff devised a way to distill the phrases for each category into a sentence for each. An additional study was implemented to test whether the sentence selection method differed from that of the card selection. Differences in the selection process did exist whether the participants were shown the cards or the sentences. An additional question was added to the study asking why s/he selected that reason for visiting.

Results:
We conducted a comparative analysis between the original card format and the adapted sentences with the results showing that despite some variation there was no statistically relevant difference between the two methods ($p=0.06$). When using the sentences in the context of specific studies, the findings were in accord with what we would expect as well as most of the findings of John Falk according to the visitor categories and their respective interests/needs. We have found that among public program attendees surveyed ($n=515$), there were an equal percentage of Explorers and Professional/Hobbyists (36%), which is the inverse of the Professional/Hobbyist category as seen in our general exit survey. In a recent featured exhibition ($n=652$), those visitors were more likely than regular visitors to be Professional/Hobbyists and Facilitators. Both of the above survey results could be attributed to the types of exhibitions and programs and the content of those offerings.

Importance:
Using and adapting Falk's model has allowed us to better understand our audiences and has provided us with a common language for referring to our visitors across departments. We were searching for something that would be easily integrated into our current studies and adapting the format of how the question is delivered allows for easy comparison across surveys. Staff currently uses the five visitor motivations as a guide

for having something on offer in various activity spaces or in exhibitions. We would like to encourage others to think about how this model can be adapted and tested as well as consider additional ways that this approach to segmenting visitors can aid in inter-departmental planning for marketing, visitor services and orientation, programming, and interpretation.

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Insights for Informal Science Institutions from Citizen Science Projects

Presenter:
Ryan J. Cook, Adler Planetarium

Purpose:
Institutions of informal science education have been expanding their presence on the Internet beyond simple visit-planning towards increasing mission fulfillment. Yet it is not always clear how such expansion serves missions or engages visitors. What opportunities for learning might exist within these institutions' websites? How much do visitors attend to online content or interactive features found therein? And what balance do visitors strike between simple doing and deeper learning or investigating?

This poster will offer one potentially useful method for institutions to discover more about their website visitors and what those visitors get out of engagement with their websites. In this case, a team from the Adler Planetarium mapped learning opportunities in "citizen science" websites and then tracked users' activity within those sites. We will suggest how this experience can be potentially useful for museums and other institutions as they reach out to visitors through an increased online presence.

Perspectives:
In 2009 Adler Planetarium partnered with what became the Citizen Science Alliance to expand their growing collection of web-based tools that facilitate data-heavy research projects in the natural sciences and humanities (Cormier et al., 2011; Raddick et al., 2009). This "Zooniverse" of projects involves large numbers of non-expert volunteers as "citizen scientists," generating, processing, and analyzing data. They also provide opportunities for the volunteers to go deeper, interacting with each other or with project scientists about the research and the concepts involved.

The limited but growing scholarship on citizen science (e.g., Brossard et al., 2005; Jordan et al., 2012; Trumbull et al., 2000), while useful, did not treat virtual citizen science like the Zooniverse. Thus we focused on the handful of studies suggesting that participation in citizen science projects affects volunteers' learning about science. We also drew on research into informal science learning (e.g., Bell et al., 2009; Bonney et al., 2009; Miller 2010) to pinpoint the kinds of transformations to look for in the volunteers. And we employed work in science studies (e.g., McGinn & Roth, 1999; Millar & Wynne, 1988) on how non-experts engage with scientific concepts and practices.

Methods:
Our grant-supported research team had to address two main challenges in order to discern what and how much learning was taking place: identify the learning opportunities; and systematically track volunteers' engagements with those opportunities. We first formulated a model of science learning based on the literature in science education and science studies. We then mapped and coded the website components accessible to volunteers by reference to that model. The result was a validated catalog of the websites' affordances and constraints that mapped the extent and density of their science learning opportunities. After completing those tasks, we collected visitor traffic data through Google Analytics, obtaining aggregate figures on visitors and webpages, in particular which webpages received the most visits and views.

Data & Analysis:
We married the Google Analytics data to similar statistics—e.g., number and duration of visits—that we created for website components not covered by Google. Graph analysis of this quantitative data allowed us to directly compare and contrast different parts of the websites by their actual visitor engagement as it related to their learning opportunity profiles.

Using volunteers' recorded activity in the science tasks and in the Zooniverse's social media, we disaggregated and regrouped them into "initial," "sustained," and "meta" profiles. We were then able to compare these types' profiles to actual patterns in engagement to suggest what science learning opportunities the different types of visitors were likeliest to encounter.

Results:

While analysis is not complete, our preliminary work shows that it is possible to catalog the range of science learning opportunities in websites and to compare them to the opportunities actually taken by users. We have, for instance, found that:

a) truly rich opportunities for science learning are unevenly distributed within and between the Zooniverse websites;
b) the highest-traffic parts of the Zooniverse websites generally do not feature the richest learning opportunities; and
c) only a minority of visitors persist in their engagement with the Zooniverse websites long enough or deep enough to encounter those opportunities.

