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Interactivity in Louisville museums.

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INTERACTIVITY IN LOUISVILLE MUSEUMS

By

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DEDICATION

This thesis is dedicated to my grandparents

Mr. Clyde Goforth

and

Mrs. Bobbie Joyce Goforth

without whom this would not exist.

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ABSTRACT

INTERACTIVITY IN LOUISVILLE MUSEUMS

Robert S. Goforth

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This study examines interactive exhibits in a selection of museums in Louisville, Kentucky, and argues that interactive exhibits are a necessary addition to contemporary history museums. It examines the importance of interactivity, how it is used within museums, and critically evaluates the interactive exhibits examined in Louisville on their effectiveness. This effectiveness is judged using three measures: amount of self-directed learning or level of interaction involved, contextual information available, and information imparted to the visitors through the interactive experience. The study examines forty-three exhibits and concludes that a slight majority succeed with all three measures. The paper concludes that studies such as these must continue and, since there are limitations in the field on how to judge the success of these exhibits, a standardized measure must be created to more accurately judge the effectiveness and success of interactive exhibits in history museums.

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CHAPTER I

THE IMPORTANCE OF INTERACTIVITY IN HISTORY MUSEUMS

The history museums of the twenty-first century are much different than the history museums of the previous century. The stoic and revered halls of knowledge have changed into institutions that are more a part of their community than apart from their community. Technology and innovation allow exhibit designers and others in the museum to display their exhibitions in ways that were never before possible. As museums have altered their images to become more accommodating to their communities, the environments of the museums changed in ways that allow different approaches to the productionof exhibitions. Every avid museum patron is familiar with the text panel, the artifacts locked away behind glass, and the silent mannequins in period dress that give an idea of how a scene from history might have appeared. But this is not enough to engage many museum patronsin this century. This is not enough for visitors who live in a world where they are constantly bombarded with technology and interactivity. History museums must adapt to survive. The embrace of interactive exhibits is one such adaptation.

If interactive exhibitsare important in museums today, then they should be examined with that in mind. Using a sample of the museums and exhibits in Louisville, Kentucky, this thesis examines the interactivity seen in these museums. Other museums in the region including two institutions in Cincinnati, two in the Indianapolis area, and

one in Nashville have also been studied. To complete this examination, I personally visited each museum surveyed in this study, looked at every permanent exhibit within each museum, and noted and examined in detail each interactive exhibit. Afterwards, I created a clear definition of interactivity and examined exhibits that fully qualified under the definition. To effectively examine these exhibits, they were examined using three measures: amount of self-directed learningor level of interaction involved, contextual information available for the visitor, and information imparted to the visitor through the interactive experience.[1]Finally, I classified the interactive exhibits into separate categories. This allowed for a greater examination of the effectiveness of the interactive exhibits in Louisville museums as they were then analyzed on interactivity alone without taking the overall museum into account.

In the first part of the study, I compared the history museums in Louisville with one another along with those in other cities that are geographically closeto conduct a critical analysis on how well these museums embrace interactive exhibits. For instance, if only museums in Louisville were studied it would not be fair to say they were successful or not without comparative examples. They may have been much better or much worse than examples from the other cities, but without other cities to use as benchmarks it would be impossible to critique Louisville history museums alone. For the second part of the study, a sample of the exhibits at the museums in Louisville were thenseparated into categoriesto remove the inherent parameters around the exhibits and help to bring the focus onto their strengths and their weaknesses as well as their overall effectiveness. Therefore, chapter two shows how (and to what degree) history museums

[1] These categories are defined in greater detail in Chapter 3.

are using interactive exhibits while chapter three judges the effectiveness and success of these interactive exhibits in Louisville.

However, before addressing those observations and the subsequent analysis, the case for interactivity must be made. Interactive exhibits are not always effective. Therefore, merely having an interactive exhibit in a museum does not make the museum or the exhibit better simply because it is interactive. Yet, successfully implementing an interactive exhibit is important for history museums for numerous reasons. First, it can help educate visitors by helping to create an experience that is more active than passive. This engages the visitor and they become part of the exhibit. The visitor learns from the experience as well as the accompanying text panels. Second, it opens up new ways to express information. Not everyone learns in the same way, so restricting exhibits to text panels and objects that cannot be touched does not cater to those that learn through other means. Furthermore, according to a study done by the Smithsonian Institution, "museum visitors have come to expect a high level of interactivity in museum exhibitions…"[2]

In the ever-changing world of entertainment, interactivity is becoming the status quo. While a museum cannot compete directly with an audience for a blockbuster 3-D movie, it is still true that a family on a Saturday outing has to decide what to do with their free time. Fair or not, when they decide whether to visit a movie theater or visit a museum, those two venues are competing. As Graham Black, author of *The Engaging Museum*, stated, "We must remember that the bulk of our audience is in a recreational

[2]Andrew Pekarik et al, "Developing Interactive Exhibitions at the Smithsonian," Smithsonian Institution, May 2002, http://www.si.edu/Content/opanda/docs/Rpts2002/02.05.InteractiveExhibitions.Final.pdf, vii (accessed April 1, 2013).

frame of mind, seeking positive activities to fill their leisure time. Most want to 'discover new things', but not to have to work too hard at it."[3]

In America, interactivity is seen more and more in entertainment. The idea that a person is part of the action experience is moving away from being "cutting edge" and is now seen more commonly. In video games, the Wii, the Playstation Move, and the X-Box Kinect allow players to use their bodies to control the characters or action in the game.[4] Furthermore, voice activation features are appearing on the market with more frequency. Examples include the X-Box Kinect (which has a voice command feature) and the iPhone. Smartphones allow users to learn more about products and services. By taking a picture of a special symbol (called a "QR code") found on everything from ketchup bottles to advertisements in magazines, the user can use technology to learn information and engage with the world around them like never before. Even theme parks use interactivity more now than ever before. For example, Walt Disney World, arguably the leader in theme park entertainment, recently opened an attraction called "Sorcerers of the Magic Kingdom." This "game" has players traveling throughout the park with a special card that can be scanned at interactive kiosks. The kiosks tell a story and put players in the adventure. These are a few of the ways interactivity is used today. As Nina Simon put it, "As more people enjoy and become accustomed to participatory learning and entertainment experiences, they want to do more than just 'attend' cultural events and institutions."[5]

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[3] Graham Black, *The Engaging Museum: Developing Museums for Visitor Involvement* (New York: Routledge, 2005), 81.

[4]These three video game systems allow the user to interact with their gaming systems in more realistic ways by standing and moving along with the avatars on the screen. This is especially true with the X-Box Kinect as a controller is not used and only the player's body controls the system.

[5] Nina Simon, *The Participatory Museum* (Santa Cruz: Museum 2.0, 2010), ii.

The word "interactivity" can mean many things. It can mean very different things to a wide variety of museum professionals and there is no one set professional definition on what it means for an exhibit to be interactive. As of 2002, not only had the definition not been defined, but the "conceptualization and design" of interactive exhibits had not been standardized either.[6]Communication historian Alison Griffiths's definition and view on interactivity states that "the closest thing to a definition is the idea of it as an activity that extends an invitation to the spectator to insert their bodies or minds into the activity and affect an outcome via the interactive experience."[7]According to one participant in the aforementioned Smithsonian study, "an interactive is an exhibit component that requires visitor involvement, while another member of the study stated that it can be defined as "anything that engages you and makes you wonder, think, get excited, and want to delve deeper to learn more."[8]But, for this paper, interactivity is more narrow than this broad definition might lead one to believe. Interactivity is the act of the visitor touching and/or manipulating an exhibit to augment or change the learning process. Touching an artifact (or a reproduction of one) offers one example. It can be using a smartphone to learn more about an object or to gain information or even to play a game based on an exhibit. It can be creating something in an exhibit that one can take home with them. It is very important to note that interactivity cannot be accomplished without touching an exhibit, manipulating the exhibit in some way, or becoming part of the exhibit itself. To further clarify: opening a door to see an answer to a question, drawing a picture at an exhibit,speaking into a microphone, obtaining an identification card that treats the user as

[6]Pekarik, vii.

