USING VIDEO AS A VISITOR RESEARCH TOOL IN MUSEUMS

By

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August 29, 2005

Submitted in Partial Fulfillment
of the Requirements for the Degree of

Master of Arts

in

Museum Studies

in the

School of Education and Liberal Arts

at

John F. Kennedy University

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Master’s Project Coordinator            Date
ACKNOWLEDGEMENTS

For their support, instruction, and generosity I would like to thank:

Dr. Joshua Gutwill for guiding me through the Exploratorium

Chris Parsons for her suggestions and advice

Dr. Steven Yalowitz for dropping whatever he was doing to discuss visitor research and evaluation

Katharine Newman for her editorial and emotional support

The Museum Studies Department Faculty and Students
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>I.</th>
<th>INTRODUCTION</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Questions and Objectives</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Methodology</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Limitations</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Product Description</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Glossary</td>
<td>21</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>II.</th>
<th>BACKGROUND</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding Evaluation and Visitor Research in Museums</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>The Practical Elements of Visitor Research and Evaluation</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Creating Recordings of Visitor Behaviors</td>
<td>56</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>III.</th>
<th>FINDINGS AND CONCLUSIONS</th>
<th>62</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Advantages of Using Video to Collect and Study Visitor Behavior Data</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>Digital Video: Better Data Collection Through Technology</td>
<td>76</td>
<td></td>
</tr>
<tr>
<td>Gaining Informed Consent From Visitors to Study Their Behaviors on Video</td>
<td>81</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IV.</th>
<th>RECOMMENDATIONS</th>
<th>84</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>V.</th>
<th>BIBLIOGRAPHY</th>
<th>93</th>
</tr>
</thead>
</table>

| VI.  | PRODUCT (Article: *Using Video as a Visitor Research Tool in Museums*) | 99 |

INTRODUCTION

Visitors to science museums, technology centers, or aquariums and zoos experience a fun-filled, noisy, and sometimes hectic environment. However, visitors to these museums also have transformative learning experiences both before and upon reflection, well after their visit. Museum visitor researchers are attempting to understand the inter-connected web of human emotions and behaviors which constitutes a visitor’s learning experience, the study of which is a revealing and complicated undertaking. Museum professionals have spent the last eighty years successfully adapting social science and ethnographic research techniques to the museum setting and they are adept at using several data collection methods, including unobtrusive observations and random-sample interviews. Over the course of visitor research in museums, difficult questions have arisen that require close analysis of nuanced visitor behaviors. For example, looking for evidence of learning involves conversational and behavioral analysis. Researchers have either had to forgo or had to compromise the study of such fascinating and elusive research questions. Visitor researchers actively addressing these types of research questions can be well-served using video to collect, document, observe, and analyze visitors – or more accurately – visitor behaviors in
museums. I emphasize behaviors because these are the outward manifestations of the visitor experience and it is this behavioral evidence that can be studied by researchers.

Using video to collect visitor behavior data in museums is both an exciting and valuable use of the medium. Also, the recent technological advancements of digital video equipment and video editing software afford researchers a worthwhile method to document visitor behaviors for study. While recording visitor behaviors in museums with video is easily visualized, based on our cultural saturation with the medium, it remains vital for visitor researchers and evaluators to consider issues, both legal and ethical, surrounding video when deciding to use it for data collection in the museum.

Visitors to museums stop and gaze at objects as they communicate in numerous ways with each other, engaging in casual conversation and intense debate. When visitors interact with the components (labels, objects, or interactives) of an exhibition, either conversing in a group or alone, much of their behavior is highly nuanced and easily missed by anyone attempting to study visitor actions. A researcher attempting to analyze the behavioral effects of exhibit elements on visitors, such as testing different labels on the same exhibit, requires fixed concentration to discern the exact occurrences of the actions under study. The human limits
of observation, such as weariness, hinder the types of research questions that can be entertained about the effects of exhibit elements on visitor experience. Inquiry that requires a level of research detail too demanding or invasive vis-à-vis the visitor experience, such as watching visitor behaviors and listening to their conversations throughout an entire museum visit, are liable to be cast aside and left unanswered. Whether researchers are looking for moments in which visitors learn and acquire conceptual nuggets, or evaluating the effectiveness of exhibitions, they must be able to collect and analyze this dynamic data in greater detail and accuracy.

The Exploratorium’s Conundrum

Recently, researchers at San Francisco’s Exploratorium wanted to determine if there were differences in certain behaviors when visitors were using two types of interactive exhibits on the museum floor. They designed a research study to analyze the questions visitor groups asked themselves and how they went about answering those questions while interacting with Exploratorium exhibits. The project compared the questions and responses that arose vis-à-vis two different types of Exploratorium exhibits—“Active Prolonged Engagement” (or APE) exhibits, designed to elicit “what would happen if?” questions from
visitors, and “Planned Discovery” (PD) exhibits, designed to elicit “why did this happen?” questions from visitors.\(^1\) To conduct their study, Exploratorium researchers had to analyze visitors’ questions and their respective responses as they were occurring during while interacting with the exhibit.

This situation in which researchers attempted to carefully listen to a visitor group in conversation, properly determine if the conversational statement was a question, and classify that question was a challenge without a data collection method that allowed for replay and review. Also, researchers were required to pay attention to and properly classify the response to that previous question, all the while making themselves inconspicuous, so as not to interfere with the visitor experience and the potentially outward behaviors by which those experiences may be measured. That researchers had to listen carefully to conversations while battling the cacophony of sound on the floor of the Exploratorium, which has been compared to freeway traffic in decibel levels, was problematic. Since researchers were categorizing visitor questions, they also had to

\(^1\) Both APE and Planned Discovery (PD) exhibits could be considered constructivist in design based on their high level of interactivity. However, APE exhibits were intended to provide visitors with activities that, while highlighting a scientific phenomenon, did not specifically focus on explaining scientific concepts. APE exhibits were designed to elicit a certain type of scientific inquiry from visitor groups, “What would happen if…” type questions. PD exhibits on the other hand were designed to explain specific conceptual information. PD interactives are intended to promote visitors to ask, “Why does this (scientific concept) occur?”
determine exactly what constituted a question statement in naturally occurring speech and oscillating voice patterns of individuals. Even if a visitor’s statement was determined to be a question, how could researchers be sure they would classify the question type accurately? The responses to questions in visitor conversations and behaviors follow quickly, so researchers needed to accurately observe and record data in split seconds, a doubtful proposition. Expecting researchers to conduct reliable data collection so frantically is next to impossible. Furthermore, researchers needed to sustain the exhausting data collection pace over several question/response occurrences and repeat the entire process over several visitor groups. How did researchers at the Exploratorium gather the data they needed without a disruption to the visitor experience and analyze the data in enough detail to tease apart fluent and spontaneously occurring group conversations and behaviors? The solution to the data collection dilemma arrived at by Exploratorium researchers was to record visitor behaviors on videotape.

*The Researcher’s Video is Not Like the Others*

Recording visitor actions on video is a promising solution to the Exploratorium’s data collection problem, and the data that is thereby collected can open up new realms of behavioral information for
researchers and evaluators. Video allows researchers to review onsite observations for accuracy, pause and otherwise control the pace of the recordings, and be unobtrusive so that there is little effect on visitor behaviors. However, making a permanent recording of visitor conversations and their corresponding behaviors is accompanied by some ethical and practical issues, such as visitor consent and camera placement. Video allows researchers unparalleled access to how visitors are behaving and what they are discussing, i.e. experiencing while interacting with museum exhibitions or attending programs.

Despite assumptions, the medium of video itself may alleviate some visitor discomfort with being recorded. Three Louisiana State University sociologists, Shrum, Duque, and Brown, explain that video recording equipment is such a routine sight in our society that the subjects of study decreasingly notice the technology under which they are being watched. This phenomenon is known as the “routinization of surveillance.”² The normalization of video from security cameras, webcams, “reality” television shows, your auntie’s camcorder at birthday parties, and everyday discourse surrounding privacy and the resulting lawsuits are indicative of the pervasiveness of video. As a result,

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researchers in museums may find that the visitors under study are more amendable to sharing the museum floor with video cameras than being subject to different research methods.

Video affords researchers the opportunity to perform countless reviews of a visitor group’s interaction with each other and the exhibit element. However, a caveat applies here: a video clip by itself cannot answer research questions; it must be analyzed like than any other data collection tool, be it photographs or sheets of paper. An illustration of this premise can be seen in one famous court case.

During the 1992 trial of four Los Angeles police officers accused of using unnecessary force in the beating of Rodney King, the 81-second video recorded of the incident was used to both prosecute and defend the officers. The video clip, depicting horrific violence, seemed to speak for itself, ensuring a guilty verdict and punitive measures against the four officers. However, defense lawyers’ interpretation and analysis of the video, contingent upon their parsing of the video into single frames, swayed the jury enough to clear the police officers of most charges, and the inner-city of Los Angeles was promptly set ablaze in protest.3

While the results of most museum visitor studies do not have such dire consequences, the researcher’s analytical skill is necessary to unlock

3 The Rodney King Case: What the Jury Saw in California vs. Powell (Oak Forest, IL: MPI Home Video, 1992).
the potential uses of that data. Visitor behaviors featured in video clips need to be anchored in context and interpreted to have any benefit to researchers or those with whom researchers are communicating.

Sociologist Paul Henley, on the topic of ethnographic film-making, proposes that the context of video actually occurs at two moments. The first is when a video clip is produced, during equipment set-up and framing of shots and the second, when a video clip is viewed. When viewing behaviors on video, it is important for researchers to interpret the footage within a defined research schematic. As a result, the process of reviewing and analyzing visitor behavior recorded on video may take many times longer than the actual moments the visitor was on screen. Yet, if researchers and evaluators desire to discuss, dissect, and comprehend the conversations and dynamic actions visitors display in museums, recording those behaviors on video is actually the most efficient method.

**Video Research in Museums**

Visitor behaviors recorded on video can be analyzed by researchers in a multitude of ways, from simply counting the number of visitors who touch a certain interactive exhibit, to listening in on

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conversations to discover learn while using an exhibit. For example, imagine an evaluator was asked to determine if visitors were using a science-based interactive exhibit in the ways intended by the exhibit design team. Suppose the evaluator recorded the visitor behaviors on video, analyzed the data, and recommended the museum add some additional explanatory text labels based on confusion expressed by visitors. The evaluator was also able to recommend the addition of benches next to the interactive since the researcher observed on the video visitors leaning on a nearby wall to rest and watch while the other people use the exhibit. Now that the project was completed and the interactive exhibit improved, the evaluator put the video data on a shelf.

Fast-forward one year: a group of researchers at the same institution want to find out if there are differences between how males and females use interactive science exhibits. Conveniently, rather than having to gather fresh data for their study, these researchers can capitalize on the visitor behaviors previously recorded and stored on video. Since the researchers save a tremendous amount of time and resources from not having to collect all of their visitor behavior data, they are able to conduct their study across several different science interactives, leading to a more robust research project and an enhanced comprehension of their topic.
In today’s museums, visitor researchers and evaluators are well-versed on several techniques of watching and noting visitor behavior as it occurs onsite and in real-time. However, only a handful of researchers have the thorough understanding of how to use video as a data collection method. Visitor researchers and evaluators should be provided with information on the advantages of using video to conduct visitor studies, a practical explanation of how data collection using video is conducted, and the ways visitor behaviors collected on video can be useful to their research. In addition, and perhaps most importantly, visitor researchers and evaluators should know in what ways this data collection method can lead to a better understanding of visitors.

The purpose of this project is to inform museum evaluators and other museum professionals about the potential advantages of using video for audience research and evaluation. The project findings will culminate in an account of how video was indispensable during the previously described visitor study conducted by the author at the Exploratorium in San Francisco, California. The product for this master’s project is an article for Visitor Studies Today, the publication of the Visitor Studies Association (VSA), about the benefits of using video to collect data. This article illustrates the positive aspects of using video to collect data, address ethical concerns, including adherence to human subject protocol
guidelines, and discuss video equipment and set-up procedures. In sum, this project documents the value of collecting visitor behaviors on video and advocates for the increased use of video data in visitor studies and exhibition evaluation.

Research Questions and Objectives

My investigation into the potential benefits of using video for visitor studies begins with an understanding of evaluation and visitor research in museums. The visitor studies field in museums is constantly addressing progressive research questions and methodologies, and video should be thought of as another beneficial method currently available to researchers. The practical elements of using video to collect visitor behavioral data, including explanation of data collection methods and data analysis, will also be relevant. Following this section, some considerations will be explained around the notion of making permanent recordings of visitors (on both audio and video) for research purposes. For these primary steps, I conducted a literature review of scholarly journal articles, museum trade magazines, and several books written on museum evaluation techniques.

After the literature review, I interviewed fifteen visitor researchers and evaluators nationwide to determine what they already knew and
needed to know to properly conduct worthwhile studies using video. The conversations established whether and in what ways they currently use video as a data collection tool and discerned exactly how much practical instruction is needed in the field to supplement the current understanding of this method. Finally, I report my experiences during a visitor research study at the Exploratorium while working under the direction of Dr. Joshua Gutwill, Senior Researcher. This hands-on experience allows me to expound in detail on the advantages of using video data for visitor research.

