The Impact of Character Actors at the London Transport Museum

The Impact of Character Actors at the London Transport Museum

An Interactive Qualifying Project submitted to the faculty of

WORCESTER POLYTECHNIC INSTITUTE

In partial fulfillment of the requirements for the Degree of Bachelor of Science

Submitted by:

Jacqueline Ciesynski
Charlotte McDonnell
Mark Mordarski
Matthew Rotier

Project Advisors:
Dominic Golding and Ruth Smith

Sponsor Liaison:
Elizabeth Puddick
The London Transport Museum

April 29, 2010

Abstract

The London Transport Museum employs character actors as one method of enhancing visitor understanding and appreciation of social aspects of the past. This project was to evaluate the museum's use of character actors. We used various methods to assess visitor interaction, enjoyment, and learning, including tracking, observing, and surveying visitors. The results from our research were analyzed to determine that the attractiveness for five exhibits increased and the holding power for all eight exhibits increased when the characters were present at their corresponding exhibits. Overall the program is a success.

Authorship

This report was developed through a collaborative effort by all of the members of the London Transport Museum 2010 Team: Jacqueline Ciesynski, Charlotte McDonnell, Mark Mordarski, and Matthew Rotier. All sections were developed as a team, with each member contributing equally.

Acknowledgements

Our team would like to thank our sponsor, Elizabeth Puddick for giving us the opportunity to work on our project with the London Transport Museum. We would also like to thank Richard Hodder and the actors of Spectrum Drama, for taking time to speak with us. We would also like to extend our gratitude to the London Transport Museum Learning Team and the museum staff for their hospitality and generosity, which helped us to acclimate to working in London. Finally we would like to thank our advisors Dominic Golding and Ruth Smith for providing us with advice and feedback that helped us in completing a successful project.

Executive Summary

Background

The London Transport Museum was started by the London General Omnibus Company in the 1920s with two Victorian horse buses and an early motorbus. The museum's current collection consists of many vehicles, some dating as far back as the late 1700's. The museum uses many different methods to present information to the visitors. One particular way is through the use of character actors. Actors from Spectrum Drama are stationed throughout the museum and speak to visitors about different aspects of transportation in their "day." In this project, we evaluated the effect the characters have on visitors' experience at the museum and explored how the program may need to be modified. Table 3 shows the nine characters evaluated and their respective exhibits.

Table 1: Exhibits and Associated Characters

Exhibit Number	Exhibit Name	Character
L0-54	1911 B-Type Motorbus	B-Type
L0-73	1970 DMS Bus	Punk
L0-11	Electric Locomotive and Coach	CSLR
L0-05	Going Deeper Underground	Miner
L1-08	Metropolitan Railway Coach	1930's Woman
L1-03	Metropolitan Railway Steam Locomotive	Fireman
L2-21	Shillibeer Horse Bus	Shillibeer Bus Driver Victorian Passenger
L2-16	Tilling Horse Bus	Crossing Sweeper

Objectives and Methods

The project team sought to answer four primary questions:

- Do visitors meet the characters?
- Does meeting the characters enhance the visitor's experience?
- Do visitors learn things they would not have otherwise?
- Are characters used in the proper locations?

To address these questions, three primary methods were used to collect the necessary data:

- Observations of visitors at selected exhibits

- Visitor surveys
- In-depth interviews with character actors.

Our first objective was to determine whether or not visitors met the characters. We did this by observing character/visitor interactions. We counted the number of visitors entering a gallery and, of that number, counted how many interacted with the exhibit and/or the character being evaluated. This was done, with and without a character present, to determine the character's effect on the exhibit's attractiveness as well as the percentage of visitors who interacted with the character.

The second objective and third objective were very similar and as such we used a similar method to address these. Through these objectives we needed to determine if the visitor's experience was enhanced through meeting the character and if the visitors learned things they would not have otherwise. We did this by conducting visitor surveys to glean additional information about the visitors' experience at the museum. The surveys were given orally to visitors we observed interacting with the character. The surveys provided data about how much knowledge visitors retained during their visit and helped determine the visitor's experience with the character in the museum.

Our final objective was to determine if characters are used in the proper location. While we were collecting data on visitor/character interactions and dwell times, we observed that the location of the character played an important role in both the attractiveness and holding power of an exhibit. We compared these observations with the data collected from our visitor observations to determine if and how characters could benefit from modifications to their placement.

Breakdown of Results

By analyzing the attractiveness and holding power of each exhibit, with and without the character present, and surveying visitors, we were able to answer all four of the proposed questions.

Using the data we collected from observing dwell times, we developed decay curves to illustrate the holding power of the exhibits with and without the characters. A decay curve displays the percentage of visitors remaining at an exhibit after a certain amount of time has passed. For example, as seen in Figure 1, without the character present, 18% of the visitors were still at the Metropolitan Railway Coach after two minutes. From the decay curves shown in Figure 1 and Figure 2, we can see that there was a substantial increase in holding power when a character was present.

Figure 1: Decay Curve without Character

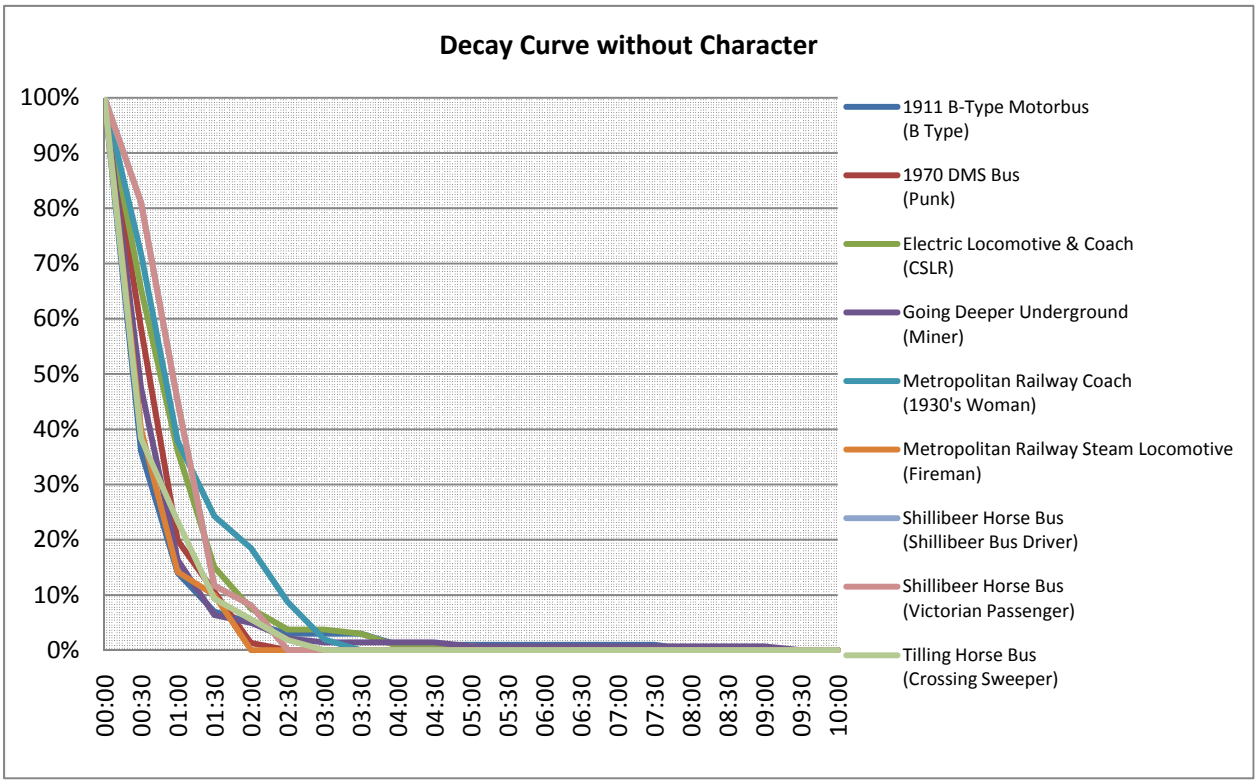
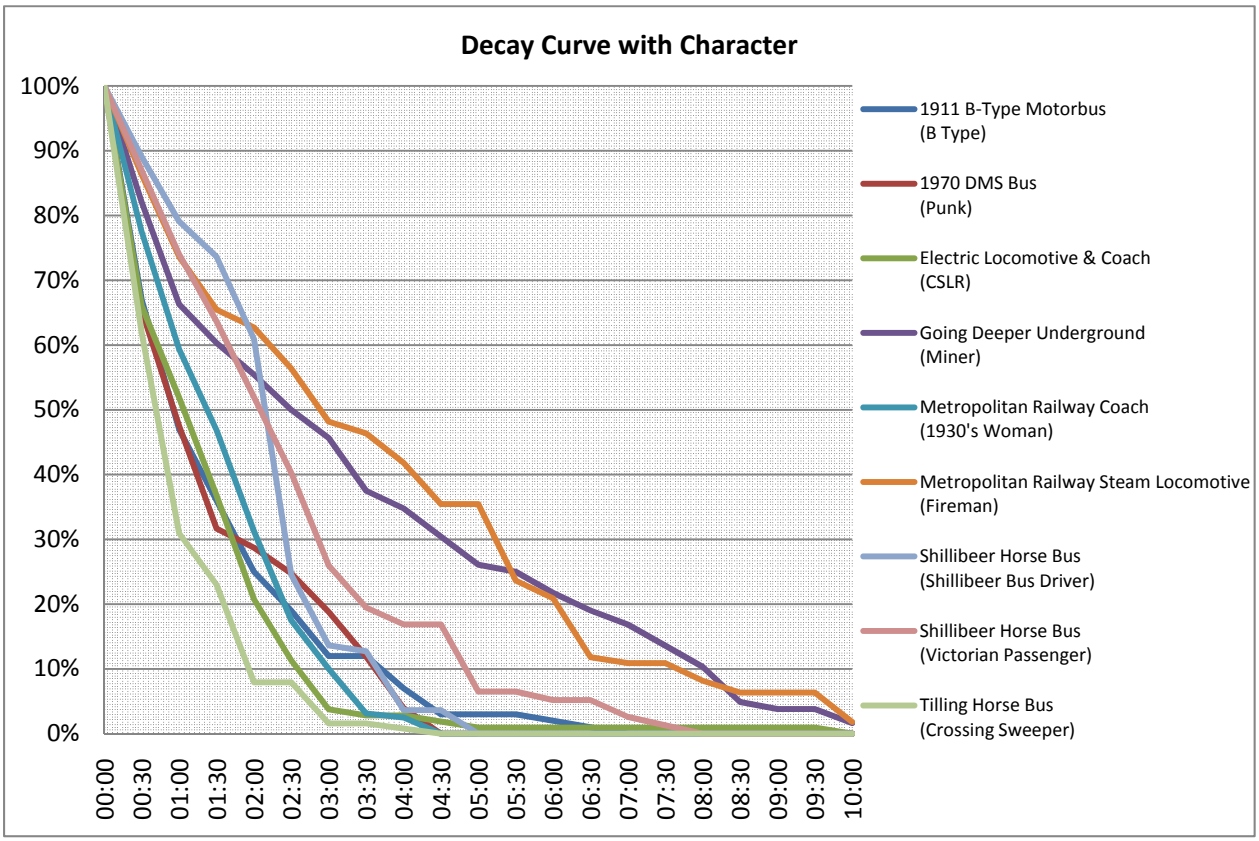


Figure 2: Decay Curve with Character



Without the character present, less than 10% of visitors spent more than two minutes at the exhibits, with the exception of the Metropolitan Railway Coach. When a character was present, all exhibits except the Tilling Horse Bus had at least 20% of visitors remaining after two minutes, with the greatest being the Shillibeer Bus Driver with 61%. The Miner and Fireman had the greatest holding power. After six minutes, 20% of the visitors were still interacting with the exhibit.

Overall Assessment

Our observations indicated that 51% of visitors that entered a gallery, when characters were not present, interacted in a meaningful way with the eight exhibits included in the evaluation. When a character was introduced to an exhibit, the average percent of interaction increased to 55%. This shows that the addition of a character, on average, increased the attractiveness of an exhibit by 4%.

Taking this into account, we observed that the visitors do indeed interact with the characters in the museum. In the case of inherently less attractive exhibits, characters can substantially increase the attractiveness of that exhibit. When a character was present, 55% of visitors in a gallery interacted with the exhibit and/or character (Figure 4). Of those who interacted, 65% either spoke to or listened to the character specifically (Figure 3).

Figure 4: Overall Percent of Interaction

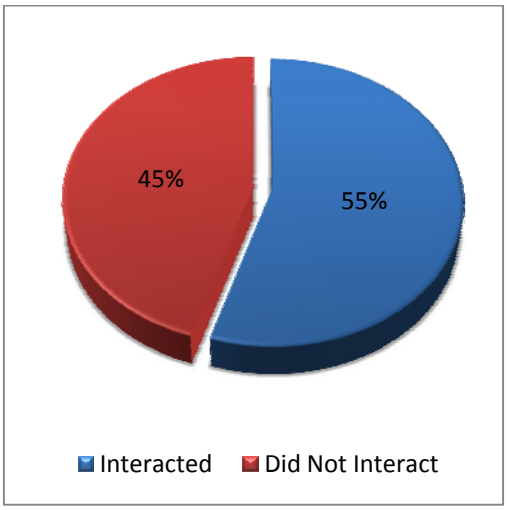
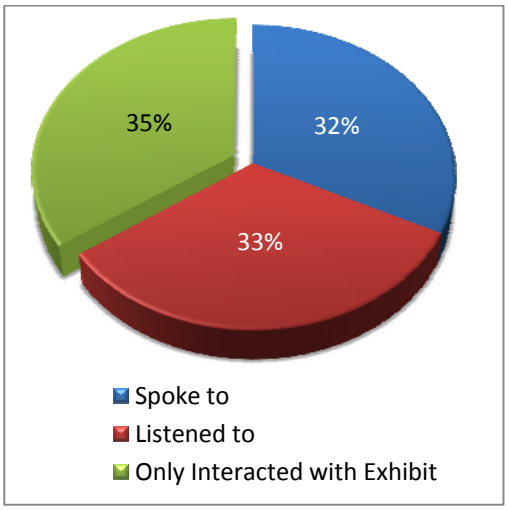


Figure 3: Overall Extent of Interaction



Our direct observation of the visitors also showed that the vast majority of their time spent interacting with the characters was spent towards learning. The advantage of characters, in regards to learning, lies in their ability to adapt to the interests of the visitor. To evaluate this, we surveyed visitors who interacted with the characters. When asked whether or not they learned anything from their interaction with the character, 71% responded that they had. One common example provided was for the Shillibeer Bus Driver. Many visitors who were surveyed said that they had learned how the bus fare dropped from a shilling to a penny, which allowed more people to take the bus. From these specific responses and others, there was supporting evidence to show that visitors learned from their interactions with the characters. Our overall conclusion on the use of character actors in the London Transport Museum is that they provide a quality experience that is unique from any other medium in the museum.

Recommendations

Although our evaluations provided positive feedback for the use of all of the characters, we do have recommendations for maximizing their use. These include modifying the placement, behaviors and props, costumes, and scheduling of characters.

From our observations, we noticed that the placement of the character within and around the exhibit played a major role in the exhibits attractiveness. The placement of some characters inhibited the flow of visitor traffic at their exhibit, discouraging interaction. The three characters who we believe would benefit from being moved are the Punk, the CSLR, and the 1930's Woman.

Two other important factors that played major roles in the attractiveness of a character are their behavior and their props. We observed that characters who took a more proactive approach to attracting visitors, both through the use of props and by initiating conversation, had a higher percentage of interaction. Two characters who we believe can benefit from the use of props and/or the modification of behavior are the Crossing Sweeper and the 1930's Woman.

Costumes play an important role in the distinction between characters and visitors. We observed that most of the characters wore costumes that made them easily identifiable as characters. Characters such as the Punk and the 1930's Woman had less distinguishable costumes. We noticed that many people did not realize that they were characters initially. We suggest looking into ways of increasing the character's visibility.

The final recommendation we have has to do with the scheduling of the characters. Throughout our study, we observed that when characters, who were on Level 0, were scheduled to begin at 11:00 AM, they had very few interactions within the first hour compared to those who were on the top two levels. This was because the museum opens at 10:00 AM and most visitors began their visit on Level 2 and worked their way down. From this, we recommend that any characters on Level 0 should begin no earlier than noon.

Table of Contents

List of Figures

List of Tables

Introduction

Over the past century, there has been an ongoing shift in museum ideology. Many museums, especially science and children's museums, have shifted emphasis from formal, didactic exhibits and teaching methods to incorporate more interactive, engaging methods that draw on behaviorist and constructivist notions of education and learning. Museums have adopted more varied ways to present information. Audio tours, visual displays, computers, live shows, and hands-on activities are all modern methods of increasing visitor engagement and interest in the subject matter. Employing character actors is another way museums aim to enhance the visitor experience.

Many historical museums use character actors to bring the exhibits to life and better convey the social aspects of life in the past (Anderson, 1982). Character actors provide a unique museum experience that cannot be achieved through didactic or other kinds of interactive exhibits. "Museum personnel use living history to interpret the life of the past to the public. Living history is above all concerned with realistic or authentic experience" (Handler, 1987). Unlike static exhibits, or even sophisticated interactive exhibits, knowledgeable character actors can tailor the experience to match the demographics and interests of the visitor, and create a unique human interaction and a more immersive and enjoyable experience.

The London Transport Museum's approach to enhancing visitor experience has been a constantly evolving process with the shift from solely preservation to that of both preservation and education. They began using character actors in the 1990's as a way to further connect to their visitors (Hodder, 2010). The renovation and reopening of the museum in 2007 brought with it a shift in focus to include the social effects of transportation (E. Puddick, personal communication, January 28, 2010). The character actors play a central role in this effort.

Despite years of operation, the museum had not conducted a formal evaluation of the character actor program. The goal of our project was to determine how the actors affect the visitor's experience. Specifically, we were interested in determining how visitors interact with the actors, if visitor engagement and learning are enhanced by such interactions, and if the actors are stationed properly within the museum (E. Puddick, personal communication, January 28, 2010). We answered these questions by surveying visitors, observing visitor behavior in the museum, and interviewing the actors. The following section includes background research pertaining to our project.

Literature Review

Millions of people visit museums every year. In fact, more people in the United States visit museums in a given year than attend professional sports events (Ivey, 2000). Similarly, official Tourist Board figures indicate that more people visit museums in Great Britain than go to football (soccer) matches (Pearce, 1994). People visit museums for many reasons, but regardless of their motives for visiting, learning is always an outcome. The following section will cover the purpose museums play in society, how learning is facilitated and evaluated in the museum setting, and how character actors are used to enhance interaction and learning in museums.

Purpose of Museums

Museums are generally considered to fulfill a threefold mission. First, they serve as depositories devoted to the preservation and conservation of objects. Secondly, they provide samples of the objects or natural environment related to human culture in different times and societies. Finally, they are centers of research and education (Wittlin, 1970). The International Council of Museums (ICOM) defines a museum as "a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment" (International Council of Museums, 2009).

How museum professionals think of museums differs greatly from how a visitor would describe one. When asked to describe a museum, a museum professional would likely provide a formal definition, as provided by ICOM or describe particular collections and programs, whereas "visitors will say: 'It's a nice place to take children to show them their heritage,' or 'The museum is a wonderful place to take out-of-town visitors. It's interesting, inexpensive, and fills up a day,' or 'The museum is a quiet place where I can escape from the work-a-day world'" (Falk & Dierking, 1992).

Museum professionals and visitors think of museums differently, but museum professionals do not necessarily hold similar views among each other either. The London Transport Museum, like many others, started out as an institution whose purpose was merely to preserve objects for future generations. Over the years, however, many museums have shifted the emphasis of their approach from that of preserving artifacts to educating visitors. With this shift many museums have augmented their mission statements to include terms such as education and even entertainment, while still placing importance on the preservation of artifacts and knowledge. By placing more emphasis on the inclusion of education and entertainment within their museum than in the past, they have been able to expand the audience that they wish to engage.

While one may try to break down a museums purpose into one of these two dichotomies, they would be simply generalizing what a museum is. There are subtle differences in how a museum functions and to attempt to classify a particular museum into one category would be underestimating the complexity of the museum world and culture. The London Transport Museum can then be viewed as not only a place for preserving the objects within it, but as a center for imparting knowledge and understanding to visitors as well.

Educational Theory

"Everything that a visitor experiences contributes to the educational role of [a] museum. The architecture of the museum, the arrangement of the galleries , the style of the signage welcoming the visitors, the composition of the staff, all contribute to communicating a museum's educational policy" (Hein, 1998). When discussing a museum's role in education, one must first understand what knowledge is and how one learns it.

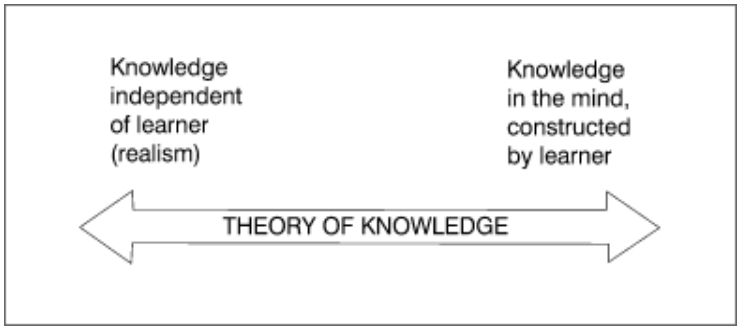
Theory of Knowledge

The term Epistemology was first introduced into the English language by the Scottish philosopher, James Frederick Ferrier. Epistemology, or the theory of knowledge, is the study of what knowledge is and how one comes to have knowledge. "Among the many topics included in epistemology are logic, belief, perception, language, science, and knowledge… In this respect, epistemology cannot be investigated without regard to what there is" (Silverman, 2008).

Realism vs. Idealism

In learning theory the idea of epistemology has been debated since the time of Plato and Socrates. What is knowledge and how do individuals obtain it? Most epistemological theories can be categorized on a range between two extremes: realism and idealism. The positions of other ideologies can be illustrated along this idea of a continuum, as seen in Figure 5 (Hein, 1998).

Figure 5: A Continuum of Theories of Knowledge



(Hein, 1998)

Realism consists of a whole set of theories claiming that the "real" world exists independent of any ideas humans may have about it. Plato argued, that "our perceptions of the

world were only poor imitations of the real ideas, and that dialog and reason (not experimentation and interaction with nature) could bring us closer to an understanding of these true ideas" (Hein, 1998).

Idealism, which directly opposes realism, is the view that knowledge exists only in the human mind. "There can be no ideas, no generalizations, no "laws of nature" except in the minds of people who invent and hold these views" (Hein, 1998). British philosopher, George Berkeley, a famous proponent of idealism, argued that "sensations of the world depend on human minds for their existence" (Hein, 1998). He also argued that there was no real existence of physical constructs. Notable constructivist, von Glaserfeld, made more extreme statements regarding this position and called it, "radical constructivism" (Hein, 1998).

Objectivism vs. Constructivism

Two well known and much debated ideologies that fit into the continuum from Realism to Idealism are Objectivism and Constructivism. Objectivism is the idea that "knowledge and truth exist outside the mind of the individual and are therefore objective" (Runes, 1962). Knowledge therefore exists in the physical world and is obtained through teaching students to understand the real world. It is thought that there is a specific mass of knowledge that should be conveyed to the learner and thus learning is viewed as the acquisition and accrual of a finite set of skills and information.

There are subcategories of Objectivist theory, the main two being Behaviorism and Cognitivism. Behaviorism turned learning into a science. Behaviorists developed an associational notion of learning: there is a stimulus that the learner perceives, then there is a response that follows, with which a material, concept or fact is learned. Cognitivism, on the other hand, claims that knowledge is created as one interacts with the environment. Information forms branches in one's mind and as one learns they are simply connecting the branches (Dierking, 1992).