[7] Alison Griffiths, *Down Your Spine: Cinema, Museums, and the Immersive View* (New York: Columbia University Press, 2008), 3.

[8]Pekarik, 1.

though they are a character in an exhibit or any other action that makes the visitor a part of the exhibit are all examples of interactivity. Looking at letters behind glass or choosing which text panels to read is not interactive. It is true that a visitor determines their experience in a museum of any kind. They have the freedom to choose what they wish to see and experience. But freedom of choice alone is not all it takes to make an exhibit interactive.

To reiterate once more: interactivity is the act of the visitor touching and/or manipulating an exhibit to augment or change the learning process and interactivity cannot be accomplished without touching an exhibit, manipulating the exhibit in some way, or becoming part of the exhibit itself.[9]

A costumed performer, background audio, and thematic architecture are not examples of interactivity. These examples fall under the heading of immersion.[10] The difference is in the actions of the visitors. For an exhibit or experience at a museum to be truly interactive, the visitor participates in the exhibit and directs the flow of learning to some degree. Furthermore, interactivity cannot work without context. Without context, interactive exhibits drift away from educational museum exhibits and towards attractions that exist solely for entertainment. In addition, without context, these exhibits can leave

[9]However, while some consider merely pushing a button to be interactive, this is a very low-level interaction. There must be more justification to the use of interactivity than simply starting a presentation. For example, the Muhammad Ali Center uses different ways to start presentations than go beyond touching a button. This is seen below in the following chapters. Pekarik, 1.

[10] Immersion is an effective way to bring visitors into a state of mind that can make them feel as though they have stepped back in time. This is a superb way to convey historical information and many great examples of immersion are seen at places like Conner Prairie and the Cincinnati History Museum (this is mentioned again in Chapter 2). However, this paper is focused only on interactive exhibits. There are major differences between the two (immersion and interactivity), but the major difference is that interactivity is hands-on and physically involves the visitor while immersion is more passive and deals with the feelings conveyed to the visitor through the feel of the environment. A study on immersion in Louisville museums is a separate study that is worthy of its own paper.

visitors feeling confused, uninformed, and convinced that the museum has evaded its responsibility to educate visitors about what they are experiencing.

The notion that museums should utilize interactive exhibitions is far from new. According to Griffiths, "So much of what passes for 'new modes of immersive and interactive' spectating has precedents in the nineteenth century; it is not just shortsighted but extremely egocentric of us to assume that [people alive today] alone lay claim to these ideas."[11]Furthermore, she states that, much like today, curators of the past recognized the need for a "learning experience [that was] pleasurable," but that the problem is "in justifying these techniques within the philosophical remit of the institution."[12]In other words, they found it difficult to combine education with entertainment in way in which they could be taken seriously.

During the 1960s and 1970s, Charles and Ray Eames created exhibits that were more interactive and ahead of their time. Yet by the 1980s, this style was moved away from as "many history exhibits had come to look more and more like art exhibits."[13]Andrew Barry found that in 1986, the Management Plan for London's Science Museum stated:

> Passive and poorly interpreted attractions will suffer at the expense of those that develop live demonstrations, provide participation, interactive displays, and give a quality of personal rather than institutional service to their visitors. In formality and friendliness will be valuable attractions. [14]

[11]Ibid.,160.
[12]Ibid.,165.
[13] Gary Kulik, "Designing the Past: History-Museum Exhibitions from Peale to the Present," in *History Museums in the United States*, ed. Warren Leon and Roy Rosenzweig (Urbana: University of Illinois Press, 1989), 28-29.
[14] London Science Museum, "Management Plan," quoted in Andrew Barry, "On Interactivity: Consumers, citizens, and Culture," in *The Politics of Display: Museums, Science, Culture*, ed. Sharon Macdonald (New York: Routledge, 1998), 98.

This was written over twenty-five years ago and it foreshadowed the current state of more than just science museums.

During the 1990s new technologies became available. A 1991 study focused on different learning styles, and(even though the exhibit studied was originally designed for those with disabilities) the "changes made improved the experience of everyone, except those wanting a very quiet, solitary visit."[15] In 1993, public historian Harriet Purkis published an article encouraging history museums to invent low-cost, hands-on exhibits such as those seen in science museums. After examining an exhibit at the St. Albans Museum called "Hands-on History," she concluded that the exhibit "proved that a visitor's experience in a history museum can go beyond passively reading or listening to the story of a town or history of an industry. By using everyday objects, historical concepts and questions can be addressed. [Also, it is] proven to be cheap, effective, and fun."[16]While it is true that pandering for an audience and ignoring an institution's mission statement is simply wrong, there is no reason that a museum with a valid mission and message would not want to reach a larger audience. For museums, adaptability is the key to survival. Making changes that include a greater level of interactivity in exhibitions is paramount since museums want to appeal to their communities. Communities that are already saturated with interactivity in other areas of life and their entertainment options.

Many non-visitors still believe that museums are the stereotypical "dry, dusty places, with… rude museum attendants who are clearly out to ensure you do not enjoy

[15] Betty Davidson, Candace Lee Heald, and George E. Hein, "Increased exhibit accessibility through multisensory interaction," in *The Educational Role of the Museum*, ed. Eilean Hooper-Greenhill (New York: Routledge, 1994), 179.

[16] Harriet Purkis, "History: in hand, low-tech and cheap," in *The Educational Role of the Museum*, ed. Eilean Hooper-Greenhill (New York: Routledge, 1994), 177-178.

your visit."[17]But this is far from the current state of museums. Long gone are the days of the unfriendly and impersonal museum. Changes have occurred just as the London Science Museum predicted they would.[18]This is the state of history museums today.

It is now the norm to see interactivity in history museums. This was not always the case. According to EunJung Chang, the change to the new participatory model of museums began during the 1990s. This was when museums changed from the model made up of "static store-houses for objects into active learning environments for people."[19]This was also when history museums began using interactive exhibitson the level seen today. John H. Falk and Beverly K. Sheppard explain that this new model brought a new expectation from the visitors in museums. The new ideal exhibit should be controlled by the visitor and interact with the visitor to such a degree that it becomes more than a text panel or artifact could ever become: it becomes an experience. Over the past ten years, there have been many ways that history museums have embraced interactivity.

One of the greatest examples of how interactivity changed a museum is with the transformation of the Strong Museum in Rochester, New York. Those at the museum were aware of the competition they were facing with "shopping malls… television watching and video-game playing…" and their attendance had "plateaued at… 350,000 guests annually."[20] They decided to focus on the process of "play" as a means of reaching and educating their audience. "Play," in the way that it is used in their museum, means

[17]Black, 81.

[18]London Science Museum, 98.

[19]EunJung Chang, "Interactive Experiences and Contextual Learning in Museums," *Studies in Art Education* 47, no. 2 (Winter 2006): 171.