**Methodology**

In order address the research questions and objectives for this project, three research methods were used. A broad range of literature, mostly from the social sciences, but also from marketing, was reviewed for this study. Interviews with museum professionals, mostly in the visitor studies field, helped me to identify what video as a data collection tool looks like when used for different research projects in various institutions. Third, I conducted a visitor research study I conducted at the Exploratorium.


**Literature Review**

A literature review of scholarly journal articles, such as those featured in *Curator: The Museum Journal* and *Visitor Studies Today* were consulted for the background and the findings sections of this project. These journals, along with museum trade magazines, like *Museum News* were the primary resources for the current visitor research and evaluation discourse. Also, the literature review was comprised of several books written by museum visitor researchers and evaluators and social scientists.

**Interviews**

To further solidify the background and findings of this project, I interviewed fifteen evaluators to solicit their perspectives on using data recorded on video for research and evaluation purposes. The fifteen key informants are from various institutions across the United States and represent visitor researchers and evaluators affiliated with universities and those affiliated with one or two specific museums. In addition, I consulted contract researchers and evaluators hired by museum administrators and museum educators, I wanted to find out to what extent these evaluators currently employ video or have used this method in the past. Finally, I wanted to gather the perspectives these researchers and evaluators have
about the potential role of using video to collect visitor behavior data for research and evaluation.

Visitor Research Project at the Exploratorium

In addition to the interviews, I conducted a visitor studies project primarily using videotape at the Exploratorium under the direction of Dr. Joshua Gutwill, Senior Researcher. This research project compares the visitor behaviors using two different types of interactive exhibits at the Exploratorium. Dr. Gutwill wanted to find out if visitors using APE exhibits engaged in different behavior than those using Planned Discovery exhibits. Before I came to work on the project, Dr. Gutwill decided to look at the types of questions visitors asked and how they (or others) responded to those questions while they were interacting with each type of Exploratorium exhibit.

Through this opportunity I was able to use the Exploratorium library of video data to watch previously recorded visitor groups from eight different Exploratorium exhibits. As a primary step, I watched several groups to familiarize myself with the video equipment, as well as the pace of visitor conversations and actions during a typical visit to the Exploratorium. Then over several meetings, Dr. Gutwill and I, along with input from another Exploratorium evaluator, Nina Hido, developed and
refined a coding scheme based on visitor conversations and behaviors seen in video clips. I then spent a few hundred hours watching visitor groups recording their physical attributes (for later identification), their questions (verbatim), and their responses (both verbal and behavioral) in a database. Dr. Gutwill and I then performed some statistical functions as part of our analysis and are in the process of drafting a report of the findings. During the course of the project, I watched, coded, and analyzed videotape of over 250 visitor groups.

**Limitations**

*Single Institution Limitation*

The methodology of this project concentrates on the study of visitors at only one institution and only one type of institution, a science museum in the United States. Different museums have different considerations when they wish to conduct any sort of data collection. Time, budget, and the number of people that can work on any one project dictates, more than curiosity or research enthusiasm, whether a method using video to collect data is feasible. Each institution has its own set unique set of variables that would affect video research. It would be rewarding to conduct other projects at a range of museums to understand inter-institutional differences, which would result in a greater specificity
and depth in the comprehension of this topic. For example, a museum may want to use video for an exhibition-wide timing and tracking study, where another museum wants to focus on one specific exhibition element. The video equipment requirements would be different, researchers would need mobile cameras to track visitors around and exhibition, where as they would need stationary cameras if focusing on a single exhibit. By conducting different kinds of visitor studies using video, a researcher would then be in a position to compare the methodologies of the projects and gain a further understanding of the medium.

**Scope Limitation**

The project I conducted at the Exploratorium is an instance of visitor research, not evaluation per se, as those terms have been defined and discussed in the Background section of this project. By making the distinction between visitor research and evaluation, and then conducting a project that looks at video only for visitor research purposes, not evaluation, limits the scope of the project and some of the conclusions that could be drawn vis-à-vis using video for evaluation. The advantages video provides for parsing conversations and behaviors may not prove a valuable use of resources to an evaluator wanting to get information about a future exhibition topic, where a face-to-face interview may suffice. A project that
includes comparisons between video data used for a visitor studies project and video data for evaluation would be a productive exploration for another study in which to draw parameters around the appropriate instances to help researchers decide whether and how to use video for data collection.

Site Limitation

One of the benefits of conducting a project at the Exploratorium is the institutional importance placed on evaluation and visitor studies. The administration has allocated resources to a visitor research and evaluation department which houses four full-time evaluators. The Exploratorium’s commitment to evaluation has allowed its visitor research department to compile a library of videotaped footage of visitor behaviors for study. However, while this attitude toward evaluation may be increasingly common among science centers, this level of commitment is rarely manifested in other types of museums. When removed from this positive research atmosphere, institutional roadblocks regarding the trial of new data collection methods could limit researchers in different institutions. Furthermore, researchers with hopes of doing a similar project at another location would be hard pressed to find an adequate collection of video and
may have to establish new video data, further limiting and complicating the options of study.

Finally, the expense of the conducting research in San Francisco, the geographic location of the Exploratorium, limits the amount of study that researchers can perform. Prospective researchers are limited if they want to conduct similar studies using videotape at the Exploratorium. They will encounter little room for error and have limited resources to augment a pre-determined research design or otherwise explore their topic.

**Technical Expertise Limitations**

More practical experience conducting visitor research and evaluation studies on my part would have improved the outcome of this project. More familiarity with research methods, would allow me to better weigh video against other methods. Also, The more experience I (or any other researcher) have will allow for comparison between different institutions and enrich the project, its findings, and its conclusions. Finally, I had to rely on the expertise and generosity of several museum professionals that shared their knowledge to shape this project.

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5 This frustration was evident in a quote from Gaea Leinhardt and Karen Knutson: “We also wanted to study a show at the Exploratorium, but in this case cost, not weather, was a constraint: collecting data in the San Francisco Bay area would be nearly three times expensive as collecting data in other locales, so the work needed to be done quickly and efficiently.” *Listening In on Museum Conversations.* (Walnut Creek, CA: Alta Mira Press, July 2004).
Product Description:

When investigating the use of video as a data collection method, interested museum professionals must research and review a multitude of different articles from a variety of academic disciplines to form a holistic understanding—both in theory and practice—of data collection using video. There are different articles from sociology and marketing written over the past thirty years addressing a broad range of aspects, from the benefits of using video as a research tool, ways to achieve visitor consent to be part of a research study, and how to set up video recording equipment.

This product addresses the fragmented nature of the information about using video as a data collection method by culling the various sources into one article. The article, entitled, *Using Video as a Visitor Research Tool in Museums*, will be written primarily for professional museum visitor researchers and evaluators, either affiliated with an institution or contracted by a museum to perform specific evaluation studies. I have chosen to submit an article to the journal, *Visitor Studies Today*, published by the Visitor Studies Association (VSA), since the publication is widely read by researchers and evaluators in the museum community and is devoted to articles on visitor studies topics, frequently including both research and evaluation reports.
This product grew out of discussions with Dr. Gutwill during the visitor research project cited above. The overall purpose for the product, and indeed the project itself, is to promote the value of using video as a method for data collection. The product addresses informed visitor consent and documents some of the creative means researchers at different museums around the country have used to validate their research techniques to federal grant issuers. Also, an illustration featured in the article provides one suggested way to set up recording equipment, which was similar to the set-up for my project at the Exploratorium.
Glossary:

The following terms (unless otherwise noted) have been adapted from various conversations and interviews with museum professionals by the author.

Coding: During data analysis, visitor researchers and evaluators assign symbols to represent various qualitative data so the information can become measurable. For example, when coding conversations of visitors in a group during an exhibition, questions could get a “Q” code, responses an “R” code, exhibit manipulation an “EM” code, and so forth. Finally, a coding scheme, or list of visitor behaviors with each corresponding code will typically be produced and used to quantify otherwise qualitative data.

Ethnography: The study and systematic recording of human cultures.  

Evaluation: Evaluation in museums is the systematic study of how visitors perceive and use exhibitions and programs. Time in which an evaluation study is conducted in the exhibition development process determines its type. The four types (in chronological order) are front-end, formative, remedial, and summative. Evaluation studies are typically applicable only to its respective exhibition or program. The results of worthwhile evaluation studies help the decision-making processes in museums, as well as benefit the visitor experience.

Formative Evaluation: Formative evaluation is conducted after an exhibition’s themes are decided but before an exhibition is completely built and installed. This type of evaluation consists of testing full size models of exhibition components. These mock-ups, often described as “quick and dirty” versions of exhibition elements, can test anything from label text and color to the function and placement of interactive exhibits.

Front-end Evaluation: Front-end evaluation is conducted by questioning potential visitors to ascertain important information used during the development of an exhibition. Front-end studies should be designed to determine what visitors know about an exhibition topic and it should expose any misconceptions surrounding the exhibition’s...
theme. Also, this type of evaluation should inform developers of the expectations visitors have for exhibitions about the topic.

**Informed Visitor Consent:** In order for researchers to ethically and legally conduct visitor studies or evaluation in a museum setting using identifiable human subjects, the subjects under study must be aware of their participation. Once visitors are aware of their participatory status, they can choose whether or not they wish to continue or terminate their involvement in a study.

**Qualitative Data:** Data which is not measurable in its natural form, for example, visitor behaviors, interview data, and anecdotal data. Typically qualitative data will undergo a process, such as coding, to transform the data into something that can be counted for statistical analysis.

**Quantitative Data:** Data that naturally occurs in a numerical format.

**Reliable:** The degree to which a method/instrument is consistent and dependable.\(^7\)

**Remedial Evaluation:** Remedial evaluation is characterized by making improvements to exhibitions and their elements based on visitor research. This type of evaluation takes place after an exhibition is permanently installed and open for public display.

**Science Center/Museum:** Any institution that displays exhibitions with scientific content, which houses interactive exhibits that illustrate scientific concepts and does not primarily feature living specimens.

**Summative Evaluation:** Summative evaluation projects are used to determine the success or failure of the exhibition development process. This type of evaluation typically documents visitor behaviors in one specific exhibition. As a result, data from summative studies are usually only applicable to its respective exhibition within its respective institution. The findings of summative evaluation projects can be as general as whether or not the overall goals of the exhibition were met or as specific as the analysis of

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\(^7\) Adapted from Chris Parsons, Instructor: JFK University, MUS 5775:  
Savvy Evaluation Consumer, July 2004, Berkeley, CA.
relationships between visitors and individual exhibit elements.

Valid: The degree to which an instrument or method actually measures what it is designed to measure.\(^8\)

Video: a medium that captures both audio and visual behaviors at once. In this paper, the video medium can be played, edited, and stored on either on an analog format, usually magnetic videotape or digitally, referred to as digital video (DV).

Visitor Behaviors: The physical actions visitors engage in when they are attending exhibitions and interacting with exhibits and other visitors. Visitor behaviors are only part of the multi-faceted visitor experience.

Visitor Experience: The observations, perceptions, conversations, actions, and behaviors of visitors to a museum exhibition and/or program.

Visitor Research: Visitor research projects are typically conducted across several museums and/or different types of institutions. Visitor research is designed to have universal results, which can benefit museums worldwide and typically differs from evaluation in purpose and scale.

Visitor Studies: describes the systematic and scientifically reliable and valid study of visitor behaviors in a museum setting. Visitor studies are a larger, umbrella term for visitor research and evaluation.

\(^8\) Ibid.
BACKGROUND

Understanding Evaluation and Visitor Research in Museums

If all you want is praise, skip evaluation, and do a peer review by hand selected people who will tell you what you want to hear: ‘Beautiful installation,’ ‘Stunning presentation,’ ‘Best collection west of the Mississippi.
– Beverly Serrell

Early Visitor Research

The importance of visitor research and evaluation was not widely recognized until after the 1950s. However, there were a handful of museum professionals from the turn of the twentieth century to the late 1940s who, through the study of visitors to exhibitions, gained a better understanding of how visitors experience museums. Visitors to museums are not the proverbial tabula rasa, ready to absorb any interpretation offered by museum exhibitions without question. Museum visitors have needs, expectations, varied perceptions, an assortment of learning styles, and different levels of prior knowledge about topics of exhibition, all of which affect their experience. These visitor studies were the genesis of a field in which ethnographic questions are posed by museum professionals to understand visitors in the museum setting. The research methods used to address and answer these questions have become more sophisticated

9 Beverly Serrell, Exhibit Labels: An Interpretive Approach (Walnut Creek, CA: AltaMira Press, 1996).
and museum researchers and evaluators have taken advantage of prevalent technologies to aid their studies.