Constructivism is the idea that "knowledge and truth are constructed by people and do not exist outside the human mind" (Duffy & Jonassen, 1991). John Dewey, another philosopher to discuss constructivism, stated "education is a constant reorganization or reconstructing of experience" (Dewey, 1916). Dewey and later Merrill described learning as a process of creating knowledge through experience. It was an active process and interpretation of reality was personal, there was no such thing as shared reality (Merrill, 1991).

Although these theories are contradictory in nature, they can be combined to form an instructional design paradigm. According to Jonassen, knowledge acquisition is useful during

introductory stages where learners can be given practice routines and adequate feedback. As the learner progresses, they can move into a less structured domain in which they are expected to function at a more advanced level of knowledge acquisition. Lastly there is the expertise level in which learners must rely on their experience to solve more complex problems or issues. Expert learners are expected to be self-directed critical thinkers and even instructors (Jonassen, 1991).

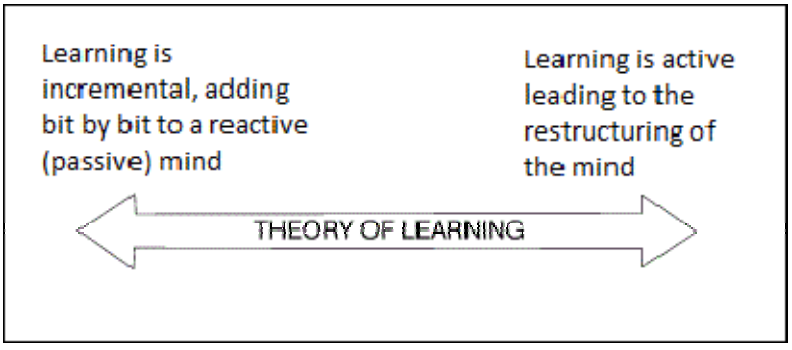
"For any theory of museum education, epistemological positions, whether articulated or tacit, determine how a museum decides what it is that is contained within its walls and how it should be displayed" (Hein, 1998). Museums that take a realist position, will likely group objects together that seem to fit together by the "nature of the subject", while museums with the idealist epistemology might arrange their exhibits to show multiple perspectives or in a way that allows for individuals to draw their own conclusions after interacting with it (Hein, 1998).

Epistemology and learning theory are separated in principle, but are still relatable in relevance to education in museums. Hein uses the example of the structure of textbooks and museum exhibits to explicate the presentation of material to the reader. The simplest information was presented first little by little, but what constitutes simplicity? "If 'simplicity' (defined as "requiring the least mental effort") is considered only as the outcome of a logical analysis of content, then it refers exclusively to theory of knowledge; if 'simplicity' is defined with reference to a theory about how the mind of the learner works, then it slips over into learning theory" (Hein, 1998).

Learning Theory

Learning Theory, like epistemology, can be illustrated on a "continuum with two clear contrasting positions at its extremes" (Hein, 1998). At one end of the spectrum (Figure 6) is the absorption-transmission model, in which "individuals were assessed to determine whether they learned *specific, predetermined* information" (Falk, 1999). The idea is that people learn by absorbing information in small amounts, adding it to their collective "storehouse of information"(Hein, 1998).More recently investigators have come to realize the problems with this model. Prior experiences, knowledge and interest about certain topics range vastly from visitor to visitor and must therefore be taken into account when assessing learning.

Figure 6: A Continuum in Learning Theories



(Hein, 1998)

At the other end of the spectrum is a group of learning theories that are based on the constructivist ideology that people construct knowledge. “Much of the recent educational theory, following the writings of John Dewey, the empirical work of Piaget and his followers, and the socially situated theories of learning of Vygotsky and others, emphasizes the active participation of the mind in learning” (Hein, 1998). This idea of conceptual learning involves the person to actively create associations and is measured by the associations, comparisons, generalizations, analyses, and syntheses people make when asked open ended questions about exhibits (Donald, 1991).

There are also certain conditions that need to be met in order for a visitor to learn at museums. Prior knowledge is essential for people to make associations and learn new things. “A large body of findings shows that learning proceeds primarily from prior knowledge, and only secondarily from the presented materials” (Roschelle, 1995). Hein states that another important condition for learning in museums is visitor comfort. He defines visitor comfort as everything from physical comfort (places to rest and convenient facility locations) to psychological comfort (uneasiness people feel in wide open or constrained areas) (Hein, 1998).

Hein also states that visitors cannot learn without interaction. “In order for learning to occur in the museum, the visitor has to attend to something” (Hein, 1998). Visitor engagement is therefore used as a prerequisite for learning. The idea is that the longer visitors stay at a particular exhibit, the more they will learn. The challenge for museums is to provide an experience that is interesting and enjoyable as well as educational (Briggs, 2000). The primary terms used when assessing the success of an exhibit are attracting power and holding power. Attracting power refers to the demographics and number of visitors that view an exhibit. Holding power refers to the amount of time visitors spend examining an exhibit (Donald, 1991). Measuring visitor engagement is a complex and complicated task. Because holding power and attractiveness are more easily measured, they are commonly used as surrogates to measure engagement.

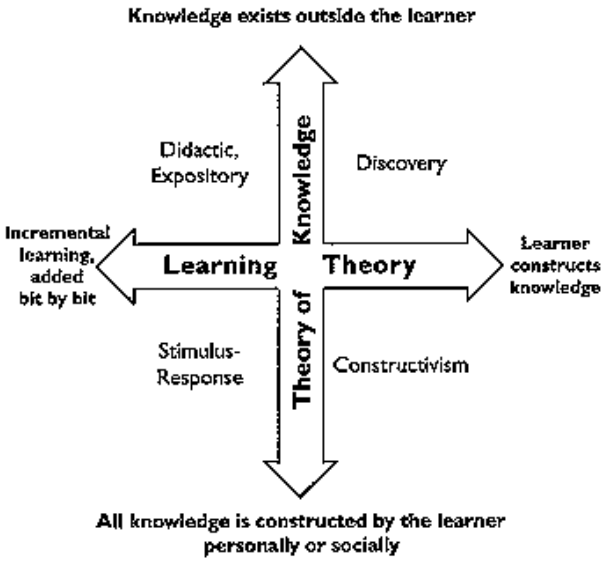
Educational Theories

The two continuums of epistemology theory and learning theory can be “juxtaposed on each other orthogonally to create four domains” (Hein, 1998), each describing a different type of educational theory. The four educational theories are: Didactic, Expository; Stimulus-Response; Discovery; and Constructivism, as seen below in Figure 7.

Didactic, Expository

From the diagram in Figure 7, the "epistemological challenge for the [museum that] subscribes to the views contained in this quadrant is to represent the 'true' content in an orderly fashion" (Hein, 1998), from simple to complex and in small units that are easy to absorb. Museums that subscribe to the didactic, expository educational theory intend on telling a story that has a beginning and end and presents information that is in fact "true" (Hein, 1998).

Figure 7: Educational Theories



(Hein, 1998)

Exhibitions in this type of museum are usually displayed in sequential order with a clear beginning and end. They contain didactic components such as labels and panels that contain facts and figures telling the visitor what they should learn from the exhibit. The information is typically set up to present the simple concepts first and working towards the more complex concepts.

Stimulus- Response

The stimulus-response theory falls into the domain sharing incremental learning theory with didactic, expository, but makes "no claim for objective truth of what is learned" (Hein, 1998). This form of educational theory ties directly back to behaviorist psychology. "Stimulus-response theory refers only to the outcome of a specific stimulus" (Hein, 1998).

Museums organized in line with the stimulus-response theory, have exhibits similar to those of the didactic, expository theory. The exhibits may have panels and plaques. They are often in sequential order, and are intended for pedagogic purposes. However, rather than simply presenting facts and figures the panels may include reinforcing components, such as a "positive written or computer screen response ("Yes, that's the right answer!") when a visitor pushes the correct button, lifts the appropriate flap, or arranges items in the correct sequence" (Hein, 1998). This approach, unlike the didactic, expository approach, cannot legitimately make the claim that they are presenting the truth, because it falls under the epistemology that truth is constructed by the learner.

Discovery

With the discovery theory's shift across the learning theory spectrum, the language describing educational theory shifts as well from "expository *teaching* [to] discovery *learning*" (Hein, 1998). "The diagram refers to the theory underlying educational practice. What actually takes place is inevitably more complex" (Hein, 1998). An anonymous "discussant from a conference pointed out that just because teaching is inductive, it does not follow that the learner is discovering. Conversely, simply because the teacher is instructing didactically, discovery experiences on the part of the learner are not precluded" (Shulman & Keislar, 1966). The main problem regarding this theory is that it is moving to the right of the diagram implying that the learner should actively construct their own knowledge, but at the same time draw the conclusions determined by others (Hein, 1998).

Despite its problems, there is still interest in discovery learning. Museums that are structured with the discovery theory in mind usually have exhibitions that encourage exploration. The exhibits may include a wide range of active learning modes, such as panels and labels that ask questions and prompt the visitors to figure things out for themselves.

Constructivism

The last quadrant of educational theory, illustrated in Figure 7, is constructivism. This theory proposes that learning requires the learner to discover information and formulate their own conclusions from what they discover. As stated above in the learning theory section, Dewey as well as well as others put great emphasis on the active participation of the mind in learning.

This recognition of requiring active participation on the part of the learner is the first step in constructivist theory. The second being that, "constructivist education requires that the conclusions reached by the learner are not validated by whether or not they conform to some external standard of truth, but whether they 'make sense' within the constructed reality of the learner" (Hein, 1998).

Like the exhibitions found in the discovery ideology, constructivist exhibitions will allow for visitors to construct knowledge from what they are presented with. These exhibits will not, however, offer validation or confirmation that what the visitor is constructing is "correct" or that their conclusions line up with what the curatorial staff intends to portray. Constructivist exhibitions will have many entrances, with no predetermined path or route through the galleries. They may present a wide range of active learning exhibits and multiple points of view. The exhibits "will enable visitors to connect with

objects (and ideas) through a range of activities and experiences that utilize their life experiences. [Visitors will be encouraged to] experiment, conjecture and draw conclusions" (Hein, 1998).

While didactic, expository exhibits were the traditional source of education in museums, more museums have begun to include a constructivist approach to designing their exhibitions. Many museums have multiple functions and ideologies, and often times they overlap (Linn, 1983). For instance museums have been and/or are now expanding their educational policy beyond that of simply presenting the facts and including a more interactive, Constructivist environment (Wittlin, 1970). The use of hands-on exhibits and character actors are a few of the methods that have been implemented by museums to include different types of educational theories within their educational policy. Without subscribing to one particular ideology, the integration of these theories allows for museums to expand their audiences and thus allow more visitors to learn from the museum.

Evaluating Exhibitions

With the amalgamation of educational theories mixed to create a museum's exhibitions, there needs to be a way to evaluate the effectiveness of different exhibitions. There is a universal standard of evaluating learning available for museums in the UK. It is known as Generic Learning Outcomes, or GLO. Most museums use this method or some adaptation of it. GLO consists of 5 major categories of outcomes: Knowledge and Understanding; Skills; Attitudes and Values; Enjoyment, Inspiration, and Creativity; and Activity, Behavior, and Progression (Museums, Libraries and Archives Council, 2008).

Many museums will develop programs and exhibits that are evaluated on all of these categories to a greater or lesser extent. Museums, whose programs are designed mainly to convey knowledge and understanding, want to help visitors learn about a particular topic. They focus on presenting facts and hope to deepen the visitors understanding of the subject. On the contrary, museums, whose programs are designed mainly to teach visitors skills, tend to worry less about the knowledge of what an object is and more on how to use it. While basic information regarding the background of an object is not disregarded completely, the main goal of the program is to show how something is done. The museum concentrates on how to build a visitors' social, communication, physical, and intellectual skills (Museums, Libraries and Archives Council, 2008).

Affecting attitudes and values are also important to museums. The desire to affect a visitor's feelings, opinions and perceptions is a common outcome museums hope to achieve. As Silverstone states, "The meaning of an object does not stop with its display or the description offered of it in the

adjoining label. The meaning of the object continues in the imaginative work of the visitor who brings it to his or her own agenda, experiences and feelings" (Durant, 1992). The attention to motivation, empathy and attitudes of the visitors speaks especially to art and history museums (Museums, Libraries and Archives Council, 2008).

One of the final two outcomes that the Museums, Libraries and Archives Council (MLA Council) has deemed important for museums in the UK to focus on is enjoyment, inspiration and creativity. Museums promoting enjoyment, inspiration, and creativity tend to incorporate more modern, interactive exhibits and programs to inspire innovation and experimentation. They want to urge the visitors to explore their creativity and enjoy themselves while on their visit (Museums, Libraries and Archives Council, 2008).

Lastly the MLA Council lists Activity, Behavior and Progression as its final category of outcomes for museum evaluators. This category incorporates the discovery of what people do, what people intend to do, and what people have already done. From these finding the visitors can look at what is going on and can decide how to make a change in how they live their lives (Museums, Libraries and Archives Council, 2008).

While these are the standards for evaluation offered by the MLA, they are not the only forms of evaluation that museums use. These are just general set of guidelines a museum evaluator can use to formulate their own method of evaluation to fit the type of exhibition they are evaluating.

Background of Character Actors

To create a more interactive environment, some museums have employed the use of character actors to compliment their exhibits. By integrating character actors into exhibits, museums draw on "theatre's emphasis on human relationships as a spur to learning, meaning making, and inquiry" (Pickard, 2006). The use of character actors, particularly in living history museums, also has an ancillary research function since it also offers historians and archaeologists the opportunity to examine and understand situations that cannot be determined solely through empirical evidence.

The impact of character actors is partially dependent on the nature of the museum. Particular museums lend themselves to character actors far better than others. Because human relationships are important to our understanding of history, the experience offered by character actors complements, but is not limited to, history museums. Many artifacts and exhibits at natural history and science museums

can be interpreted through social and historical lenses as well. Therefore character actors are appropriate for these museums as well.

Character actors who play a particular character or role that they are intimately familiar with are referred to as costumed interpreters. Battle re-enactors and actors at living history museums are examples of costumed interpreters. Interpreters have a more developed knowledge of the time period and person they are portraying. Typically, they are closely involved with the creation of their character and therefore can provide their own interpretations. Furthermore, since interpreters may portray the same character for many years, they often develop skills, such as metal forging or carpentry, which enrich their character and increase visitor engagement.

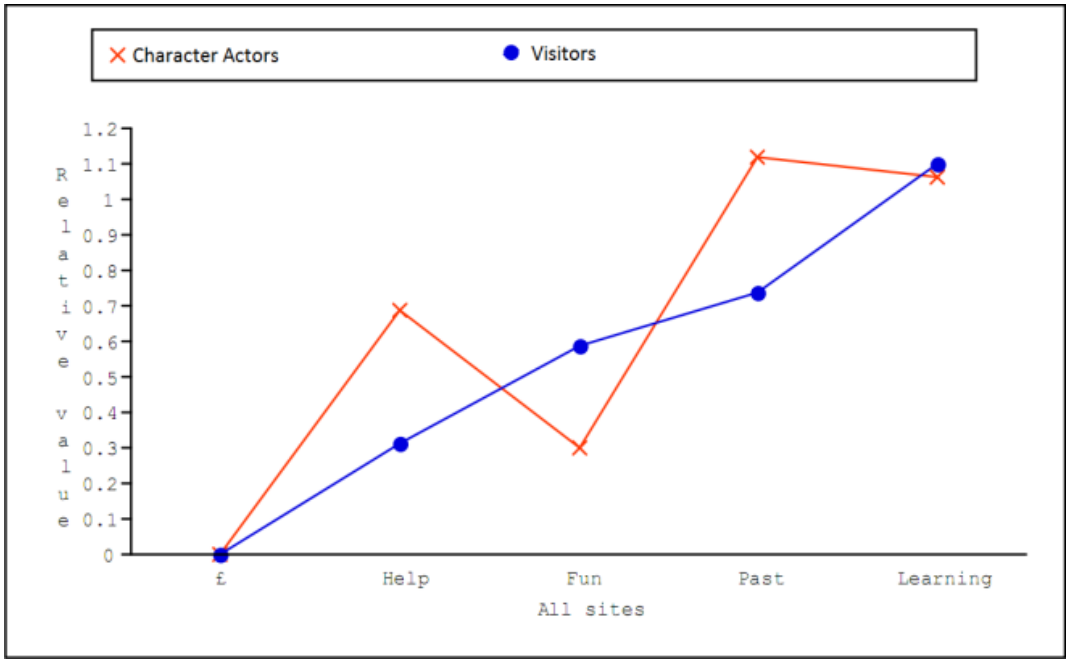
The first museums to employ character actors were identified as living history museums. In order to preserve Swedish heritage, Artur Hazelius started Skansen in Sweden in 1881. Hazelius employed musicians, Sami, and Dalecarlian peasants to live and work in the living museum (Handler, 1987). The idea of living museums caught on soon after in North America with the establishment of Greenfield Village and Williamsburg (Handler, 1987). The format of living history museums lend themselves to character actors. In contrast with traditional museums, living museums "interpret the life of the past to the public" (Handler, 1987). "Living history is above all concerned with realistic and authentic experience" (Handler, 1987). While artifacts can tell us what life may have been like, it is through interpretation and reenactment that the visitor can come to understand the complexities of past societies (Anderson, 1982).

Costumed interpreters at living history museums have been studied by archaeologists to help determine social and cultural aspects of historical societies. At Plimoth Plantation in Cape Cod, interpreters were challenged to build a traditional colonial home using only materials, methods, and tools available at the time. A similar experiment was performed at Plimoth Plantation to determine how Pilgrims may have brewed beer in 1627. While these experiments do not prove how Pilgrims performed these tasks, the additional insight these interpretations provide aids historians in better understanding Pilgrim society. Character actors have also been used to "measure the energy needed to pull a wooden moldboard plow on a 1770s Pennsylvania farm" (Anderson, 1982)(Anderson, 1982)(Anderson, 1982). The importance of character actors extends beyond their role of educating visitors. John D. Rockefeller, Jr., a major proponent of living history who in 1926 provided the funding to restore Williamsburg, Virginia, said "an authentic, three-dimensional environment was essential to understanding the 'lives

and times' of early Americans and appreciating their contribution 'to the ideals and culture of our country'" (Anderson, 1982).

More traditional history museums also lend themselves to character actors because of the important role that human relationships play in understanding history. However, the impact of the characters is also dependent on the actors meeting the priorities of the visitor. According to Jane Davies, in a survey of visitors at 589 different museums in which character actors are used, actors placed less emphasis on entertainment than did the visitors (Figure 8). However, Davies also states that learning and knowledge of the past, which ranked first and second in visitor priority, were both high priorities of the actors (Malcolm-Davies, 2004). Nonetheless, simply because an actor has the same priorities of the visitors they interact with, does not guarantee the actor will be able to engage the visitor. How do we gauge actors then? Pickard argues that museum theatre should be critiqued just like any other art form. For a proper evaluation of a character actor program, interpretation of data such as visitor numbers, survey results, and visitor comments should be performed by an outside party (Pickard, 2006).

Figure 8: Comparison of Visitor and Actor Priorities



Modified from (Malcolm-Davies, 2004)

Human understanding of history is based on our interpretation of data. Conventionally, 'experts,' such as museum curators and educators perform this interpretation, and the character actors

perform based on a script. However, Elizabeth Pickard found that 80% of museums that use character actors on the museum floor rely in part on the interpretation of the actors (Pickard, 2006). Consequently, the actor's knowledge and experience plays a pivotal role in ensuring that the expectations of the museum and visitors are met: entertainment and historical accuracy. Character actors provide a vessel to "convey the sense of a different reality" (Anderson, 1982); specifically the reality of another time and culture. J. Geraint Jenkis of the Welsh Folk Museum explained the role of character actors when portraying ordinary people.

> What the student of folklife is not concerned with, except as they affect the daily life of the people, are the political crises, the diplomatic intrigues, and the prominent personages of the past that quite properly find their place in the usual history books. Our chief aim is to study the ordinary people as they constitute the overwhelming proportion of every community. Our duty is to collect the tools and implements that they need and to record details of their life, their skills, their homes, their fields, their customs, their speech, and their leisure activities. The student of folklife searches for the key to the world of ordinary people; he attempts to throw light on their astonishingly ill-documented day-to-day life (Dorson, 1972).

Although the character actors of a folk museum typically only portray ordinary people, the same perspective can be applied to any character portrayed by an actor. Actors at the London Transport Museum portray both ordinary and famous historical figures (Hodder, 2010). Above all, character actors serve as a bridge between historical data and human relations. They provide an interpretation of the past that allows the visitor to find commonalities between their lives and the past. Since the London Transport Museum reopened in November, 2007, "the museum saw a change from a focus on [the] technology side of [the] collections to a more social history, focused on people" (E. Puddick, personal communication, January 28, 2010).

The inclusion of a more social history and focus on people shows a shift of the museums ideology from didactic, expository to constructivism. While not abandoning the "teaching" styles completely, the museum is encouraging visitors to rely on associations with personal experience to help them "learn". The introduction of character actors can help in that process, bringing life to many of the exhibits and offering for a personal connection to be made between the story and the visitor.

London Transport Museum

The London Transport Museum was started by the London General Omnibus Company in the 1920s with two Victorian horse buses and an early motorbus. The original collection was not open to the public and was merely a means of preserving the vehicles for future generations to study. When the museum officially opened to the public in the 1960s, it was located in an old bus garage in Clapham as The Museum of British Transport (Wills, 2008a). The Museum focused on a more didactic education style, simply presenting the vehicles and a brief history of them. This presentation style falls into one of the most common transport museum exhibition methods: a vehicle on display, rather than a space for telling a story. This approach of formalism, which is a "tradition with deep roots in the earliest public museums, sharing a good deal with the common sense view that the inherent qualities of objects are what is most important about them" (Divall & Scott, 2001). This formalistic approach was almost completely unchallenged in transportation museums up into the 1970s and still has its advocates. "The glorious clutter and serried ranks of vehicles so typical of these exhibits might be glorious indeed for knowledgeable visitors, but they were, and are, limited in appeal to visitors - or would be visitors - who understand little about the objects displayed"(Divall & Scott, 2001).

Over the years the museum has had numerous changes not only in name, but in location as well. Recently**,** the museum was substantially renovated and reopened in Covent Gardens with an entirely new layout and design (Wills, 2008b). Along with the physical transformations of location and appearance the museum's purpose and style has also evolved. The presentation of exhibits has shifted from that of didactic display and plaque to that of engaging visitors through interaction and entertainment. Elizabeth Puddick, the Learning Manager of the London Transport Museum, described these changes in the museum's philosophy.

> In 2008 the museum reopened to the public with new gallery spaces. The reopening of the museum saw a change from a focus on [the] technology side of our collections to a more social history, focused on people. The museum's collections cover the history of London transport from 19th century on present day, and included not only the icon[ic] buses and trains, but design, art and peoples stories (E. Puddick, personal communication, January 28, 2010).

The London Transport Museum's new design and exhibition style is meant to appeal to a new audience. Before the museum was renovated, the main audiences were families and historians. After the renovations, the target audience grew to include those in their twenties and thirties who are interested in art and design while still retaining its prior patrons (Divall, 2008). The museum's different galleries are designed to appeal to some demographics more than others. The galleries that are designed to appeal more to families include a learning zone, in which one can use 'driver's eye' simulators or play in a "play area" for children ages five and under. Families can also explore more interactive exhibits located throughout the entire museum (Bhatt, 2005). These interactive exhibits demonstrate the museums shift from formalism to engagement through interaction.

Actors are also stationed throughout the museum as a way to engage and educate the visitors. These actors portray an individual from a specific period in history. Each character is knowledgeable about the transportation methods in their "time" (Hodder, 2010). Although they are actors, not expert interpreters per se, they offer a glimpse into how transportation was important in shaping society and the lives of many different people. The actors can be enjoyed by adults and children alike. For adults, they can be a source of information: answering questions about the exhibits and offering a more personal interpretation of that period. For children, they can be a source of entertainment, engaging the child and stimulating their interest in the subject. There are also galleries that are designed to specifically for adults who are not visiting in family groups, including galleries that show the museum's famous design heritage and public transportation ranging from World War I to modern vehicles (Bhatt, 2005).