[20] Scott G. Eberle, "How a Museum Discovered the Transforming Power of Play," *The Journal of Museum Education* 33, no. 3 (Fall 2008): 265.

intense interactivity much like how one plays a game or a child plays with a toy. The best example of this is with their exhibit *Field of Play* which opened in 2006. Some of the highlights of this exhibit include"paired time-trial dragsters, a Dance Dance Revolution machine, a pretend underwater-scape, and… [a room which uses] deceptive, off-kilter proportions… [to challenge] the muscles and the mind."[21]While the museums uses the word "play" to describe the hands-on exhibits featured there, this is just their word for the process of using interactive exhibits. According to a Scott G. Eberle, vice-president for play studies at the Strong Museum, one of the results of the "remade museum" includes a larger attendance that "is now nearly ten times higher than it was at its nadir twenty five years before".[22]

As noted,a part of what makes an exhibit interactiveoccurs when the visitor touches and/or manipulates an exhibit to augment or change the learning process. This definition can be applied to a variety of exhibit types that can be hands-on or involve input from the visitor to work. Although, one form of interactivity takes advantage of an item that many people in America have before they enter the museum: the smartphone. Cary Carson proposed a few ideas on the subject when the smartphone craze was still in its infancy:

> They can use their personal, hand-held equipment to record visual information from curators, actors, guides, interpreters, and ultimately from themselves, their own reactions to what they are seeing and learning. Later they can download supplementary background material from the museum's own Web site…the hook that turned them into museum-goers in the first place.[23]

[21] Ibid.,270-271
[22]Ibid., 271.
[23] Cary Carson, "The End of History Museums: What's Plan B?" *The Public Historian* 30, no. 4 (Fall 2008): 25.

He also suggested involving other websites outside of the museum's site such as Facebook and YouTube. It is important to keep in mind how many business pages there are on Facebook that people "like" as well as how many products today that people interact with by using their smartphones. For example, the program Foursquare allows their members to "check-in" to any destination they want so they can tell their friends and followers where they are. Some businesses are utilizing that by giving electronic coupons sent to their phone when users check-in. If this is possible, and more importantly already being used, then museums need to keep up with what is out there and available for them.

A 2007 study in Tokyo at a zoo and a science museum tested smartphone interactivity in such settings. By using interactivity through the visitor's phone, the museum and zoo found benefits to this upgrade: for the museum/zoo there was no cost in replacing equipment since the phones belonged to the visitors, and for the visitor the experience was fully self-directed as they could use the features when and where they chose. The test was a success with the majority of complaints directed towards the study (they had participants visit both the zoo and the science museum back to back) or the limited technology of 2007. While this was only five years ago, mobile phone technology is much more advanced than it was then. [24] The authors of this study addressed these problems at the end of their paper and stated that the program will be

[24] Some examples of problems include trouble with the QR codes, small screens on their phones, hard to understand programs, etc. These problems should no longer be a problem since phone screens have enlarged greatly since then, the technology is more fluid, and more people are used to interacting with their smartphones nowadays.

worked on to fix these problems in the future. Luckily for them, advancements in mobile phone technology fixed some of their problems for them.[25]

Smartphone use enables another form of interactivity that overlaps with those examples. This includes personalization and the unique experiences that the visitor takes part in when visiting the interactive exhibits. For example, the Walker Art Center in Minneapolis, Minnesota has a program "uses the phone's caller-ID to personalize sessions by eliminating redundant information and… users can revisit their tour by visiting the Walker's website and entering their phone number."[26] This allows for a much greater deal of information and interactivity than can occur in the art museum by merely reading the text panel and looking at the picture.

The museums previously mentioned include a science museum, an art museum, and even a zoo. Yet these interactive experiences can easily be transferred to history museums. Instead of works of art at an art museum, visitors at history museums could use their phones to personalize their sessions. Instead of focusing on the art, it can focus on historical objects. The study of the zoo and science centers shows that the benefits and user-directed learning seen there would be quite useful at history museums.

Personalization can be much more interactive and intimate than this. In Baltimore at the Walters Art Museum, visitors chose a Greek mythological figure "with whom they self-identified" and were then given a personalized tag and ID card which not only "provided more information… [but also] connected them to specific artifacts in the

[25] Hiroyuki Arita-Kikutani and Kazuhiro Sakamoto, "Using a Mobile Phone Tour to Visit the Ueno Zoological Gardens and the National Science Museum in Tokyo, Japan," *The Journal of Museum Education* 32, no. 1 (Spring 2007): 36; 43-45.

[26] Robert Dowden and Scott Sayre, "The Whole World in Their Hands: The Promise and Peril of Visitor-Provided Mobile Devices,"in *The Digital Museum: A Think Guide*, ed. Herminia Din and Phyllis Hecht (Washington, DC: American Association of Museums, 2007), 39-40.

exhibition."[27]This gives the visitor a greater connection to the artifacts on display. If they decide that they are Zeus, then every artifact displaying Zeus now has an additional meaning added onto it which draws them deeper into the exhibit. Perhaps without this exercise, the visitor would glance at each artifact in passing as they might not find a reason to stop and become more intimate with any of them. With this personalization application, they may now have a greater reason than before since they have a greater connection to certain objects. Of course, it could be argued that connecting a visitor to one theme within an exhibit is limiting and would cause a visitor to ignore those artifacts or parts of the exhibit that do not pertain to their personalized connection. There is validity to this argument. Visitors in such an interactive exhibit may develop a sort of tunnel vision and only focus on one theme while ignoring everything else. However, this is their choice. As stated above, visitors determine their experience in a museum. Using this example, visitors identified as Zeus may develop a greater connection to the specific artifacts mentioned and that connection may lead them to learn more about Zeus or even more about Greek mythology. They may ignore everything else in the exhibit or they may not. The idea with this sort of interactive exhibit is to form a greater connection between the visitor and some part of the exhibit. In the end, it is up to the visitor to decide what he or she wishes to take away from the exhibit, but approaching history through experiences involving self-direction can mean deeper engagement and that is an important part of both learning and retention.

This idea was shown to be successful in Switzerland at the StapferhausLenzberg in 2006. In *A Matter of Faith*, visitors "were required to choose [to be] 'believers' or

[27] Simon, 42-43.

'non-believers' [and] they received USB-data sticks to wear [marking] their choice."[28]By the end of the exhibit, "…95% chose to share their responses" of further questions asked in the exhibit with therest of the visitors, and most visitors "went…to the area… related to their own profile to learn more about themselves…"[29]This sort of interactivity is not for all visitors and might even make quite a few people uncomfortable. However, the quotes listed above show that it was a success. Making the interactive exhibit personalized worked and most people were involved and wanted to learn more.

Not every interactive exhibit has to seem over-the-top or reliant on technology though. According to Peggy Wireman, an economic developer, certified planner and author, the High Desert Museum has "seeds displayed in plastic cases with signs asking visitors to identify them."[30] The visitors have to "lift a piece of wood" to find out the answer.[31]Wireman argues that interactivity does not have to be extravagant to work, and something as simple as this can be used and is "especially important in appealing to people who learn best from experience rather than from reading or lectures."[32]Therefore, if any museum worker or professor of museum studies feels that interactivity is not feasible for some institutions because of the cost, then they are not thinking creatively enough. Exhibits are not only limited by budget but also by the creativity of their designers. For instance, the museum found at a local historic home such as Locust Grove might not be able to compete with the budget found at a larger institution such as

[28]Ibid., 52-53.
[29]Ibid., 53-54.
[30] Peggy Wireman, *Partnerships for Prosperity: Museums and Economic Development* (Washington, DC: American Association of Museums, 1997), 50.
[31]Ibid.
[32]Ibid.

theFrazier History Museum but by using their minds they can create exhibits that are interactive and enjoyable for their visitors.