Benjamin Ives Gilman, the director of the Boston Museum of Fine Arts was the first museum administrator to hire docents, incorporate lecture rooms, and develop educational materials and tours. He was also among the first museum professionals to conduct visitor studies projects. For one notable study in 1916, Gilman wanted to understand the physical experiences of visitors to his galleries, so he requested patrons engage in several pre-determined activities, such as viewing objects and label reading, while he photographed their physical positions. After analyzing the photos and writing the findings Gilman concluded, in a report entitled “Museum Fatigue,” that the low placement of objects in cases, and installations in broad cases increased visitor weariness. As a result, Gilman recommended museums show fewer objects and divide collections between exhibitions and study areas. The findings of this groundbreaking study have affected nearly all of the exhibitions developed after its publication, and has benefited the physical dispositions of visitors ever since.

Two research psychologists from Yale University, Professor William S. Robinson and his protégé, Arthur W. Melton, were the first to

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conduct systematic studies of visitor behaviors in museums throughout the 1920s and 1930s. Large sample sizes of visitors (as many as n=2000) were timed and followed through art and science museum exhibitions to find out how long visitors spent in exhibitions and what they noticed. The data collected from these studies included numbers of stops at exhibition elements and the total time spent in the galleries. Robinson and Melton reported on the dismally small amount of time visitors spent in galleries. Their work also identified, described, and recommended exhibition design elements taken for granted today, such as attraction power and holding power. 11 The contributions to the visitor research field made by these two scholars during a decade of visitor studies were their efforts to use progressive and scientifically valid, reliable, and repeatable data collection methodologies. Today, timing and tracking studies, as well as other observational methods, are commonly used when researchers wish to assess the value of museum exhibitions or find out how visitors are behaving during museum experiences.

Progressing further toward robust visitor studies projects, 1940s British museum researcher Alma Wittlin was the first to conduct a comparison study of visitor perceptions of two similar exhibitions. The qualitative data collected during interviews of visitors was analyzed by

11 Ibid.
dividing the responses into three categories of what visitors thought were the exhibitions themes. The Wittlin study explored the gaps between curators and visitors in awareness of an exhibition’s themes. Methodologically speaking, this study was one of the first instances of coding practiced in museum visitor studies. Wittlin’s work also played a significant role in current exhibition development, including the need for easily understood exhibition themes. \(^{12}\)

Although the previously described studies differed as to the types of data they collected–Gilman and Wittlin analyzed qualitative data, while Robinson and Melton used quantitative data–they agreed that research in museums was essential to understanding the visitor experience. Visitor studies and evaluation is, for all intents and purposes, social research in a museum setting. Therefore, evaluation projects, like any kind of ethnographic or sociological research, must be conducted with scientific rigor. So, distinctions were made between the purposes and goals of visitor research and exhibition or program evaluation.

**Visitor Research**

Determining a definition of visitor studies is problematic since some museum professionals consider all research projects conducted in a

\(^{12}\) Ibid.
museum setting about exhibitions as “evaluation.” Even those museum professionals who are constantly cited in various publications do not make distinctions between visitor studies and evaluation. For example, Kathleen McLean writes, “[evaluation] can be defined as basic research to obtain generalizable knowledge.”13 For purposes of clarifying the study of visitor behaviors in museums, I am going to separate general visitor/audience studies from evaluation of specific exhibitions.

Current evaluation practice dictates most research projects conducted at specific institutions become the property of that institution. And even in the results of a simple evaluation project there are several stakeholders, from administrators to security guards. Typically, there is little publication of evaluation study findings outside the confines of an institution. As a result, the dispersal of other information, like data collection methods, is not shared with different museums, even though there may be potential benefits for similar institutions. For example, an aquarium evaluates an exhibition featuring a rare species could potentially be valuable information to other aquariums and zoos planning a similar exhibition. Since the evaluation information remains in-house, another institution would not benefit. Visitor studies projects on the other hand are

typically conducted across several museums and/or different types of institutions. Consequently, visitor research projects are designed to have universal results, which can benefit museums worldwide.

Broadly stated, visitor/audience research differs from evaluation in scope and application of the information gleaned from studies of visitors. According to Minda Borun, visitor research “answers broad questions about visitor behavior to elicit generalizable principles,” while evaluation “answers project or museum specific questions.”\(^\text{14}\) In addition, some visitor research studies have compares data across a number of institutions, not just the project’s host institution. Furthermore, visitor research projects can occur over long periods of time. For example, two, several-year studies conducted at the Monterey Bay Aquarium and Disney’s Animal Kingdom by Steven Yalowitz and the Institute for Learning Innovation respectively, are examining visitor behavior change as a result of institutional advocacy.\(^\text{15}\) According to Dr. Joshua Gutwill, general research studies often report results that can be applied to other projects, while specific evaluation reports


typically do not; however, evaluation studies sometimes contribute new or interesting methods to the field.\textsuperscript{16}

The difference between evaluation and visitor studies can also be explained further by examining Beverly Serrell’s seminal visitor study entitled \textit{Paying Attention: Visitors and Museum Exhibitions}. Serrell’s study focused on the amount of time visitors spent in several different museum exhibitions and the number of stops at the elements within each exhibition. The study chronicled data from 110 exhibitions across different types of museums to illustrate learning and visitor meaning-making in informal education environments. A vast amount of what exhibition developers, museum educators, and audience researchers know about how visitors behave in exhibitions is a result of Serrell’s massive study. For example, Serrell documented that the majority of visitors typically spend less than twenty minutes in an exhibition and that visitors usually stop at only one-third of the components in an exhibition.\textsuperscript{17} Serrell also developed a standardized measurement that allows researchers to compare the times visitors spend in exhibitions of different sizes. This formula, called the “Sweep Rate Index,” divides the amount of time visitors spend in

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\textsuperscript{16} Joshua P. Gutwill, 2005.
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exhibitions by the square footage of the exhibition to represent the relative time visitors spend in an exhibition area. Serrell’s study does not focus on one exhibition, and the goals for the study do not focus on the learning outcomes of any particular exhibit element. Instead, her study was designed to hone the methodologies and understanding of how evaluators assess exhibitions, and what behaviors visitors display in all types of exhibitions at all types of museums.

*Exhibition and Program Evaluation*

Museum evaluators Minda Borun and Randi Korn describe evaluation as bridging the gaps between the goals of museums and visitors’ expectations. Evaluation studies can range from asking visitors what they expect to see about a topic of exhibition to asking if their expectations were met when they leave the museum. Evaluators compile visitor reactions to present or proposed exhibitions and present the findings to their colleagues within the museum so as to have an accurate basis for improving current or future exhibitions. The importance of evaluation’s benefit to visitors is explained by exhibition designer Kathleen McLean, “[Museum] evaluation…is the systematic collection and interpretation of information about the effects of exhibitions and

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programs on visitors for the purposes of decision-making.”\textsuperscript{19} Worthwhile evaluation studies allow museum professionals to place themselves in the shoes of visitors and receive a better understanding of how museum patrons experience exhibitions and programs.

On a related note, exhibition and program evaluation directly affects museum staff relations. In an article authored by McLean, she describes the dividends of good visitor research which “can lead to rich discoveries about visitor perceptions…and can encourage curators and designers to question their own assumptions about their intentions, their methods, and their audiences.”\textsuperscript{20} Similarly, Randi Korn directed an evaluation article to museum professionals in a recent issue of \textit{Museum News}. In the article, she explains the importance in understanding the institutional aspirations of a museum, then determining what is actually achievable, before initiating an evaluation study.\textsuperscript{21} For example, at the Monterey Bay Aquarium (MBA) whose mission is to inspire conservation, evaluators assessing exhibitions typically ask visitors if they notice the marine conservation messages prevalent in all MBA exhibitions. Finally,

\textsuperscript{19} Kathleen McLean, 1993.


museum consultant Kathleen Brown explains a museum’s choice to conduct evaluation takes “commitment, conviction, and courage – the truth isn’t always pretty or easy, and sometimes it isn’t at all what you expect.”

*Front-End Evaluation*

Just as distinctions are made between visitor studies and evaluation, the stages at which exhibitions and programs are assessed also assume separate characteristics. Thus, there are four different types of evaluation studies: two types – front-end and formative – are conducted while an exhibition is being developed and another two – remedial and summative – are conducted after an exhibition has been installed. The point of conducting evaluation and visitor research, then applying the results of these studies to exhibitions is to benefit the visitor experience.

In *Questioning Assumptions*, museum evaluators Lynn Dierking and Wendy Pollock define front-end evaluation as, “a process of challenging our own assumptions…by which those of us engaged in planning in museums can uncover our own preconceptions about

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22 Kathleen Brown, “Community Consultation: Evaluating Community Concerns.” LORD Cultural Resources.
visitors.” Front-end evaluation is conducted by questioning potential visitors to ascertain important information used during the development of an exhibition. Front-end studies should be designed to determine what visitors know about a given exhibition topic and should expose any misconceptions surrounding the exhibition’s theme. Also, front-end evaluation studies should inform developers of the expectations visitors have of exhibitions about the topic.

Front-end evaluation can be a difficult undertaking, not only in methodological terms, but in determining when, during the development of an exhibition, a front-end study will yield the most usable information. Kathleen McLean cautions, “In the initial stage of exhibition development, ideas are still unformed and often vague, and it is difficult to pin down what exhibit planners want to know about people’s understanding of a topic.” Johanna Jones, a senior researcher at the evaluation consultant firm Randi Korn and Associates, addressed the importance of timing during a recent interview with the author. She explained that many museums conduct their front-end evaluation studies too early. Exhibition


25 Ibid.
and program developers fail to establish several interpretive strategies before asking visitors what they do and do not know about a topic. Many front-end evaluation studies are conducted by asking visitors for their opinions on what they would like to see exhibited about a certain topic without a context for that topic. Often, visitor wishes are so grand the museum does not have the resources to materialize those desires. Front-end evaluation becomes more rewarding when evaluators provide a framework of interpretation based on what the museum has to offer about a topic, and then visitors can provide more practical preferences.  

Randi Korn addresses another issue for the front-end research process in her article “Making the Most of Front-end Evaluation.” When talking to potential visitors about a planned exhibition, there is a similarity of response between visitor disinterest and unfamiliarity with a topic. In order to resolve the difference between the two, Korn suggests prompting the visitor with cues that may help them understand the topic. “When interviewees said they were uninterested in the topic initially,” she explains, “they were actually unfamiliar with it. They became interested after…learning a little about the subject.”


Formative Evaluation

Long-time museum evaluator Chandler Screven gives a simple definition of formative evaluation in his article, “What is Formative Evaluation?” Screven explains, “Formative evaluation leads to exhibitions that work better.” The major distinguishing characteristic of formative evaluation consists of testing full size models of exhibition components. These mock-ups, often described as “quick and dirty” versions of exhibition elements, can test anything from label text and color to the function and placement of interactive exhibits. Also, formative evaluation allows for a relaxation of the scientific discipline required for other types of evaluation. Screven refines his aforementioned definition by noting, “[formative evaluation] lack[s] control groups, statistical analyses, and other rigid scientific procedures.”

Formative evaluation is conducted after an exhibition’s themes are decided but before an exhibition is completely built and installed. Through visitor interaction with inexpensive mock-ups of the actual object, exhibit developers can learn a vast amount of information. During formative evaluation studies, visitors are presented with sample labels, sometimes

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29 Ibid.
written on poster board, and interviewed to see whether or not the information presented on the label was understandable. Another formative evaluation technique is the construction of exhibits with temporary materials. Visitors are observed using the models to determine the proper size and placement of the interactives components and to determine if the conceptual elements were properly transmitted to the user. Museum evaluator Minda Borun and her colleagues testify to the importance of this type of evaluation, “The power of [formative] evaluation became evident as visitors’ encounters with prototypes provided valuable feedback about what worked and what did not.”

The previously described procedures occur before the actual exhibit element is constructed for several important reasons. Often, formative evaluation can prevent museums from investing large sums of time and money on the development of exhibitions that confuse visitors at best, and are ignored by visitors at worst. Formative evaluation studies can even settle exhibition development disputes. Museum researcher Samuel Taylor, editor of the formative evaluation handbook, *Try It!* explains, “Formative evaluation can help exhibition development teams avoid arguments when team members disagree. The evaluator can bring

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empirical evidence to help sort out opinions." In sum, formative evaluation is considered by some museum professionals the most important type, since in the end it typically saves valuable exhibition development resources and greatly enhances the visitor experience. Kathleen McLean notes, “Formative evaluation is arguably the most valuable form of evaluation for exhibition planners because it incorporates visitors in the development process and focuses on ways to improve and refine an exhibition during its development.”

Remedial Evaluation

Remedial evaluation consists of improvements made to exhibitions and their elements based on observations of visitor interactions with exhibits. Typically, museum visitors are tracked throughout an exhibition or observed using interactive exhibits. This type of study is similar to formative evaluation; however there are some distinct differences.

Like formative evaluation, remedial evaluation is characterized by making improvements to exhibitions and their elements based on visitor research. But unlike formative evaluation, remedial evaluation takes place after an exhibition is permanently installed and open for public display.