The formal method of displaying exhibits still has its place in the London Transport Museum despite its recent style shift at its main location. In October 1999, the museum opened a second location in Acton. This location, known as the Depot, is open to the public on set days during the year. It is used as a base and storage for the museum, holding over 370,000 items including those too large to fit in the Covent Garden location (Wills, 2008a). Divall describes these artifacts as:

> [T]rophies of humanity's triumph over time and distance through mastery of mechanical power. They represent in material form the complex social practices of transport and travel in ways that trigger fantasies and memories while eliciting admiration. These features are reinforced in the case of vehicles by virtue of their sheer size: most transport displays are physically, and hence intellectually and affectively, dominated by them (Divall & Scott, 2001).

While there are intrinsic characteristics of the vehicles being displayed in the London Transport Museum, this is not the only focus of the museum. Rather the vehicles on display are signifiers, or a means of representing some other aspect of reality. “As Tony Bennet puts it, the ‘visible is significant not for its own sake but because it affords a glimpse of something beyond itself.’ The significance of objects thus lies with what they can communicate about an otherwise hidden world - the history, present condition and future prospects of transport and travel” (Divall & Scott, 2001).

The purpose of the museum is to preserve artifacts, conduct research, and educate. This purpose includes an amalgamation of all four educational theories. Museum visitors retain more information when the subject interests them and they have some prior knowledge. Museums should design exhibits to attract and entertain specific audiences. Character actors are a common way that many museums, including the London Transport Museum, enhance visitor experience. However, the actual impact of these actors on visitors at the London Transport Museum had not been evaluated in the past.

Methodology

The overall goal of our project was to evaluate the role that character actors play in enhancing the visitor experience at the London Transport Museum. Specifically we were asked by our sponsor to explore the nature of visitor interactions with the characters and examine how the interactions affected learning and the overall visitor experience. Additionally, we were asked to assess whether the characters were placed effectively throughout the museum. This chapter discusses methods that were used to collect the data and information necessary to assess the character actor program and answer these questions.

We used four primary methods: visitor tracking studies, observations of visitors at selected exhibits, visitor surveys, and in-depth interviews with actors. We conducted visitor tracking studies to determine which exhibits were the most popular (i.e., "attractiveness") and how long people tended to spend at different types of exhibits (i.e., "holding power"). We observed visitors at specific exhibits to determine differences in visitor behavior when the character actors were or were not present. Visitor surveys provided us with additional information about the nature of the visitor interactions with the character actors and were used as one method of gauging learning outcomes. They also offered another source of data to supplement and help interpret the tracking and observation data. Interviews of character actors provided us with insight into their role in the museum.

Preliminary Setup

Before collecting any data, we first created a layout of the museum by assigning a number to each exhibit and determining the types of interaction it utilizes. Exhibits were categorized as having one or more of the following: vehicles, dioramas, placards, digital displays, digital interactions, physical interactions, or sounds. Furthermore, vehicles were divided into subcategories of those visitors are allowed to board and those they are not.

Figure 9: Sedan Chair – Chair to Anywhere

Table 2 shows the categorization corresponding to the exhibits shown in Figure 9, Figure 10, and Figure 11. The maps showing where each exhibit is along with the full chart of exhibit categorizations can be found in Appendix A: Museum Maps and Appendix B: Exhibit Characteristic Chart respectively.

Table 2: Sample of Exhibit Categorizations

Exhibit Number	Exhibit Name	V	V*	D	P	DI	PI	DD	S
L2-01	Sedan Chair - Chair to Anywhere	X			X				
L2-19	Before the Bus			X	X				
L0-10	Underground Diorama			X			X		X

V=Vehicle, V*=Boardable Vehicle, D=Diorama, P=Placard, DI=Digital Interaction, PI=Physical Interaction, DD= Digital Display, S=Sound

Figure 10: Before the Bus

Vehicles are defined as any full-scale mode of transportation within the museum, i.e. sedan chairs (Figure 9), horse drawn carriages, train engines and coaches, buses, and cars. Dioramas are scaled models of vehicles or places; examples can be seen in Figure 10 and Figure 11. Placards are any non-digital form of written text affixed to an exhibit. Digital displays are any form of video, including projected text or images. Although some of these may have had sound included, we defined sound as a separate category because not all digital displays had sound. In addition, some exhibits contained sound effects or audio without a corresponding digital display. Exhibits which had digital interactions contained digital displays that could be physically interacted with, such as the podium touch screens found at exhibits with vehicles. Figure 12, on the next page, is an example of the interactive podium at the Shillibeer Horse Bus exhibit. Exhibits which have a physical interaction allow a visitor to engage with a tangible object. For our definition of physical interaction, digital interactions and vehicles that can be boarded were excluded from this category because they have more specific categories of their own. An example of physical interaction can be seen in Figure 11. The black object affixed to the glass is a looking glass which allowed the visitor to see a magnified view of a scene in the diorama. Some of the looking glasses throughout the museum also had sound.

Figure 11: Underground Diorama

The museum was also separated into galleries. Level 2 was treated as a single gallery because of its small size, Figure 13. Level 1 was divided into two galleries separated by the bridge, Figure 14. Level 0 was divided into four galleries based upon the layout and character placement, Figure 15. We did this to make observing interactions with the characters and their exhibits less difficult. Keeping track of every visitor on the larger floors was difficult, but dividing them into galleries allowed for easier and more accurate tracking and observation.

Figure 12: Podium at Shillibeer Horse Bus

Figure 13: Level 2 Gallery Map

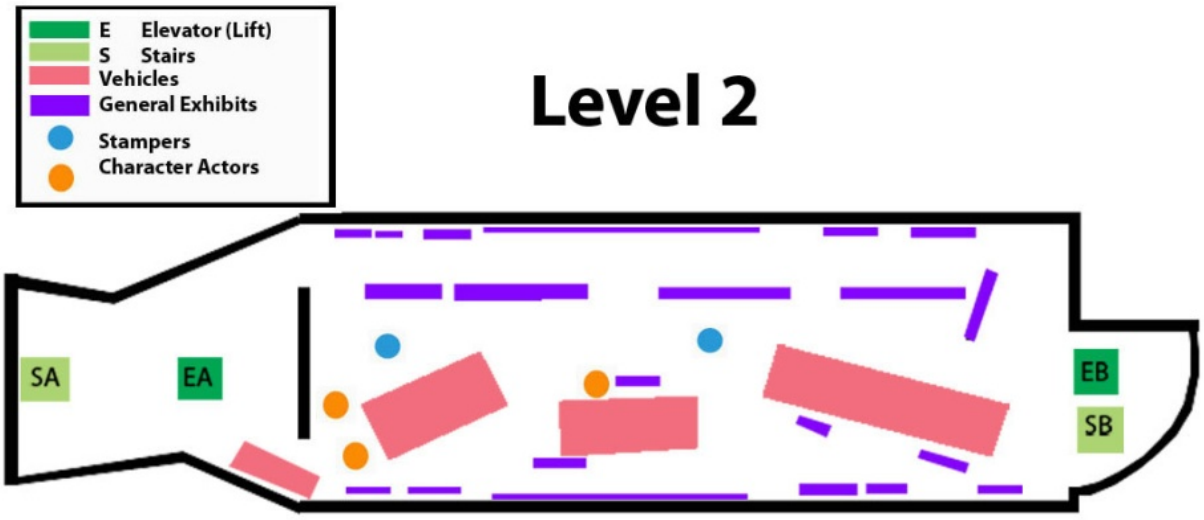


Figure 14: Level 1 Gallery Map

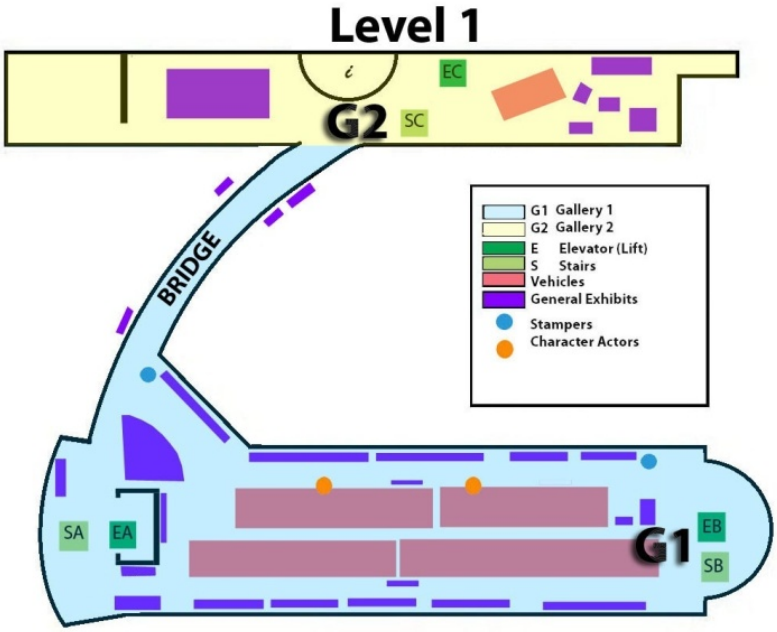


Figure 15: Level 0 Gallery Map

Tracking Studies

Tracking involved observing a visitor and noting their behavior throughout the museum. These naturalistic methods of observation involved observing visitors without their knowledge (Hein, 1998). By conducting pilot studies, we found that tracking individuals through the entire museum was both difficult and ineffective. After a week of tracking visitors, we noticed that most of them realized they were being tracked after following them from floor to floor. Since visitor behavior changed when they realized they were being tracked, we changed the tracking protocol such that visitors were only tracked on one floor of their visit. This minimized the likelihood of the visitor realizing that he or she was being tracked because our presence was limited to a small portion of their visit and thus not as obvious. Tracking on one floor helped to ensure unprompted, natural behavior.

To conduct our tracking studies, visitors were selected as they arrived on a particular floor on which we were conducting tracking studies. The first single adult or adult member of a group to enter the floor was selected for tracking. Once a particular tracking observation was complete the team member would return to the same location and again select the first adult to enter the floor. The layout of the museum encourages visitors to begin their visit on Level 2, 19th century London, which most visitors arrive at via Lift A. From our initial observations, we found that when finished on Level 2, most visitors would go down either Lift B or Stairs B to Level 1, Steam Underground. Thus, when tracking visitors on Level 1, visitors were selected from Lift B or Stairs B. Although some visitors also descended Lift C, Stairs C, and Stairs A to Level 0, the layout of the museum is designed so that visitors should use Lift B or Stairs B. Therefore, we chose to track visitors entering Level 0 from Lift B and Stairs B. The locations of the stairs and lifts are shown on the maps in Figure 13, Figure 14, and Figure 15.

Once a visitor was selected, they were tracked by a team member. If the visitor used the toilet, we waited for the visitor to return to the floor and continued our tracking. If the visitor went into the café or gift shop, we ended our tracking of that particular visitor because both are located at the exit to the museum. For each visitor who was tracked, we recorded the type of group they were with, their gender, and their approximate age. We defined the different types of groups as: a single person, a couple, a group of friends (the number of visitors in the group was recorded), a single parent with child(ren), parents with child(ren), and families. Families were groups that contained grandparents, parents, and children. Additionally, time spent at each exhibit was recorded. If their time at an exhibit was not long enough to be recorded, we indicated that they glanced at it. The data sheets used to collect data can be found in Appendix C: Tracking Studies Data Sheet. We tracked a total of 36 visitors,

some on multiple floors, and gathered 22 data sets for Level 2, 19 data sets for Level 1 and 19 data sets for Level 0.

Observing Visitors

For our visitor observations, we recorded the interactions and dwell times at the exhibits at which characters were stationed. Data were collected both when characters were and were not present. In contrast with tracking studies, where a single visitor was tracked throughout multiple exhibits, observations were made at a single exhibit for an extended period of time. This allowed us to collect many data points for these specific exhibits.

In our evaluation, we focused on eight different exhibits in which characters were incorporated. There were nine different characters associated with these exhibits. Table 3 shows which character was associated with each exhibit. Both the Shillibeer Bus Driver and the Victorian Passenger were assigned to the Shillibeer Horse Bus.

Table 3: Exhibits and Associated Characters

Exhibit Number	Exhibit Name	Character
L0-54	1911 B-Type Motorbus	B-Type
L0-73	1970 DMS Bus	Punk
L0-11	Electric Locomotive and Coach	CSLR
L0-05	Going Deeper Underground	Miner
L1-08	Metropolitan Railway Coach	1930's Woman
L1-03	Metropolitan Railway Steam Locomotive	Fireman
L2-21	Shillibeer Horse Bus	Shillibeer Bus Driver Victorian Passenger
L2-16	Tilling Horse Bus	Crossing Sweeper

Although these eight exhibits had associated characters, these characters were not always present. On weekdays (aside from holidays), there was at most only one character present. Most weekdays the character present was Platform Promenade, which was not included in our study because he or she interacted exclusively with school groups, which was outside the scope of our evaluation. On weekends while we were evaluating, there were two characters present in the museum. From April 2nd to April 18th, 2010 public schools were on holiday; therefore, there were no school groups so a character

relevant to our study was present each day. The museum contracts three other characters (the Policeman, the Flower Girl and the Shelter characters), but they were not scheduled during time the study was conducted.

In addition to creating the layout of the museum and defining the contents of an exhibit, we also created a hierarchy of visitor interactions with character actors and the character's corresponding exhibit. We initially only observed visitor interactions with the character, but we realized that without also counting interactions with the exhibit, we could not identify differences in visitor behavior from when the characters were and were not present. The classifications, from highest to lowest ranking, are: "speak with character," "listen to character," "interact with exhibit," and "glance at exhibit." Each classification is included in the one above it, with the exception of glance at. For example, visitors who spoke with a character also listened because you cannot converse without listening. Visitors who listened to a character also interacted with the exhibit because the character was an extension of the exhibit. Glance at exhibit was excluded because it was not an interaction but was included as a classification to distinguish the visitors who actively looked at an exhibit and chose not to interact from those who did not. The differentiation between glance at and interact with exhibit was the length of time spent looking at the exhibit. Spending less than three seconds looking at the exhibit was defined as a glance because no significant knowledge can be gained in that amount of time. We considered speaking to a character more than just answering a yes or no question. Visitors who would ask questions or have a full conversation with the character fall into the category of speaking with.

Character/Visitor Interaction

The "attractiveness" of an exhibit can be approximated by observing and calculating the percentage of visitors that interacted with an exhibit. One way to gauge the attractiveness of a character is to calculate and compare the percentages of visitors that interacted with the exhibit both with and without the character present. To do this, one group member was placed at the entrance to the gallery, the "gallery counter." He or she counted the number of people who entered the gallery during a set period. Visitors already on the gallery were not counted as visitor flow rates were relatively consistent over time and any visitors who were already in the gallery were compensated for by visitors counted at the end of the observation session who may have interacted with the actor after data collection had finished. The data collected by the counter provided a reference to determine percentages.

Another group member, the "interaction counter," counted the number of people who interacted with the character or exhibit being tracked. The types of interactions recorded were "glance

at exhibit," "interact with exhibit," "listen to character," and "speak with character." The interaction counter kept track of the number for each classification on the Character/Visitor Interaction Chart using tally marks (Appendix D: Character/Visitor Interaction). These data provided a percent interaction to determine the attractiveness of the character or exhibit. We observed between 200 and 400 visitors at each specific exhibit, with and without a character present. The range reflected how busy the museum was at that time and the popularity of the specific exhibit. We observed a total of 5,200 visitors interacting with the eight exhibits at times when the characters were and were not present. These data were collected between 11:00 AM and 3:30 PM over the course of twelve days between April 2 and April 15, 2010.

Dwell Times

In addition to the gallery counter and the interaction counter, a third team member, the "dwell timer," recorded the time visitors spent interacting with the character or exhibit as well as gender and approximate age. Dwell times for the eight specific exhibits were recorded by using a stopwatch and the "Dwell Times" sheet which can be found in Appendix E: Dwell Times Data Sheet**.** By starting the stopwatch at the beginning of an observation session and recording the absolute "time in" and "time out," we were able to track multiple visitors at once. We observed and recorded at least one hundred visitor dwell times at each exhibit with and without the character, with the exception of the Victorian Passenger. We were only able to record data for seventy-seven visitors while the Victorian Passenger was present due to time and scheduling restrictions. A total of 2,040 dwell times were recorded for observed visitors. These data were also collected between 11:00 AM and 3:30 PM over the course of twelve days between April 2 and April 15, 2010.

These data allowed us to determine the "holding power" of the exhibit. Holding power is the ability of the exhibit to retain the attention of the viewer. The interaction counter and the dwell timer would stand close enough to the exhibit or character to observe the interactions, but out of the way of visitor traffic. Time spent at an exhibit has been shown to correlate with visitor engagement and learning (Donald, 1991).

Surveying Visitors

The main purpose of the surveys was to glean additional information about the visitors' experience at the museum. The surveys offered a set of data and visitor feedback in regards to the visitors' experience. We gathered this information from our general survey and our interaction specific survey.

The general survey (Appendix F: General Survey) was intended to be given orally to visitors we had tracked. After tracking a number of visitors, we noticed that many of them did not interact with the characters. To gain more directed feedback regarding interactions with the characters, we developed the Interaction Specific survey (Appendix G: Interaction Specific Survey) which was given orally to visitors whom we had observed interacting extensively with the character actors. These surveys can be viewed as biased, but are acceptable because the feedback we were looking for from these surveys pertained specifically to visitors who had interacted with a character actor. The Interaction Specific Survey was also given to anyone who would agree to answer a few questions, at a time when a character was present, when leaving the gallery. This was done to gain additional feedback from those who may not have interacted and their reasoning.

The surveys provided data about how much knowledge visitors retained during their visit. In addition, the surveys also provided data on what characteristics of exhibits attract visitors, visitor enjoyment, and which exhibits visitor's preferred. Furthermore, the data collected determined the visitor's experience with the character actors in the museum.

We coded the surveys using the methods defined by the Museums, Libraries and Archives Council (MLA) as the "Inspiring Learning Framework" (Museums, Libraries and Archives Council, 2008). The Inspiring Learning Framework is a widely accepted process that "helps museums, libraries and archives to capture and evidence their impact by identifying generic learning and social outcomes for individuals" (Museums, Libraries and Archives Council, 2008). The five Generic Learning Outcomes (Knowledge and Understanding; Skills; Attitudes and Values; Enjoyment-Inspiration-Creativity; and Action-Behavior-Progression) were used to categorize the responses. After going through the tutorials offered from the MLA website, our team worked together to code the surveys. Having multiple people working together served as a check on individual differences in interpretation. Some statements were categorized under multiple outcomes. The data collected from coding the surveys allowed us to look at which outcomes are being addressed and whether or not one or more stand out.

Interviews

While surveys provided information about the experience of the visitors, interviews of the actors provided information about the roles that they play in the museum.

Interviewing Actors

The actors at the London Transport Museum were interviewed to determine background information and the experience of the actors, as well as their perspective on the program's operation.

We interviewed eight actors that work at the museum. Between these actors all nine characters that we observed were represented. We conducted in-person interviews with each actor during his or her break or when there were no visitors around. This varied because of time constraints and the availability of the actor. In order to maintain anonymity, names and personal information are omitted from the interview notes.

First, background information was collected to establish an understanding of the actor's experience and provide a more comfortable setting. For example, time spent working with Spectrum Drama, the London Transport Museum, and other museums. Also, which other characters they play and how their script was developed. Secondly, the interview determined how information was presented to the visitors in comparison to other museums they work at. Comparing their experience at the other museums to the London Transport Museum allowed us to determine how character actors are used at other museums without evaluating several museums.

The interview concluded with questions pertaining to actor's perspectives on the program and visitor experience, such as visitor interest, common questions visitors ask, and whether they believe the character affects their visit. We also asked questions pertaining to how they think the program can be changed or improved at the London Transport Museum. Interview questions pertaining to the actors can be found in Appendix H: Richard Hodder Interview Questions and Appendix I: Actor Interview Questions**.**

Results and Analysis

The data that we collected has been organized into three sections of measurement: attractiveness of exhibits, holding power of exhibits and visitor enjoyment and learning. The following analysis illustrates how the character actor's presence affects the three measures of visitor experience.

Evaluation of Exhibits

One of the benchmarks of evaluating the effectiveness of an exhibit was gauging its attractiveness. The attractiveness of an exhibit was important because a visitor must first be drawn to an exhibit in order for learning to occur. As stated above in the methods section, the attractiveness can be measured by the percentage of visitors who interact with an exhibit. In addition to attractiveness, an exhibit's effectiveness can also be gauged by its holding power. The holding power was measured by the length of time visitors spent interacting with the exhibit or dwell times. Since the amount of time spent at an exhibit has been shown to correlate with learning, dwell times were used to provide evidence of learning in the museum. The surveys with visitors and interviews with the actors provided further evidence that the time spent at the exhibit contributes towards learning. Using a combination of the results from tracking studies and visitor interaction studies we were able to evaluate both the attractiveness and holding power.

The number of visitors in a gallery at any given time was not constant and visitors take different paths through the museum. However, using the counting methods described above we are able to make claims regarding the percentage of visitors who stop at an exhibit. These percentages offer a look into the initial step in evaluating an exhibit's effectiveness.

General Evaluation

There are many factors that can attribute to an exhibit's attractiveness and holding power. In our initial evaluations of the museum, we developed a chart and accompanying map of all of the exhibits in the museum. The chart, which can be found in Appendix B: Exhibit Characteristic Chart, details the different attributes that each exhibit contains, be it a digital display or an audio track. Using this chart and our tracking studies, we can make claims regarding patterns about which factors are the most attractive to most visitors. While other variables such as content effect attractiveness and holding power, by collecting data on all of the exhibits in the museum we can minimize the effect of these outside variables.

We observed that visitors tend to interact with or glance at more of the exhibits on Levels 2 and 1 than on Level 0. Giles Velarde states that visitors prefer to be guided through their experience. If a gallery was too open visitors will become confused and will not bother with some of the exhibits (Velarde, 2001). We think this may be a contributing factor at the London Transport Museum. The top two floors are more linear areas so visitors tend to see more of the exhibits. Level 0 has one area that has a linear flow but the rest was less structured. Using the data collected from our tracking studies and the museum map, we created a heat map of the museum. This heat map is a graphical representation of the attractiveness of exhibits in the museum. Areas colored blue have a low attractiveness whereas areas colored red have a high attractiveness. Most characters are located at exhibits within galleries with a high percentage of visitation. The heat map of the museum is shown in Figure 16, Figure 17, Figure 18, and Figure 19.