Importance:
Our team's attempts to discover what science learning might be occurring through each mode of user interaction with the Zooniverse websites have some bearing on museums' attempts to more broadly and deeply engage visitors through their websites. Our experience thus far suggests that institutions should be able to identify learning opportunities in their existing websites, delineate patterns of visitor engagement with those sites, and then use both to guide further web development.
Furthermore, the poster will offer potential avenues to pursue to critically reexamine and strengthen findings from the aforementioned research. For instance, to gain some qualitative depth, we will pursue a series of semistructured interviews of selected volunteers, asking them to assess their activity levels, changes in their views and attitudes regarding science, and what parts of the Zooniverse websites were connected to each.

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Additional Links:
Adler Planetarium
http://www.adlerplanetarium.org/

The Zooniverse
http://www.zooniverse.org/

Citizen Science Alliance
http://www.citizensciencealliance.org/

Citizen Science Central (Cornell University)
http://www.birds.cornell.edu/citscitoolkit

Frontiers in Ecology and Environment, Special Issue on Citizen Science
http://www.esajournals.org/toc/fron/10/6

Investigating Teens in Museums: A Practitioner-led Model for Collaborative Research

Presenter:
Danielle Linzer, Manager of Access and Community Programs, Whitney Museum of
    American Art
Mary Ellen Munley, Principal, MEM & Associates

Purpose:
In the 1990s many arts institutions made an unprecedented effort to engage young
people through intensive programming geared directly towards adolescent audiences—
teen councils, apprenticeships, and arts groups sprouted up across the country and
sought to welcome and empower teens within the museum. A group of practitioners
from around the country have come together to collaboratively evaluate the long-term
and continuing impact of this programming model, not just on the teens themselves, but
also on their institutions and the larger community. Project activities began in
September 2011 and will culminate in 2014. This project is made possible by a National
Leadership Grant from the U.S. Institute of Museum and Library Services.

Project Partners:
Whitney Museum of American Art, New York, NY
Walker Art Center, Minneapolis, MN
Contemporary Arts Museum of Houston, Houston, TX
Museum of Contemporary Art, Los Angeles, Los Angeles, CA
Mary Ellen Munley, MEM & Associates

Perspectives:
This project offers a model for collaboration and exchange between museums. The
poster session will discuss the practitioner-researcher model employed (Jarvis, 1999;
Cochran-Smith M and Lytle, 2009; Watson-Boone, 2000), which builds capacity by
increasing individual knowledge of research, skills, and techniques at each of the
participating museums This process supports the formation of a community of reflective
practitioners, and enables individuals to implement these activities more effectively at
their own institutions. In addition, this panel will explore how geographically diverse
institutions can collaborate to conduct rigorous research and evaluation projects
collectively, so that data can support the development of generalizable conclusions,
frameworks, and theory to advance the field. The comparison of program features and
formats over time at each of the institutions will also help to illuminate the characteristics
of high-impact teen programs in art museums.

Methods:
Museums have often sought to develop programs that have an impact on the
community, but evaluating the personal and public value of these efforts is a persistent
challenge. This presentation will share information about the approach and strategy for

capturing and measuring impact that manifests in the long-term and beyond the walls of the institution. In addition to a detailed survey conducted with all available alumni, this project includes case studies of individual participants using innovative methodologies such as photovoice. Photovoice is a research technique using the photographic process as a focal point for critical dialogue that has become increasingly popular in community-based participatory research (CBPR) (Wang and Burris, 1997; Lorenz and Kolb, 2009; Powers, Freedman, and Pitner, 2012). This session will focus on the importance of selecting appropriate and compelling data collection methods, including those that highlight creativity and visual thinking when evaluating arts-based experiences.

Data & Analysis:
A 34-question survey was developed and designed to capture information about the former participants' experiences in the program, as well as its significance in their lives afterwards. Project staff were successful in confirming contact information for an impressive 78.6% of program alumni (472 out of 600) who participated in these programs between 1992 and 2011. The survey was launched in May, 2011 and a total of 316 alumni responded, with 264 completing the entire survey. This represents a response rate of 67% and a completion rate of 84%.

In addition, two focus groups have recently been conducted with groups of alumni from all four institutions, and case studies of 24 individual participants, using creative/participatory data collection methodologies, will be conducted and analyzed by June 2013.

Results:
As we are currently entering year 2 of a 3 year study, it is too early to report on our results. We will share some data, early key findings and focus on discussing methods and the collaborative nature of the research.

Importance:
This national research study will yield significant findings on the long-term impacts of teen programs at art museums and aims to make a lasting contribution to knowledge in the fields of museum education, adolescent development, and youth programming. This study will also provide detailed information to the museum community about the process of implementing practitioner-lead research, and will help to foster a culture that values reflective practice and substantive evaluation. In addition, this study will yield highly useful information about program features and frameworks that generate high impact outcomes for participants, by offering comparisons of multiple programs. By examining four institutions in different geographic areas that have experimented with variations on a similar format over time, this project can help to illuminate best practices for art museum teen programs that will have the greatest impact on youth over time.