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During the development of museum visitor studies and evaluation as its own distinct field, remedial evaluation was the last to be specifically defined.

There is still some confusion regarding remedial evaluation in the museum world. Some exhibition designers and evaluators collapse the two evaluation types conducted after an exhibits installation - remedial and summative – into one category. However, museum researchers Stephen Bitgood and Harris Shettel argue for the refinement of evaluation taxonomies in their article “The Classification of Exhibit Evaluation: A Rationale for Remedial Evaluation.” Bitgood and Shettel state that remedial evaluation has its own distinctive characteristics that separate it from summative and formative evaluation. Once museum exhibitions are installed, there is frequently a need to make improvements to some elements that visitors are not utilizing to their full potential. Remedial evaluation is also important to consider when museum researchers decide to improve permanent exhibitions that were installed many years ago or may have been developed without much front-end or formative evaluation.

Another distinction of remedial evaluation lies in an exhibit’s relation to the layout of an entire exhibition, and the exhibition’s relation

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to the entire floor plan of the museum. Bitgood and Shettel explain that during the formative evaluation of an exhibition design stage, exhibit mock-ups are being tested in isolation. Any confusion or problems visitors encounter tend to be within the exhibit, not its relation to the other surrounding exhibits.\textsuperscript{34} After an exhibit is installed, “problems such as circulation through the collection of exhibits in that area, distracting influences of other exhibit displays, etc. become very evident.”\textsuperscript{35} And by extension, any visitor flow problems due to an exhibition’s inadequate placement by adjacent exhibitions within the entire museum can be improved through remedial evaluation studies.

\textit{Summative Evaluation}

While remedial evaluation intends on making changes to an exhibition, summative evaluation is conducted to study the visitor’s behavior with an unchanging exhibition. Borun and Korn state simply that summative evaluation is used to determine an exhibit’s effectiveness.\textsuperscript{36} Summative evaluation projects are used to determine the success or failure of the exhibition development process. As Kathleen McLean describes, “it

\textsuperscript{34} Ibid.

\textsuperscript{35} Ibid.

\textsuperscript{36} Ibid.
can help determine if exhibition goals (learning, process, and behavioral goals) were met, and what the visitor learned and experienced.”37 These types of projects typically document the visitor behaviors in one specific exhibition. As a result, data from summative studies are usually only applicable to its respective exhibition within its respective institution. So, the findings of summative evaluation projects can be as general as whether or not the overall goals of the exhibition were met, or as specific as the analysis of relationships between visitors and individual exhibit elements. As the moniker suggests, summative evaluation is best characterized as the assessment of a completed and installed exhibition. Summative and remedial evaluation studies can be, and typically are, conducted at the same time. However, the data are used for different purposes, remedial evaluation projects intend to make changes to exhibitions, while summative evaluation studies are initiated to determine if the exhibition’s goals have been effectively transmitted to visitors. Museum scholar Stephen E. Weil explains the importance of defining goals to legitimize summative evaluation projects in his Museum News article about outcome-based evaluation. “It may be simpler to establish a credible approach to evaluation when an institution’s goals are clearly defined and it can articulate with some precision what sort of an

educational impact it hopes to make.” For evaluators to conduct worthwhile summative evaluation projects, exhibition developers must first provide them with the intended goals of the exhibition. This critical step is sometimes overlooked, undermining the summative evaluation project.

*Visitor Studies and Evaluation’s Future*

Perhaps due to an ambiguity of understanding by museum professionals of exactly what evaluation and visitor studies entails, the field is not realizing its potential. Minda Borun and Randi Korn express their concern with the future of visitor studies at the end of *Introduction to Museum Evaluation*. They write, “We are faced with a need to train additional practitioners, specify minimum standards of competency, define a museum staff evaluator position, and sharpen our focus on the central question of this work.” Finally, they conclude with frustration stating, “There is no degree program or even concentration in visitor studies for the would-be practitioner.” Museum studies programs throughout the United States would be wise to examine their educational programs and

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increase the amount of visitor research training, or at the very least, impart future museum educators with the understanding that effective evaluation and visitors studies projects have a tremendous benefit to the visitor experience.

_Today’s Science Centers: The Forefront of Visitor Research and Evaluation_

Sadly, most museum visitors do not reap advantages from the applied results of visitor studies and evaluation projects. The majority of museum practitioners who conduct worthwhile evaluations of their exhibitions are primarily affiliated with science-based institutions. Most of the effective evaluation techniques and meaningful visitor studies projects are being developed, performed, and discussed by those in science museums. Consequently, most of the valuable evaluation information is distributed and applied solely in science centers. Therefore, these types of museums have historically been the leaders in the field of visitor studies and evaluation. Some reasons for this occurrence can be found in the historical funding arrangements of science museums. Kathleen McLean states organizations that typically fund science center exhibitions, “such as the National Science Foundation [NSF], increasingly expect to see thorough evaluation plans spelled out in exhibition proposals for
funding.

Perhaps still another reason science centers exceed other types of museums in the field of visitor studies and evaluation is the support researchers receive from the board of directors and administration of their institution. The leadership of the Exploratorium in San Francisco, for example, is committed to applying the results of evaluation and thus, has a thriving in-house visitor research department considered among the leaders in the field.

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41 Joshua P. Gutwill, Interview by Author. 10 February 2005, Berkeley.
The Practical Elements of Visitor Research and Evaluation

“The core problem for any methodology is how to select and then capture the important and valued information in a manner that is credible, reliable, and valid.”
– Gaea Leinhardt and Karen Knutson 42

Data Collection Methods

The following research methodologies can be used for all types of evaluation and visitor studies projects. The list that follows is not exhaustive; rather they are an illustration of some commonly employed methods. These data collection methods can be better understood when organized into two main categories. The first category consists of techniques where, in many cases, the data collector and the visitor are interacting with full knowledge of each other’s presence. These methods include, but are not limited to, interviews, surveys, and questionnaires. Another category of data collection methods, observations, requires a researcher to watch museum patrons without interfering in the visitor experience. Observational methods can be as simple as counting visitors or as complicated as looking for evidence of learning during the visitors’ museum experience.

42 Gaea Leinhardt and Karen Knutson, Listening In on Museum Conversations, (Walnut Creek, CA: Alta Mira Press, July 2004).
Interviews, Surveys, and Questionnaires

Interview, survey, and questionnaire data collection methods can take many forms and work particularly well for front-end and summative evaluation. Focus groups, concept mapping, as well as pre- and post-testing all fit under the interview, survey, and questionnaire taxonomy. These methods can glean either quantitative data - information with numerical values - or qualitative data - information that expresses visitors’ attitudes, feelings, and opinions, usually anecdotal responses to open-ended questions. The type of data an evaluator wishes to collect depends on the goals of research project, which is the primary step in designing a research study.

The methods used to collect data from interviews, surveys, and questionnaires can be done in a variety of ways. The most common is the face-to-face interview. These discussions can consist of open-ended or pre-coded questions and range from simple and quick interactions to in-depth extended interviews. The majority of interviews, surveys, and questionnaires have a closed structure where one question leads to the next.

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43 Museum exhibition and program evaluator Chris Parsons has done extensive work exploring the potential of concept mapping in museum research. Concept mapping is similar to creating conceptual bubble diagrams and works particularly well with children who can sometimes articulate their ideas better through drawing.

in sequential order. However, pre-coded interviews, surveys, and questionnaires limit the research participants to a list of answers that has been established during the design of the data collection instrument.\footnote{Ibid.}

In contrast, other survey and interview research methods can be designed with undefined structures and are conducted in a free-form way, with the interviewer engaged in an open-ended conversation with a visitor. Open-ended interviews are characterized by a researcher asking previously prepared probing questions to begin a conversation in which the visitor is given a chance to articulate their thoughts without pre-fabricated response suggestions.\footnote{Zahava Doering, “Role of the Interviewer in Survey Research” (In \textit{Introduction to Museum Evaluation}. Borun, Minda and Randi Korn, eds. Washington DC: AAM, 1999).} In turn, researchers typically base their further questions on the free-flowing direction of the interview, although making sure to address pre-designed questions in any order. However, surveys, interviews, and questionnaire methods are not limited to close proximity interactions between the researcher and the visitor.

Telephone interviews are frequently used to collect information and provide visitors some time for reflection on their museum experience, enriching the research data. Many visitor studies projects conducted to comprehend how visitor learning experiences at an exhibition affects post-
museum visit behavior, primarily use telephone interviews. Another way interviews, surveys, and questionnaires can be distributed is through the mail, using e-mail or a traditional paper copy. Museum researcher Marilyn Hood cautions, “A mail-questionnaire, however, is useless for a general audience because the response rate will be so low that the project will be a waste of your [the researcher’s] effort, time, and money.” Instead, she suggests a more effective technique is mailing research instruments to museum members or members of institutions with similar interests or purposes, who will be more likely to respond because they are invested in the organization.

Kathleen Brown sums up the advantages and disadvantages of using interviews, surveys, and questionnaires when she notes, “surveys sacrifice depth…however, for breath of responses, surveys are excellent tools.” She continues, explaining that survey information can be used as a springboard for other data collection methods. While these data collection tools provide useful information for researchers, they are used

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47 To read very good examples of post-museum experience research, refer to the following books by John Falk and Lynn Dierking: *The Museum Experience*, *Learning From Museums*, and *Lessons Without Limit*.


49 Ibid.

50 Brown
to a lesser extent for formative and remedial evaluation. These evaluation types, as well as summative, are better suited for observational methods.

**Observational Methods**

Observing visitors in the museum setting while they are interacting with exhibition elements can provide valuable insight into the visitor experience. Observational data illustrates exactly what visitors physically do, though not necessarily what they are thinking, when attending exhibitions. Museum researcher and science educator Judy Diamond advocates for this type of data collection when she states, “The results of detailed observations have had a major impact on how educators view the experience of visiting a museum, zoo, aquarium, or park.”\(^{51}\) Also, results from the analysis of observational data, such as head counts, watching visitors interact with exhibit prototypes, and timing and tracking studies have a beneficial impact on the visitor experience.

Unobtrusive observations – or those which the researcher tries to collect observational data without the visitor becoming aware – are frequently employed by evaluators. To begin observational data collection, exhibition stakeholders must define the people or groups they are going to...

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watch. Ideally, the sample of visitors observed will represent all visitors to
the exhibition. To maintain scientific reliability and increase the
probability that research results will be generalizable to the entire
audience, a large variety of visitors must be studied. The higher number
the of visitors and the greater the diversity of visitors – including
commonly overlooked audiences such as visitors with disabilities, visitors
with special needs, and visitors who primarily speak a language other than
English – increase the validity of the visitor studies project.\textsuperscript{52}

Typically, a researcher will track a single person (visiting on their
own or within family and friend groups) beginning from his or her
entrance into an exhibition usually after crossing an imaginary line
determined by the study designer. The observation terminates after the
visitor crosses an imaginary exit line or has a significant period of non-
exhibition related activity, such as chatting on a cellular phone.\textsuperscript{53} Data
from observations are recorded on collection sheets, which can be as
straight-forward as visitor demographic information forms. For the more
complicated timing and tracking studies, information is recorded on
exhibition maps or behavioral ethogram matrices. An ethogram matrix is a

\textsuperscript{52} Ibid.

\textsuperscript{53} Data collection requirements differ, but timing and tracking studies conducted
by the author and other researchers require the termination of observations after 5
minutes of non-exhibition related activity.
text-based exhibition map featuring exhibit element descriptions and a list of corresponding potential visitor behaviors seen when interacting with exhibits. 54 The behaviors for the ethogram matrices are developed from actions seen during preliminary observations of visitors at the exhibition. The form includes activities such as talk about, use alone or with others, and misuse are included on timing and tracking data collection sheets. 55

Whether a person is eligible for tracking depends on the prefabricated research design based on the goals the study. Data collectors can focus on children in family groups, or adult females, for example. However, unless research designs specify, visitors in school or other organized groups are not tracked and do not have their behaviors analyzed. Visitors in organized groups are typically told what information to seek out during their museum visit according to assignments, not interest. Also, the amounts of time spent at various exhibit elements are dictated by external forces, such as an instructor. This type of information is not

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54 Judy Diamond (1999) refers to an ethogram in her Practical Evaluation Guide, while researchers at Randi Korn and Associates (RKA) developed and commonly employ this technique when conducting timing and tracking studies.

55 Johanna Jones, senior researcher at RKA, includes these behaviors on the timing and tracking forms she develops.
desirable for most studies since these visitors are not in control of their own museum experience.\textsuperscript{56}

The information revealed from the analysis from visitor observations can be used practically as well as theoretically. Results from observational data can determine where to place exhibition elements that are independent of the exhibition’s theme, such as chairs and benches for visitor comfort. Also, observational studies are conducted to look for evidence of learning during the visitor experience. In most cases (though ideally in all cases to maintain scientific rigor) both data collection methodologies, interviews and observations, are used in conjunction to gain a holistic, and much more realistic, understanding of the visitor experience.