Figure 16: Level 2 Heat Map

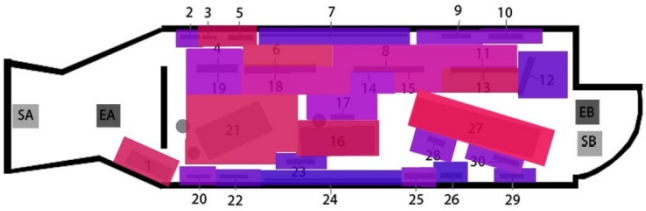


Figure 17: Heat Map Key

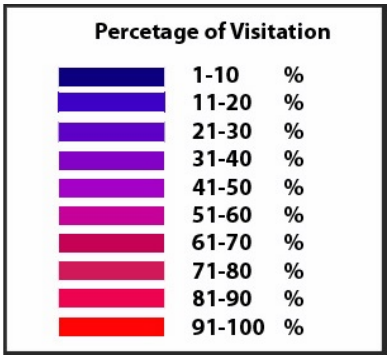


Figure 18: Level 1 Heat Map

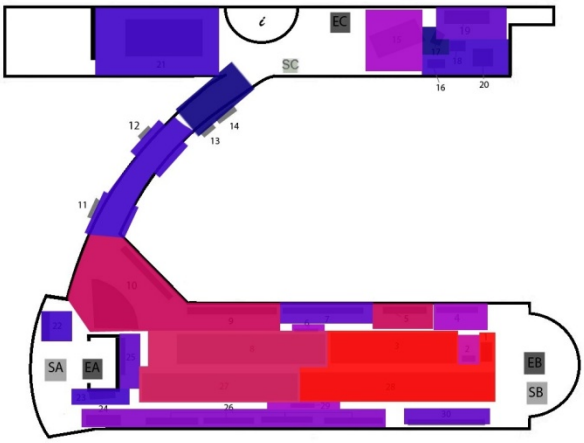
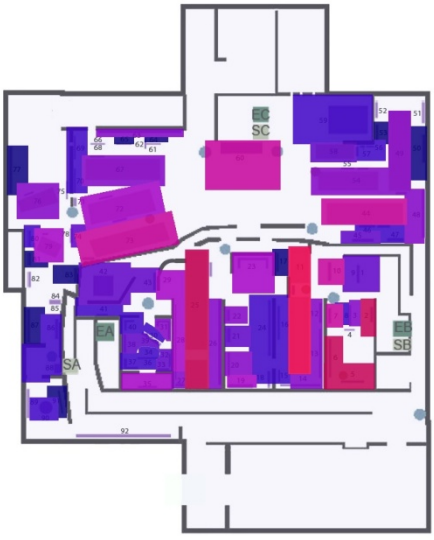


Figure 19: Level 0 Heat Map



In the London Transport Museum's case, many of the vehicles are inherently attractive due to their size, accessibility, and iconic status, such as the double-decker buses. Other factors that can catch a visitor's attention are visual and audio aids. Objects that allow for physical interaction or those accompanied by a video or a greater amount of information often increase visitor dwell time. All of these factors play into how effective an exhibit is. The graphs in Figure 20 and Figure 21 show how different characteristics of exhibits affect the holding power and attractiveness of exhibits.

Figure 20: The Effect of Exhibit Characteristics on Visitor Interaction

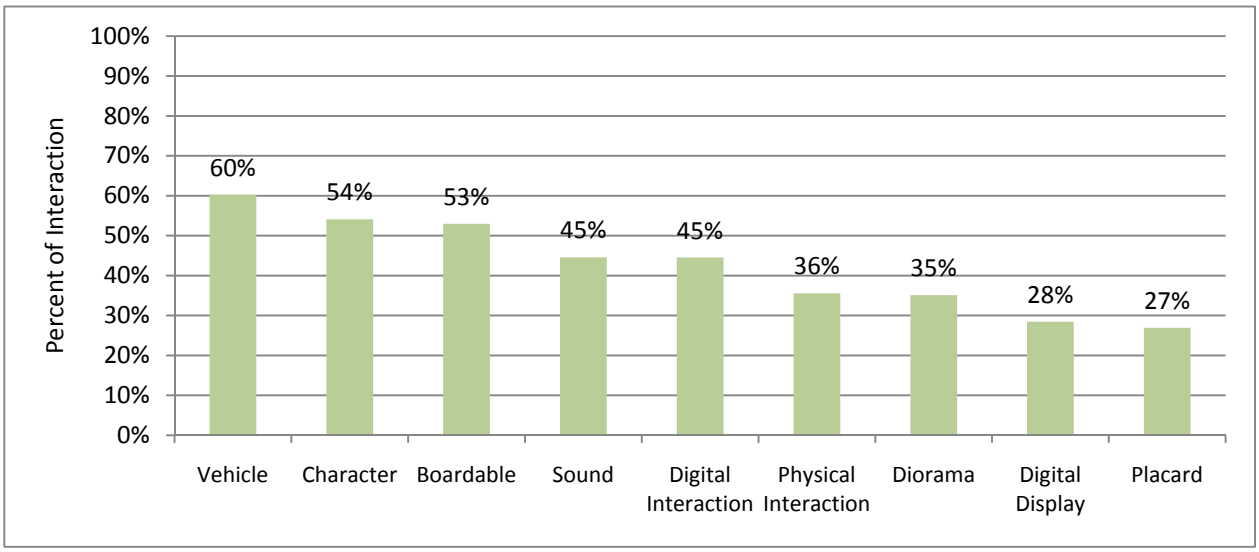
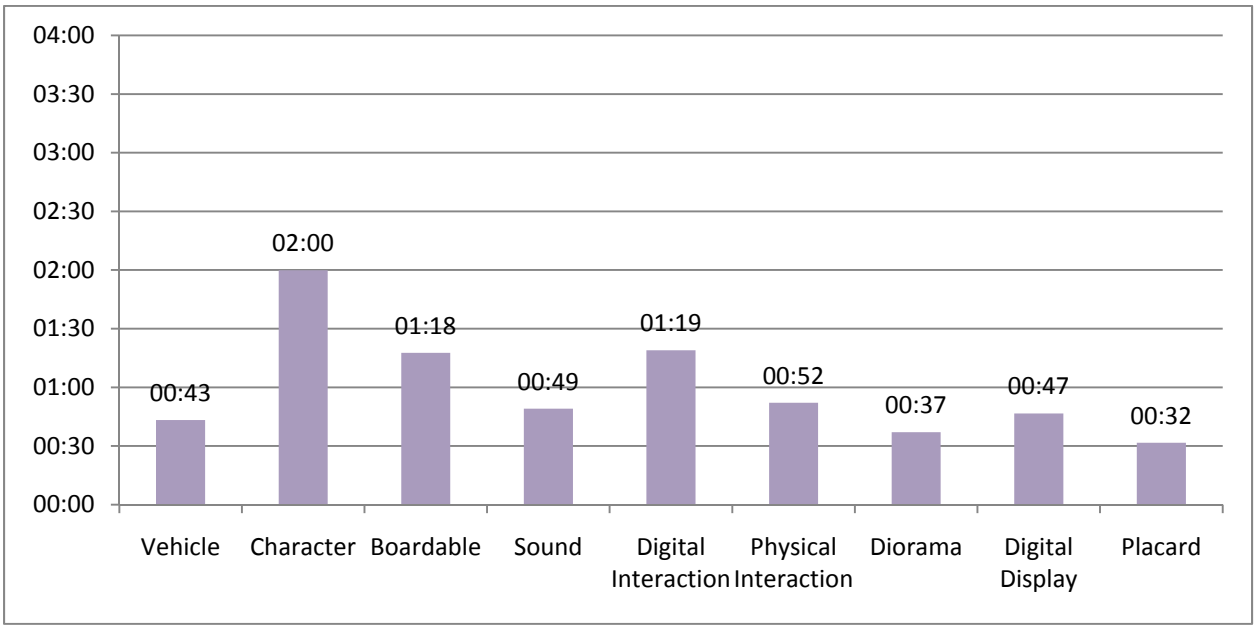


Figure 21: The Effect of Exhibit Characteristics on Dwell Time

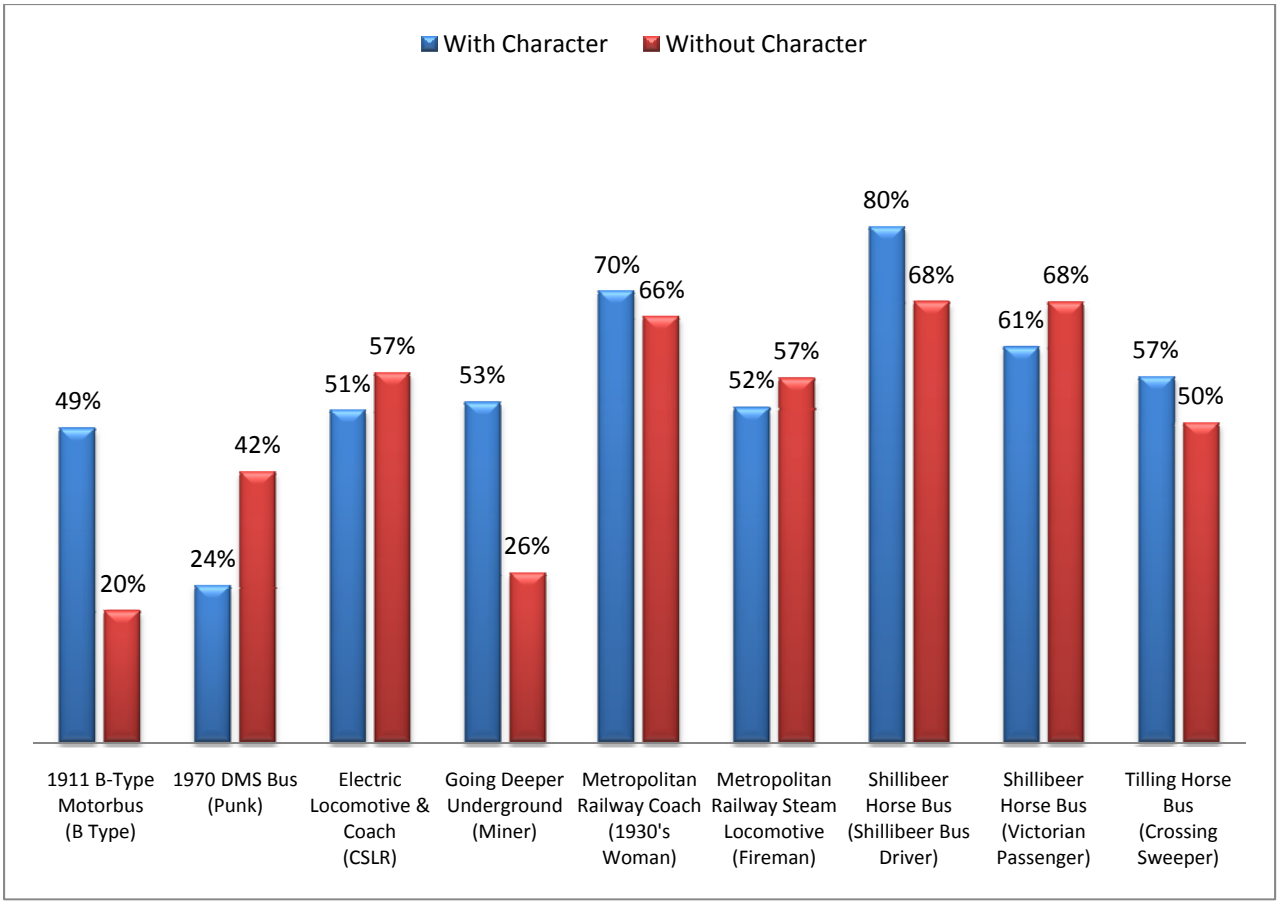


As seen in the above graphs, vehicles, both boardable and not, are the most attractive features of exhibits in the museum. However, attractiveness alone was not the only measure of an exhibit. Dwell times are another measure used (Figure 21). While non-boardable vehicles may be very attractive, they have less holding power than boardable vehicles. Since time spent at an exhibit was associated with amount learned and visitor enjoyment, the dwell time of an exhibit holds more weight than attractiveness. However, if an exhibit was not attractive, it could not be effective as few people would stop to interact. Characters are an example of a characteristic that had both a high attractiveness and holding power.

Overall Evaluation of the Characters

From our observation studies, we were able to evaluate the characters' overall effect on visitor interaction with the exhibits. One important characteristic of an exhibit was its ability to attract visitors. We determined the attractiveness of exhibits through observing visitor interaction with exhibits, with and without a character present. From the data we created the graph shown in Figure 22.

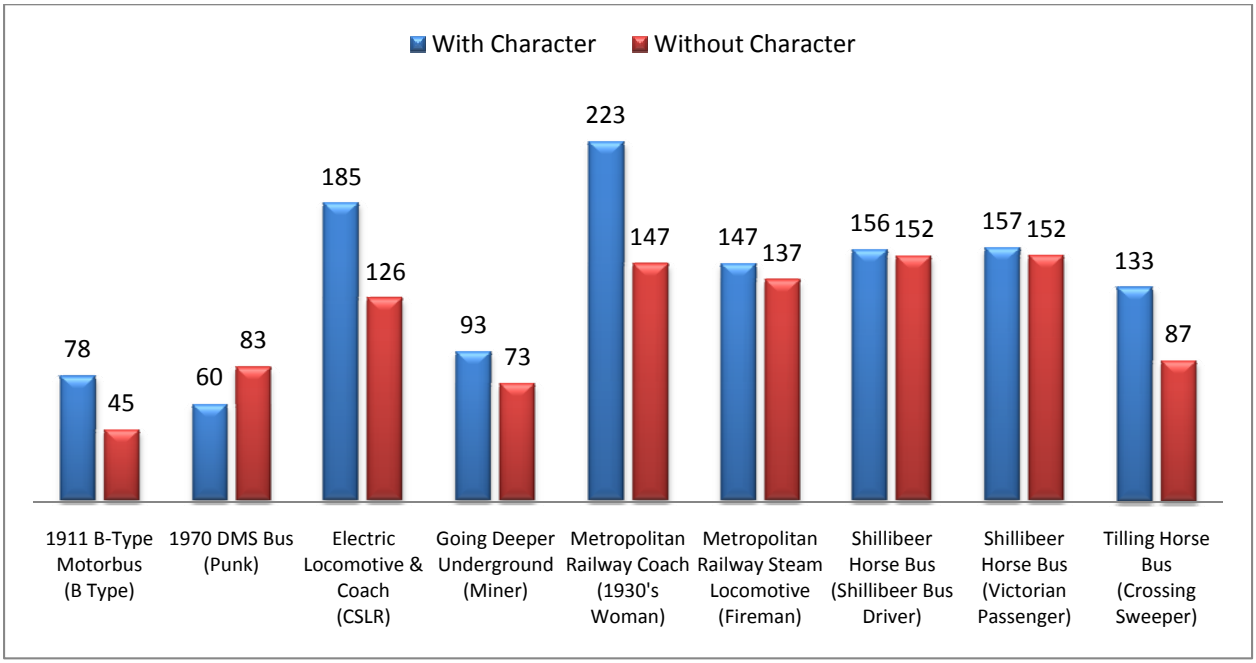
Figure 22: Percent of Interaction with Exhibit



This graph shows the percentage of visitor interaction, which was the percentage of visitors in the gallery who interacted with the exhibit. This percentage increased for the 1911 B-Type Motorbus, Going Deeper Underground, Metropolitan Railway Coach, Shillibeer Horse Bus (Bus Driver), and the Tilling Horse Bus exhibits when the character was present. The percent of interaction decreased for the 1970 DMS Bus, Electric Locomotive & Coach, Metropolitan Railway Steam Locomotive, and the Shillibeer Horse Bus (Victorian Passenger). Of the five that increased, three increased significantly, with the greatest being an increase of 29% for the 1911 B-Type Motorbus. Although the percentage decreased for four of the exhibits, three of them decreased no more than 7%. The variances between percent of interaction with the characters will be discussed further on in the character specific section.

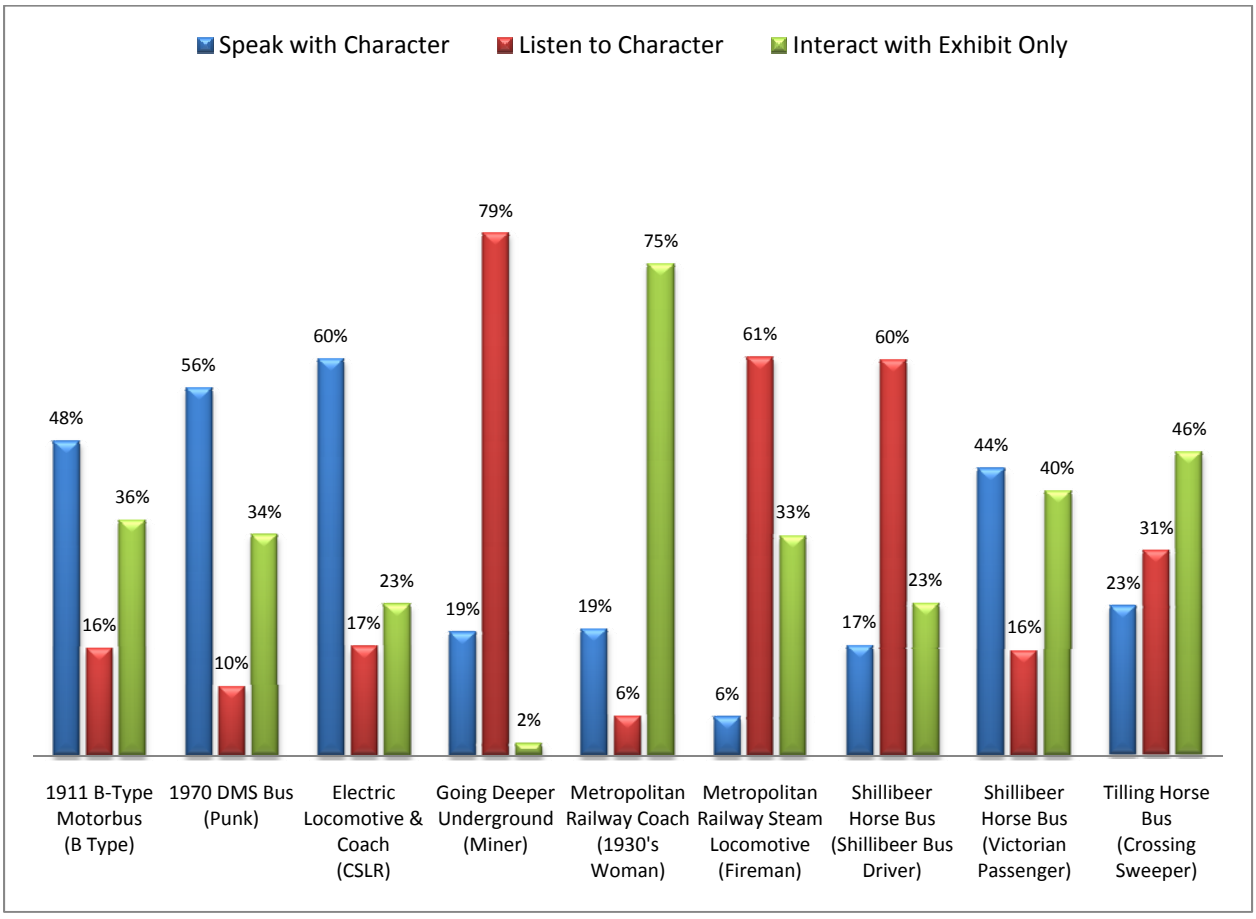
In addition to the percent of interaction, we were able to extract the number of interactions with an exhibit per hour. Using this data we can show that in some cases although the percent of interaction goes down when a character was present, the total number of interactions increases or remains approximately constant for most exhibits. These data can be used to suggest that some exhibits may have a cap on the number of visitors that can interact per hour, which may account for the decrease in percent interaction during busy periods. The graph showing the number of interactions per hour can be seen in Figure 23.

Figure 23: Interactions with Exhibit per Hour



Using the data collected while observing visitor interactions with characters, we created a graph that shows to what extent visitors interacted with the exhibit. For example, we observed that 53% of the visitors who went into the gallery, where Going Deeper Underground is located, interacted with the exhibit while the character was present. Figure 24 shows that of the visitors who interacted with the exhibit, 19% spoke with the character, 79% listened to the character, and 2% interacted with only the exhibit. These data from the graph will be analyzed further in the character specific section.

Figure 24: Extent of Interaction with exhibits



Holding power was measured by observing and recording dwell times. From the data we collected, we calculated average dwell times at each exhibit (Figure 25) with and without the presence of the character.

Figure 25: Average Dwell Times

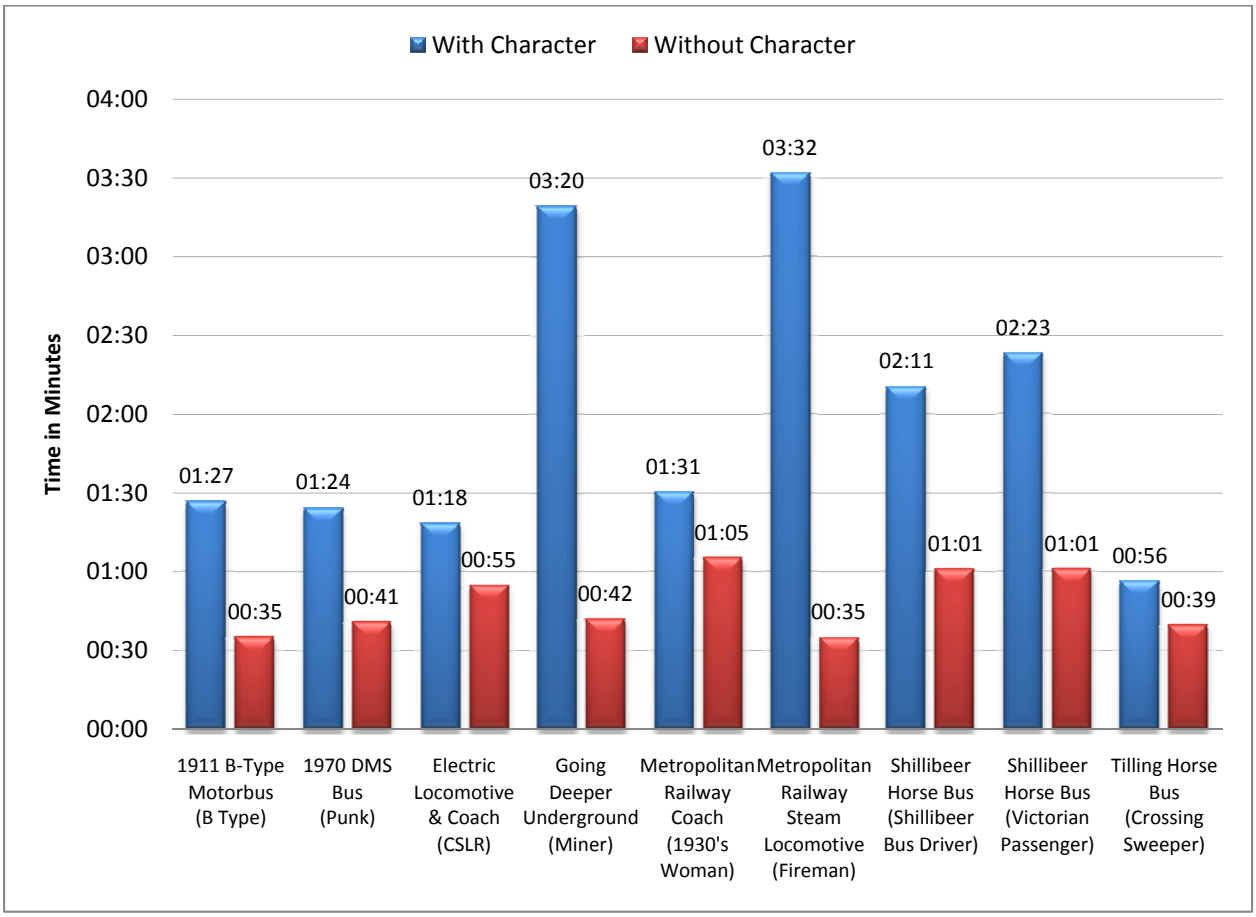


Figure 25 shows that the average dwell time at each exhibit increased substantially for all the exhibits when the character was present. The dwell time at the Metropolitan Railway Steam Locomotive increased from 35 seconds to 3:32 minutes with the addition of the Fireman. The Miner also substantially increased the dwell time of his corresponding exhibit, Going Deeper Underground, from 42 seconds to 3:20 minutes. Furthermore, four other characters doubled the average time spent at their corresponding exhibits.

Using the data we collected from observing dwell times, we also developed decay curves to illustrate the holding power of the exhibits with and without the characters. A decay curve displays the number of visitors present at an exhibit after a certain amount of time has passed. For example, as seen

in Figure 26, without the character present, eighteen out of one hundred people were still at the Metropolitan Railway Coach after two minutes. From the decay curves shown in Figure 26 and Figure 27 we can see that there was a substantial increase in holding power when a character was present.