Beverly Serrell, a museum exhibition consultant, gave more examples of how interactivity does not have to be a complicated process to create. She wrote that"[labels] that encourage visitors to do something with their own low-tech bodies can work in a variety of settings…"[33]One such example given by her includes putting one's head against glass in an aquarium to "sense sound vibrations" to show how fish hear.[34]

Making exhibits in history museumsinteractive means taking a hands-on approach. The idea of touching objects in a museum may feel as though the very notion goes against everything that has been taught to visitors in Western museums. This was not always the case since collections displayed during the eighteenth century were "meant to be handled, smelled, even tasted, as well as seen."[35]Even today such a statement may seem shocking to some museum professionals and even horrifying to others. If artifacts and materials are handled by the public, then they will eventually deteriorate and become unusable by others in the future. Yet, we should never accept any rule without considering its reasoning. So the question should be asked, "Why is it so wrong to handle some objects and artifacts?" Zimmer, Jeffries, and Srinivasan point out that many natural history museums "have objects…visitors… are encouraged to feel."[36] They add that making replicas is "a surprisingly rare thing to do, perhaps because of

[33] Beverly Serrell,*Exhibit Labels: An Interpretive Approach* (Walnut Creek: Alta Mira Press, 1996), 174.

[34]Ibid., 173-174.

[35] Robert Zimmer, Janis Jefferies and MandayamSrinivasan, "Touch Technologies and Museum Access," in*Touch in Museums: Policy and Practice in Object Handling,* ed. Helen J. Chatterjee (New York: Berg, 2008), 151.

[36]Ibid., 154.

expense and perhaps because of the issues it raises about authenticity and value."[37]But again, why is that?

In the following chapters, I will disprove the view that the use of replicas is rare. While visitors rarely touch real artifacts, reproductions are far from "surprisingly rare" in my study. Arguing for touching in museums does not mean arguing that important and delicate historical artifacts should be taken out of their cases and handled by visitors. It is an argument for replicas. It is an argument to be able to touch items that are "unprovenanced… or items of lesser quality than the museum's main collection" as is done in some museums.[38]

Explaining why touching objects is important is the same reasons why every other form of interactivity is important. It can be summarized by remembering why museums exist. Museums have a mission to share their knowledge and their artifacts with their visitors. The information and artifacts in each museum may differ but that goal is still one of the core reasons behind their existence. Touching and interactivity do more than just get more people in the doors of museums; they allow a greater audience to learn from the museums. After all, "the mission to educate [is] at [the museum's] core."[39]

The sense of touch is very important when it comes to memory. Alberto Gallace and Charles Spence did a study on tactile memory which raises some very good points that we must keep in mind when discussing interactivity in museum exhibits. For instance, the "tactile system is… the only sensory system to have a direct connection with

[37]Ibid.

[38] Fiona Candlin, "Museums, Modernity and the Class Politics of Touching Objects,"in *Touch in Museums: Policy and Practice in Object Handling,* ed. Helen J. Chatterjee (New York: Berg, 2008), 18.

[39] Brian Goldfarb, *Visual Pedagogy: Media Cultures in and beyond the Classroom* (Durham: Duke University Press, 2002), 143-144.

the motor system."[40]They also point out in their study that this might be why "something touched is more 'real' than something seen."[41]Although the study of tactile memory is still under-researched and debated, they conclude that "information that is gained through multisensory stimulation (stimulation that includes the sense of touch) may provide stronger and longer-lasting memories…than for information acquired solely by visual or auditory stimulation."[42]If that conclusion is applied to hands-on interactive exhibits in history museums, that would mean that the information imparted in such an exhibit would be retained longer and more vividly than a memory of a text panel or an artifact by itself. If something is more real by touching it, then perhaps greater love and respect can be given to an object in history since it more than just a story in some old textbook, but a real item that adds weight to its existence.

Moreover, if museums neglect this form of teaching, they would neglect an entire area of what educators call "learning styles." There are three learning styles: auditory, visual, and kinesthetic. The museum of the past was based on visual learning because most people are visual learners. However, neglecting the other two learning styles means that museums are unable to fulfill one of their core tenets: the education of all visitors. Some of the suggestions given by Donna Walker Tileston in her book on teaching practices include using "a hands-on approach to learning… simulations when appropriate… [bringing] in music, art, and manipulatives… [and using] discovery learning when appropriate."[43]Tileston does not mention interactive exhibits in her advice

[40] Alberto Gallace and Charles Spence, "A Memory for Touch: The Cognitive Psychology of Tactile Memory," in *Touch in Museums: Policy and Practice in Object Handling,* ed. Helen J. Chatterjee (New York: Berg, 2008), 163.

[41]Ibid., 164.

[42] Ibid., 179

[43] Donna Walker Tileston, *10 Best Teaching Practices: How Brain Research, Learning Styles, and Standards Define Teaching Competencies,* 2nd ed. (Thousand Oaks: Corwin Press, 2005), 20; 25.

on how to teach kinesthetic learners, it is not out of line to suggest that these words of advice can be directly applied to interactive exhibits in museums, and in the very least that these exhibits are necessary to engage this category of learners. Therefore, a failure to embrace and use interactivity and hands-on exhibits is a failure to respond to a sizeable portion of the museum's visitors.

In her study of exhibit designs, Sue Allen cited a study that "both children and adults recall actions they themselves perform better than those they observe."[44]She also adds thatinteractivity in this sense is well-known in "science (and children's) museums," and research suggests it"can promote engagement, understanding, and recall of exhibits."[45]This is seemingly good news for the argument for interactivity, and there is no reason it cannot work in a history museum as well as it does in children's museums and science centers. In a book from 1988, Joanne Cleaver wrote that "curators at history museums are just now beginning to find ways to integrate hands-on activities in their exhibits."[46]This is a crucial element that is seen time and time again in contemporary history museums.

Experience is a key element in the learning process and successful interactive exhibits can help to create memorable experiences for the visitors. Nathan Stalvey, curator for the Louisville Slugger Museum, believes:

> …the more senses you can appeal to at a museum, the more memorable the visit. [The Slugger Museum] not only want[s] to be thought of as a great "museum" but also as a great 'experience.' …the more than can be incorporated the better the experience. Interactivity allows for the visitor to do more than just walk around

[44] Sue Allen, "Exhibit Design in Science Museums: Dealing With a Constructivist Dilemma," in *In Principle, In Practice: Museums as Learning Institutions*, ed. John H. Falk, Lynn D. Dierking, and Susan Foutz (Lanham: Alta Mira Press, 2007), 49.

[45]Ibid.

[46] Joanne Cleaver, *Doing Children's Museums* (Charlotte: Williamson Publishing Co., 1988), 21.