\textit{Data Analysis}

Once museum researchers have collected data, there are as many ways to analyze the data as there are reasons to conduct visitor research in the first place. Minda Borun and Randi Korn simply state that data analysis consists of “focus[ing] on patterns in the data--on what the data

\textsuperscript{56}The seminal Falk and Dierking studies regarding free-choice learning for example (see The Museum Experience, Learning From Museums, and Lessons Without Limit) are dependent on the visitor choices of what exhibit elements to visit and how long to spend at a particular exhibit being intrinsic rather than external.
means.” When analyzing data sets, some researchers like Dr. Joshua Gutwill, seem to almost personify the data. These researchers ask questions of the information and spend time with the raw data to discover the stories it can reveal. However, before a researcher can effectively analyze the collected data, some types must first be coded.

**Coding**

When using quantitative data, statistical analysis is not a problem since the information is already in a numerical format. However, when using qualitative data, evaluators must develop a coding scheme to turn qualitative information, which could consist of conversation transcriptions or a narrative description of visitor behaviors, into something measurable. For example, when coding conversations of visitors in a group during an exhibition, questions could get a “Q” code, responses an “R” code, exhibit manipulation an “EM” code, and so forth. Finally, a coding scheme, or list of visitor behaviors with each corresponding code will typically be produced and used to quantify otherwise qualitative data.

Stating goals from the outset of a research project is a common characteristic of evaluation in practice, and coding is no different. The goals of a research project will determine the degree of coding specificity.

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There is a slight catch in the coding process however; one researcher, with his or her unavoidable biases, should not code all of the data without first comparing the coding process with different researchers. For scientific reliability and validity at least two researchers must come to an agreement about what visitor behaviors constitute a particular code before the entire data set is coded. The goal of this process is to achieve inter-rater or inter-coder reliability. Typically, two researchers will code only a sample of the entire data set, and once agreement is established, one researcher will complete the coding.

After the goals of a research study are written, the inter-rater agreement procedure begins by exploring a sample of the data. A list of behaviors and their corresponding codes, or a coding scheme, is developed from these primary data investigations. Afterward, at least two researchers separately observe identical data and use the coding scheme to code the visitor behaviors. The two independent observations are then compared to determine their level of agreement, measured in a percentage. Social scientists Roger Bakeman and John Gottman suggest using an “agreement or confusion matrix” to determine this percentage. A square chart is designed with the two researchers and their corresponding visitor behavior codes from the coding scheme on each axis (see Figure One). Both

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58 Roger Bakeman and John M. Gottman, Observing Interaction: An Introduction to Sequential Analysis (Cambridge University Press, 1997).
researcher’s tally their codes and divides their coding agreements by the total number of possible agreements to determine their inter-rater agreement percentage. For example, if independent researchers code the same 50 occurrences and agree on 46 behavioral codes, their inter-rater score is 92 percent. Or stated another way, they agree 92 percent of the time that an observed behavior is correctly coded. Commonly, inter-rater scores are considered scientifically reliable if they are 80 percent or higher.

*Figure One: Agreement Matrix*

<table>
<thead>
<tr>
<th>Researcher 2: Behavioral Codes</th>
<th>Q</th>
<th>R</th>
<th>EM</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Researcher 1: Behavioral Codes</td>
<td>Q</td>
<td>12</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>Q</td>
<td>12</td>
<td>1</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>R</td>
<td>1</td>
<td>25</td>
<td>0</td>
<td>26</td>
</tr>
<tr>
<td>EM</td>
<td>0</td>
<td>1</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>27</td>
<td>10</td>
<td>50</td>
</tr>
</tbody>
</table>
Creating Recordings of Visitor Behaviors

Data analysis, statistical functions, and especially coding, are helped greatly when data is permanently recorded. Researchers who record visitor behaviors create a lasting record that can be studied in detail after a visit has taken place. All of the previously described data collection methods and data analysis retain a degree of anonymity. However, when a recorded document is generated that involves identifiable human subjects; the process evaluators use to conduct research is required to change.

Visitor Consent, It’s the Law

When researchers record visitors on audio or video, human subject research ethics, as well as visitor behavior authenticity comes into question. If a museum conducting research on its visitors receives any money from the United States government, typically in the form of grants from either National Science Foundation (NSF) or the National Endowment for the Arts (NEA), the institution must adhere to federal research standards. Title 45, Part 46 in the Code of Federal Regulations in the United States Department of Health and Human Services Office of Human Subjects Research (OHSR), states human subjects, museum visitors included, must be informed that their behaviors are being
studied.\(^{59}\) It is the ethical and legal responsibility of museum audience researchers and evaluators to inform visitors that they are the subjects of studies. Visitors consent to be studied is crucial so they understand the purposes of the research project and have the option of whether or not they wish to participate. Judy Diamond writes, “Sometimes subjects mistakenly believe that the purpose of the research is to make judgments about their performance, so it can be very reassuring if they know that the purpose is to make improvements in the institution or its programs.”\(^{60}\) However, there is an added dilemma for researchers when visitors know they are being watched; they may behave differently, affecting the authenticity of the visitors’ actions under scrutiny.

*Audio Recordings*

Collecting visitor conversations on audio tape creates a permanent record that researchers can refer to after a museum visit has taken place. Researchers then have the opportunity to examine visitor conversations in detail for a multitude of different research purposes. Data collection methods using audio tape can be conducted two ways. The researcher can


\(^{60}\) Judy Diamond, 1999.
discreetly follow a visitor or group of visitors and speak into an audio recorder describing visitor conversations or behaviors. Also, audio recording devices can be attached directly to visitors themselves in order to capture their conversations. For some studies, researchers use both techniques simultaneously and later synchronize the recordings to produce a more complete reproduction of the visitor experience. ⁶¹ Leinhardt and Knutson describe the tradeoffs when recording museum visitor conversations: “The issue of what method to use for collecting conversational data is, again, one of unobtrusiveness weighed against the collection of fine-grained data.” ⁶² The issue of reactivity, or the way recording devices affect visitor behavior, is a pertinent issue when conducting research with recording devices. Gathering data that does not interfere with normal visitor behaviors and reactivity complications (where in some cases, visitors transport egregiously invasive and unwieldy audio recording devices through an exhibition) is a problem without easy or transparent answers. In certain respects, the previously illustrated

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reactivity complications with audio recordings are intensified when recording visitor behaviors with video.

Recording Behaviors on Video

Using video for museum visitor research and evaluation is another research method that can be used to address questions that may have been too complicated to study previously. Like audio recordings, video records of visitor behaviors afford researchers and evaluators with the means to study visitors in detail. Examining visitor behaviors recorded on video represents another element in the evolution and development in the research and evaluation field. Video allows researchers and evaluators to address questions that are best answered by examining the behaviors of visitors when they are interacting with exhibitions and each other. As a technology, video equipment can improve upon paper, clipboards, and pencils.

The equipment used to record visitor behaviors is recognizable by museum patrons, so reactivity and equipment intrusiveness used to be prevalent issues. However, technological advances making video recording devices smaller and easier to operate promise new research possibilities, such as visitor held video cameras, and a less obtrusive research instrument will alleviate some reactivity. Digital video is another
advancement that allows researchers to examine video clips countless times without affecting the integrity of video recorded on tape, which is susceptible to damage every time the videotape is viewed, spooled, or copied.

When using video to study visitors, researchers and evaluators must decide where to place video equipment to record exactly what data they wish to collect. For example, if an evaluator wishes to analyze how visitors are using a stand-alone interactive, a camera might focus on exhibit-users. On the other hand, if the interactive is on a tabletop, the video camera should be placed above to capture a larger range of visitor actions. Microphone placement is also important, especially in science centers where the noise levels can be higher than at other types of museums. If a study is being conducted in a setting with high atmospheric volume, researchers may wish to use shotgun microphones, which can be pointed at specific areas, to capture the conversations from targeted visitor groups. To complicate matters, all different types of recording equipment will yield data with a variety of characteristics, so it is important for researchers to be comfortable operating their hardware.

The advantages gained by visitor researchers and evaluators when coupling recorded audio conversations with behavioral action on video has tremendous research potential. Visual and audio data offer a more
complete picture when trying to understand visitor experiences at museums, their motivations for learning, and how visitors engage with exhibit elements.
FINDINGS AND CONCLUSIONS

Overall, using video for data collection has several advantages, can
tremendously increases the breadth of topics that can be proposed for
investigation, and allows researchers and evaluators to study visitor
behaviors in greater detail for a multitude of purposes. The findings and
conclusions of this project illustrate the benefits to using video as a data
collection tool. Also, this section helps identify characteristics that will
ensure a visitor research and/or evaluation study using this method will be
a positive, worthwhile, and ethical undertaking.

The following discussion compiles information from different
academic disciplines, interviews with museum visitor researchers and
evaluators, and first-hand experience with the medium. The pertinent
material for visitor studies does not come from one single academic
discipline. Therefore, I consulted publications by sociologists and
marketers who have used video to gather ethnographic data in their
research, in addition to literature from authors with a museum background.
Culling information from these different academic fields leads to a greater
understanding of the possibilities for using video to conduct visitor
research and evaluation studies in museums.
Also, similar in breadth to the literature review, I have consulted several individuals from various academic backgrounds. Most interviews were conducted with visitor researchers and evaluators affiliated with museums, either employed by a single institution or as hired consultants. During the interview process, I wanted to determine the positive aspects of using video to collect and study visitor behavior data. I spoke with university research academics and museum professionals who currently use video to find out how they take advantage of the medium to conduct worthwhile studies. This approach allowed me to conclude some elements common to all museum visitor researchers that have successfully used video to conduct meaningful studies.

Finally, I report on my experience conducting a visitor research study at the Exploratorium. As part of this project, I watched and coded the behaviors of over 250 visitor groups recorded on videotape. While watching the videotape, I was required to listen to visitor conversations as well as note the visual behaviors. By working primarily with videotape on this visitor research project, I was able to acquire a firsthand understanding of the affordances of video. Also, I discovered the rewarding research possibilities for using this medium throughout the entire visitor studies field.
The findings and conclusions of this project are organized into three main themes. The first section illustrates the advantages of using video to collect and studying visitor behaviors in museums. The second section features a discussion of digital video which has even more advantages for visitor researchers and evaluators over older, analog forms of video. The final section focuses on some creative ways visitor researchers have gained informed consent from visitors to be studied on video.
The Advantages of Using Video to Collect and Study Visitor Behavior Data

The degree to which researchers benefit from using video to collect visitor behaviors will vary depending on the research atmosphere of their museum. The reasons to conduct research and exhibition assessment are different in all museums as are the researchers and evaluators in those museums. However, there are several general benefits to working with video to study dynamic visitor behaviors. Video has advantages when coding behavioral data, video saves researchers time, video increases communication between researchers and other museum professionals, and video decreases visitor reactivity to researchers and data collection tools.

Human Communication is Highly Visual

To better understand how video data allows researchers to analyze visitor behavior in greater detail, a description of how people communicate when interacting is helpful. To facilitate this illustration, the work of Christian Heath, a social scientist specializing in interaction and technology, provides some context. He states that gestures and other body kinesthesia are heavily involved in communication. Furthermore, people frequently use of artifacts when talking to each other, and elements of
their surrounding physical environment also become relevant during the course of their interactions.\textsuperscript{63}

Video can capture several elements of a visitor experience, including the aspects researchers may not be interested in studying (at the time), or may not completely understand. Also, data collected on video affords researchers the ability to conduct other types of studies, at different times, on unrelated topics to the reason the data was primarily collected, at a great benefit to the costs of conducting visitor research and evaluation. For these reasons, Heath explains the benefits of using video, “It has been recognized that recordings of human…interaction, despite [its] limitations, provide researchers with unparalleled access to social action, allowing the…complexity of particular events to be subjected to detailed and repeated scrutiny.”\textsuperscript{64}

\textit{Using Video Has Advantages When Coding Visitor Behaviors}

The PISEC Perspective, a visitor study conducted by visitor researchers and evaluators from the Franklin Institute in Philadelphia, assessed family learning in museums. The report for the study featured


\textsuperscript{64} Ibid.
some data collection techniques that “didn’t work.” Chief among them was, “Coding live action at the exhibit: Initially data collectors coded their observations of families directly onto a coding sheet, but it proved too difficult to write and observe at the same time.”\textsuperscript{65} During their study, the PISEC researchers encountered dynamic visitor communication teeming with frequent and subtle behaviors. The researchers decided to collect data on video “as a further refinement” of their study. In this case, the information researchers wanted to discover proved to be highly detailed. Data that was studied in detail had to be collected using video, which allowed researchers to rewind, replay, and review visitor behaviors several times to ensure their analysis would not yield murky results.

Also, researchers looking for learning behaviors in visitors may find video to be a suitable data collection method. John Falk and Lynn Dierking spearhead a group of museum researchers concerned with how visitors engage in free-choice learning at museums. One such behavior is “modeling,” where by “family members…watch one another, other groups, and museum staff…to figure out how to manipulate interactive exhibitions and behave appropriately in the setting.”\textsuperscript{66} Using video to

\textsuperscript{65} Minda Borun, Jennifer Dritsas, and Julie I. Johnson, 1998.