Figure 26: Decay Curve without Character

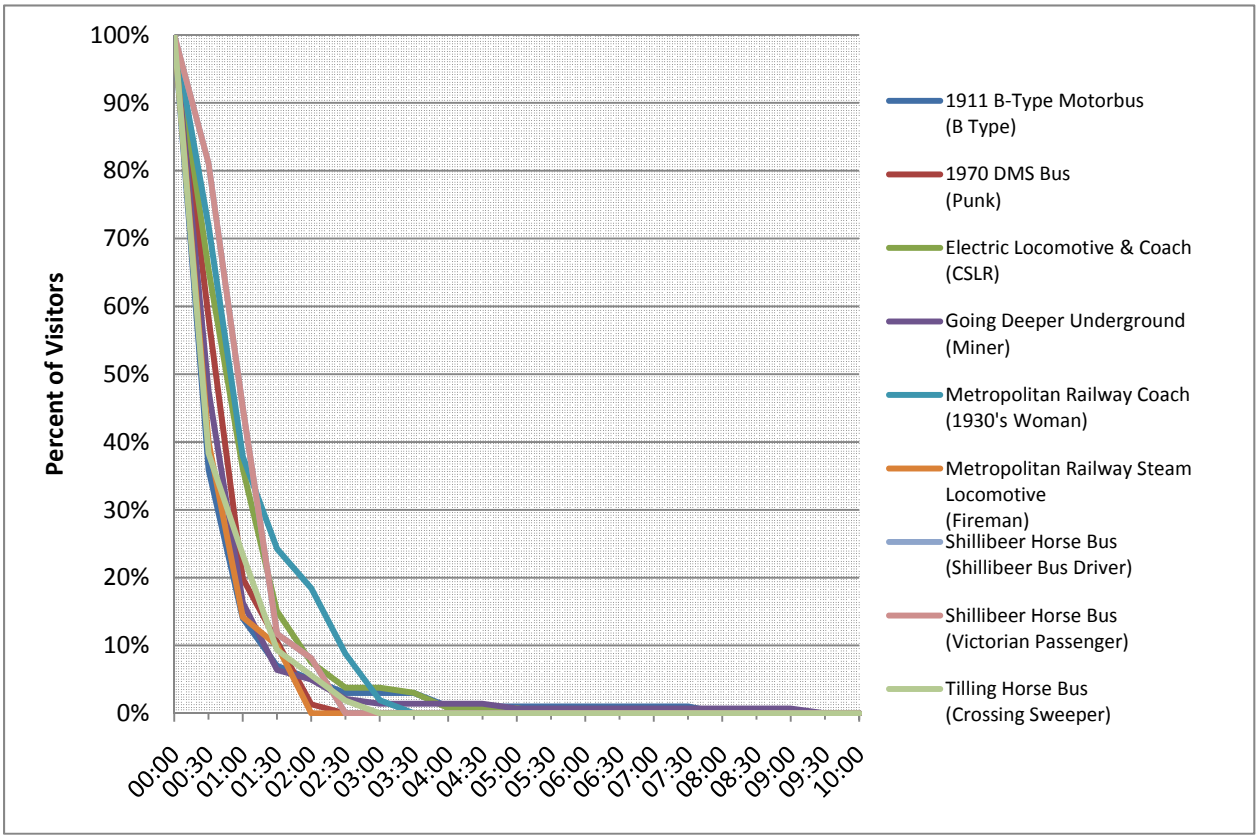
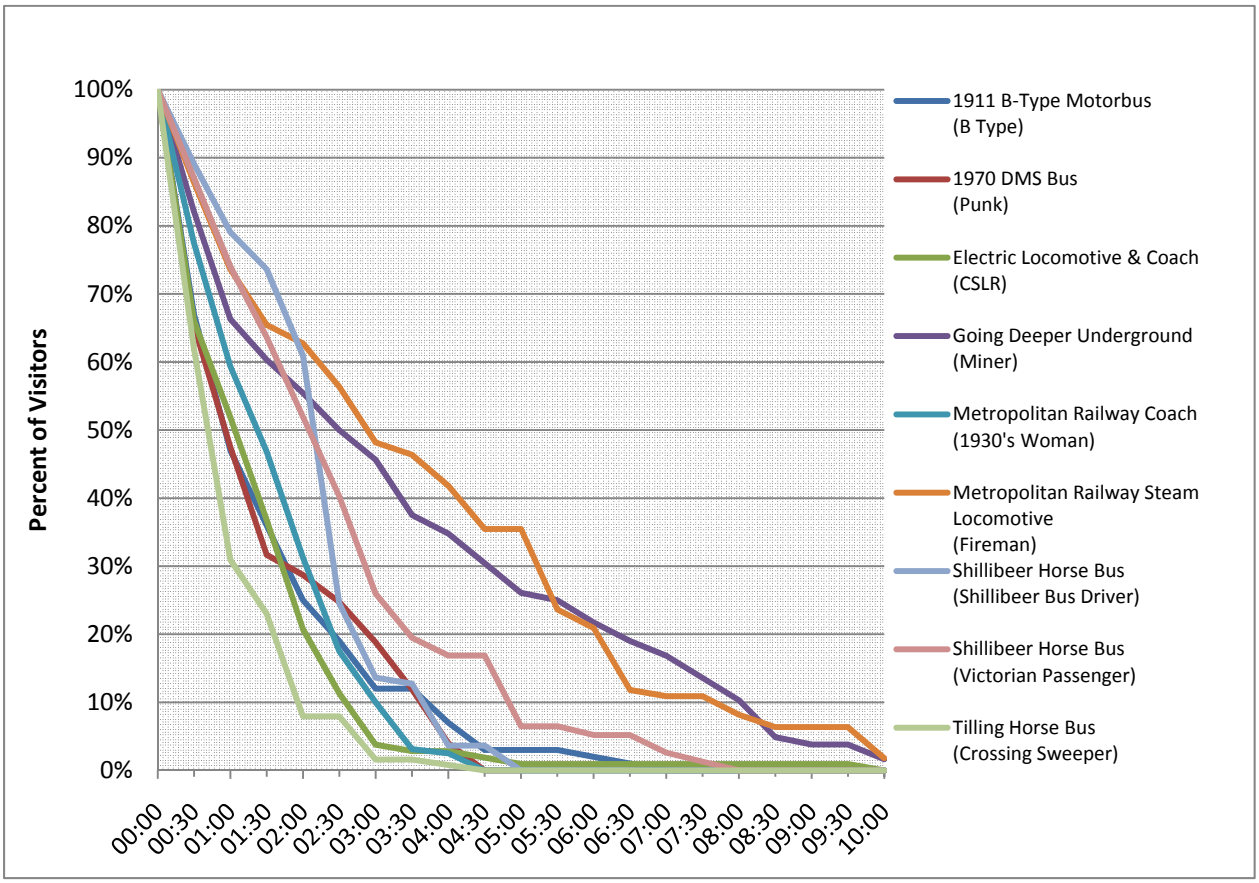


Figure 27: Decay Curve with Character



Without the character present, less than 10% of visitors spend more than two minutes at the exhibits, with the exception of the Metropolitan Railway Coach, which has 18%. When a character was present, all exhibits except the Tilling Horse Bus have at least 20% of visitors remaining after two minutes, with the greatest being the Shillibeer Bus Driver with 61%. The Miner and Fireman had the greatest holding power. After six minutes, 20% of the visitors were still interacting with those exhibits.

Exhibit Specific Evaluations

This section breaks down the above data into individual analyses of the eight specific exhibits. The evaluated exhibits were the: 1911 B-Type Motorbus, 1970 DMS Bus, Electric Locomotive & Coach, Going Deeper Underground, Metropolitan Railway Coach, Metropolitan Railway Steam Locomotive, Shillibeer Horse Bus, and Tilling Horse Bus.

1911 B-Type Motorbus

One exhibit was the 1911 B-Type Motorbus. This was an exhibit with a vehicle that cannot be boarded and has a digital interaction in the form of a podium. Because of the name of the bus, the

character was named B-Type. The character was a female technician from the early 1900's who preformed maintenance work and regular cleaning of the motorbus. An image of the character and the bus can be seen in Figure 28.

Our evaluation of this exhibit showed that with no character present 20% of visitors that enter the gallery interacted with the exhibit. However, with the character present, the percentage increased dramatically to 49%. This represented the largest increase in attractiveness out of the eight exhibits evaluated. Although the B-Type character is on par with the other characters (see Figure 22), when she was not present, the motorbus has the lowest attractiveness observed. We attribute this low interaction percentage to its placement in the gallery and inability to be boarded.

Figure 28: 1911 B-Type Motorbus and Character

The vehicle is placed between two highly attractive areas: the children's play area (Exhibit L0-59) and the 1910 Electric Tram (Exhibit L0-44). The Electric Tram, as shown in Figure 29 can be boarded and was very popular amongst children and adults alike. After visiting the Electric Tram, many visitors bypass the motorbus to enter the play area.

Figure 29: 1910 Electric Tram

The holding power of the B-Type Motorbus almost triples with the presence of the character. The average time spent at the motorbus without the character was 35 seconds whereas the time spent with the character present was 1:27 minutes. This places the motorbus into the same average time frame as a boardable vehicle without a character. This was significant because the motorbus without the character present was tied for the shortest dwell time of the eight exhibits.

We observed that the B-Type character approaches visitors and also uses props to help increase the attractiveness and holding power of the motorbus. The props used are cleaning equipment,

such as cloths and buckets, and job flyers. The cleaning equipment was used to demonstrate how she performed her daily duties and allows visitors to experience her job. The character uses the job flyers as a means of initiating conversation with passing visitors. In addition to the props, the character approaches visitors as they leave the Electric Tram who may not have otherwise interacted with the exhibit. For example, in one instance we observed the character approach a woman who was standing to the side by herself, and started talking to her about the B-Type bus and how women during that time worked on the buses.

1970 DMS Bus

The 1970 DMS Bus can be boarded by visitors and also contains a digital interactive in the form of a podium. The character at this exhibit was a 1970's Punk. This character was a male drummer who would often ride the bus. The bus and character are pictured in Figure 30: 1970 DMS Bus and PunkFigure 30.

Figure 30: 1970 DMS Bus and Punk

Our evaluation of this exhibit showed that with no character present 42% of visitors to enter the gallery interacted with the exhibit. However, with the character present, the percentage decreased to 24%. This represented the largest decrease in attractiveness out of the eight exhibits evaluated. This decrease can be partially attributed to the limiting factor of space he has to work in. Looking at Figure 31, it can be seen that the space provided between the DMS Bus (left) and the Routemaster (center) was very narrow. We observed that many visitors, especially when a group was with the Punk, passed between the Routemaster and the Green Line Motor Coach (right), bypassing the DMS Bus completely. This was because the Punk usually stands in between the two buses and blocks the path while speaking with visitors. Although the percent of interactions with the Punk was low, 56% of the visitors who interacted with the exhibit spoke with him.

Figure 31: DMS, Routemaster, and Green Line Motor Coach Buses

During the two days we had to observe the Punk, the number of visitors who entered the gallery was substantially different. In our first observation, the Punk

interacted with 28 out of 321 visitors who passed through the gallery over a period of 45 minutes. The second observation consisted of 20 out of 78 visitors over a half hour. Although the total number of visitors passing through the galley on the first day was approximately four times the number on the second, by calculating the interactions per an hour we found that there were 37 interactions per an hour the first day and 40 on the second. This provides statistical evidence that the low percentage of interaction can be partially attributed to the size of the character's space.

We observed that when a visitor entered between the two buses, the Punk would immediately approach them and start talking. Sometimes visitors didn't realize he was a character until he began speaking with them. This was partially because the costume he wore was very similar to clothing you might still see today. From our interview with the Punk, we learned that one of the reasons he was stationed between the two buses was because he compares the two buses to each other as they both operated during the 70's. Due to the confined space, detailed information, such as conversations with visitors, was difficult to collect without disrupting the naturalistic behavior of visitors.

Although the attractiveness of the exhibit decreased, we observed that the holding power of the 1970 DMS Bus doubles with the presence of the character. The average time spent at the bus without the character was 41 seconds whereas the time spent with the character present was 1:24 minutes. The average time spent at this bus when the character was not there was much lower than other boardable vehicles. This may be because, unlike many other boardable vehicles, visitors cannot sit down. However, when the character was introduced the average time spent at the bus increases so that it was on par with the rest of the boardable vehicles (Figure 21).

Electric Locomotive and Coach

The Electric Locomotive and Coach was the first electric Underground train. The exhibit was a vehicle that visitors can board which also has a digital interaction podium (Figure 32). On the side of the coach was written C&SLR, which stands for City and South London Railway, the company that operated the locomotive. The character's name, CSLR, was derived from this. The character portrayed was the locomotive's conductor and was dressed in a dark blue hat and jacket. The vehicle was unique in that it was split into two sections, the locomotive and the coach, with a small

Figure 32: Electric Locomotive and Coach

space in between them. The coach can be boarded and offers a large amount of seating for visitors. Additionally, a number of mannequins are placed further back in the coach. The locomotive cannot be boarded; however the inside can be easily viewed.

Our evaluation of this exhibit showed that with no character present 57% of visitors who enter the gallery interacted with the exhibit. However, with the character present, the percentage decreased slightly to 51%. Although the percentage decreased, half of the visitors in the gallery interacted with the exhibit while he was present. We attribute the decrease in interaction to the character's placement at the entrance to the coach. While the coach has one of the largest seating areas of any boardable vehicle, when visitor's stopped to speak with the character, they sometimes blocked the entrance to the coach. However when the character was not present, visitors enter the coach immediately, providing room for other visitors to enter easily.

The holding power of the locomotive and coach increases from 55 seconds to 1:18 minutes with the presence of the character. Although not a large increase, this indicates that visitors do spend more time at the exhibit when the character was present. The coach has an additional holding power because of the large amount of seating. We observed that many visitors sit for a lengthy period of time, which was indicated by the average dwell time without the character present. This time was one of the highest and was on par with other vehicles with large amounts of seating, such as the Shillibeer Horse Bus and the Metropolitan Railway Coach.

We observed that the CSLR character approaches visitors as they enter the vehicle. This may explain partially why he does not increase the attractiveness of the exhibit. The character spends much of his time explaining the history of the vehicle and its importance to the London Underground. For those interested, he also provides a detailed explanation of the locomotive and the engineering involved. One visitor, who was surveyed after speaking with the CSLR character, said that the engineering and naval information, provided by the character, caught his interest because of his experience with the Navy. This particular vehicle was of greater interest to this visitor after he learned, from the character, that it was built in his hometown. He even recalled seeing the factory as a child.

Going Deeper Underground

Going Deeper Underground was a huge life size diorama which was accompanied by a placard. The character, the Miner, actually goes inside the diorama and sets up a small stage for himself (Figure 33). This exhibit displays how the underground was built. The miner interacts with the wax figures and

uses props to engage the visitors. Unlike the other characters, the miner puts on a show and interacts with the visitors.

Figure 33: Going Deeper Underground & Miner

Our evaluation of this exhibit showed that with no character present 26% of visitors interacted with the exhibit. However, with the character, the percentage of visitors increased significantly to 53%. This represented the second largest increase in attractiveness out of the eight exhibits evaluated. Some factors that might have made these numbers change so dramatically were that the diorama was in the back of a room and had dim lighting. We observed that most visitors either glanced at the exhibit or didn't even see it when the character was not present. Along with the increase in attractiveness, the holding power of the exhibit increased from an average of 42 seconds when the character was not there to an average of 3:20 minutes when he was there.

From our observations, we saw that when the character was there he would move around within the diorama. This movement would attract visitors to the exhibit and he would begin talking. Once other visitors saw visitors gathered around the exhibit their curiosity would draw them in as well. A large crowd would then form and most visitors would listen to him the entire time he was talking. The presence of this character engaged visitors much more and allowed the visitors to learn more. Most of what the character's script contains cannot be found anywhere else at that exhibit, thus enhancing the visitor's learning.

Metropolitan Railway Coach

The Metropolitan Railway Coach, on Level 1, was part of the first underground steam train. This exhibit consists of a vehicle that can be boarded and a digital interaction podium. Accompanying this exhibit was the 1930's Woman character (Figure 34). Unlike some of the other characters, the 1930's Woman does not use the fact that the vehicle was boardable as a way of interacting with the visitors. Rather, as a woman of the 1930's, she would likely have used the ladies-only coach and therefore stands near that portion of the exhibit, using it as a topic of conversation with visitors.

Figure 34: Metropolitan Railway Coach and 1930's Woman

In our evaluation of this exhibit, we found that 66% of visitors who entered the gallery interacted with the exhibit when there was no character present. With the character there the percentage of interaction dropped to 60%. Even though the attractiveness of the exhibit decreased with the character there, the average interaction with the character present still exceeds that of the overall average percentage of interaction for boardable vehicles, which was 53%.

While there was a slight drop in visitor interaction, there was a comparable increase in dwell time when the character was present. The average time spent at the Metropolitan Railway Coach when the character was not present was 1:05 minutes, whereas, when the 1930's Woman was present the dwell time increased to 1:31 minutes. That 26 second increase boosted the average dwell time of the railway coach to above that of the average for boardable vehicles.

We observed the 1930's Woman many times while evaluating the character actor program at the museum. In our observations, we noticed that, much like the Punk, the 1930's Woman's attire was not entirely different than what you might see today. This caused her to blend into the crowd and it was clear that some visitors did not realize she was a character. Rather they viewed her as just another visitor. Although this may be so, we observed that she would greet visitors as the passed the ladies-only coach, sometimes striking up a conversation. She would speak about her travel on the Underground which provided a story, or association, to tie her to the exhibit.

Metropolitan Railway Steam Locomotive

Another exhibit that has an associated character was Metropolitan Railway Steam Locomotive. This exhibit includes a vehicle and a digital interaction podium. Visitors normally cannot board the locomotive, but when the character was present visitors were allowed to climb aboard. The character at this exhibit was the Fireman; a picture of him interacting with visitors can be seen in Figure 35.

Figure 35: Metropolitan Railway Steam Locomotive & Fireman

Our evaluation of this exhibit showed that without the character present 57% of the visitors in the gallery would interact with the exhibit. This was a reasonably high percentage, which may be due to the nature of the exhibit. The Metropolitan Railway Steam Locomotive was London's very first underground train; therefore the vehicle itself has a high attractiveness. When the Fireman was present the percent of interaction with the exhibit decreased slightly to 52%. However, the number of interactions per hour increased from 137 to 147 interactions per hour with the addition of the character. The only way for the number of interactions per hour to increase and have the percentage of interaction decrease was to have a higher total number of people in the gallery on the days data was collected. This tells us that the decrease in percentage of interaction could be caused by factors such as over congestion of the area and not necessarily that the character makes the exhibit less attractive.

The evidence in support of the character comes from the data collected from our dwell time observations. The Fireman increased the average time spent at the locomotive by nearly 700%. The average time spent at the exhibit without his presence was only 35 seconds, but when he was there the average dwell time increased to 3:32 minutes. This represents the largest increase in dwell time out of any exhibit.

The Fireman character would stand in the locomotive and invite visitors aboard. Once aboard he would explain to them how his job was to shovel in the coal and make sure the fire kept burning. He would also show visitors how the controls worked to drive the train. When explaining how the train works to children, he would compare the train to Thomas the Tank Engine because the steam

locomotive was also a tank engine. He would open up the cap for the water tank and let the children look inside while explaining that the two things necessary for the train to operate were water and the coal to make steam. This provided an interactive and memorable experience for children and adults alike.

Shillibeer Horse Bus

Another exhibit included in this study was the Shillibeer Horse Bus. This exhibit consists of a boardable vehicle and a digital interaction podium. There was also sound because the mannequins sitting inside speak to one another. This exhibit was unique because it was the only one where there are two different characters that are part of the exhibit. These two characters are the Victorian Passenger and the Shillibeer Bus Driver. Although they shared the vehicle, they were never present at the same time. Figure 36 shows the Shillibeer Horse Bus and Figure 37 shows the Shillibeer Bus Driver. Unfortunately we were unable to get a picture of the Victorian Passenger.

Figure 36: Shillibeer Horse Bus

This exhibit was determined to be the most attractive from our observations. The data from the Visitor/Character Interaction observations showed that 68% of visitors that entered Level 2 interacted with the Shillibeer Bus. This was a higher interaction percentage than any other exhibit with or without a character. This may be partially because it was one of the first exhibits most visitors encountered upon their arrival. When the Shillibeer Bus Driver was present at the exhibit, there was a sizeable increase to 80%. Our data shows, however, that with the presence of the Victorian Passenger there was a decrease in interaction to 61%. Although the data shows the Shillibeer Bus Driver interacted with a higher

Figure 37: Shillibeer Bus Driver

percentage of visitors, when looking at the interactions per hour, there was an average of 152 interactions per hour with the horse bus when neither character was present, 156 when the bus driver was present, and 157 when the Victorian Passenger was present. This provides strong evidence that layout of the gallery and flow of visitors limit the number of interactions with the Shillibeer Horse Bus to about 155 per hour. This shows that both characters and the exhibit alone are very attractive, but at busy times a lower percentage of visitors are able to interact.

Although the characters seem to have a minimal effect on the number of people that interact with the exhibit, both characters doubled the average time spent at the exhibit. The average time spent at the bus without a character was 1:01 minutes. When the Shillibeer and Victorian characters were there, the average dwell times increased to 2:11 and 2:23 minutes respectively. These times are all impressive considering the dwell time of the exhibit alone was almost as long as a few exhibits with their respective characters present.

The Shillibeer Bus Driver and the Victorian Passenger have different approaches at engaging the visitors and the data shows they are both successful in their own way. The bus driver follows a constant routine of welcoming visitors aboard the bus and then stands in the doorway while telling them about the bus. After his speech, which usually lasts about two minutes, he says “well, I think we have arrived at your stop folks” then steps down from the doorway and motions for the visitors to get off. This allowed for the next 10 to 15 visitors to climb aboard and listen to his speech. He rarely initiated one-on-one conversations with visitors, but if asked a question by a visitor he would not hesitate to vary his usual script to answer the question. This observation was supported by the data presented in Figure 24: Extent of Interaction with exhibits, which shows that only 17% of the visitors that interacted with the exhibit spoke with him whereas 60% listened to him.

The Victorian Passenger takes a slightly different approach. Rather than ushering visitors into the bus and speaking to them while they sit, she tends to get them more involved. She would teach the young girls how to curtsy. She would sometimes speak to the visitors outside the bus, allowing others to explore the inside on their own. Other times she would climb inside with visitors and sit with them while talking. Visitors were usually more interested in her dress and Victorian society than the bus itself. She engaged 44% of the visitors who interacted with the bus in conversation.

Tilling Horse Bus

This exhibit was a vehicle that cannot be boarded and has a digital interaction podium. The character that was associated with this exhibit was the Crossing Sweeper (Figure 38). She was dressed like a crossing sweep from the 1800's. The crossing sweeper would sweep the horse droppings out of the street so when the wealthy would cross they would not step in it. This character would hold a broom and have fake horse droppings and a bucket as props.

Figure 38: Tilling Horse Bus and Crossing Sweeper

We observed that when the character was present the visitor interaction percentage increased slightly from 50% to 57%. Although this was not a huge difference, the number of interactions per hour increased from 87 to 133 visitors. The holding power of this exhibit also increased. When the character was not present the average dwell time was 39 seconds and when she was present it increased to 56 seconds.

Figure 39: Stamper

We observed that since this vehicle was not boardable, most visitors looked at the exhibit, interacted with the podium, or listened to the talking horses, but they did not stay for long. Another observation was that most people rush past the exhibit because there was a Stamper right next to the exhibit. The Stampers are placed throughout the museum as a way of engaging children in their museum visit. Children are given a Stamper Card when they enter the museum and at each Stamper they encounter, they insert the card and punch a hole which indicates that they visited that area of the museum. A picture of Stamper 3 is shown in Figure 39.