> and look at things… [And there] is a growing trend in museums across the country to make the museum more of an "experience" rather than a museum.[47]

Learning through experience is also mentioned in an article about an interactive exhibit designed with children and teenagers in mind which was implemented in Brazil called "NanoAventura (NanoAdventure)." which taught nanoscience and nanotechnology. Even more promising for advocates of interactive learning in museum settings:

> The results of our NanoAventura research indicate that visitors learned in our space, and it was also an engaging, fun experience to which visitors wish to return…[We] noticed that after visiting the exhibition most of the visitors, no matter the age and the context of the visit, were able to better define [nanoscience and nanotechnology]… It was also found that after the visit many participants were able to define N&N in terms of science and technology and many prospective uses of nanotechnology.[48]

Studies such as these offer proof of the necessity for interactivity by showing that not only is it entertaining, but educational as well. The study shown above also displays the value of interactivity for all ages.

Interactivity is not without its critics or its problems. One of the biggest concerns is, what Cynthia Moreno of the Speed Art Museum calls, "gratuitous interactivity [orinteractivity] that on the surface may be fun but lacks depth or does not lead the viewer to make emotional or intellectual connections to objects and experiences."[49]She raises a valid concern. The interactive elements found in museums should do more than entertain. They are there to strengthen and add to the learning, not to replace it for the

[47]Nathan Salvey, "Thesis Inquiries," message to the author, April 8, 2013, E-Mail

[48] Sandra E. Murriello and Marcelo Knobel, "Encountering Nanotechnology in an Interactive Exhibition," *The Journal of Museum Education* 33, no. 2 (Summer, 2008): 228.

[49] Marianna Adams, Cynthia Moreno, Molly Polk, and Lisa Buck, "The Dilemma of Interactive Art Museum Spaces," *Art Education* 56, no. 5 (September 2003): 43.

sake of attendance alone. Plus, not only would superfluous interactivity be irresponsible, but people can see through such actions.

In historians Roy Rosenzweig and David Thelen's study of how Americans view their history, one person "dismissed the Ripley's Believe-It-or-Not Museum as 'pure entertainment,'" while another visitor said that they would not "trust a museum…if it was 'a ploy to get money.'"[50] This shows that visitors have the ability to differentiate creditable history from for-profit entertainment institutions. People expect more from history museums and hold them to a higher educational standard than movie theaters and theme parks.

This distrust may stem from the idea that educational experiences do not coincide with fun. According to Bullock, people "both inside and outside the institution… [perceive this] asa violation of the traditional mission and/or dumbing-down or 'Disneyfication' of the museum experience."[51] This fear is echoed in different forms again and again as one of the main reasons to be against the addition of interactivity in museums. Some may believe that there is a firm division between entertainment and education. Museologist Andrea Witcomb feels that the "division is further deepened by suspicion on the part of the curators that interactives are merely a form of entertainment rather than a philosophy which could improve museum communications."[52] Just because something is fun or entertaining does not mean that it cannot be important, meaningful, and educational. In a study on audience and accessibility, educators Lynn D. Dierkingand

[50] Roy Rosenzweig and David Thelen, *The Presence of the Past: Popular Uses of History in American Life* (New York: Columbia University Press, 1998), 108.

[51] Robert Bullock, "Pennsylvania History as Public History: The Morphing Landscape of Museum Exhibit Experiences," *Pennsylvania History* 73, no. 3 (Summer 2006): 344.

[52] Andrea Witcomb, *Re-imagining the Museum: Beyond the Mausoleum* (New York: Routledge, 2003), 132.

John H. Falk obtained a quote from a man who stated "Technology is good for kids, but challenges some adults, and seeing kids clustered around terminals is intimidating to some adults."[53]This is a very valid point, but it is not a reason to stop advancements in museum exhibits. Many hand-on exhibits are simple to use and other interactive exhibits require little effort to operate. As of 2002, the Smithsonian stated that interactive exhibits "tend to be thought of as child-oriented…" but in their experience with more than two dozen interactive exhibits in the National Air and Space Museum, they state that these types of exhibits are "well-received by visitors of all ages."[54]

Introducing interactive elements to museums can sometimes cause problems. One such problem can be the noise if many exhibits contain loud and boisterous audio. Robert Fry wrote an article on how to lessen the noise levels after confronting the problem firsthand. He wrote that "for visitors to… approach an exhibit intellectually, they must wade through a distracting cacophony, after which there is no guarantee that they will be able to concentrate enough to absorb its content."[55]While this is directed towards science museums,it serves as a warning for history museums that take on interactivity. Too much of a good thing can often turn bad. As Sue Allen argues "…we should be skeptical about sweeping claims that interactivity is essential to learning, or even that it… creates the most powerful, memorable, or attractive experiences in museums."[56]A warning such as this is prudent. Interactivity alone will not solve all problems in a museum exhibition. Millions have learned about tornadoes without being

[53]Lynn D. Dierking and John H. Falk, "Audience and Accessibility," in*The Virtual and the Real: Media in the Museum*, ed. Selma Thomas and Ann Mintz (Washington, DC: American Association of Museums, 1998), 67.

[54]Pekarik, vii,

[55] Robert Fry, "Delightful Sound and Distracting Noise: The Acoustic Environment of an Interactive Museum," *The Journal of Museum Education* 27, no. 1 (Winter 2002): 14.

[56]Allen, 50.

in an interactive exhibit that teaches about them. Visitors to the Louvre do not need a noisy interactive exhibit to fully enjoy the Mona Lisa. Interactivity is important, but it is also important to realize that it is not an answer to how to make everything better in every way. Halina Gottlieb once wrote "This stirs up questions regarding what will constitute 'good' interaction design in the future."[57]

Some forms of interactivity, especially high-tech exhibits, also raise real problems. Dierking and Falk noticed two of these problems in interviews for their paper on audience and accessibility. First, one of the major complaints is when these intricate or high-tech exhibits malfunction or do not work. They quoted one museum visitor as saying "Nothing is more frustrating than going in and finding something that doesn't work. Very frustrating!"[58] Second, items can become quickly dated when they rely on cutting-edge technology. If a museum cannot afford to replace items or update them as they become available, it becomes evident and may affect the image of the museum poorly. However, it should be noted that even though there were complaints, Dierking and Falk concluded that this "debate is moot" because visitors are coming to "expect to encounter some type of media experience at a museum."[59]

The cost of interactivity is another complaint when faced with the idea of using these exhibits. It is true that the cost of implementing a highly technical interactive exhibit is much higher than a case or a text panel. According to the blog *Museum Planning*, a highly interactive science center can cost "$550 per square foot and beyond"

[57]Halina Gottlieb, "Interactive Adventures" in*Digital Technologies and the Museum Experience: Handheld Guides and Other Media*, ed. LoïcTallon and Kevin Walker (Lanham: Alta Mira Press, 2008), 175.

[58]Dierking and Falk, 67.

[59]Ibid.

while a natural history museum exhibit is closer to "$250-$400 per sq. ft."[60] Interactive exhibits can cost much more than a normal exhibit within a history museum and this discourages smaller museums from undertaking the task of installing interactives. However, interactive exhibits do not have to be large, cutting-edge, and technologically impressive to succeed. The Museum of the American Printing House for the Blind excels with their interactive exhibits and none of these successful exhibits use technology from this century. The Kentucky Derby Museum has another way of viewing the costs associated with interactive exhibits. According to their curator of collections, Chris Goodlett, while the museum tries to "keep costs down… [they] don't solely use cost as a measuring stick. It's probably safer to say whatever the costs might be, it's crucial to our mission to have interactive components in our exhibits."[61]To some, the benefits they find from their more expensive interactive exhibits are not only worth the cost, but are necessary for them.