\textsuperscript{66} John Falk and Lynn D. Dierking, \textit{Learning From Museums}, (Walnut Creek, CA: Alta Mira Press, 2000).
capture these, sometime subtle yet commonplace, non-verbal actions is critical to their understanding by researchers.

The APE study at the Exploratorium compared the amount of times visitors referred to the label to help answer their questions about a scientific concept. Researchers hypothesized there would be a difference between how visitors used the labels at “APE” exhibits and “Planned Discovery” (PD) exhibits. Since APE exhibits were designed to have visitors explore their inquiry through use of the exhibit, by asking “What would happen if…” type questions, visitors did not refer to the label as frequently as they did at PD interactives. Since visitors to PD exhibits asked more “Why does this (scientific concept) occur?” type questions, they were found to use the label more frequently.

During the data coding stage, the repeated review of visitor behaviors was necessary. I watched visitor groups for evidence of label use and coding this occurrence was straightforward when visitors read the label text aloud. However, most visitors did not read aloud, they simply looked down or stared ahead at labels. This visual behavior was the only

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67 Exploratorium researchers also wished to study labels for larger museum-visitor power sharing reasons. The use of (or dependence on) labels brings up notions of the power relations in museums. Typically, labels are written in a curatorial voice, even when explaining scientific concepts which are seen as factual. However, does visitor dependence on a label to answer their questions stifle the inquiry process, regardless of the label’s sophistication in design, style, and voice?
signifier of interaction with a label, one of the important fundamentals of the study. 68

Also, visual and auditory responses to questions in the form of another question were a frequent behavioral occurrence. This conversational characteristic was much too intense in pace to record as it would naturally occur in conversation and action. Without the use of video to record the visual and dynamic visitor behavior, I would have missed occurrences of the specific actions I was looking for and compromised the results of an entire research project. Museum researcher and author, Karen Knutson, echoes my experience when she described studies where researchers, who are watching visitors without recording them on video, get distracted and miss something crucial. “If that is the case,” she stated, “that observation has to be terminated and the data is gone.” 69 During the APE study, video was also advantageous when isolating behaviors at crowded exhibits since I could observe the interactions of several visitor

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68 Both the video equipment and placement were limitations of the APE study. The video cameras used at the Exploratorium are not equipped to follow eye movement. They were however set up facing visitors, and researchers determined that when visitors appeared to be reading labels (ex. looking down at the spot on an interactive exhibit where a label is placed), they were coded as “referring to the label” to answer their question(s). At the time this paper was written, researchers were still analyzing the data, determining findings, and formulating conclusions.

69 Karen Knutson, Interview by Author. 19 April 2005, Pittsburgh, PA.
groups simultaneously operating an exhibit by concentrating on one group then rewinding the video and focusing on another.

Video Saves Researchers Time

Recording visitor behaviors on video saves time if what the researcher is attempting to study does not occur often, like reading labels. Dr. Steven Yalowitz, the Audience Research Specialist at the Monterey Bay Aquarium (MBA), conducted a label study where recording visitors with video saved time. At MBA, there are a variety of labels each with its own specific purpose, so Yalowitz decided to study how long visitors “attended to” these different types of labels. He wanted to determine which label type visitors were using most, so MBA could concentrate their efforts on presenting interpretive messages in a viable format. Dr. Yalowitz mounted video cameras overlooking the area where the text panels were placed to “record label-reading behavior since labels are typically less thoroughly used by visitors compared to other components like live animal tanks or interactives. With video, we didn’t have to wait around for a long period before someone looked at a particular label.”

The video camera can record all day, and then a researcher can fast-

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70 The term “attended to” includes visitor attention to an exhibition element, in this case labels, for a minimum of two seconds.

71 Steven Yalowitz, 19 April 2005.
forward through the parts where the behaviors are not happening.\textsuperscript{72}

Interestingly, this study did not use an audio track in conjunction with video, just as in the Gilman study, described in the Background, analysis of visitors’ physical behaviors can tell researchers a plethora of information.

\textit{Using Video as a Data Collection Tool Decreases Visitor Reactivity}

As the previous paragraphs illustrate, looking beyond the realm of museum-related literature to the work of social scientists in different, yet complimentary fields helps researchers understand visitors in museums. Similarly, the results of an investigation conducted by three sociologists can be applied to using video in a museum setting. Smith, McPhail, and Pickens conducted a study that compares the level of subject reactivity between live researchers using clipboards to collect information and data gathered using a video camera. The results of the study were summarized by stating, “The data suggest that the use of the camera is no more associated with subject reactivity than the paper and pencil mode of observation and recording.”\textsuperscript{73}

\textsuperscript{72} Steven Yalowitz, Interview by Author. 28 April 2005, Monterey, CA.

The phenomenon of visitor reactivity to researchers collecting data is inherent in data collection itself. There is no single method that will be devoid of interference by the researcher to the natural visitor behaviors. So, the goal of all social science research in general, not just visitor research and evaluation, is to minimize reactivity. Accordingly, the video data collection techniques Steven Yalowitz typically used at the Monterey Bay Aquarium, “is much less obtrusive than a data collector standing there observing visitors.”

When dealing with crime, video equipment is used two ways, the first as perpetrator identification if a crime has been committed, and the second as a deterrent to crime. The purpose of signage warning potential criminals that their actions are being recorded on video is to get the reaction of not committing a crime. However, a recent study found there was little reactivity to being recorded on video. “The study…that placed 684 cameras in parks [and] shopping centers found that crime didn’t fall in most places [and] people said the presence of cameras didn’t make them feel safer.” The presence of video equipment and possibly being recorded on video did not get people to change their behavior, even in tourist areas, like parks, stores, and potentially museums.

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74 Steven Yalowitz, 19 April 2005.

Video Increases Communication with Other Museum Professionals

While using video to the study of the physical nuances during visitor conversation has beneficial attributes, this method can also be used by other researchers simultaneously to increase communication. Leslie Atkins, a doctoral student at Dartmouth College, frequently watches the family conversations she records on videotape with multiple people.\textsuperscript{76} To the benefit of all involved, researchers, exhibit developers, educators, explainers, docents, and others are able to watch and discuss the visitor behaviors seen during a museum experience, at the same time. Similarly, Lisa Hubbell, the evaluator from the California Academy of Sciences, sees the advantages of using video to present information to those who learn in a visual way, including some exhibition designers. She has found that colleagues who do not otherwise embrace evaluation are nevertheless receptive to audiovisual presentation of study findings. While she cautions against the tendency on the part of evaluation clients to identify with comments from individual respondents, she recognizes the strength of video in “bringing to life” evaluation data. Technological improvements to video editing (see following section) also makes it possible to have several versions of the same footage, pieced together in

\textsuperscript{76} Leslie Atkins, Interview by Author. 28 April 2005, Dartmouth College, Hanover, NH
different ways to accommodate different audiences.⁷⁷ Technological improvements to video editing (see following section) also makes it possible to have several versions of the same footage, pieced together in different ways to accommodate different audiences.⁷⁸

A common misconception of research and evaluation, especially in a museum setting, is that results are seen as a personal judgment of the skills of those under scrutiny. As a result, evaluation is met with reluctance at best and complete disregard at worst. Dr. Sue Allen, Director of Visitor Research and Evaluation at the Exploratorium, mentioned how video had been a useful professional development tool for a group of teachers, whose teaching practices she had previously evaluated as part of a larger study by the Educational Testing Service (ETS). In order to better understand effective teaching practice, Dr. Allen and her colleagues had used video to record each instructor in the classroom, and had started "video clubs" for teachers to view and discuss their tapes in groups. When the teachers watched themselves instructing their class, they were typically more judgmental of their techniques than were the evaluators or their teacher colleagues. To ease their discomfort, teachers were invited to share only those parts of the video they wanted to, and to frame the

⁷⁷ Lisa Hubbell, Interview by Author. 13 April 2005, San Francisco.
⁷⁸ Shrum et. al., 2005.
discussion for the group. Gradually, the instructors’ reluctance to be evaluated gave way to an intrinsic embrace of evaluation on their terms, not from a researcher, who can be seen as an outsider.79

Some exhibit developers share the sensitivity to evaluation with the teachers studied by Dr. Allen. Video allows exhibit developers to watch visitors using exhibits in the formative evaluation stage, to decide for themselves (or in conjunction with an evaluator’s analysis) what improvements should be made. Simple analysis of data collected on video can be a less threatening and easier understood way to advocate for exhibit assessment, succeeding in ways that convoluted evaluation reports have not. Considering the advantages described thus far, this method has the potential to further refine the research process in museums and by extension, improve the visitor experience. However, improvements to this method are on the technological horizon and will further benefit researchers and evaluators using video to study visitor behaviors.

79 Sue Allen, Interview by Author. 8 May 2005, San Francisco.
Digital Video: Better Data Collection Through Technology

During the last few decades, video, like audio, has changed format from an analog source (magnetic tape) to a digital source (ones and zeros). As such, the digital video (DV) format has changed the way researchers can record behaviors and edit video data. Also, digital video recording equipment can change reactivity effects on visitors, and DV technology can open up new forms of data collection within exhibitions.

Digital video equipment is constantly becoming smaller, easier to use, produces a higher quality picture and sound, and less expensive than previous models. Researchers have more freedom when considering where to place cameras, which angles are possible to capture, and how noticeable equipment is upon set-up. The move toward using digital video is also promising for editing and working with video. Analog videotapes, like the ones used during the Exploratorium’s APE project, are subject to a reduction in quality each time the tape is played, paused, or rewound. As far as we currently know, digital video can be viewed countless times without damaging the recording’s integrity or copied countless times without suffering generation loss. Computer based video editing systems are also becoming easier to use with an array of features unavailable to analog video editing systems. Shrum explains that today’s video editing tools are comparable to word processing documents, “Editing software
makes it possible to manipulate audio and visual data as if it were text, that is, to edit, cut, paste, and modify media for analysis, comparison and presentation.**80** However, digital editing programs can have so many bells and whistles that anyone other than professional videographers can be confused by their operation. Dr. J.A. Spiers of the International Institute of a Qualitative Methodology warns, “Don’t be seduced by a range of capabilities that you may never need...the role of a researcher is not to manipulate the [video] data for production, but to manage it and make it understandable**81** When researchers are familiar with DV equipment, including editing software, they can better corral the loads of information that results from recording museum visitor behaviors on video.

Chris Parsons expressed her previous reluctance to use video to collect data. Older video cameras, she explained, were too invasive and disruptive to visitors, affecting their naturally occurring and spontaneous behavior. Yet, with the advent of small and lightweight DV cameras, the intrusiveness factor is reduced when operated by researchers. She praised

**80** Shrum et. al., 2005.

DV cameras since they require very little training, noting that “any idiot can use” them.\textsuperscript{82}

Initial reservations from researchers and evaluators to using video cameras based on their unwieldy size can be alleviated somewhat by access to portable recording devices. This notion is also promising if, like audio recorders, video cameras can be taken into exhibitions by the visitors themselves and used, for example, as timing and tracking tools. Wearable video, for example, is a data collection method currently used in marketing research and can be applied to museum visitor research. A marketing technique described by sociologist Juliet Schor involves teens taking cameras into grocery stores and filming everything they did, “such as what they looked at, which [areas] they lingered in, what they picked up, and what they ultimately chose to put in the cart.”\textsuperscript{83}

Video recording equipment that travels with a research subject captures the details of their action, be it a decision to buy something or to stop at an exhibit, and gets more information than other commonly employed research methods, like surveys and focus groups. Todd Eisen, President of the market research firm, Action Speak, explains that “a

\textsuperscript{82} Chris Parsons, 2005.

particular challenge in qualitative research is that the human mind tends to summarize, and so when you ask customers to recount their experiences…many significant details are glossed-over, if not lost.”\textsuperscript{84} The cameras that Action Speak uses are mounted into the front straps of backpacks that subjects wear into stores. Once their shopping experience is finished, researchers watch and discuss the video with the shoppers. Eisen continues, “It’s not merely enough to look at behavior, to stand at a distance, and to guess-timate why people do what they do, you have to engage them in a conversation.”\textsuperscript{85}

When this method is transferred into the museum, researchers will have the ability to investigate the emotional elements of an experience, described by the visitors themselves. This process would glean valuable information, like what exhibitions were visited and why, and which exhibit elements were attended to by museum-goers. Visitors have the potential to focus on objects in the exhibition, other visitors, museum staff, such as docents or security guards, or themselves by recording their


\textsuperscript{85} Ibid.
personal thoughts. Also, since visitors become their own data collectors, comfort with the data collection tools and method may increase.  