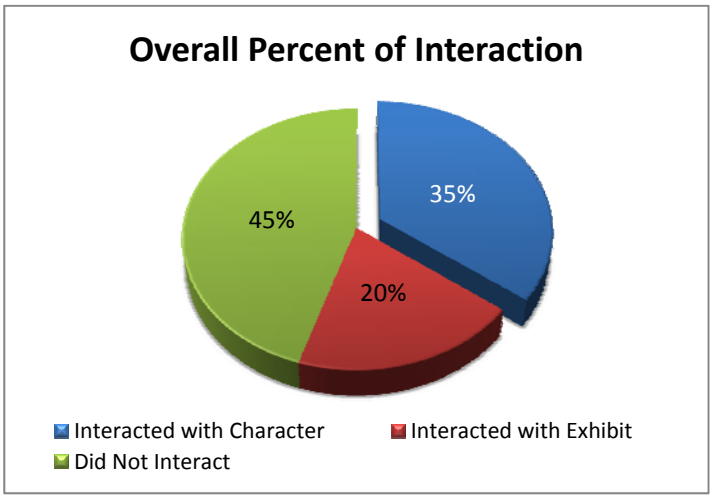
Conclusions on Character Actors

The project team sought to answer four primary questions: do visitors meet the characters, does meeting the characters enhance the visitor's experience, do visitors learn things they would not have otherwise, and are characters used in the proper location. Through our surveys, tracking studies, and observations, we hoped to provide evidence to address these questions. By analyzing the attractiveness and holding power of each exhibit, with and without the character present, and surveying visitors, we were able to answer all four of these questions.

The first step in educating and entertaining a visitor is to get them to interact with an exhibit in the museum. The ability of a particular exhibit to catch visitor interest is called the attractiveness. We utilized this concept to determine if visitors meet the characters. Our observations indicated that 51% of visitors that entered a gallery, when characters were not present, interacted in a meaningful way with the eight exhibits included in the evaluation. When a character was introduced to an exhibit, the average percent of interaction increased to 55%.

Although this does not represent a large increase in attractiveness, when evaluating characters on an individual basis, strong evidence of an increase in visitor interaction appeared. All of the exhibits which experienced a small shift in attractiveness of ±7% are already highly attractive on their own, such as the Electric Locomotive and Coach and the Metropolitan Railway Coach. This left little room for the character to increase the attractiveness of an exhibit as each was limited in how many visitors it could handle at any given time. However, at exhibits where the immediate attractiveness of the exhibit was apparently low, such as the B-Type Motorbus or Going Deeper Underground, the addition of a character increased the attractiveness by over 200%. The only instance of a dramatic decrease in attractiveness was at the 1970 DMS Bus. However, as discussed in the exhibit specific findings, this was partially explained by both the layout of the gallery, which limited the number of visitors to the bus, and to the extraordinarily high number of visitors to the gallery on our first day of observing.

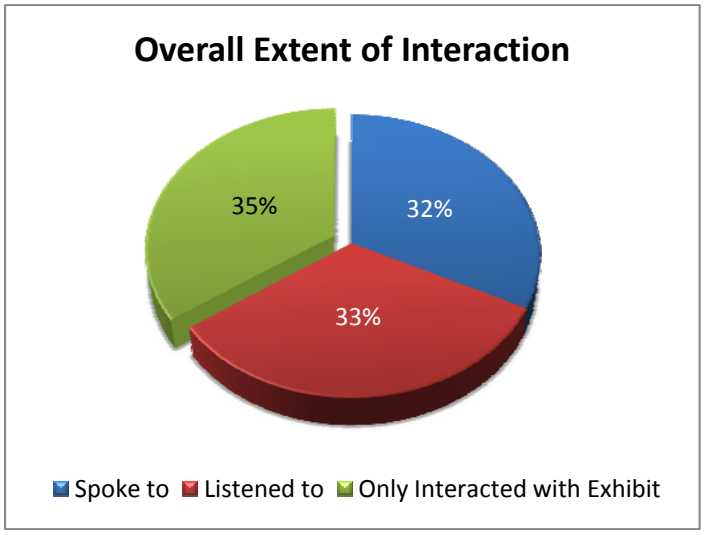
Figure 40: Overall Percent of Interaction



Taking this into account, we observed that the visitors do indeed interact with the characters in the museum. In the case of less immediately attractive exhibits, characters can substantially increase the attractiveness of that exhibit. When a character was present, 35% of visitors in a gallery either spoke with or listened to the character (Figure 40). This accounts for 65% of people who interacted with the eight exhibits (Figure 41). Furthermore, the dramatic increase in attractiveness of the DMS Bus and B-Type Motorbus indicates that the attractiveness of the exhibit with the character present was not entirely due to the inherent attractiveness of the exhibit, but that the character also has an intrinsic attractiveness that draws visitors.

Once a visitor begins interacting with an exhibit, it is the goal of the museum to educate and entertain them. The length of time a visitor spends at an exhibit indicates how much they are enjoying their experience and how much they are learning. While there are many factors that play into how long a visitor spends at an exhibit, such as past experiences and personal interests, by collecting data on many people, we were able to minimize the effects of these uncontrollable variables. From our observations we determined that visitors spend an average of 48 seconds at the eight exhibits when a character was not present. However, when a character was present, the average time spent increased significantly to 2:00 minutes. This was significant because less than 10% of visitors spent more than two minutes at all of the exhibits, except for the Metropolitan Railway Coach, when the characters were not present.

Figure 41: Overall Extent of Interaction



As indicated by our interviews with the actors, the priority of the actors was to engage and educate the visitor. The Punk explained that he tries to create a "fantasy land" in which the visitor is pulled into a different time and place. Once he is able to bring visitors in, he finds that their curiosity increases and their inhibitions diminish, opening their minds to discovery, learning, and asking questions. Our direct observation of the visitors also showed that the vast majority of their time spent interacting with the characters was spent towards learning. The advantage of characters, in regards to learning, lies in their ability to adapt to the interests of the visitor. Most exhibits must take into account the broad demographic at a museum and therefore must contain information that is interesting to different people with different interests, education, background, and ages. However, this requires that the visitor sift through a large amount of text and information to find what interests them. For parents with young children, this can prove an impossible feat because, as we observed, they have very little time at an exhibit before they are pulled away by their child. However, a character can tailor the information they provide to better suite their audience.

The only question that could not be answered through observations was "Do visitors learn things they would not have otherwise?" To evaluate this, we surveyed visitors who interacted with the characters. When asked whether or not they learned anything from their interaction with the character, 71% responded that they had. One common example provided was for the Shillibeer Bus Driver. Many visitors who were surveyed said that they had learned how the bus fare dropped from a shilling to a penny, which allowed more people to take the bus. Visitors who interacted with the Crossing Sweeper commented that they learned that her job was to sweep up horse droppings. Other visitors, who interacted with the B-Type character, learned that women had to drive the buses during World War I. From these specific responses and others, there was supporting evidence to show that visitors learned from their interactions with the characters.

Recommendations

Our overall conclusion on the use of character actors in the London Transport Museum is that they provide a quality experience that is unique from any other medium in the museum. We have shown supporting evidence which indicates that visitors did interact with the characters, meeting the characters did enhance the visitor's experience in a meaningful way, and from our surveys and what we have read in the literature, we can assume that visitors did learn more from the characters than they would have otherwise. Although our evaluations provided positive feedback for the use of all of the characters, we do have recommendations for maximizing their use.

Placement

From our observations, we noticed that the placement of the character within and around the exhibit played a major role in the exhibits attractiveness. An example of this is the Fireman character. As previously stated, his placement within the Metropolitan Railway Steam Locomotive was ideal because he did not interrupt the flow of the museum surrounding the exhibit. Furthermore, because visitors could board the locomotive, they could interact with the Fireman in a location that was not blocking traffic. Although not all of the characters had the benefit of a vehicle which could be boarded, there were three characters who did not take full advantage of their vehicles. The three characters we recommend moving are the Punk, the CSLR, and the 1930's Woman.

The placement of the DMS and Routemaster buses limited the number of visitors who could pass between them. Previously we discussed how the Punk's current placement sometimes disrupted the flow between the buses, discouraging people from interacting with the exhibit. We propose that the Punk attempt to talk to visitors either in front of or on board the bus whenever possible. This will allow for the narrow opening between the buses to remain clear for other visitors to view the exhibit, increasing its attractiveness.

Another character we observed whose placement could be improved is the CSLR. As discussed in his character specific evaluation, his current location between the coach and locomotive inhibited visitor access to both the coach and the podium. As with the Punk, this discouraged visitors from interacting with the exhibit when he was already interacting with other visitors. To avoid this congestion, we propose that the character be placed either inside the locomotive where he will be out of the way of visitor traffic, in front of the locomotive, or inside the coach where he can interact with visitors while they sit inside, similar to the Shillibeer Bus Driver.

The final character whose exhibit could benefit from better placement is the 1930's Woman. Currently, she stands outside the ladies-only coach because her character would traditionally sit there. Since that section of the coach could not be boarded, she did not have an area where she could hold an audience. Additionally, due to the flow of visitors through the gallery, most had already interacted with the boardable portion of the exhibit before they got to her. We recommend that she stand near or inside the boardable portion of the coach, thus allowing her to take advantage of the natural attractiveness of the exhibit. This also places her at the beginning of the exhibit rather than the end.

Behavior and Props

Two other important factors that played major roles in the attractiveness of a character were their behavior and their props. We observed that characters who took a more proactive approach to attracting visitors, both through the use of props and by initiating conversation, had a higher percentage of interaction. Examples of this are the B-Type and the Miner characters. Both initiated conversations and used props to engage visitors. The "Percent of Interaction with Exhibit" graph shows that these characters increased the attractiveness of their exhibits the most of any character.

The Crossing Sweeper is an example of a character who we believe could be improved by slightly modifying her behavior. Although the character used a twig broom, bucket, and fake horse droppings as props, she did not use them as a means of attracting visitors. Rather, she waited until a visitor approached her to begin using the props. We believe that by sweeping even when not yet interacting with visitors, her actions will attract attention, similar to the Miner and the B-Type characters.

Another character who we believe could improve their attractiveness by altering their behavior is the 1930's Woman. Although the character did greet visitors as they walk by, she waited for them to approach her before initiating a conversation. If she were to approach visitors as they are still interacting with the exhibit, we believe this would increase the percentage of interaction with the character at the Metropolitan Railway Coach.

Costumes

Costumes played an important role in the distinction between characters and visitors. We observed that most of the characters wore costumes that made them easily identifiable as characters. For example, the Victorian Passenger wore a full Victorian dress that clearly set her apart from visitors. However, characters such as the Punk and the 1930's Woman had less distinguishable costumes. Although we do not have any specific recommendations on how to improve these costumes, we noticed

that many people did not realize that they were characters initially. We suggest looking into ways of increasing the character's visibility.

Scheduling

The final recommendation we have to improve the use of the character actors has to do with the scheduling of the characters. Throughout our study, we observed that when characters that were on Level 0 were scheduled to begin at 11:00 AM, they had very few interactions within the first hour compared to those who were on the top two levels. This was because the museum opened at 10:00 AM and most visitors began their visit on Level 2 and worked their way down. From this, we recommend that any characters on Level 0 should begin no earlier than noon. This allows visitors time to make their way down to them.

References

Anderson, J. (1982). Living history: Simulating everyday life in living museums. *American Quarterly, 34*(3), 290-306. Retrieved from http://www.jstor.org/stable/2712780

Bhatt, R. (2005). *The project.* Retrieved 1/15/2010, 2010, from http://web.archive.org/web/20061119163956/http:/www.ltmuseum.co.uk/project/project.shtml

Briggs, N. (2000). Reaching a broader audience. *The Public Historian, 22*(3), 95-105. Retrieved from http://www.jstor.org/stable/3379581

Dewey, J. (1916). Democracy and education. *Democracy and education* (pp. 76). New York, N.Y.: MacMillian Company.

Dierking, L. D. (1992). The audience in exhibition development. *American Association of Museums,* , 30-34.

Divall, C. (2008). Review: The london transport museum. *Technology and Culture, 49*(4), 1010-1017.

Divall, C., & Scott, A. (2001). *Making histories in transport museums*. London ; New York: Leicester University Press.

Donald, J. G. (1991). The measurement of learning in the museum. *Canadian Journal of Education, 16*(3, Museums and Education), 371-382. Retrieved from http://www.jstor.org/stable/1494885

Dorson, R. M. (1972). The use of artifacts and folk art in the folk museum. *Folklore and folklife: An introduction* (pp. 498). Chicago: University of Chicago Press.

Duffy, T. M., & Jonassen, D. H. (1991). New implications for instructional technology? educational technology.*31*(3), 7-12.

Durant, J. (1992). The medium is the museum: On objects and logics in times and spaces. *Museums and the public understanding of science. London: The science museum.* (pp. 34-41)

Falk, J. H. (1999). Museums as institutions for personal learning. *Daedalus, 128*(3, America's Museums), 259-275. Retrieved from http://www.jstor.org/stable/20027574

Falk, J. H., & Dierking, L. D. (1992). *The museum experience*. Washington, D.C.: Whalesback Books.

Handler, R. (1987). Review: Overpowered by realism: Living history and the simulation of the past; time machines: The world of living history; the living history sourcebook. *The Journal of American Folklore, 100*(397), 337-341. Retrieved from http://www.jstor.org/stable/540337

Hein, G. (1998). *Learning in the museum*. New York: Routledge.

Hodder, R. (2010). In Rotier M., Mordarski M., Ciesynski J. and McDonnell C.(Eds.), *Spectrum drama questionaire*

International Council of Museums. (2009). *ICOM statutes.* Retrieved 2/1/2010, 2010, from http://icom.museum/statutes.html

Ivey, W. (2000). Keynote address to the american association of museums annual meeting, 15 may 2000. Baltimore, MD.

Jonassen, D. H. (1991). Evaluating constructivistic learning. *Educ.Technol., XXXI*(9), 28-33.

Linn, M. C. (1983). Evaluation in the museum setting: Focus on expectations. *Educational Evaluation and Policy Analysis, 5*(1), 119-127. Retrieved from http://www.jstor.org/stable/1163813

London Transport Museum. (2009). *Yearbook 2008/2009 london's journey - past, present and future*

Malcolm-Davies, J. (2004). Borrowed robes: The educational value of costumed interpretation at historic sites. *International Journal of Heritage Studies, 10*(3), 277-293. Retrieved from http://www.informaworld.com/10.1080/1352725042000234451

Massender, J. (2007a). *Collecting policy | london transport museum.* Retrieved 1/24/2010, 2010, from http://www.ltmuseum.co.uk/aboutus/129.aspx

Massender, J. (2007b). *Our mission | london transport museum.* Retrieved 1/17/2010, 2010, from http://www.ltmuseum.co.uk/aboutus/143.aspx

Merrill, M. D. (1991). Constructivism and instructional design. educational technology.*31*(5), 45-53.

Museums, Libraries and Archives Council. (2008). *Generic learning outcomes.* Retrieved 3/23/2010, 2010, from http://www.inspiringlearningforall.gov.uk/toolstemplates/genericlearning/index.html

Pearce, S. (1994). Studying museum material and collections. *International Journal of Heritage Studies, 1*(1), 30. Retrieved from http://www.informaworld.com/10.1080/13527259408722128

Pickard, E. A. (2006). *Missouri historical society: Museum theatre survey results* (SurveyMissouri Historical Society.

Roschelle, J. (1995). Learning in interactive environments: Prior knowledge and new experience. *American Association of Museums,*

Runes, D. D. (1962). *Dictionary of philosophy* (15th ed.). Paterson, NJ: Littlefield, Adams & Co.

Shulman, L. S., & Keislar, E. R. (1966). *Learning by discovery: A critical appraisal*. Chicago: Rand MacNally & Co.

Silverman, A. (2008). *Plato's middle period metaphysics and epistemology.* Retrieved 3/24/2010, 2010, from http://plato.stanford.edu/entries/plato-metaphysics/

Velarde, G. (2001). *Designing exhibitions* (2nd ed.). Hants, England: Ashgate Publishing Limited.

Warhurst, C. (2007). *Governance | london transport museum.* Retrieved 1/17/2010, 2010, from http://www.ltmuseum.co.uk/aboutus/125.aspx

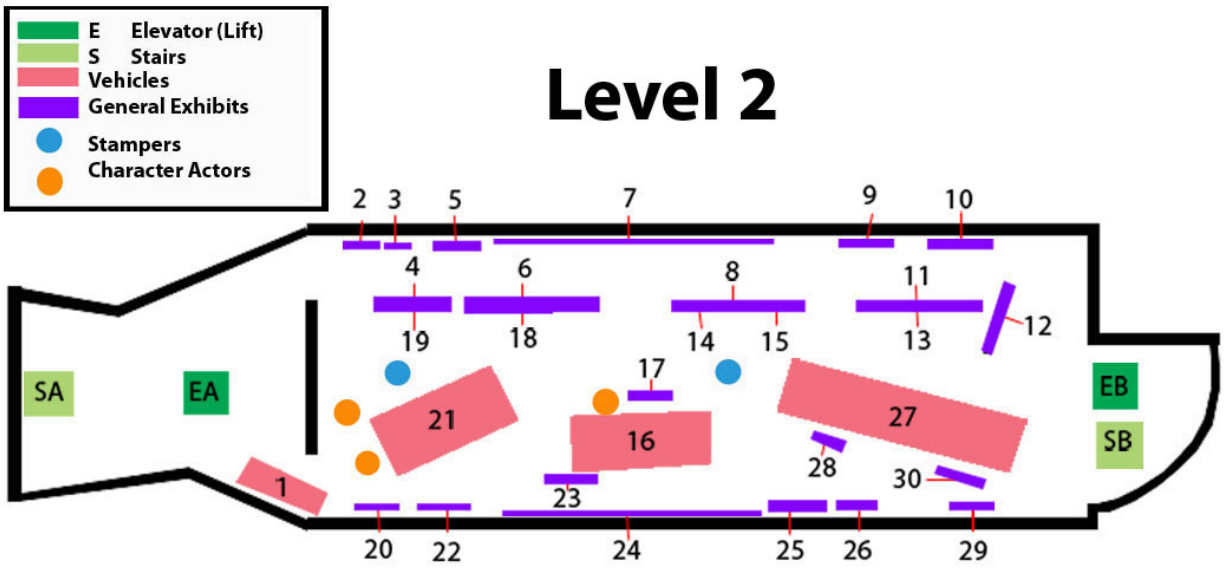
Wills, B. (2008a). *Brief history of the museum | london transport museum.* Retrieved 1/15/2010, 2010, from http://www.ltmuseum.co.uk/aboutus/135.aspx

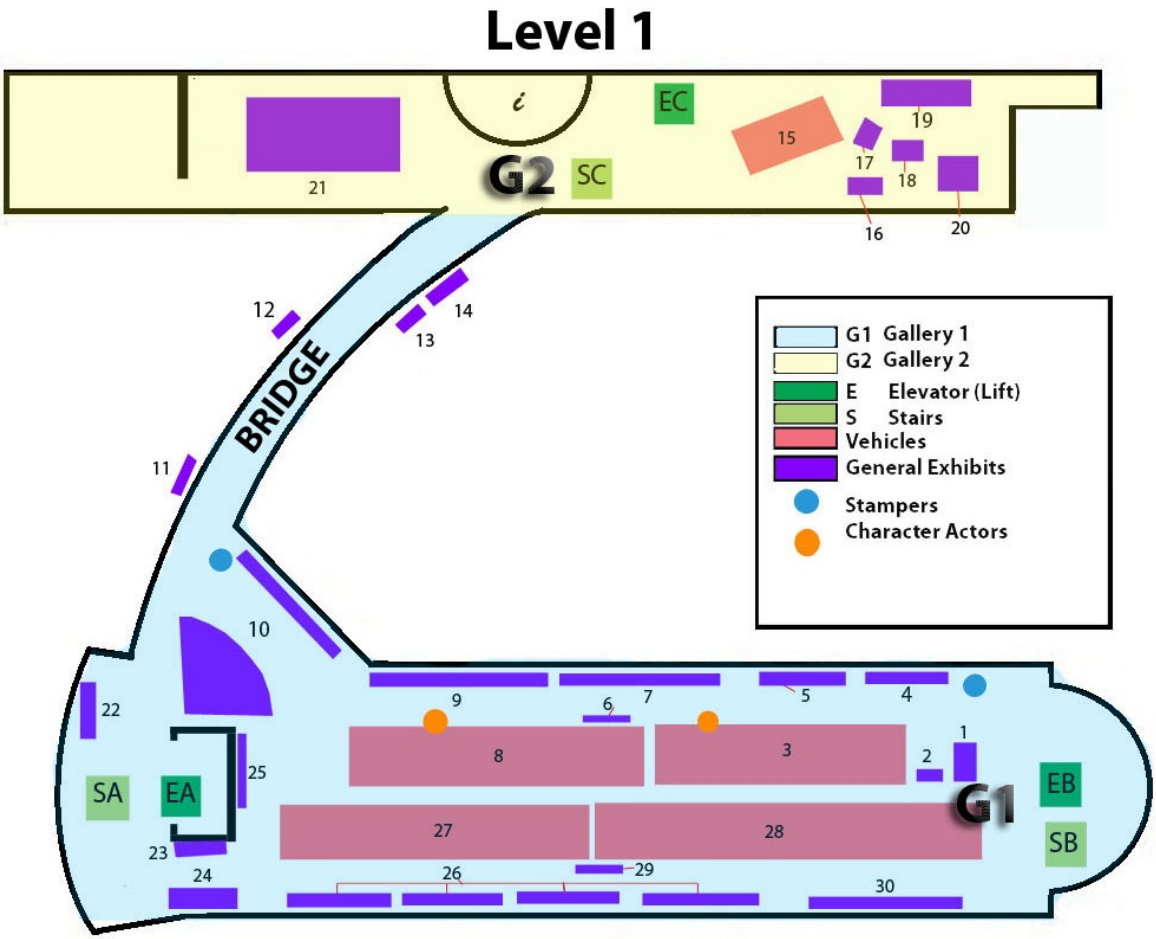
Wills, B. (2008b). *Museum re-opened 22 november 2007 | london transport museum.* Retrieved 1/15/2010, 2010, from http://www.ltmuseum.co.uk/aboutus/348.aspx

Wittlin, A. S. (1970). *Museums: In search of a usable future*. Cambridge, Mass.,: MIT Press.