With both praise and complaints about interactive exhibits, how can one judge their success? This is a difficult question to answer since there are no set guidelines for success or even a set definition of the phrase "interactive exhibit." According to Naomi Haywood and Paul Cairns, "museums have made frequent use of interactive exhibits and generally consider their use to be successful in terms of learning and engagement."[62] Yet, this is a vague statement and they concede that the "precise nature of how learning and engagement occur… remains uncertain."[63] (In fact, the goal of their cited paper is to form

[60]Mark Walhimer, "How Much Do Museum Exhibitions Cost?" *Museum Planning*, http://museumplanner.org/how-much-do-exhibits-cost/(accessed April 1, 2013).

[61]Chris Goodlett, "Questions for Thesis – Robert Goforth,"message to the author, April 4, 2013, E-Mail.

[62] Naomi Haywood and Paul Cairns, "Engagement with an Interactive Museum Exhibit," *People and Computers*XIX – The Bigger Picture (2006): 114.

[63] Ibid.

a hypothesis to address that concern.)The rise in attendance seen at the Strong Museum after their transformation into an interactive museum could be seen as an example of success. But attendance alone is only one way to judge success. Some would even say that ticket sales are not a way to evaluate the success of a museum anyway. When asked if they feel their interactive exhibits are successful, the Kentucky Derby spokesperson responded, "The feedback we get from visitors through word of mouth and web sites like TripAdvisor are very positive. However, we currently don't conduct a formal evaluation of our exhibits."[64]However, when I asked him if the use of interactivity [with the exhibits examined in this paper] increases the knowledge of the visitor, he replied:

> Most definitely. Many of the exhibits[cited within this paper] help our visitors understand the sport of Thoroughbred racing and the Derby as a larger cultural event. *My Spot* illustrates the importance of Derby to long-time attendees who value it so much they want to watch the race unfold from a particular place. *Riders Up* illustrates the strength and athleticism of jockeys by allowing visitors to pretend to ride a horse as a jockey would. Many of the others you cite allow visitors to hear from others why the Derby is important to them using their own language and stories. The interactive components enhance the traditional display of artifacts to give a more complete picture of the Kentucky Derby.

In this museum, success with their interactive exhibits comes from imparting their information to visitors in the best way possible. The Kentucky Derby Museum believes that their interactive exhibits do just that.

The Slugger Museum also believes that their interactive exhibits are successful. The curator, Nathan Stalvey, stated that "the reviews we get, as well as the fact that we break our attendance record year after year, shows that these elements are working and that people expect it."[65]He also uses TripAdvisor and the use of visitor feedback to gauge

[64]Goodlett, e-mail to author.
[65]Stalvey, e-mail to author.

the success of the interactive exhibits. He indicates that the museum receives"tons of positive reviews within our galleries about the interactive areas."[66]

Yet, if a successful interactive exhibit is one that is seen as being a good interactive exhibit that furthers the mission of the museum, then what makes a good and successful interactive exhibit? The Smithsonian workshop on developing interactive exhibits created a list of criteria which stated what it takes to create a good interactive exhibit. Their list can be summarized by saying that interactive exhibits should be "interesting, relevant, provocative… attractive, intuitive, fun… engage imagination, link to the exhibition… [and should not] be confusing, complicated… [and it should not] be activity without a result, or take attention away from the exhibit."[67]Ed Rodley, a museum professional and creator of the blog *Thinking About Museums*, good interactive exhibits have "a point… are rooted in its physicality… provokes emotional responses… encourages play… rewards visitors… responds to visitor actions… is visitor focused… [and] makes obvious how to use it correctly."[68] As seen in chapter three of this paper, the interactive exhibits in Louisville museums are examined usingthree measures of success: amount of self-directed learning or level of interaction involved, contextual information available for the visitor, and information imparted to the visitor through the interactive experience. These measures are more direct than the numerous criteria used by the Smithsonian workshop and Ed Rodley respectively.

Despite problems, and some opposition, interactivity is necessary for the history museums of this century. Interactive exhibits are useful learning tools especially to those

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[66] Ibid.

[67]Pekarik, 5.

[68]Ed Rodley, "Gaming the museum – separating fad from function – Part two of ?," *Thinking About Museums*, http://exhibitdev.wordpress.com/2011/06/29/gaming-the-museum-%E2%80%93-separating-fad-from-function-%E2%80%93-part-two-of/ (accessed April 1, 2013).

who are kinesthetic learners. They can be entertaining and fun and it can improve their experience if done well. Lastly, interactivity conveys more than just information: it can create an experience.As long as the missions of these museums are furthered, and as long as interactive exhibits are what people want and expect, then interactive elements should be effectively utilized in history museums.

CHAPTER II

THE USE OF INTERACTIVITY IN LOUISVILLE MUSEUMS

The importanceof interactivity for history museums can best be seen by examining real-world examples already in place. For this study, I chose Louisville, Kentuckybecause there are a large number of museums in this city compared to its size. Furthermore, since I am a student at the University of Louisville, I was already familiar with the museums examined.

This chapter examines and reviews interactive exhibits in several history museums in Louisville. This serves as an overview of the variety of interactive exhibits used by Louisville museums. Afterwards, the results of a short study on other history museums outside of the Louisville area are examined. This serves to compare Louisville history museums to similar institutions in the region to more accurately analyze how Louisville is utilizing interactivity in its history museums. Not only does this chapter examine the usage of interactive exhibits in Louisville, it will also demonstrate that the size of the city is not directly related to the successful creation or use of interactive exhibits. Some may argue that embracing interactivity can be an expensive proposition, but this chapter alsoprovides examples of a wide range of interactive exhibits, from simple and inexpensive to large and lavish.

Kentucky Derby Museum

Churchill Downs, the home of the Kentucky Derby, is among Louisville's most famous landmarks. This horseracing track includes the usual amenities found at sporting venues such as gift shops and restaurants, but the attraction also contains a museum dedicated to the Derby located to the left of the main entrance. The museum is featured prominently: the eyes of visitors are drawn to the golden letters of the museum name which are directly left of the large gold letters of the name of the track. The elegance of the buildings may give the wrong impression about what the museum has to offer. Instead of quiet and respectful halls of grace and sophistication, the museum strives to connect to its audience by presenting what they believe that audience wants to see,including exhibits on derby hats, bourbon, and jockey uniforms. This also includes a great number of interactive exhibits that explore both the culture and the history of the Derby.

As soon as visitors move in into the exhibit area of the museum, they find interactive elements. The gateway to the museum replicates a starting gate where the horses burst forth at the beginning of each race. Visitors open this gate while a video of racehorses running at full speed plays.

The first interactive exhibit that visitors encounter is called *My Spot*. Visitors rotate circular images of local celebrities and personalities to discover what these people have said about the Derby. This includes television news anchor Dawne Gee, former jockey and NBC correspondent Donna Barton Brothers, and many more. This hands-on activity invites visitors to learn more about the Derby by allowing them to choose someone they may know andread what this person has said. The act of putting the

control of what is learned into the hands of the visitors means that they direct the flow of information and choose what interests them personally.[1]

The museum employs self-directed learning again with a collection of touchscreen video panels that allow visitors to watch clips of interviews and videos of past Derby winners such as the famous 1973 race won by Secretariat. The visitor can choose which interview or race to watch, but the selection is limited. Therefore, this exhibit is less self-directed than the museum's other exhibits.