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Additional Links:
Whitney Museum of American Art Education Blog, Youth Insights Look to the Future with a Long-Term Research Project
http://whitney.org/Education/EducationBlog/ImlsBlog

Whitney Museum of American Art Education Blog, Teen Art Programs Research Project Update
http://whitney.org/Education/EducationBlog/IMLSProjectUpdate

Walker Magazine, The Kids Are Alright: Teen Engagement at the Walker
http://www.walkerart.org/magazine/2011/the-kids-are-alright-teen-engagement-and-the

UpNext: The IMLS Blog, National Leadership Grant Video: Whitney Museum of American Art
http://blog.imls.gov/?p=1492

Roving Gallery Guides: From Idea to Pilot to Program

Presenter:
Jackie Armstrong, Museum of Modern Art

Purpose:
This poster presentation will highlight a process of agile development and evaluation which contributed to significant changes to in-gallery programming at MoMA. This presentation will describe how the Roving Gallery Guide initiative, informed by this process, went from an idea to a fully realized in-gallery strategy and demonstrated the need for more social and participatory visitor experiences.

This poster will explore: (1) the method and approach used to capture this process and responses from visitors; (2) key findings from the study; and (3) how the Roving Gallery Guides experience has informed other working processes, programming and evaluation practices at MoMA.

Perspective:
During spring 2012, as part of the RISE initiative (Re-imagining Interpretation and Social Engagement) at the Museum of Modern Art, a cross-departmental group was charged with engaging visitors in the galleries using social and participatory strategies. Over 30 ideas were generated, and through a discussion and selection process, the Roving Gallery Guide experiment rose to the top. In summer 2012, staff in the Department of Education piloted several strategies in the galleries – ranging from discussion-based to

hands-on activities- to determine if it was a feasible initiative and to figure out some best practices if it was implemented regularly. These unscheduled interventions are designed to create more participatory interpretive experiences in the galleries and promote close-looking at art, as well as social engagement between visitors.

Photo Credit: Jackie Armstrong

The purpose of Roving Gallery Guides is:
- To create more participatory experiences that meet visitors where they are and that are responsive to their needs and interests
- To provide a memorable experience for visitors who may not be interested in a traditional tour
- To offer interpretive support in the galleries where it is most needed

- To serve a larger and more diverse audience through the nimble and varied configurations of these interventions

Methods:
During pilot by Education staff, formative evaluation using naturalistic methodology was used to capture these early Roving interventions. Throughout all this, extensive observational documentation took place, using a narrative style of observational note-taking along with photographic documentation.
Findings from these pilots were shared as a working document of 'better practices' and communicated to freelance educators, informing proposals they submitted. Agile evaluation strategies for this phase of interventions captured visitor and facilitator experiences, building a picture of what successful social engagement and participatory learning looks like in the galleries. Naturalistic methodologies emphasized collecting data using multiple methods, primarily qualitative, and triangulating the collection of data. The evaluation strategy included observational data and photographs taken during interventions, informal conversations immediately following interventions, follow-up online surveys, and educator reflections.

Results:
Visitors of all ages, interests, backgrounds, and abilities participated in the Roving Gallery Guide interventions. For frequent visitors to MoMA, these Roving Gallery Guide sessions were a welcome surprise, offering an alternative interpretive experience to guided tours. For first-time visitors, the Roving sessions presented a unique encounter, one that was often described as the highlight of their visit. The participatory nature of the majority of these interventions enabled visitors who did not speak English as a first language to take part in something and having a meaningful experience (e.g. opportunities to touch art). Individuals visiting MoMA on their own appreciated the social engagement and conversational aspects of the Roving Gallery Guide experience. The vast majority of visitors considered the interventions to be memorable experiences and visitors indicated they are very willing to participate in other interventions.

Importance:
The Roving Gallery Guide initiative, facilitated by trained and informed MoMA educators, guides offer another layer of interpretive support, in addition to more didactic interpretive strategies including audio guides, exhibition texts, and guided lecture-based tours. The Roving Guides provide visitors with a warm welcome to MoMA, leaving a positive and personal impression of the institution and in many cases strengthening their existing associations with MoMA.

The agile and empathic development and evaluation process for this initiative has served as a model for other such initiatives at MoMA. The success of the Roving Gallery Guide interventions has also prompted a re-thinking of the ways MoMA engages with visitors and has spurred a re-structuring of the programming that takes place in the galleries, including phasing out gallery conversations and lectures in favor of more participatory, hands-on interactions (including facilitated art-making) in the galleries.

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Study of Adult Non-Art Specialists. *Indo-Pacific Journal of Phenomenolog*y, Volume 8, Edition 2, 1-11.