Appendices

Appendix A: Museum Maps






G1 Gallery 1
G2 Gallery 2
G3 Gallery 3
G4 Gallery 4
E Elevator (Lift)
S Stairs
Vehicles
General Exhibits
Stampers
Character Actors
Level 0
EC
SC
EA
SA
EB
SB
G1
G2
G3
G4

Appendix B: Exhibit Characteristic Chart

Key	
V- Vehicle	DI- Digital Interaction
V*- Boardable Vehicle	PI- Physical Interaction
D- Diorama	DD- Digital Display
P- Placard	S- Sound/ Audio

	Exhibit Name	V	V*	D	P	DI	PI	DD	S
L2-01	Sedan Chair- Chair to Anywhere	X			X				
L2-02	River Thames			X	X				
L2-03	Ghost- Thames Waterman				X				X
L2-04	Early Railways				X				
L2-05	On The Water			X	X		X		
L2-06	London's First Passenger Railway			X	X		X		
L2-07	London Water Panorama				X		X		
L2-08	Closer to the Centre				X				
L2-09	River Traffic Declines				X				
L2-10	Reshaping the River				X				
L2-11	London's Railway Network			X	X				
L2-12	Was there a Solution?				X				
L2-13	Looking After the Horses			X	X				
L2-14	Horsing Around London				X				
L2-15	Rails in the Road			X	X		X		
L2-16	Tilling Horse Bus	X				X			X
L2-17	Ghost-Cast Iron Billy				X				X
L2-18	Rise of the Horse Bus			X	X		X		
L2-19	Before the Bus			X	X				
L2-20	Crowded City				X				
L2-21	Shillibeer Horse Bus		X			X			X
L2-22	Reshaping the City				X				
L2-23	The Passenger Experience				X		X		X
L2-24	London Streets Panorama				X		X		
L2-25	Big Vision for a Better City				X		X		
L2-26	Ghost- Crossing Sweeper				X				X
L2-27	Stephenson Horse Tram	X				X			X
L2-28	Advertising Starts Early				X				
L2-29	Healthy Heart of Empire				X		X		
L2-30	Ghost- Horse Tram Conductor				X				
L1-01	Building the First Underground Railway			X	X		X	X	X
L1-02	Steam Underground			X	X		X		
L1-03	Metropolitan Railway Steam Locomotive	X				X			
L1-04	World's First Underground Railway				X		X		

	Exhibit Name	V	V*	D	P	DI	PI	DD	S
L1-05	Traveling on the Steam Underground			X	X				
L1-06	Ghost- Fireman and train driver: George Spiller				X				X
L1-07	Smoking on the Underground				X		X		
L1-08	Metropolitan Railway Coach		X			X			
L1-09	Suburban Commuting				X		X		
L1-10	Suburban Revolution			X			X	X	X
L1-11	Destination Plates				X				
L1-12	Bus Blinds				X				
L1-13	Trading Every Day Except Christmas				X				
L1-14	Bloomin' Marvellous				X				
L1-15	London General OPTARE Bus		X				X		X
L1-16	Guess Who						X		
L1-17	Build a Vehicle						X		
L1-18	Try Me On						X		
L1-19	Object Trivia						X		
L1-20	Interactive Survey						X		
L1-21	Computer Games/Museum					X	X	X	
L1-22	Michael Faraday			X	X				
L1-23	Metro-land Leisure				X				
L1-24	Leisure Travel				X		X		
L1-25	Metroland			X	X				
L1-26	Poster Parade				X				
L1-27	Metropolitan Railway Electric Locomotive	X				X			
L1-28	1923 District Railway Underground Coach		X			X			
L1-29	Ghost- Train Guard				X				X
L1-30	A Transport Revolution				X				
L0-01	Going Deeper Underground				X				
L0-02	How to Get Passengers Up and Down			X	X		X	X	X
L0-03	Up or Down?			X	X		X		
L0-04	Ghost- Escalator Legend: Bumper Harris				X				
L0-05	Going Deeper Underground			X	X		X		X
L0-06	How do You Tunnel Deep Underground			X	X		X	X	
L0-07	How to Power Trails Underground			X	X		X		X
L0-08	Power Controls			X	X				
L0-09	Providing the Power				X			X	X
L0-10	Underground Diorama			X			X		X
L0-11	Electric Locomotive & Coach	X	X			X			X
L0-12	The New Electrics				X				
L0-13	Tube Mania				X				
L0-14	An American Saves the Tube				X			X	X
L0-15	Getting the Underground Out of a Hole			X	X				
L0-16	Filling Up the Tube				X				
L0-17	The Great Bear				X				
L0-18	Designed to Move London			X	X				

	Exhibit Name	V	V*	D	P	DI	PI	DD	S
L0-19	Scrolling Overhead Display							X	
L0-20	Drawing London Together			X	X		X		
L0-21	Managing London's Design			X	X				
L0-22	London's Machines			X	X		X		
L0-23	Transport at a Glance/ Design for Travel			X	X				
L0-24	Transported by Art			X	X			X	
L0-25	Electric Tube Car 1939		X			X		X	X
L0-26	Taking the Tube			X	X		X	X	
L0-27	Antique Tube Simulator					X	X		
L0-28	A Century of Underground Trains			X	X		X		
L0-29	Tube Timeline Map							X	
L0-30	The Upheaval of War				X				
L0-31	First World War 1914-18			X	X		X	X	X
L0-32	Travelling in Wartime				X				
L0-33	First World War Ends				X				
L0-34	Women and War				X			X	
L0-35	Women in the War (room)							X	X
L0-36	Sheltering in the Tube 1940-45				X				
L0-37	Second World War 1939-45			X	X		X		
L0-38	The System Keeps Running			X	X				
L0-39	Memorial Stone				X				
L0-40	End of the War				X				
L0-41	Getting the Most From London Underground				X				
L0-42	Modern Tube Simulator		X			X	X		
L0-43	BVE Simulator					X	X		
L0-44	Electric Tram 1910	X				X	X		
L0-45	The Mechanical Revolution			X	X		X		
L0-46	Ghost- Tram Driver				X				X
L0-47	Trams for Everyone			X	X		X		
L0-48	Tram Metropolis			X	X				
L0-49	Electric Trolleybus 1939		X			X			
L0-50	Trolleybuses Overtake London's Trains			X	X		X		
L0-51	Congestion and Safety			X	X				
L0-52	Best Buses in the World			X	X			X	
L0-53	Big Bus Boom of the 1920s			X	X		X		
L0-54	B-Type Motorbus 1911	X				X			
L0-55	Ghost- Bus Driver: Jamaican Joe				X				
L0-56	Uniform Delivery			X	X				
L0-57	Taxi!				X				
L0-58	Austin Taxi 1937	X				X			
L0-59	All Aboard		X			X	X		
L0-60	Map of London			X				X	
L0-61	After the Second World War				X				
L0-62	Tilt Test			X	X		X		

	Exhibit Name	V	V*	D	P	DI	PI	DD	S
L0-63	London's Biggest Employer			X	X	X	X	X	X
L0-64	Diesel Triumphant				X			X	
L0-65	Taxi Vs. Minicab				X				
L0-66	Who Pays to Keep Public Transportation Going?			X	X				
L0-67	Green Line Motor Coach 1939		X		X	X			
L0-68	Will Cars Rule?				X				
L0-69	Long-Distance Commuting			X	X		X		
L0-70	The Tide Turns				X	X			
L0-71	Integrated Ticketing				X				
L0-72	Routemaster Motor Bus 1963		X			X			
L0-73	DMS Bus 1970		X			X			
L0-74	An Accessible Network							X	X
L0-75	Regulating for Your Safety				X				
L0-76	TX4 Taxi 2007	X				X			
L0-77	Cycling/Walking in London/The River and its Services			X	X				
L0-78	London Streetscapes				X	X			
L0-79	2000 Wright Gemini Bus		X			X			
L0-80	Six Million a Day				X				
L0-81	Dealing With Congestion in London				X				
L0-82	London's Underground/Trams tackle Congestion				X				
L0-83	Network Rail/ London Rail				X			X	
L0-84	The Challenge of Climate Change							X	X
L0-85	Doing Our Bit				X			X	
L0-86	London Moves East				X				
L0-87	Coming Soon to London					X		X	
L0-88	Visions of the Future				X			X	X
L0-89	London 2055				X			X	X
L0-90	Future Generator					X		X	X
L0-91	Moving in New Ways			X	X			X	
L0-92	Make Your Mark/Have Your Say				X		X	X	

Appendix C: Tracking Studies Data Sheet

Day of Week: S M T W R F S Date: ___/___/2010

Type of Group: Single Person Group Friends Family Teacher

(Circle One) Couple Single parent w/ Child Child w/ School Group Other:_____

Age Group:

(Circle all that Apply) <12 12-16 17-25 26-40 40-65 65+

Exhibit Location	Exhibit Name	Time In	Time Out	Time In	Time Out	Glance
L0-01	*Going Deeper Underground*					
L0-02	*How to Get Passengers Up and Down*					
L0-03	*Up or Down?*					
L0-04	*Ghost- Escalator Legend: Bumper Harris*					
L0-05	*Going Deeper Underground*					
L0-06	*How do You Tunnel Deep Underground*					
L0-07	*How to Power Trails Underground*					
L0-08	*Power Controls*					
L0-09	*Providing the Power*					
L0-10	*Underground Diorama*					
L0-11	*Electric Locomotive & Coach*					
L0-12	*The New Electrics*					
L0-13	*Tube Mania*					
L0-14	*An American Saves the Tube*					
L0-15	*Getting the Underground Out of a Hole*					
L0-16	*Filling Up the Tube*					
L0-17	*The Great Bear*					
L0-18	*Designed to Move London*					
L0-19	*Scrolling Overhead Display*					
L0-20	*Drawing London Together*					
L0-21	*Managing London's Design*					
L0-22	*London's Machines*					
L0-23	*Transport at a Glance/ Design for Travel*					
L0-24	*Transported by Art*					
L0-25	*Electric Tube Car 1939*					
L0-26	*Taking the Tube*					

L0-27	*Antique Tube Simulator*					
L0-28	*A Century of Underground Trains*					
L0-29	*Tube Timeline Map*					
L0-30	*The Upheaval of War*					
L0-31	*First World War 1914-18*					
L0-32	*Travelling in Wartime*					
L0-33	*First World War Ends*					
L0-34	*Women and War*					
L0-35	*Women in the War (room)*					
L0-36	*Sheltering in the Tube 1940-45*					
L0-37	*Second World War 1939-45*					
L0-38	*The System Keeps Running*					
L0-39	*Memorial Stone*					
L0-40	*End of the War*					
L0-41	*Getting the Most From London Underground*					
L0-42	*Modern Tube Simulator*					
L0-43	*BVE Simulator*					
L0-44	*Electric Tram 1910*					
L0-45	*The Mechanical Revolution*					
L0-46	*Ghost- Tram Driver*					
L0-47	*Trams for Everyone*					
L0-48	*Tram Metropolis*					
L0-49	*Electric Trolleybus 1939*					
L0-50	*Trolleybuses Overtake London's Trains*					
L0-51	*Congestion and Safety*					
L0-52	*Best Buses in the World*					
L0-53	*Big Bus Boom of the 1920s*					
L0-54	*B-Type Motorbus 1911*					
L0-55	*Ghost- Bus Driver: Jamaican Joe*					
L0-56	*Uniform Delivery*					
L0-57	*Taxi!*					
L0-58	*Austin Taxi 1937*					
L0-59	*All Aboard*					
L0-60	*Map of London*					
L0-61	*After the Second World War*					
L0-62	*Tilt Test*					
L0-63	*London's Biggest Employer*					
L0-64	*Diesel Triumphant*					
L0-65	*Taxi Vs. Minicab*					
L0-66	*Who Pays to Keep Public Transportation Going?*					

L0-67	*Green Line Motor Coach 1939*					
L0-68	*Will Cars Rule?*					
L0-69	*Long-Distance Commuting*					
L0-70	*The Tide Turns*					
L0-71	*Integrated Ticketing*					
L0-72	*Routemaster Motor Bus 1963*					
L0-73	*DMS Bus 1970*					
L0-74	*An Accessible Network*					
L0-75	*Regulating for Your Safety*					
L0-76	*TX4 Taxi 2007*					
L0-77	*Cycling/Walking in London/The River and its Services*					
L0-78	*London Streetscapes*					
L0-79	*2000 Wright Gemini Bus*					
L0-80	*Six Million a Day*					
L0-81	*Dealing With Congestion in London*					
L0-82	*London's Underground/Trams tackle Congestion*					
L0-83	*Network Rail/ London Rail*					
L0-84	*The Challenge of Climate Change*					
L0-85	*Doing Our Bit*					
L0-86	*London Moves East*					
L0-87	*Coming Soon to London*					
L0-88	*Visions of the Future*					
L0-89	*London 2055*					
L0-90	*Future Generator*					
L0-91	*Moving in New Ways*					
L0-92	*Make Your Mark/Have Your Say*					
L1-01	*Building the First Underground Railway*					
L1-02	*Steam Underground*					
L1-03	*Metropolitan Railway Steam Locomotive*					
L1-04	*World's First Underground Railway*					
L1-05	*Traveling on the Steam Underground*					
L1-06	*Ghost- Fireman and train driver: George Spiller*					
L1-07	*Smoking on the Underground*					
L1-08	*Metropolitan Railway Coach*					
L1-09	*Suburban Commuting*					
L1-10	*Suburban Revolution*					
L1-11	*Destination Plates*					
L1-12	*Bus Blinds*					
L1-13	*Trading Every Day Except Christmas*					

L1-14	*Bloomin' Marvellous*					
L1-15	*London General OPTARE Bus*					
L1-16	*Guess Who*					
L1-17	*Build a Vehicle*					
L1-18	*Try Me On*					
L1-19	*Object Trivia*					
L1-20	*Interactive Survey*					
L1-21	*Computer Games/Museum*					
L1-22	*Michael Faraday*					
L1-23	*Metro-land Leisure*					
L1-24	*Leisure Travel*					
L1-25	*Metroland*					
L1-26	*Poster Parade*					
L1-27	*Metropolitan Railway Electric Locomotive*					
L1-28	*1923 District Railway Underground Coach*					
L1-29	*Ghost- Train Guard*					
L1-30	*A Transport Revolution*					
L2-01	*Sedan Chair- Chair to Anywhere*					
L2-02	*River Thames*					
L2-03	*Ghost- Thames Waterman*					
L2-04	*Early Railways*					
L2-05	*On The Water*					
L2-06	*London's First Passenger Railway*					
L2-07	*London Water Panorama*					
L2-08	*Closer to the Centre*					
L2-09	*River Traffic Declines*					
L2-10	*Reshaping the River*					
L2-11	*London's Railway Network*					
L2-12	*Was there a Solution?*					
L2-13	*Looking After the Horses*					
L2-14	*Horsing Around London*					
L2-15	*Rails in the Road*					
L2-16	*Tilling Horse Bus*					
L2-17	*Ghost-Cast Iron Billy*					
L2-18	*Rise of the Horse Bus*					
L2-19	*Before the Bus*					
L2-20	*Crowded City*					
L2-21	*Shillibeer Horse Bus*					
L2-22	*Reshaping the City*					
L2-23	*The Passenger Experience*					
L2-24	*London Streets Panorama*					

L2-25	*Big Vision for a Better City*					
L2-26	*Ghost- Crossing Sweeper*					
L2-27	*Stephenson Horse Tram*					
L2-28	*Advertising Starts Early*					
L2-29	*Healthy Heart of Empire*					
L2-30	*Ghost- Horse Tram Conductor*					

Appendix D: Character/Visitor Interaction

Character/Visitor Interaction Chart Date: ____/____/ 2010

Time: ___:____

Character Actor: _____ Exhibit:_____

Glance at Exhibit	Interact with Exhibit	Listen to Character	Talk to Character

Notes:

_____

_____

_____

_____

Appendix E: Dwell Times Data Sheet

Dwell Times

Day of Week: S M T W R F S Date: ____/_____/ 2010

Exhibit:_______________________

Gender	Age Range						Time In	Time Out
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:
M F	<20	20-25	26-35	36-45	46-65	65+	:	:

Appendix F: General Survey

Day of Week: S M T W R F S Date: ____/_____/ 2010

General Exit Survey

Hello, my name is _____. I am working with the London Transport Museum conducting surveys on visitor experience. Can I take a few minutes of your time to ask you questions on your experience today?

Ant Trail #_____ (N/A)

Type of Group Single Person Group Friends (_____) Single parent w/ Kid(s)

Person is With: Couple Parents w/ Kid(s) Other:_____

Age Group: <20 20-25 26-35 36-45 46-65 65+ **Gender:** (M / F)

1. **Is this your first time visiting the London Transport Museum?**

   Yes No

2. **What exhibit was your favorite? Why?**

   _____

3. **Was there anything at any exhibits that attracted your attention?**

   Yes No **What was it?** (sound) (video) (Character) (Vehicle accessibility)

   (other_____)

4. **If this element was not there, do you think you may have walked past this exhibit?**

Yes No N/A

5. **What did you learn from your visit today?**

_____

_____

_____

6. **Did you *listen* to any of the costumed actors today?**

Yes No

If so, which one(s)? _____

If not, why? _____

(if no skip to #11, Additional Comments)

(if only one actor, skip question #7)

7. **Which of the costumed actors was your favorite? Why?**

_____

_____

_____

8. **What was your favorite part of your encounter with the character?**

_____

_____

_____

9. What did you learn from the actor that interested you the most?

_____

_____

_____

10. Did you *speak* to any of the character actors?

Yes No

If so, which ones? _____

a. Did speaking to the actors increase your interest in the exhibit?

Yes No

b. **Why or why not?**

_____

Thank you for taking a few minutes of your time to answer these questions, your feedback is greatly appreciated. Are there any additional comments you would like to add about your visit today?

11. Additional comments:

_____

_____

_____

Appendix G: Interaction Specific Survey

Day of Week: S M T W R F S Date: ____/_____/ 2010

Interaction Specific Survey

Hello, my name is _____. I am working with the London Transport Museum conducting surveys on visitor experience. Can I take a few minutes of your time to ask you questions on your experience today?

Ant Trail #_____ (N/A)

Type of Group Single Person Group Friends (_____) Single parent w/ Kid(s)

Person is With: Couple Parents w/ Kid(s) Other:_____

Age Group: <20 20-25 26-35 36-45 46-65 65+ **Gender:** (M / F)

1. **Today we had a character in the museum, Did you see a character today?**

   Yes **No**

   If so, which one(s)? _____

2. **Is this character the reason for your visit to that exhibit?**

   Yes **No**

3. **Did you interact with the character? (Listen to, speak to)**

   Yes No

   If so, which one(s)? _____

   If not, why? _____

(if only one actor, skip question #4)

4. **Which of the characters was your favorite? Why?**

_____

_____

_____

5. **What was your favorite part of your encounter with the character?**

_____

_____

_____

6. **Did you learn anything from the character that you didn't read or see in the exhibit?**

_____

_____

_____

7. **Did this encounter with the character effect your interest in the exhibit?**

Yes No

Why or why not? _____

Thank you for taking a few minutes of your time to answer these questions, your feedback is greatly appreciated. Are there any additional comments you would like to add about your visit today?

8. **Additional comments:** _____

_____

_____

Appendix H: Richard Hodder Interview Questions

1. How long have you been working as a character actor?

_____

_____

_____

   a. How long with LTM?

   _____

   _____

   _____

2. Most of the actors from spectrum perform at multiple museums around the UK. What museums have you played characters at?

_____

_____

_____

   a. Do you have a favorite character or museum?

   _____

   _____

   _____

3. What has your experience been like working as a character at LTM?

_____

_____

_____

4. How has it differed at other museums?

_____

_____

_____

5. How are the actors selected for the roles they play?

_____

_____

_____

6. How do the actors prepare for their roles? (time spent on script, research)

_____

_____

_____

7. How do you think the characters affect the visitor's experience? (impart knowledge/ entertain)

_____

_____

_____

8. What are some common questions you are asked (specific to LTM).

_____

_____

_____

_____

   a. What are some of the strangest ones that you remember?

      _____

      _____

      _____

9. What aspects, if any, do you think should be changed or improved?

_____

_____

_____

Appendix I: Actor Interview Questions

What characters do you play at LTM?

How do you develop the script for your character(s)?

Do you find you frequently need to *ad lib*?

Which of your characters do you like the most? Of all the LTM characters?

Which of your characters do visitors like the most? Of all the LTM characters?

What are some of the most common questions you get? Strangest?

How interested do you think visitors are in the characters?

How do you believe the characters affect visitor interest?

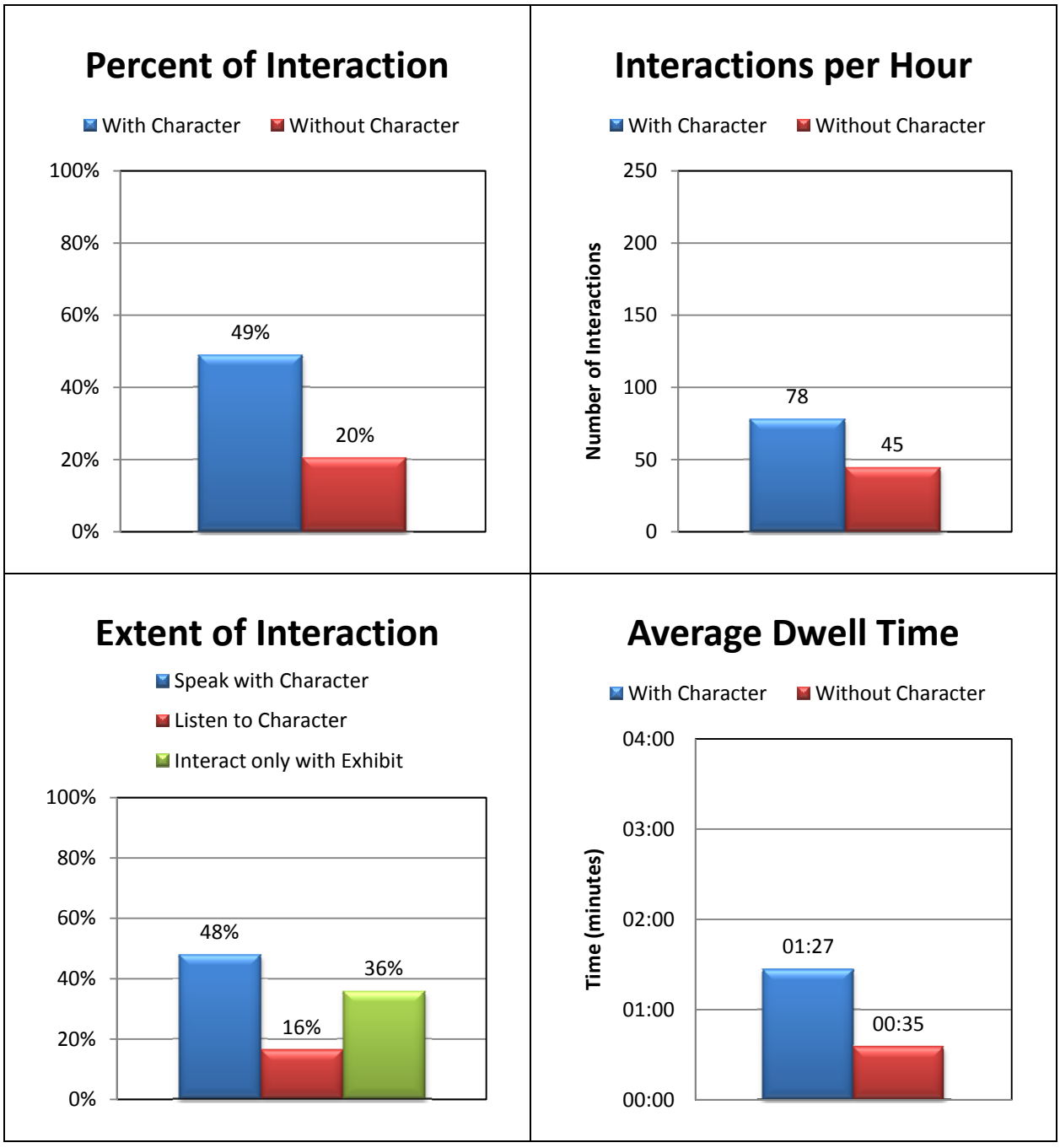
(If they have worked at other museums)

How does your experience at the LTM compare to at other museums?