The most entertaining and engaging exhibitin the museum iscalled *Place Your Bets*. It gives visitors a chance to experience the betting system used at Churchill Downs. There are "wagering windows" where the visitor approaches a touchscreen to place their bets for the upcoming race. (This upcoming race is actually a video of a random race selected from a video archive.) First, the visitor chooses three squares that represent horses in the race. They choose the position they believe these horses will finish in (win/first, place/second, or show/third). Second, they push a button to print a ticket, which they are allowed to keep. Third, this ticket is then taken to a large screen where they can watch the race and see how well their bets were placed. Finally, if they won, they scan their ticket to see how much their payout would have been had this been a real race.This highly interactive exhibit serves three purposes. First, it teaches about horseracing, the system of betting, andthe special terms used in the process. Through information on the touchscreens and through the experience itself, visitors learn the steps involved in betting on a race and the vocabulary used by gamblers. Through the contextual information that the exhibitprovides (instructions, video screens displaying horses and the race itself, etc.), they learn about betting on the races through two different

[1]*My Spot*,Kentucky Derby Museum, Louisville, Kentucky.

ways. Second, it is entertaining. Children are not old enough go through the motions of betting on horses. This gives them the thrill of gambling without actually losing or winning anything. Adults are also entertained by this experience even if no real money is won or lost. Third, it is a free souvenir. If the visitor chooses to keep their ticket, they can. Thus, they leave with a reminder of their visit and the exhibit.

Around the corner from the betting exhibit is an interactive display thatsimulates the experience of a jockey competing in a horse race called *Riders Up*. More specifically, it is an opportunity to ride a fabricated horse while playing a video game of a race. This attraction has visitors mount a horse in front of a video screen where they use the horse to compete against two other visitors in a race. Though it is not a conventional way of teaching, the exhibit attempts to replicate the feeling of being on a racehorse and riding in a race. This is an experience that few can have. The feel of the equine object beneath a person as they try to win the race against family, friends, or strangers will create a memory. Hopefully, it will create a strong memory of the excitement and entertainment of the sport. At its core, this exhibit is a virtual experience that teaches the visitor about the firsthand excitement found at Churchill Downs as well as giving a virtual hint at what it might feel like to be in the position of a jockey.[2]

Another exhibit designed to bring the visitors into the race is an area where they can call the race which is appropriately named *Call the Race.* Visitors use a touch screen and microphone to record their voice and listen to it against a video of a race. Much like the wagering windows and the virtual horseracing, this allows visitors to be a part of the

[2] It should be noted that this is not an attraction designed and meant just for children as though it were merely some toy. These are large horse bodies that a very large person can sit upon comfortably. The day that I visited this museum, I saw a group of four middle-aged people riding on the horses and enjoying themselves immensely.

event, albeit from a different position. They learn about calling the race and get to "experience" it firsthand. This represents a more intense interactive experience because the visitor has to project his or her voice into a microphone that others can hear. This requires the user of the exhibit to be a little bit of an extrovert and it will more than likely discourage many of the shyer visitors from taking part due to this. These introverted people might be more likely to enjoy the next interactive exhibit, *Test YourDerby IQ*. This three-player, multiple choice trivia game enables visitors to use three buttons (A, B, or C) to answer questions in a contest against the other two players.

The second floor of the museum also contains many interactive exhibits including the *Urban Bourbon* exhibit. This exhibit contains interactive elementsthat could be used at many history museums with varying budgets. The exhibit has doors and cabinets with text panels inside and out that offer a low level of interactivity. Many museums use this sort of low tech and hands-on function. Another such example is seen with a collection of snifters where visitors can squeeze a bulb to expunge a series of smells from the different containers. This exhibit uses sight, sound, smell, and touch to teach about historical and present day uses of bourbon.

At first glance, some may question the educational value of the exhibit and the interactive elements involved. Information is conveyed in an entertaining way, but it is not simply entertainment. The user is learning about a part of Kentucky heritage: bourbon. Opinions about alcohol differ greatly, of course, but one cannot deny that visitors have the potential to learn a great deal about bourbon and its history here.

The last exhibit area in the Kentucky Derby Museum focuses on jockeys. Visitors can design their own "silks," which are what they call the official uniforms of the

jockeys. The area finishes with a fun experience and a potential photo opportunity. It is a faux horse in a starting gate that visitors can mount to see what it feels like to be a jockey in this position. This completes the jockey experience which started with designing silks and ends with riding the horse out of the starting gate. For the visitor, however, this starting gate mirrors the way they entered the museum, and marks the end of their museum visit as well.

Frazier History Museum

What was once solely an arms museum has evolved into Louisville's main history museum.[3]Located in the downtown area known as "Museum Row," the Frazier History Museum is known for special exhibits and historic interpretations by costumed performers. Yet, the museum designers understand the importance of "touchable items,"as they are explicitly identified on the museum's map of exhibit galleries.[4]

The first exhibit that stands out is seen as soon as the visitor enters the main hall of the museum. A large rectangular box with a different interactive display on each of the three visible sidessits against the wall. On the left side, guests are told to lift a lever to feel the heavy weight of a fourteen pound gun. On the front side, guests lift a lever to feel the light weight of a ten pound gun.[5] On the right side, the handle is not to show weight, but is used to lift a panel to answer a question about the length of a long gun. These three simple interactions teach visitors the weight of larger guns that they would

[3] Even so, it is not a museum solely about Louisville history. In fact, very little exhibited here has anything to do with the city. Most of the museum still focuses on weaponry and the geographic scope ranges from the entirety of the United States and England. The temporary exhibits do not always stay within these geographic areas as was shown in their samurai exhibit.

[4]Frazier History Museum, *Museum Map* (Louisville: Frazier History Museum, 2012).

[5] There is a noticeable variance between the two weights even though four pounds is not that large a difference.

not fully grasp when they see the gun exhibits in the rest of the museum. It is understandable why they would place this exhibit first in the path of the visitor: it gives them hands-on information that they can use as they see the rest of the museum's firearms. When the visitors see the gun displays in the museum, they have a recent example of the weights of two guns which helps to further understand what they come across in the galleries containing such guns.

The majority of the exhibits are found on the second and third floors. The first interactive exhibit on the second floor is in the War of 1812 gallery. First, there is a trunk with period clothing that is located next to a mirror. While the idea of "dress-up" may seem to be a playful activity designed only for children, adults may also try these on.[6]These exhibits with costumes at this museum do not give contextual information to the process of trying these items on. The costumes may convey to the visitor that these outfits were worn by people during this time period, but without a text panel or other added information, the learning aspect of this activity is not as strong as it could be. Next to the costume exhibit is a display called *Drumbeats and Drills*.[7]Using drumsticks and drum pads placed in front of a touchscreen, visitors play different beats along with a young man on the screen. These beats include "taps" and "assembly."[8]The text panels on the wall beside the interactive portion tell the history and meaning of the drum beats while the hands-on portion lets the visitor try it themselves. While this adds an interactive layer onto what is said in the text panel, the interactive layer itself is not as strong as it could be. For example, while the visitor can push "taps" on the screen and

[6] On more than one occasion I have seen both adults and children trying on these costumes for photographs and to just play around. I may be guilty of such a thing as well while visiting the Frazier with my son or with my friends.

[7] *Drumbeats and Drills*,Frazier History Museum, Louisville, Kentucky.

[8] Ibid.

then play the rhythm on the drum pad, it never states the meaning of "taps" or when it would be used. Interactivity should be used to convey a lesson or at the very least augment an existing one. By falling short in conveying meaning, the whole displayfalls short.