Additional Links:
Blog Post on Inside/Out:
A Rovin' We Will Go: Roving Gallery Guides at MoMA
http://www.moma.org/explore/inside_out/2012/11/01/a-rovin-we-will-go-roving-gallery-guides-at-moma

From Idea to Pilot to Program: Roving Gallery Guides at MoMA
http://www.moma.org/explore/inside_out/2013/02/20/from-idea-to-pilot-to-program-roving-gallery-guides-at-moma

Regular Feature on the MoMA Talks Tumblr site:
http://momatalks.tumblr.com/tagged/momaroving

Advocating for VSA and Visitor Studies: A Resource

Presenter:
VSA Membership Committee

Purpose:
The VSA membership committee is building a resource for members who would like to share about VSA and visitor studies with their colleagues, students, clients, or peers in related disciplines. This poster introduces language, ideas, and strategies to help potential "ambassadors" have those conversations. We're also looking for feedback from both members and non-members on how to make this resource useful and effective.

Perspective:
This project is part of VSA's initiative to "Bridge Communities" by expanding and/or deepening VSA's relationships with its target audiences.

Importance:
Lots of conference attendees and VSA members highly value the association and visitor studies in general. We know there are already some "VSA super-fans" in our community and would like to help them cultivate and share their enthusiasm in order to strengthen the association and the field.

To help our members and friends advocate for VSA – and for the work we all do to support and study the experiences of visitors, audiences, and learners – we are introducing ways to officially support members who serve as "ambassadors" to their colleagues, students, clients, or peers in related disciplines or communities of practice. The Membership committee is developing a toolkit that will make it easier for potential "ambassadors" to share about VSA.

The initial unveiling of this "ambassador toolkit" will generate interest in the project and feedback about what shape (or shapes) it should take.

Visitor Studies Association: Connecting People and Ideas

Presenter:
Membership Committee, Visitor Studies Association
Poster created and designed by Jackie Armstrong, The Museum of Modern Art

Purpose:
The poster outlines the various ways conference attendees can make connections through VSA and how those connections can be mutually beneficial.

Perspective:
This participatory poster presents a playful reminder to conference attendees to connect with one another, during and after the conference. We hope the suggested paths for connecting encourage new collaborations and friendships, and empower attendees to get the most from their VSA conference experience.

Methods:
The poster will feature the VSA Twitter hashtag so conference attendees can share their experiences during the conference and connect with one another that way. It will also serve as a message board, where attendees will be invited to use post-its to set up meetings (coffee, dinner, site-seeing etc.) during the conference based on a shared interest. Conference attendees will also be able to leave their business cards with an

idea or project on the back of it and if there are any matches we'll help them to connect after the conference (share contact info.). As well, there's an interactive component where attendees are invited to take their photo in front of the poster with a piece of white board on which they will respond to a prompt (Me + VSA = ?).

Importance:
Everyone should feel they are a part of VSA. We hope this poster helps to bring conference attendees together. Whether attendees connect during the conference or after, we believe that new connections can encourage dialogue over a shared interest, spark new ideas, promote innovation or simply broaden one's network of colleagues in the field of visitor studies.

Creating a Collaboration for Ongoing Visitor Experience Studies (C-COVES): Opportunities, challenges, and strategies for design

Presenter:
 Ryan Auster, Research Associate, Museum of Science, Boston

Purpose:
An August 2013 forum will convene stakeholders from diverse science museums to design a system for collaborating to understand and improve the visitor experience. Analyses of similar collaborations have identified key questions and decisions to be considered by participants. Poster attendees are encouraged to contribute their thoughts for building an effective collaborative framework.

Description:
The Creating a Collaboration for Ongoing Visitor Experience Studies (C-COVES) forum seeks to design a framework to support science museums to collaboratively gather actionable visitor data and use it to inform understanding of the visitor experience and

practice within individual institutions and across the field. To inform discussion during this forum, project organizers have analyzed three distinct multi-institutional collaborations – the Association of Zoos and Aquarium's study *Why Zoos and Aquariums Matter,* the Association of State and Local History Museums' *Visitors Count* program, and the National Survey of Student Engagement – to identify key structures essential to the success of such collaborative, ongoing work. This analysis, in addition to input from stakeholders at 12 diverse science museums participating in the forum, have revealed four broad categories of factors required to develop a robust and usable system. These inter-related categories - purpose and mission; methods and data collection; analysis and sense-making; and flexibility and adaptation – broadly outline the aspects of the framework that must be established during the forum in order to create an effective collaborative system.

Importance:
While monitoring and studying the visitor experience within a single museum, exhibition, or program can help institutions learn about their audiences, make evidence-based decisions about services and programming, and respond to challenges, interests, and concerns in a visitor-centered manner, measuring the visitor experience across institutions can enrich and broaden opportunities for understanding visitors for both individual institutions and the broader field (Luebke & Grajal, 2011). Collaborative cross-institutional evaluation can enable networks of institutions with shared goals or projects to build evaluation capacity and foster communities of practice around evaluation practice and use, and provide benchmarks that can help institutions interpret the experience and characteristics of their own visitors within the scope of other similar institutions (AASLH, 2012; IMLS, 2012). Designing an effective framework for studies of the visitor experience across many different museums requires that participants negotiate a balanced system that accounts for the capacities, needs, and objectives of various institutions and stakeholders.