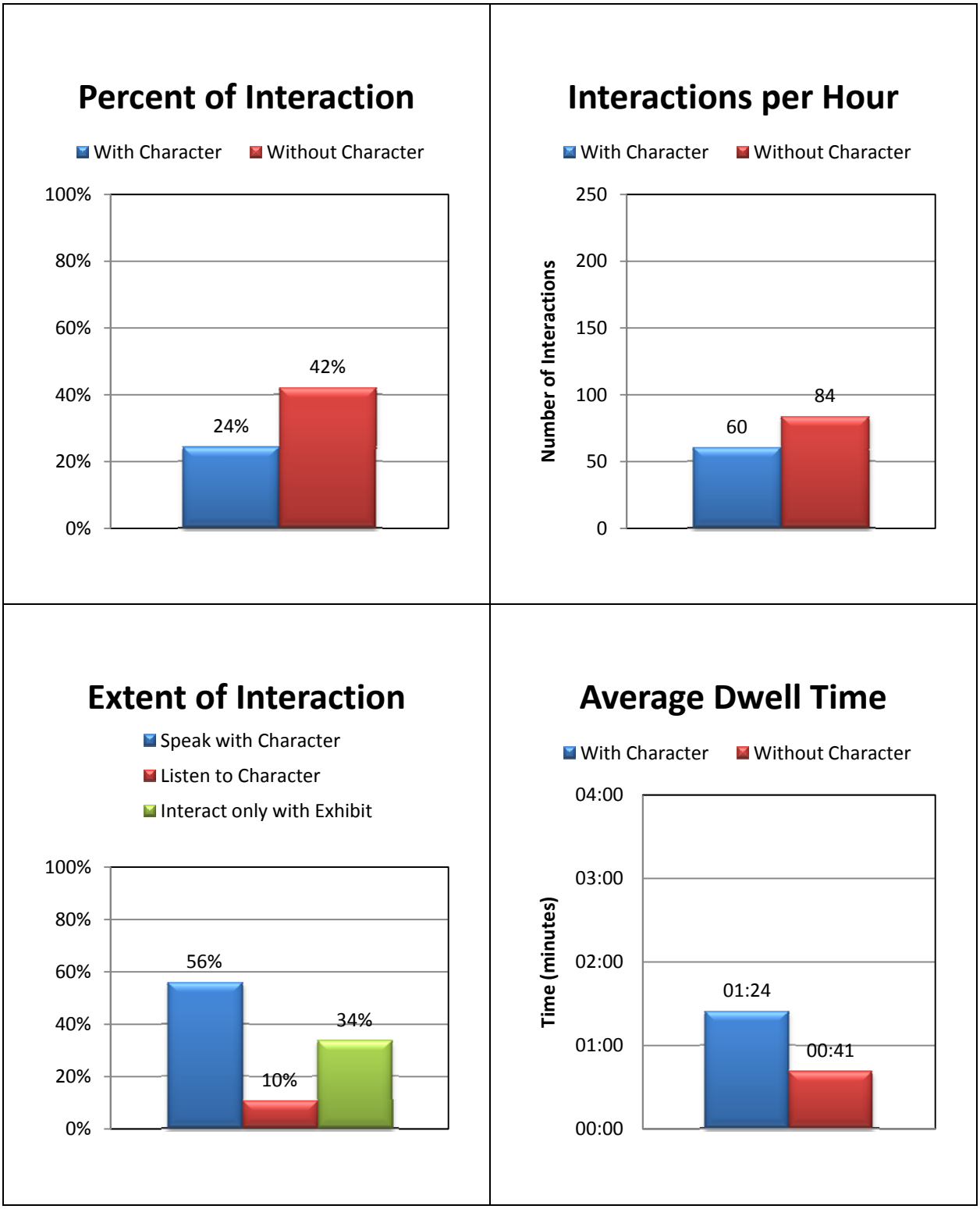
What aspects, if any, of the character actor program would you like changed/improved?

Appendix J: Exhibit Specific Graphs

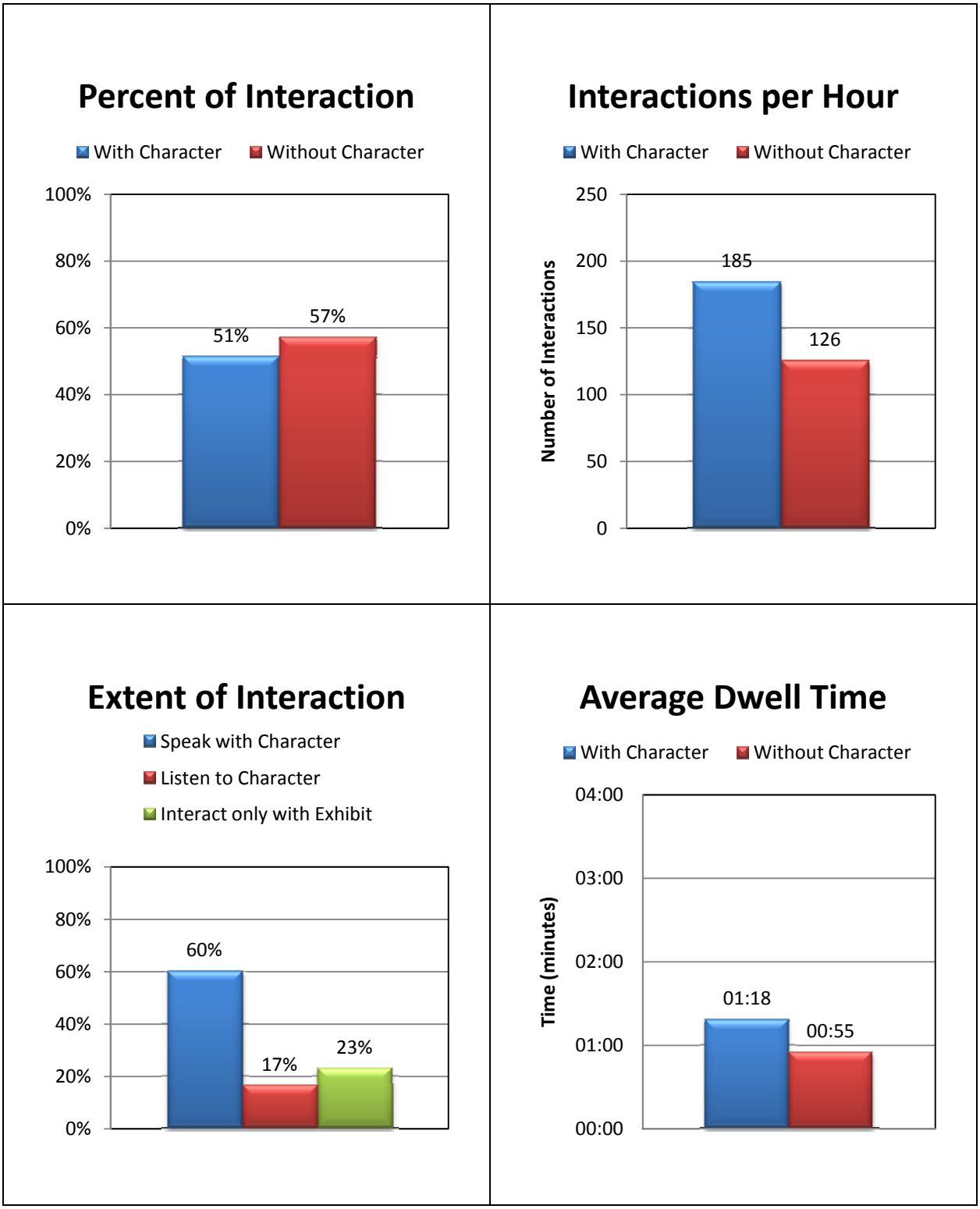
1911 B-Type Motorbus (B-Type)



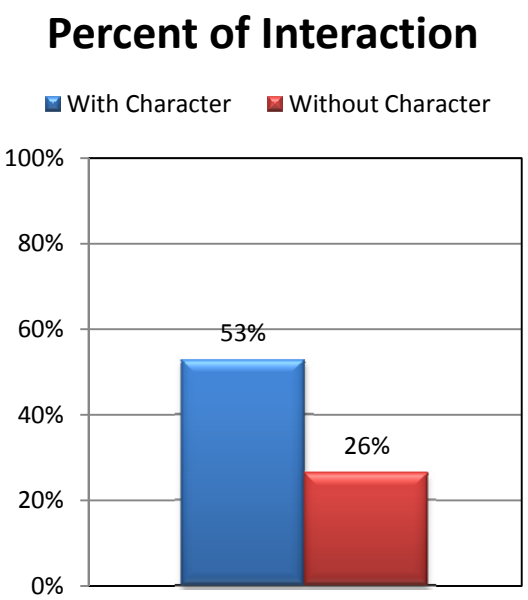
1970 DMS Bus (Punk)

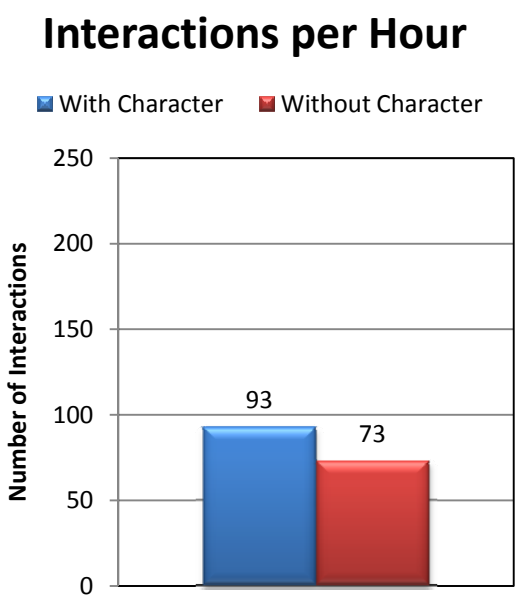


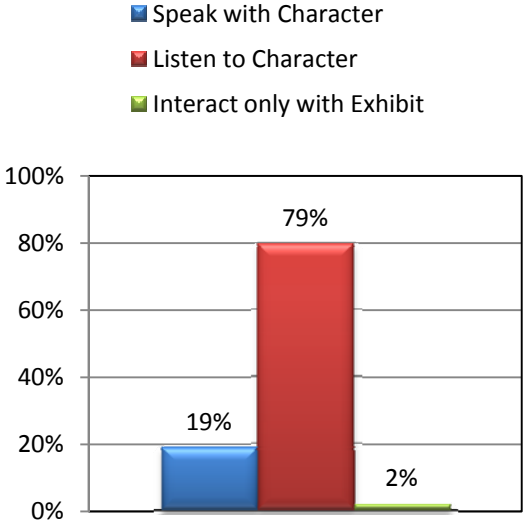
Electric Locomotive & Coach (CSLR)

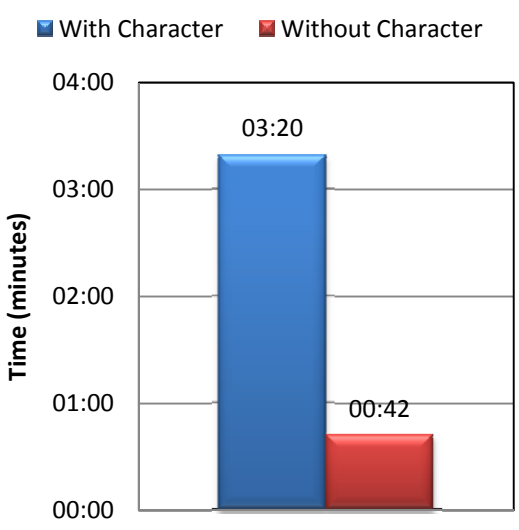


Going Deeper Underground (Miner)

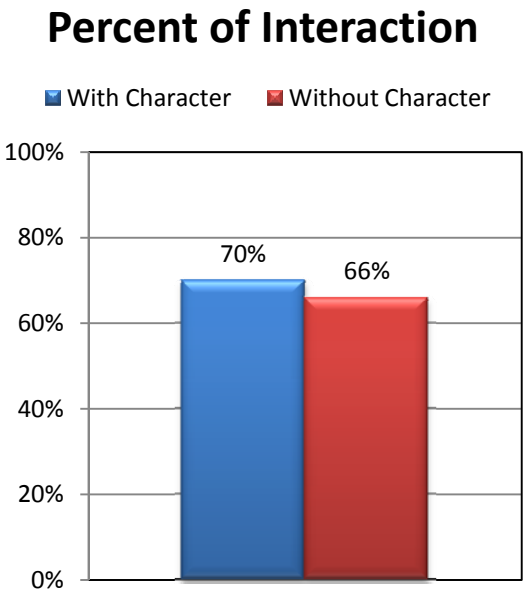


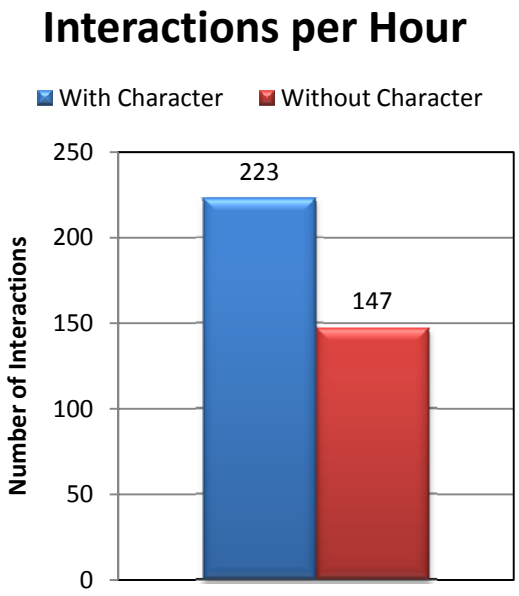


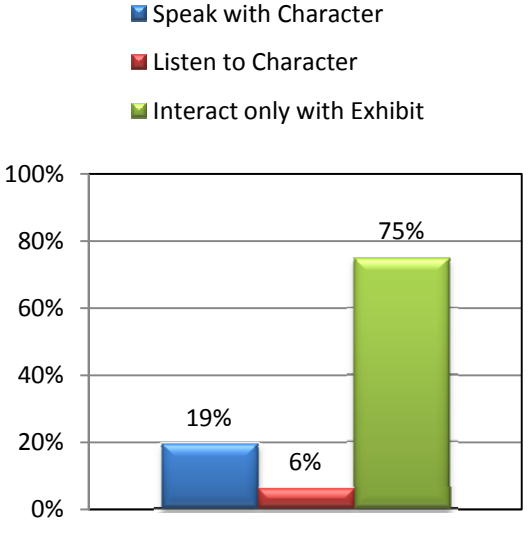


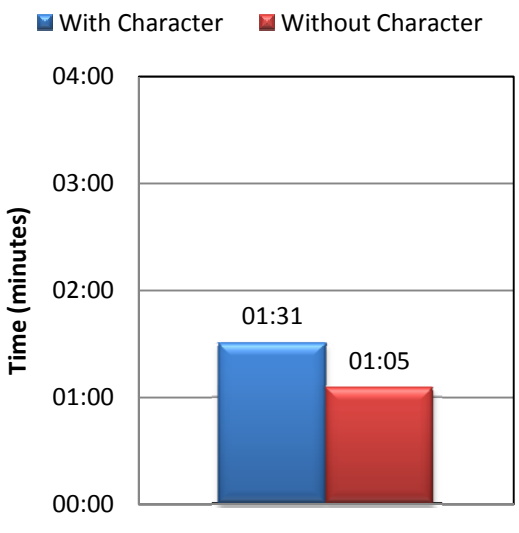


Metropolitan Railway Coach (1930's Woman)

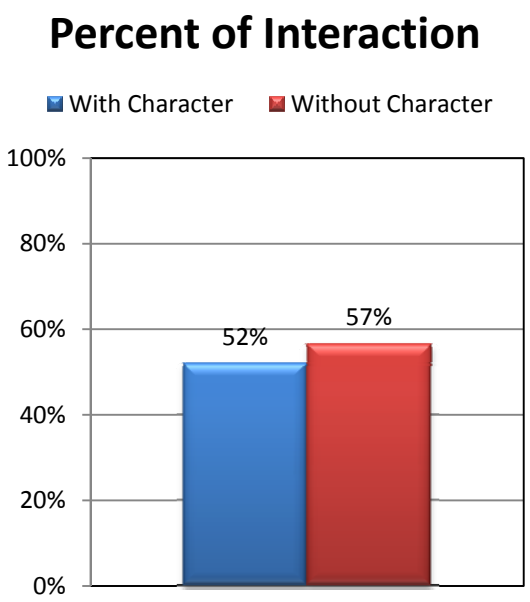


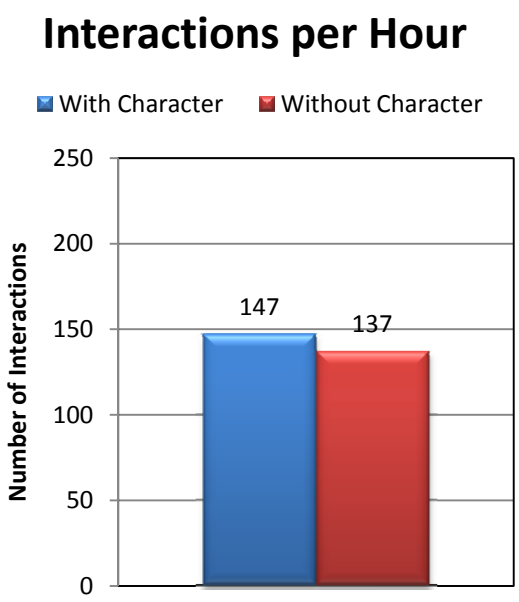


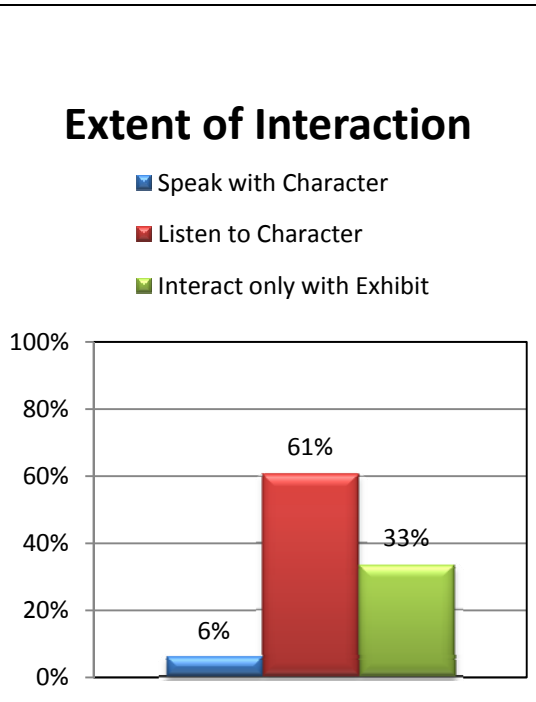


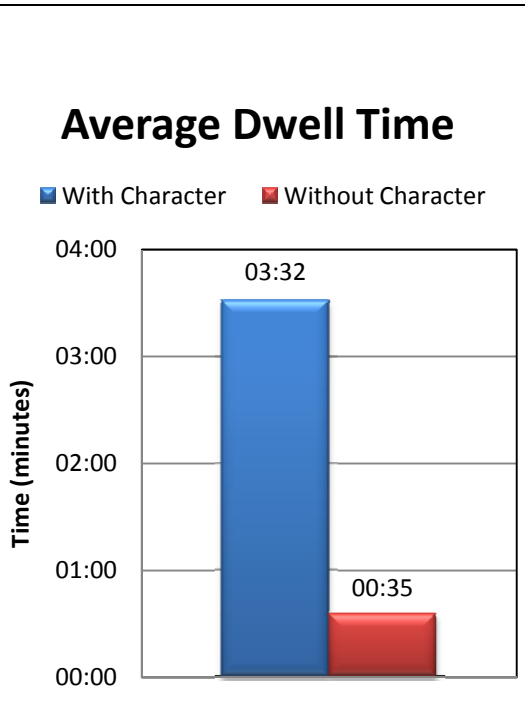


Metropolitan Railway Steam Locomotive (Fireman)

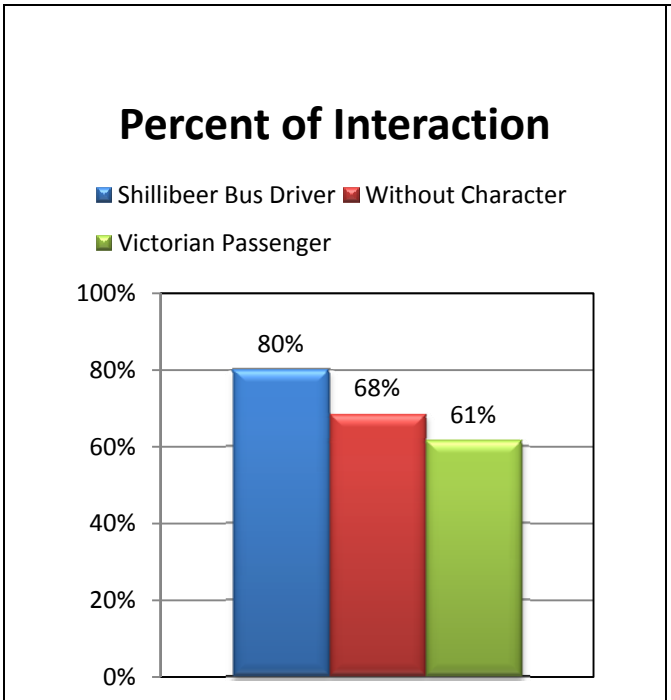


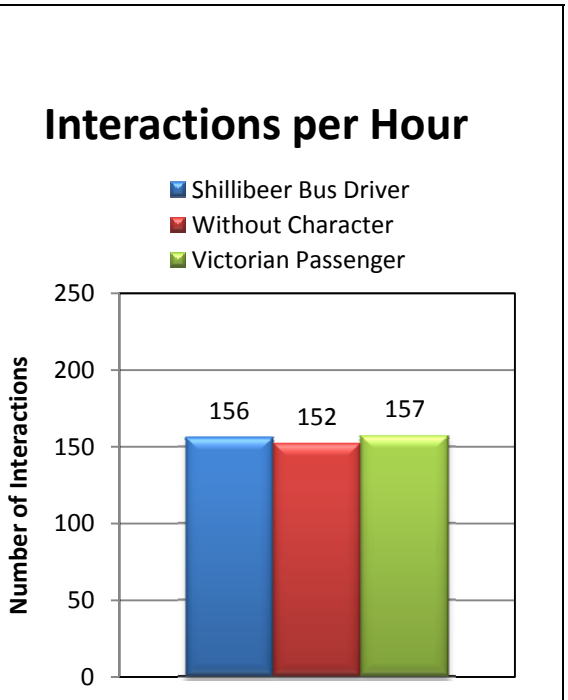


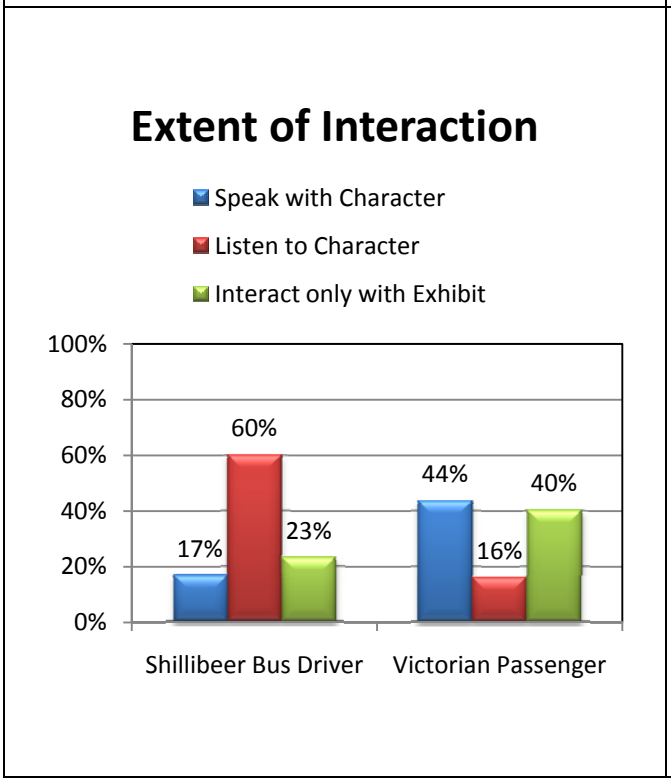


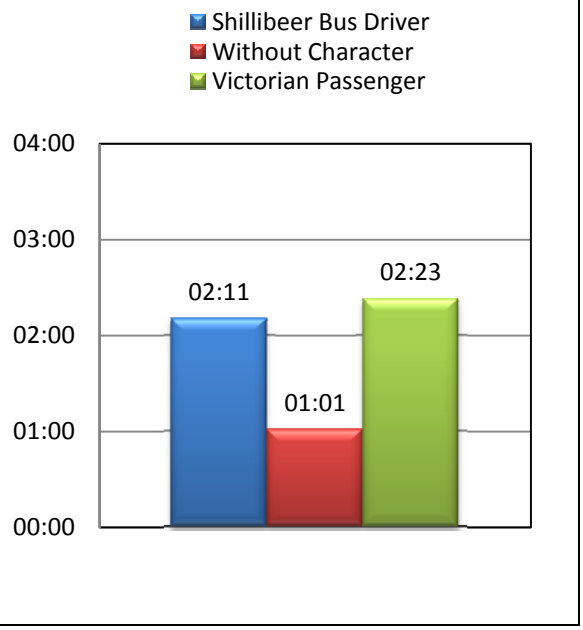


Shillibeer Horse Bus (Shillibeer Bus Driver & Victorian Passenger)









Tilling Horse Bus (Crossing Sweeper)