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86 Shrum, et. al., notes that when the social groups they studied were able to use the researchers video cameras themselves, filming researchers, one another, and themselves, “It significantly reduced the tension [caused by the data collection tool] of the encounter.”
Gaining Informed Consent From Visitors to Study Their Behaviors on Video

Once the choice to use video is made, practical issues regarding visitor consent are applicable before the camera can start rolling. The federal guidelines surrounding museum visitor consent to be the subject of study are discussed in the background section of this paper. The information that follows is the description of some creative ways in which museum researchers and evaluators have secured informed visitor consent.

The Exploratorium has conducted several studies using videotape to gather visitor behavior data, using what Dr. Joshua Gutwill calls “The Posted-Sign Method” to inform visitors that they are the subjects of study. As the moniker suggests, this technique involves placing large signs at the entrance of the museum as well as at each individual exhibit, which has also been cordoned off with ropes. During a test of this method, Gutwill discovered that “most visitors (75 percent) did seem to understand…they were being recorded at the exhibit.” To improve on the rate of visitor consent, Gutwill subsequently added the words, “Research in Progress” to the original stand alone signs. He also placed smaller signs on the actual exhibit or the exhibit label. With these additions, the rate of informed

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visitor consent jumped to 99 percent. By law, visitors have to be aware that they are being studied. And the researcher conducting the study is responsible for, at the very least, making a good-faith effort to inform museum patrons of their status as research subjects.

Informed consent laws differ slightly depending on a museum’s funding situation, but researchers primarily affiliated with a university must have signed permission. Leslie Atkins is currently studying family conversations during interactions with exhibits recorded on videotape at small museums in the Northeastern United States. She is required by law to have visitors sign release forms if they agree to be part of her study. At the entrance to the museum, the staff asks visitors if they wish to participate in the research study. If they accept, visitors sign consent forms and stickers are affixed to the back of each participant so they can be identified as they interact with exhibits and each other. When Atkins notices families with stickers on their backs, she is free to turn on the

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89 See the background section “Informed Consent, It’s the Law” for more on the Human Subject Protocol. Briefly stated, any institution that receives federal funding must adhere to federal law regarding the study of human beings. However, if a museum does not receive federal money for a research study, like those conducted at the Monterey Bay Aquarium, gaining informed consent is less stringent. Steven Yalowitz stated in an interview that he spoke with the lawyer for MBA and only has to make a good faith effort to inform visitors they are being watched or recorded. In his efforts to maintain “natural” visitor behaviors, he typically only places signs at the entrance to museum and does not place the video camera in plain sight.
video camera as the group nears an interactive. This method, or a similar one, has been used by several other university-based museum researchers since it is typically approved by a university’s research ethics board. This particular method allowed Atkins to gather data, without interrupting the families she wanted to study and she was able to stay within the legal and ethical parameters of her study.

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90 Leslie Atkins, Interview by Author. 28 April 2005, Dartmouth College, Hanover, NH.
RECOMMENDATIONS

Using video to study visitor behavior data has several advantages over other methods of data collection. Using video helps researchers working with observational data, especially when coding behaviors. Video also saves researchers valuable time, increases communication with other museum professionals, and decreases visitor reactivity to researchers and their data collection tools. Fortunately, visitor researchers and evaluators can benefit even more from using digital video equipment which, for the features needed by most in the visitor studies field, is affordable. The following recommendations for visitor researchers and evaluators will ensure that using video to collect data in museums will be worthwhile.

1. Add video to the visitor research data collection toolbox.

Using video to collect behavioral data can be beneficial for visitor research, for example, when looking for evidence of learning. Video also works well for formative and remedial evaluation and program evaluation, recording focus groups, for instance. Once researchers and evaluators include video in their data collection repertoire, they can take advantage of the mediums affordances. Video captures dynamic and subtle visitor behaviors in both verbal and physical communications. When coding behavioral data, video allows researchers to pause, rewind, and review
visitor actions to ensure proper categorization. Video allows researchers to keep track of individual visitors or visitor groups when they move around a busy exhibition space. On the other hand, if an exhibition is not crowded, video saves researchers time by affording them the ability to fast-forward through periods of visitor inactivity. Finally, using video as a data collection tool reduces visitor reactivity to research instruments and researchers themselves, which result in natural and spontaneous visitor behaviors.

2. Exploit video to communicate with other museum professionals.

Video has been used to communicate for decades and is an aspect of everyday life in a global culture. As such, people understand and are receptive to how the medium transmits information, even if they do not comprehend all of the complications involved in production of a video clip. When communicating with the non-evaluators of an exhibit development team (designers, educators, etc.), this medium is ideal to spark discussions about the visitor behaviors featured in a video clip, enhancing understanding of how exhibition elements are affecting visitors. An additional advantage to the medium is that multiple people can watch and discuss video clips all at the same time. Video data does not have to be completely analyzed and reported to effectively communicate.
However, focused viewing of video clips in a pre-determined research framework will benefit the communication process. Researchers that anchor and interpret visitor behaviors for other museum professionals will ensure that video clips will be a valuable communication tool. Exhibit developers who view video clips of museum-goers using exhibits will be able to see for themselves what successfully engages visitors or stifles their inquiry.

3. Use digital video to open up possibilities unavailable to analog video sources.

Video equipment is constantly being designed to become smaller, easier to operate, produces a higher grade picture, and be less expensive than previous models. Digital video cameras, like the ones featured in department stores, are intended to be hand-held and user-friendly. As such, when researchers and evaluators use these video cameras, collecting valuable video data is less intrusive to visitors than video equipment of the past. Also, when placed at a stationary point, smaller, less intrusive, and possibly concealed video equipment reduces visitor reactivity to research instruments. This includes reactivity to human data collectors, who egregiously stick out in places such as children’s museums. Also, after visitor behaviors have been recorded, the digital video data can be played
back, paused, and searched without causing damage to the quality of the clip, which is not the case with analog sources such as videotape. Data analysis, coding, and presentation of digital video is made even easier considering several affordable software packages designed to assist researchers edit video clips. Finally, storage of digital video will not deteriorate or take up as much physical space as shelves of videotape.

4. **Consider giving digital video cameras to visitors during their museum experience so they become data collectors.**

   Digital video recording equipment offers researchers and evaluators new ways to collect visitor behavior data, which can result in different types of research designs. For example, suppose exhibition developers wanted to know what visitors thought about a new exhibition element or wondered about visitors’ reactions to interpretive labels. Visitor researchers and evaluators could provide visitors with small, portable digital video cameras, or even wearable video cameras to take with them into exhibition space.

   Visitor researchers and evaluators in large museums frequently conduct timing and tracking studies for individual exhibitions. With digital video, not only could visitors record their path through an exhibition, they could record their path through the entire institution, including the gift
shop and restaurant. This institution-wide timing and tracking measurement is both desirable and elusive to researchers. Timing and tracking museum-goers throughout an entire visit, which is more than three hours at some institutions, typically commits too many resources to one objective for one study.

Visitors using digital video equipment could record what they were interested in as well as their likes and dislikes. On the audio track, they could narrate their thoughts and emotional reactions to the exhibition elements and labels, as they occur. Furthermore, there would be no researchers on the museum floor to distract or draw a reaction from visitors. Finally, this technology increases the possibility of visitor enfranchisement in the museum. Visitors would have the power to give all the input they wanted, dynamically, spontaneously, and candidly.

5. **Consider the possibility of exhibition developers building digital video recording equipment into exhibitions.**

Video cameras installed in public places and tourist areas are a typical sight in the United States and Europe. People are so used to interacting with video cameras that their everyday actions and behaviors are not adjusted or interrupted to avoid equipment and they typically do not act any differently. Exhibit developers, visitor researcher, and
evaluators could take advantage of the public indifference, even expectation of being recorded on video. Video equipment built into exhibitions would be beneficial to both developers and researchers. For example if cameras were placed in specific exhibits at visitor sightlines, they could be used for a multitude of purposes. Researchers could simply counting the amount of visitors using the exhibit, track visitor eye-movement while reading labels, or analyze visitor conversations. Video cameras placements designed to cover larger exhibition areas, such as where visitor traffic flows were heavy, could be used to analyze museum crowdedness at any given time. Visitor studies professionals could use data collected this way to sample the entire museum audience and analyze their characteristics. Evaluators could gauge whether an exhibition was drawing as many people as expected. Visitor researchers would be able to measure the amount of visitors to the institution, their gender, their age range, and how long they spend in a particular exhibition.

6. Acquire department specific video equipment.

A problem expressed by several visitor studies professionals during the interviews for this project and during my visitor research study at the Exploratorium was an inability to access video equipment when it was required. Intra-departmental sharing of equipment at museums is
common and sound economic practice, especially if the equipment is versatile, such as photo-copiers, still cameras, or video cameras. However, since visitor research or evaluation ties-up video recording equipment for the duration of studies, typically lasting several months, ensuring access to video equipment is essential.

At the Exploratorium, the same video cameras that recorded the visitor behavior data were the same video cameras used to re-play, pause, and search the videotapes when coding. If the video cameras were being used by another department, I could not watch or code visitor groups, which essentially halted progress on the project. Furthermore, as a result of heavy use, the video cameras broke sooner than they would have under normal use. If the Visitor Research and Evaluation Department at the Exploratorium had their own video equipment, the practical elements of their video studies would be potentially less complicated.

7. Develop museum wide guidelines to gain consent from visitors for research and evaluation studies.

Gaining consent to study visitors to a museum can be intimidating for researchers and evaluators since the process can be difficult to understand, which may result in reluctance by researchers to record visitor behaviors on video. When designing research or evaluation studies,
museum professionals devote valuable time to figuring out the best way to achieve informed consent, often having to meet, discuss, and even research previous visitor study methods. All of the different and innovative ways researchers have achieved consent from visitors to be the subjects of study are buried in methodology sections of articles that been published in decades worth of museum journals (which may or may not be indexed), on an institution’s website, or they may exist solely in the brains of the researcher who developed a particularly creative method. Based on these reasons, one database that features various methods to gain informed consent would seem to suffice. However, research needs and requirements are different in all museums, so the methods that worked well in one museum may not work at all in another. Furthermore, the funding arrangements differ from study to study even in the same institution, so at least two sets of guidelines are needed that correspond to whether or not a particular study uses money from a federal grant or is privately funded through the museum. A set of written guidelines for gaining informed consent can not only save researchers valuable time, these designs can also carry a pre-approved stamp of scientific reliability and moral responsibility.
By following these recommendations, museum visitor researchers and evaluators can use video to open up new realms of understanding museum visitor behaviors. Using video to study these behaviors benefits individual researchers, evaluators, and the entire visitor studies field. In addition, the museum field as a whole can reap the rewards from worthwhile exhibition and program evaluation using video. After all, through visitor studies, museum professionals better understand their audience, place a higher value on their opinions, and further refine and improve of their institutions.
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Using video to collect visitor behavior data in museums is both an exciting and worthwhile use of research resources. Recent technological advancements in video equipment, such as digital video and video editing software, afford visitor researchers a valuable method to document visitor behaviors for study. The following is based on a literature review, interviews, and a visitor study using video conducted at the Exploratorium in San Francisco.

This article will illustrate several advantages to collecting observational data using video and explain how digital video opens up new possibilities for research. Also, since acquiring visitor consent to participate in research can be challenging, this article will document some of the creative solutions researchers have found to address this challenge. Finally, I will provide some recommendations to museum visitor researchers and evaluators interested in using video to collect and study museum visitor behaviors.

Advantages to Using Video as a Data Collection Tool

Using video for data collection has several advantages. Video can tremendously increase the breadth of topics that can be proposed for investigation and allows researchers and evaluators to study visitor behaviors in greater detail for a multitude of purposes. Benefits to collecting visitor behaviors on video for study include: advantages when working with dynamic visitor behavioral data, especially during coding; video saves time; video increases communication between researchers and other museum professionals; and video decreases visitor reactivity to researchers and data collection tools.

- **Human Communication is Highly Visual**

To better understand how video data allows researchers to analyze visitor behavior in greater detail, a description of how people communicate when interacting is helpful. Gestures and other body kinesthesia are heavily involved in communication. People frequently use artifacts when talking to each other and elements of their surrounding physical environment also become relevant during the course of their interactions. Video can capture several elements of a visitor experience, including the aspects researchers
may not be interested in studying (at the time), or may not completely understand. Also, data collected on video affords researchers the ability to conduct other types of studies, at different times, on unrelated topics to the reason the data was primarily collected, at a great benefit to the costs of conducting visitor research and evaluation.

- **Using Video Has Advantages When Coding Visitor Behaviors**

Coding visitor behaviors as they occur in the museum setting can be problematic since it is often difficult to observe behaviors, consider the proper code, record that code on a data collection sheet, and not miss any visitor behaviors. The difficulty increases considerably when coding the dynamic behaviors of visitors to busy and noisy science and technology centers or zoos and aquariums. Using video allows researchers to collect detailed behavioral data that can be searched, replayed, and reviewed several times to ensure proper coding.