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Friday, July 19

Concurrent Session 6
9:00 - 10:15 a.m.

The IRB Continuum in Museums: When is our work 'research'?

Presenters:
Wendy Meluch, Visitor Studies Services
Doris Ash, University of California Santa Cruz
Elizabeth Kunz Kollmann, Museum of Science, Boston
Josh Gutwill, Exploratorium, San Francisco
Linda Wilson, Shedd Aquarium, Chicago
Peggy Monahan, New York Hall of Science
Erica Heath, IRB Administrator, Ethical & Independent Review Services

Purpose:
This session builds on the 2010 VSA session led by Dale McCreedy, which asked the question: *How can we leverage the opportunities offered by the IRB process, while simultaneously challenging and/or clarifying aspects of the process itself? The purpose of this session is to highlight and discuss the challenges and benefits of the IRB process facing our field.*

This session will elaborate on the benefits and challenges of IRBs in a practical and informed way, and provide time for in depth discussion. Our goal is for attendees to come away with a better understanding of the intent of IRBs, and feeling more confident about when they should be used and how to access them.

Perspectives:
Four informal education and evaluation experts, when they are and/or should be used, and a range of ways of to access them. Institutional approaches represented by these panelists have varied IRB means including an in-house IRB (MOS Boston), an in-house IRB-like body (Shedd Aquarium), a long-established relationship with an outside IRB service (Exploratorium), and a newly formed association with an IRB service (NYSCI).

Each panelist will describe their institutional approaches to IRBs, and share personal insights about their experiences learning the tricky ins and outs of this work

requirement. If possible, an expert IRB administrator will explore the intent of IRBs, and will shed light on the issue from the point of view of an actual IRB.

- Elizabeth Kunz Kollmann, Museum of Science, Boston
- Josh Gutwill, Exploratorium, San Francisco
- Linda Wilson, Shedd Aquarium, Chicago
- Peggy Monahan, New York Hall of Science
- Erica Heath, IRB Administrator, Ethical & Independent Review

Importance:
Knowing when to use IRB review can be confusing and is often misunderstood. VSA has spent considerable effort discussing IRB reviews over the years, an issue that affects many VSA members. IRB reviews are becoming essential as large funding agencies (NSF, NIH, NASA, IMLS, etc.) increasingly require them. Many informal education institutions and evaluation practitioners have little or no experience with IRBs as a result of never being required to use them. And many professionals have happily avoided them because they are intimidating, confusing and expensive. VSA members and evaluation practitioners need a productive, informative and ongoing conversation about IRBs.

Measuring the Un-Measurable? A Role for Qualitative Paradigms

Presenter:
Elee Wood, PhD, Indiana University - Purdue University Indianapolis

Purpose:
More conversation has emerged around holistic approaches to visitor studies and the meaning of visitor experiences in relation to public value. As a field we are constantly looking for strategies to capture the value of visitor experience, and methods that address the "un-measurable" qualities of affective experience such as perception of value, perspectives, and personal meaning. Finding appropriate ways to study these "un-measurable" experiences of informal learning is undoubtedly a direction we must take as a field. Qualitative research paradigms emphasize the nature of research as one of understanding rather than prediction and control and tend to emphasize more action on behalf of the researcher to reveal the influences of values rather than to minimize them (Lincoln & Guba, 2005). Recent articles in Visitor Studies (see for example duToit & Bye, 2008; Everett & Barrett, 2009) begin to raise awareness of qualitative paradigms for studying visitor experiences in new ways.

Importance:
The researcher's paradigm, or basic beliefs about the nature of knowledge and the role of inquiry influence the choice of questions and methods for gathering data. While qualitative methods are frequently integrated into many evaluation and research

designs, the underlying worldview of the role of the research may not always stem from a qualitative paradigm. Equally challenging is the potential knowledge gap between an evaluator or researcher's understanding of qualitative paradigms in terms of rigor, reliability, or validity—as in fact they are vastly different conceptions in qualitative paradigms. Knowing these orientations to research or evaluation enhance our ability as a field to champion both rigor and innovation in our work. Knowing the roles of different qualitative strategies—phenomenology, narrative inquiry and ethnography—helps researchers and evaluators ask and answer different questions. These methods can help visitor studies measure the "un-measurable" aspects of visitor experiences such as value, meaning, and lived experiences.

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Additional Links:
Phenomenology Online:
http://www.phenomenologyonline.com/

Creating Pathways for Diversity in Visitor Studies Professions (Part 2)

Presenters:
Andy Aichele, COSI
Marcie Benne, Oregon Museum of Science and Industry
Marjorie Bequette, Science Museum of Minnesota
Laura Huerta Migus, Association of Science-Technology Centers, Inc.
Shelly Valdez, Native Pathways

Purpose:
Professional fields and communities of practice often step back and reflect on who is involved in their field, how they entered, and who isn't involved in the field, and why they haven't entered. For this type of reflection, many fields have adopted metaphors of pathways or pipelines to describe how talent travels into and out of the field. Building on the results of a 2008 survey of the VSA membership, this session will introduce the challenges we face in the visitor studies field to attracting and retaining individuals from minority backgrounds, and review best practices from the talent management sector that can be used to overcome these issues. Participants will workshop and refine a new model for thinking about professional pathways into visitor studies that support invitation to candidates from diverse backgrounds, and create action plans to test new strategies in their own organizations.

Panelists' Perspectives:
In 2008, VSA implemented a membership survey to gather descriptive data on VSA members, including organizational affiliation, location, job role, and demographics. Significant findings from this study include the demographics of VSA's membership: 91% White and 79% female. These statistics present a challenge for the visitor studies sector: how do we improve the cultural competence of our practice when practitioners are a relatively homogenous group?

Presenters will facilitate a working session help participants:
- Identify practical strategies to implement including recruiting and retention strategies, identifying allies/experts for support, and general resources for future questions
- Provide input on a larger field-wide effort led by VSA to support this positive momentum

Importance:
Diversification of the informal learning field is a more pressing issue than ever – changes in visitor demographics that were projected a decade ago are now reality, and informal learning organizations are now being held accountable by external and internal stakeholders to report on how they are planning for and serving more diverse

audiences. In order to meet these expectations, it is critical that visitor studies teams have the diversity of skill sets and experiences to support and guide the practice of informal learning organizations, especially with respect to racial/ethnic and language diversity. In this session, participants will leverage this opportunity to gather to share individual experiences in the spirit of consensus and mutual support that will result in a roadmap for the field.

Zoo Visitors' Perceptions of Animal Welfare

Presenters:
Roy Ballantyne, The University of Queensland
Jan Packer, The University of Queensland
Jerry Luebke, Brookfield Zoo

Purpose:
In recent years, the anti-zoo lobby has brought the issue of animal welfare in zoos to the attention of the public. Visitors now expect that animals in zoos will be well cared for, and will appear not only healthy, but "happy". Although zoo veterinarians have established objective indicators of animal welfare, visitors are not always aware of these and base their judgements on subjective indicators of animal welfare. It is likely, therefore, that many visitors have misconceptions about the meaning of different animal behaviors, and base their evaluations of the zoo's performance on criteria that can be inaccurate or misleading. This session will establish the importance of visitors' perceptions of animal welfare for their satisfaction with their visit; contribute to understanding the ways in which visitors evaluate animal welfare; and explore the impact of these evaluations on visitors' satisfaction, emotional responses to the animals, and receptiveness to conservation messages.

Panelists' Perspectives:
Roy Ballantyne will present the results of a visitor survey conducted at 13 zoos and aquariums in USA, UK, Canada and South Africa. A total of 1546 questionnaires were returned from the 13 institutions. Respondents rated the extent to which different aspects of their visit contributed to their level of satisfaction. Questions were also asked about the perceived role of zoos and aquariums, and visitors' information preferences.

Jan Packer will present the results of a study that collected qualitative and quantitative data from visitors to the Brookfield Zoo in order to further explore how visitors understood and rated the extent to which individual gorillas appeared to be well cared for. A range of predictor variables were investigated, including perceptions of the animal's appearance, behavior, mood and physical environment.
Jerry Luebke will present the results of study at the Brookfield Zoo that asked visitors to identify the animal exhibit they liked most or least, and to rate that exhibit in terms of its care of the animals and enclosures, and the perceived happiness and health of the

animals. They also rated their reactions to the exhibit in terms of learning, connection with nature, environmental concern and satisfaction with the visit.

Results:
The first study demonstrated that of the 12 items presented to visitors, the one that was considered to contribute most to visitor satisfaction was "seeing animals that are well cared for," followed by "seeing animals in enclosures that simulate their natural environment".

The second study found that a combination of animal and environmental characteristics influenced visitors' judgements of how "healthy" and "well cared for" the animals were. In turn, these judgements influenced visitors' satisfaction with their visit and their emotional connection with the animals. Open-ended comments revealed some of the criteria visitors used in making these judgements.

The third study found that four variables had a significant impact on whether an exhibit was identified as most or least liked. These were: if a favorite animal was in the exhibit; visibility of animals was high; overall attractiveness of the exhibit was excellent; and animals appeared happy.

Importance:
Results from these three studies provide insights for staff of zoos and aquariums on visitors' perceptions of the role of zoos and aquariums, and the aspects that visitors consider to be important to a satisfying visit. In particular, the factors that inform visitors' judgements about animal welfare are identified. The results suggest actions that zoos and aquariums could take to improve visitors' perceptions of animal well-being. These include exhibit maintenance, animal enrichments, and visitor interpretation efforts.