During the data coding stage of the visitor research project in which I was involved at the Exploratorium, called “Going APE,” the repeated review of visitor behaviors was necessary. I watched visitor groups for evidence of label use and coding this occurrence was straightforward when visitors read the label text aloud. However, most visitors did not read aloud, they simply looked down or stared ahead at labels. This visual behavior was the only signifier of interaction with a label, one of the important fundamentals of the study.ii

- **Video Saves Researchers Time**

Recording visitor behaviors on video saves time if what the researcher is attempting to study does not occur often, like reading labels. Dr. Steven Yalowitz, the Audience Research Specialist at the Monterey Bay Aquarium (MBA), conducted a label study where recording visitors with video helped him do just that. At MBA, there are a variety of labels each with its own specific purpose, so Yalowitz decided to study how long visitors “attended to” these different types of labels.iii “With video,” Yalowitz explained, “we didn’t have to wait around for a long period before someone looked at a particular label. The video camera can record all day, and then a researcher can fast-forward through the parts where the desired behaviors are not happening.” Interestingly, this
study did not use an audio track in conjunction with video. However, analysis of only visitors’ physical behaviors can tell researchers a plethora of information.

- **Using Video as a Data Collection Tool Decreases Visitor Reactivity**

Looking beyond the realm of museum-related literature to studies conducted by social scientists can be valuable when applied to using video in a museum setting. Three sociologists conducted a study that compares the level of subject reactivity between live researchers using clipboards to collect information and data gathered using a video camera. The results of the study were summed up by stating, “The data suggest that the use of the camera is no more associated with subject reactivity than the paper and pencil mode of observation and recording.”

Another recent study conducted by those in law enforcement found there was little reactivity to being recorded on video. “The study…that placed 684 cameras in parks [and] shopping centers found that crime didn’t fall in most places [and] people said the presence of cameras didn’t make them feel safer.” The presence of video equipment and possibly being recorded on video did not get people to change their behavior, even in tourist areas, like parks, stores, and potentially museums.

- **Video Increases Communication with Museum Professionals**

While using video to study physical nuances during visitor conversations has beneficial attributes, this method can also be used by researchers to increase communication with others. For example, Lisa Hubbell, the evaluator from the California Academy of Sciences, sees the advantages of using video to present information to those who learn in a visual way, including some exhibition designers. She has found that colleagues who do not otherwise embrace evaluation are nevertheless receptive to audiovisual presentation of study findings. While she cautions against the tendency on the part of evaluation clients to identify with comments from individual respondents, she recognizes the strength of video in “bringing to life” evaluation data. With video, evaluators, educators, and exhibit designers have the ability to view and discuss visitor behaviors all in the same room. Also, technological
improvements to video editing (see following section) make it possible to have several versions of the same footage, pieced together in different ways to accommodate different audiences.\textsuperscript{vii}

**Digital Video: Better Data Collection Through Technology**

During the last few decades, video, like audio, has changed format from an analog source (magnetic tape) to a digital source (ones and zeros). As such, the digital video (DV) format has changed the way researchers can record behaviors and edit video data. Also, digital video recording equipment can decrease reactivity effects on visitors, and DV technology can open up new forms of data collection within exhibitions.

Digital video equipment is constantly becoming smaller, easier to use, produces a higher quality picture and sound, and is less expensive than previous models. Researchers have more freedom when considering where to place cameras, which angles are possible to capture, and how visible video equipment is upon set-up.

Analog videotapes are subject to a reduction in quality each time the tape is played, paused, or rewound. As far as we know, digital video can be viewed countless times without damaging the recording’s integrity or copied countless times without suffering generation loss. The move toward using digital video is also promising for editing video.

Computer based video editing systems are also becoming easier to use with an array of features unavailable to analog video editing systems. However, digital editing programs can have so many bells and whistles that anyone other than professional videographers can be confused by their operation. Dr. J.A. Spiers of the International Institute of Qualitative Methodology warns, “Don’t be seduced by a range of capabilities that you may never need...the role of a researcher is not to manipulate the [video] data for production, but to manage it and make it understandable”\textsuperscript{viii}

**Digital Video Affords New Research Possibilities**

Initial reservations from researchers and evaluators to using video cameras based on their unwieldy size can be alleviated somewhat by access to portable video recording devices.
This notion is also promising if, like audio recorders, video cameras can be taken into exhibitions by the visitors themselves and used, for example, as timing and tracking tools. Wearable video is a research method that comes from the marketing field and can be applied to museum visitor research.

Video recording equipment that travels with a research subject captures the details of their action, be it a decision to buy something or to stop at an exhibit. Also, video that travels with research subjects gets more information than other commonly employed methods, like surveys and focus groups. Todd Eisen, President of the market research firm, Action Speak, explains that “a particular challenge in qualitative research is that the human mind tends to summarize, and so when you ask customers to recount their experiences…many significant details are glossed-over, if not lost.” The cameras that Action Speak uses are mounted into the front straps of backpacks that subjects wear into stores, and then once their shopping experience is finished, researchers watch and discuss the video with the shoppers. Eisen continues, “It’s not merely enough to look at behavior, to stand at a distance, and to guess-estimate why people do what they do, you have to engage them in a conversation.”

When this method is transferred into the museum, researchers will have the ability to investigate the emotional elements of an experience, described by the visitors themselves. This process would glean valuable information, like what exhibitions were visited and why, and which exhibit elements were attended to by museum-goers. Visitors have the potential to focus on objects in the exhibition, other visitors in their group, museum staff, such as docents or security guards, or themselves by recording their personal thoughts. Also, since visitors become their own data collector, comfort with the data collection tools and method may increase.

Getting Consent From Visitors to Study Their Behaviors with Video

- Informed Consent

Gaining informed consent from visitors to study their behaviors can be an intimidating process since, in some cases it is required by federal law. If any research funding comes from the federal
government, such as NSF or IMLS grants, visitors must give consent to be subjects in the research study. The following describes some creative ways in which museum researchers and evaluators have secured informed visitor consent.

The Exploratorium has conducted many studies using videotape to gather visitor behavior data, using what Dr. Joshua Gutwill calls “The Posted-Sign Method” to inform visitors that they are the subjects of study. As the moniker suggests, this technique involves placing large signs at the entrance of the museum as well as at each individual exhibit, which has also been cordoned off with ropes (see Figure 1). During a test of this method, Gutwill discovered that 99% of visitors understood they were being videotaped.
Figure 1: Video Equipment Set-up at the Exploratorium. Used by author's permission. Curator © 2003.

A. Signs at entrances to exhibit area
B. Camera
C. Microphones
D. Signs on exhibits in area
E. Signs on cordons
• **Signed Consent**

Consent laws differ slightly depending on a museum’s funding situation and some researchers must have signed permission from visitors before they can use video to record their behaviors. Leslie Atkins, a doctoral student at Dartmouth College, is studying family conversations recorded on videotape at small museums in the Northeastern United States. She is required by law to have visitors sign release forms if they agree to be part of her study.

Visitor consent starts at the entrance to the museum. The staff asks visitors if they wish to participate in the research study. If they accept, visitors sign consent forms and stickers are affixed to the back of each participant so they can be identified as they interact with exhibits and each other. When Atkins notices a family with stickers on their backs, she is free to turn on the video camera as the group nears an interactive.¹⁻² This method, or a similar one, has been used by several other university-based museum researchers since it is typically approved by a university’s research ethics board. This particular method allowed Atkins to gather data, without interrupting the families she wanted to study and was able to stay within the legal and ethical parameters of the study.

**Recommendations to the Visitor Researchers and Evaluators Interested in Using Video to Collect and Study Visitor Behavior Data**

The following recommendations to museum professionals who conduct visitor research and evaluation studies will ensure they use video as a worthwhile data collection method in museums.

1. **Add video to the visitor studies data collection toolbox.**

Using video to collect behavioral data can be beneficial for visitor research, for example, when looking for evidence of learning. Video also works well for exhibition evaluation, such as formative and remedial studies, and program evaluation, recording focus groups, for instance. Video captures dynamic and subtle visitor behaviors and both verbal and physical communications.

When coding behavioral data, video allows researchers to pause, rewind, and review visitor actions to ensure proper categorization. Video allows researchers to keep track of
individual visitors or visitor groups when they move around a busy exhibition space. On the other hand, if an exhibition is not crowded, video saves researchers time by affording them the ability to fast-forward through periods of inactivity. Finally, using video as a data collection tool reduces visitor reactivity to research instruments and researchers themselves, which result in natural and more spontaneous visitor behaviors.

2. **Exploit video to communicate with other museum professionals.**

When communicating with the non-evaluators of an exhibit development team (designers, educators, etc.), this medium is ideal to spark discussions about the visitor behaviors, enhancing the understanding of ways to improve exhibitions or how exhibition elements are affecting visitors. For example, exhibit developers who view video clips of museum-goers using exhibits will be able to see for themselves what successfully engages visitors or stifles their inquiry. An additional advantage to the medium is that multiple people can watch and discuss video clips all at the same time.

3. **Use digital video to open up possibilities unavailable to analog video sources.**

Video equipment is constantly being improved and becoming less expensive. Digital video cameras, like the ones featured in department stores, are intended to be hand-held and user-friendly. As such, when researchers and evaluators use these video cameras, collecting valuable video data is less intrusive to visitors than video equipment of the past. Also, after visitor behaviors have been recorded, the digital video data can be played back, paused, and searched without causing damage to the quality of the clip, which is not the case with analog sources, like videotape. Data analysis, coding, and presentation of digital video is made even easier considering several affordable software packages designed to assist researchers edit video clips. Finally, storage of digital video will not deteriorate as fast or take up as much physical space as shelves of videotape.

4. **Consider giving digital video cameras to visitors during their museum experience so they become data collectors.**

Digital video recording equipment offers researchers and evaluators new ways to collect
visitor behavior data, which can result in different types of research designs. For example, suppose exhibition developers wanted to know what visitors thought about a new exhibition element or wondered about visitors’ reactions to interpretive labels. Visitor researchers and evaluators could provide visitors with small, portable digital video cameras, or even wearable video cameras to take with them into exhibition spaces.

Exhibit developers, visitor researchers, and evaluators in large museums frequently conduct timing and tracking studies for individual exhibitions. With digital video, not only could visitors record their path through an exhibition, they could record their path through the entire institution, including the gift shop and restaurant. This institution-wide timing and tracking measurement is both desirable and illusive to researchers. Without video, timing and tracking museum-goers throughout an entire visit, which is more than three hours at some institutions, typically commits too many resources to one objective for one study.

Visitors using digital video equipment could record what they were interested in and what they liked and disliked. On the audio track, they could narrate their thoughts and emotional reactions to the exhibition elements and labels, as they occur. Furthermore, there would be no researchers on the museum floor to distract or draw a reaction from visitors. Finally, this technology increases the possibility of visitor empowerment in the museum. Visitors would have the opportunity to give all the input they wanted, dynamically, spontaneously, and candidly.

5. Acquire department specific video equipment.

A problem expressed by several visitor studies professionals during the interviews for this project was an inability to access video equipment when it was needed. At the Exploratorium, the same video cameras that recorded the visitor behavior data were the same video cameras used to re-play, pause, and search the videotapes when coding. If the video cameras were being used by another department, I could not watch or code visitor groups, which essentially halted progress on the project. Furthermore, as a result of heavy use, the video cameras broke sooner than they would have under normal use. If the Visitor
Research and Evaluation Department at the Exploratorium had their own video equipment, the practical elements of their video studies would be potentially less complicated.

**Summary**

Whether researchers are looking for moments in which visitors learn or evaluating the effectiveness of exhibitions, they must be able to collect and analyze the dynamic data in detail and accuracy. Using video, especially in a digital format, to collect and study visitor behaviors has several benefits.

- Using Video Has Advantages When Coding Visitor Behaviors
- Video Saves Researchers Time
- Using Video as a Data Collection Tool Decreases Visitor Reactivity
- Video Increases Communication with Museum Professionals
- Digital Video Affords New Research Possibilities

For those interested in using video, I recommend the following:

1. Add video to the visitor research data collection toolbox.
2. Exploit video to communicate with other museum professionals.
3. Use digital video to open up possibilities unavailable to analog video sources.
4. Consider giving digital video cameras to visitors during their museum experience so they become data collectors.
5. Acquire department specific video equipment.

By following these recommendations, museum visitor researchers and evaluators can use video to open up new realms of understanding visitor behaviors. Using video to study museum visitor behaviors benefits individual researchers, evaluators, and the entire visitor studies field.
Endnotes


ii For more information about the “Going APE” study, contact Dr. Joshua Gutwill, Senior Researcher at the Exploratorium. joshuag@exploratorium.edu.

iii The term “attended to” includes visitor attention to an exhibition element, in this case labels, for a minimum of two seconds.


vi Lisa Hubbell, Interview by Author. 13 April 2005, San Francisco.


x Shrum, et. al., notes that when the social groups they studied were able to use the researchers video cameras themselves, filming researchers, one another, and themselves, “It significantly reduced the tension [caused by the data collection tool] of the encounter.”


xii Leslie Atkins, Interview by Author. 28 April 2005, Dartmouth College, Hanover, NH.