Concurrent Session 7
10:30 - 11:45 a.m.

The Role of Interest in Capturing and Engaging Visitor Attention

Presenters:
Stephen Bitgood, Jacksonville State University
Deborah Perry, Selinda Research Associates, Inc.
Marcella Wells, Wells Resources, Inc.

Purpose:
The purpose is to increase awareness of the theoretical, methodological, and practical issues associated with the concept of interest in visitor studies. There are a number of possible approaches to the study of interest and its implications for conducting visitor research and evaluation. Some researchers make little or no distinction between interest and attention (e.g., Melton, 1935). Some seem to argue that interest in a topic is one of the best predictors of visitor attention and learning (e.g., Dahl, 2011). Others have argued that there are multiple types of interest (e.g., Ainley, Hidi, & Berndorff, 2002). The panel will challenge these views and explore the complex role of interest based on practical considerations, theoretical models, and research data. Interest will be examined as: (1) both a facilitator of attention and learning and as an outcome of the visitor experience; (2) one of several concepts that contribute to visitor motivation; and (3) part of the interpretive planning and evaluation process.

Panelists' Perspectives:
According to all three speakers, engaged attention and learning result from three factors: (1) *past history* variables (e.g., knowledge, interest), (2) *physical & social setting* variables (e.g., exhibit design and social influence), and (3) the *interaction between the two*. Interest functions within a complex of interacting variables, not independently.

Steve Bitgood examines the role of interest in the attention-value model (Bitgood, 2010; 2011; 2013). This model perceives value (defined as a ratio of utility divided by cost) as a major motivator of engaged attention. A number of studies are reviewed that demonstrate interest is only one of several important variables that contribute to the visitor experience.

Deborah Perry describes how interest fits into the Selinda Model of Visitor Learning in which motivation to engage is understood in terms of communication, confidence, challenge, control, and play (Perry, 2012). Interest is one of the components of curiosity.

Marcella Wells approaches the role of interest from an interpretive planning perspective (Wells, Butler, & Koke, 2013). Assessing interest is one of the important aspects of getting to know your audience.

Importance:

Visitor research and evaluation must recognize that interest works in conjunction with other factors rather than by itself in producing a context for engaged attention and learning. Unfortunately, there is poor agreement on the definition of interest, how to measure it, and its role in the visitor experience. More open discussions of the role of interest in visitor studies will hopefully advance our knowledge of what makes a rewarding and satisfying museum experience.

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Object Knowledge

Presenters:
Kiersten F. Latham, Kent State University
Cecilia Garibay, Garibay Group
John Russick, Chicago History Museum
Zdanna Tranby, Science Museum of Minnesota

Purpose:
Objects are central l to the work done in collections-based museums. An ongoing consideration for museum professionals, therefore, is how visitors relate to objects. While a body of research exists about visitors and objects (e.g. Paris, 2002), many questions remain about how to apply research findings to practice. As museums strive to develop more participatory and experience-driven exhibitions for visitors, questions whether objects are still a significant part of the museum-going experience continue to surface (Wood & Latham, 2009, and Wood & Latham, forthcoming).

Questions central to this session:
  • How do visitors relate to museum objects?
  • Are three-dimensional objects still a significant part of the museum experience in the context of an increasingly participatory world?
  • How do populations accustomed to (ubiquitous) digital technology engage with three-dimensional objects?
  • How do we apply research findings from visitor-object experience research to practice?
  • Is the traditional visual access to exhibits enough to engage today's visitors?

Panelists' Perspective:
Latham will provide an overview of the body of scholarship about objects and visitor experiences then present findings from a phenomenographic study on visitors' perceptions of "the real thing"—about museum objects and how they are perceived to be different from replicas or representations of objects and the impact on visitor engagement.

Garibay will present findings from a study which examined the ways families engaged with objects at a history museum when minimal interpretation was provided. Research identified affordances (Norman, 1988) and impediments inherent in objects from the collection and ways families thought about material culture.

Russick will discuss the Chicago History Museum's effort to become more effective collectors and interpreters of collections. He will discuss ways findings from Garibay's study informed practice, particularly ways it forced CHM to reconsider some old assumptions about the power of objects and the role of material culture in interpreting the past.

Tranby will discuss a front-end study for exhibition that examines themes of persistence, resistance, and sustainability from Dakota and Ojibwe communities' perspectives. Research explored how peoples' stories about objects might be used to bridge cultural differences and talk to visitors about connections between science and Native ways of knowing.

Importance:
This session highlights current research about museum objects and visitors. Panelists will discuss a range of studies that not only illuminate ways various audiences perceive and connect with objects, but also how current research findings are challenging assumptions about objects and the role of material culture in interpreting the past, opportunities and challenges in engaging new audiences with museum collections, and how findings help us further understand the conceptual ramifications of museum objects in the visitor experience.

References:
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Wood, E. & Latham K. F. (forthcoming). The Objects of Experience: Transforming Visitor-Object Encounters in Museums. Walnut Creek, CA: Left Coast Press.

Wood, E. & Latham, K.F. (2009). Object Knowledge: Researching Objects in the Museum Experience. *Reconstruction* 9.1

Additional Links:
In Honor of the People
http://www.inhonorofthepeople.org

Measuring Environmental Conservation Behavior Change Outcomes of Informal Science Experiences

Presenters:

Maia Werner-Avidon, Research Specialist in the Research Group at the Lawrence Hall of Science at the University of California, Berkeley

Leah Reisman, Assistant Research Specialist in the Research Group at the Lawrence Hall of Science at the University of California, Berkeley

Lindzy Bivings, Manager of Enhanced Museum Visits for Students at the California Academy of Sciences

Purpose:

This roundtable discussion will explore the challenges and opportunities associated with measuring change in museum and science center visitors' environmental conservation behaviors. Participants will discuss such topics as: (1) What potential do museums have to change visitors' long-term conservation behaviors, and what are the challenges associated with such goals? How realistic are expectations that museums can effect lasting change in visitors' behaviors? (2) How can evaluators best investigate these impacts? Through this discussion, we hope to generate a common understanding of the potential of museum programming with regards to behavior change, and identify best practices and innovative new methods for evaluating for these outcomes in informal learning institutions.

Perspectives:

Evaluating for change in museum and science center visitors' environmental conservation behaviors involves significant challenges. Dierking et al. (2004) describes the difficulties involved in measuring these outcomes in informal learning institutions: "Behavior change, particularly in an area such as conservation, is complex, takes considerable time and is difficult to discern, thus it has proven challenging to document and measure the extent to which free-choice learning institutions […] achieve their educational mission of influencing subsequent behavior and action in this area" (p.323).

Studies have shown that museum exhibitions have potential for short-term impacts on visitors' knowledge and attitudes, but little evidence exists of long-term impacts on attitudes or behavior from visits to such institutions (e.g. Mayes et al., 2004, Hughes, 2011, Falk & Adelman, 2003, Dierking et al., 2004).

Lawrence Hall of Science Research Group members will frame the discussion using our experience evaluating the California Academy of Sciences Rock Family Nights. The program offered free evening events for families from underserved San Francisco communities, with a goal of promoting sustainability behaviors. In addition to providing access to the Academy's exhibits, the program included special booths focused on certain environmental issues: urban gardening, light pollution, plastic bag use, and sustainable fishing.

Methods:
Methods for the Lawrence Hall of Science Research Group's evaluation of the Rock Family Night program at the California Academy of Sciences included the use of a pre-survey, event survey, and post-survey to look at change in families' behaviors over time, as well as focus groups and interviews to provide more in-depth information related to the survey findings. Methods for a second, more exploratory year of data collection (currently underway) include focus groups with adults and children from participating schools, event interviews, and interviews conducted three to six months after the event.

Data & Analysis:
Research instruments were designed to gather information on participants' demographics, use of the California Academy of Sciences and other science education resources, attitudes toward the environment and sustainability, knowledge of the key environmental issues highlighted in the events, and behaviors related to those same key issues. Matched pre-and post-surveys were collected from 125 event attendees and 74 individuals in the comparison group. Open-ended responses were coded, and data were subjected to statistical analysis using nonparametric tests.

Results:
The following summarizes the key findings related to participants' knowledge, attitude, and behaviors related to the environment.

- Event attendees felt more informed about the key environmental issues (except for issues related to plastic bags) than the comparison group. In addition, event attendees had a much stronger understanding of light pollution than the comparison group.
- Even before attending the event, participants indicated that they had very strong positive attitudes toward the environment. There was no change in environmental attitudes from pre to post.
- There was no change from pre to post in the frequency with which families reported engaging in specific pro-environmental behaviors related to the event.
- These evaluation results were consistent with other similar studies conducted by the Research Group and others.

Importance:
The importance of environmental conservation is increasingly discussed, as scientific evidence of humans' role in causing (or avoiding) disastrous environmental changes grows. Correspondingly, many zoos, aquariums, museums and science centers have taken stances on climate change and the importance of conservation, asserting their commitment through exhibitions, programs, and even mission statements. Correspondingly, these institutions and their funders expect assessments of programs' impacts on visitors. Expected outcomes are often expressed in terms of changes in visitors' knowledge, attitudes, and especially behaviors around environmental

conservation. However, behavior change as an outcome is challenging to effect and evaluate. By generating a common understanding of museums' potentials with regards to attitude and behavior change, and identifying best practices and innovative methods for evaluating for these outcomes in informal learning institutions, this discussion will provide the visitor studies community with new tools and knowledge to use in rigorously evaluating this increasingly important and desired outcome.

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Additional Links:
The Research Group at the Lawrence Hall of Science
http://www.lawrencehallofscience.org/services_and_expertise/research_group

California Academy of Sciences
www.calacademy.org/