The next "touchable item" found here is with the pelts near *Buffy the Buffalo*. Tanned buffalo hide, buffalo fur, a buffalo skull, a buffalo horn, and a buffalo jaw next to a necklace made of buffalo teeth are all available to touch and examine. But unlike the drum display, this one gives the visitor contextual information. The text panels explain how the Plains Indians used these items in daily life. With this knowledge, it is now understandable why these items are to be touched. The visitor can feel what tools, clothing, and jewelry made from buffalo remains may have felt like. The text panels, along with handling these items, can make a greater connection to visitors than the text panels can do by themselves.[9]

A gallery devoted to Medieval history contains several interactive exhibits within the museum. First, visitors can touch a mail armour shirt. In fact, the sign even says "Please touch!"[10]The armour hangs next to a repeating video explaining how this sort of protective clothing is created. Visitors who interact with the mail armour can experience something that the video can never truly express: the weight and toughness of the shirt. Visitors can get a better idea of what men experienced when they wore such garments even if they cannot go as far as putting the mail on.

The second exhibitdemonstrates the use of a bow. The first section tests for the visitor's dominant eye using a painting of a bull's-eye and written instructions that

[9]*Winning the West* and *Museum Map*, Frazier History Museum, Louisville, Kentucky.
[10]*Mail Order*, Frazier History Museum, Louisville, Kentucky.

explain how the experiment works. This is an interactive display that was created with little effort and without any expensive technology. It is an example of how creativity can be used to engage the visitor without spending thousands of dollars on fabrication and upkeep. Plus, it teaches visitors a personal and interesting lesson: eye dominance. The second half of the exhibit is not done as well as the first. A bow is pulled back and let go to determine whether the visitor would be "DEAD ON TARGET," fall short, or shoot too far to some degree.[11]This section falls short in a few ways. First, it is difficult to figure out what the sensor is measuring. It may feel like the visitor has not changed their shot, but the sensor may show great differences. Second, the visitor "fires" into a wall. No projectiles leave the bow at any time, but by facing a static wall, it feels slightly claustrophobic and even confusing. The visitor faces a blue wall located less than four feet away.At least a faux target on the wall would have made more sense. Third, in theory it teaches the difficulty in using a bow, but it feels so unrealistic that many adults may feel confused by the experience and convinced that it is a game of chance that was strangely placed in the middle of a history museum.

The third interactive exhibit involves rubbing a crayon-like utensil on paper placed over a raised portrait of a person (or in one case a dog) from the late medieval period. The interactive display found within this exhibit does not send information directly as a text panel would. Instead, it conveys the style of art seen during this period in England while allowing the visitor to make a representation of that art for themselves. Plus, any sort of object that is created and taken home from the museum can be a keepsake and souvenir from that day. Reminders of this experience can reinforce memories and information obtained that day, or at least remind the visitor of this exhibit

[11]*Bow Pull*,Frazier History Museum, Louisville, Kentucky.

and their experience there. One of the major goals of the history museum is to impart lessons and information that the visitor can take with them. If research suggests that interactivity "can promote engagement, understanding, and recall of exhibits," then taking a piece of the exhibit homemust greatly assist the recall of the exhibit since they have a memento from their day at the museum.[12]

Muhammad Ali Center

Muhammad Ali is a famous, Louisville-born African American boxer known worldwide for both his boxing and humanitarian efforts. It is only fitting that the center that showcases his legacy and beliefs should stand in the heart of the downtown area. Unlike the majority of the other museums in this study, the Muhammad Ali Center focuses on the history and ideals of one man. The exhibits reflect the core principles of the museum: conviction, confidence, dedication, giving, respect, and spirituality. This museum is comparable to the Kentucky Derby Museum as its main focus is not on history, but it still provides a great deal of historical knowledge forthe visitors. Yet, this museum does teach visitors about the history of Muhammad Ali. In the process, the museum provides information on historical events as it related to Ali throughout his life such as segregation and the war in Vietnam. As the center is unique in its use of one person as a filter for all of its lessons, it is equally unique in its use of interactive exhibits. The center has a large variety of interactive exhibits between the two main floors of the museum. It showcases how interactivity can be used intelligently in a museum.[13]

[12] Allen, *In Principle, In Practice*, 49.
[13] This study does not include the art gallery areas because they do not contain interactive exhibits.

One such exhibit allows visitors to interact with a book on segregation at a diner counter. Visitors turn the pages of the book to read headlines from replica newspapers and other information about the history of segregation in both Louisville and the entirety of the United States. The subject matter of the clippings is about racial segregation and how it occurred in Louisville. This sort of hands-on activity is augmented greatly by the immersive environment of the exhibit. As the visitor walks in, the lights dim in the fabricated diner and the attention of the visitor is brought to the newspapers clippings book by the room's lighting. A voice tells the visitor, "Hey you! What you doing in here? You know I can't serve you. Now leave," while another voice responds "You heard what he said. We don't serve your kind in here. Get out!"[14]While the visitor is reading newspaper reports on segregation, they are bombarded by hateful and racist speech directed at them. This multisensory interactive experience may be short, but it is very powerful. In fact, it offers the most powerful, provoking, and memorable experience of the exhibits surveyed.

Moving away from the diner, there are many signs in this area that say, "Please Touch." These items include a container of *Jet* magazines, a bicycle seat, boxing gloves, and even boxing headgear. Touching these items start a multimedia show on the screen behind them. This was done in other areas by placing a hand into the handprint of Ali. While this is interactive and literally hands-on, it does not feel like it necessarily brings anything more to the experience than the traditional "push the button to start the film" exhibit that is seen in so many other museums. The presentation of the "button" is much better and more thematic but more could have been done to add to the interactivity of the switch. Putting on the boxing gloves, or sitting on the bicycle seat instead of merely

[14]*Conviction*,Muhammad Ali Center, Louisville, Kentucky.

touching them are two ways that interactivity could have been amplified here. As Sue Allen showed, interactivity and experiences "can promote engagement, understanding, and recall of exhibits."[15] These interactive items may be simple, but they are also memorable.

However, heightened interactivity is not a problemwith the exhibits located in the area called*Train with Ali*. In one exhibit within this area, visitors can "shadowbox" with Ali: a silhouette of Ali with whom visitors may spar.[16] This is a highly physical activity with a warning label stating that visitors with "medical conditions that exclude this type of exercise should not participate."[17]Other interactive exhibits in this area are equally physically demanding. For example, visitors are invited to attempt to "match the pace" with a speed bag on two levels: beginner and expert.[18]Finally, there is an area shaped like a boxing ring where one receives boxing tips from Muhammad Ali's daughter. These exhibits work together to teach a common lesson: the difficulty of boxing and the dedication needed to excel. Simply stating that boxing is a demanding activity or by showing video clips of Ali in the ring, the visitor gets a glimpse into the training of Muhammad Ali. By allowing visitors to experience some of these workouts and training exercises themselves, they are allowed a deeper understanding of Ali's training as they practice it firsthand.

The floor below the aforementioned exhibits contains an area called *Ali All the Time*. It is here that "[fifteen] of Ali's greatest fights are available at six interactive

[15] Allen, 49.

[16]Although it is not stated, the shadow appears to depict Ali during his years as a boxer during the 1960s and 1970s.

[17]*Train with Ali*, Muhammad Ali Center, Louisville, Kentucky.

[18] Ibid.

stations…"[19]The stations are situated in a darkened area where viewers may sit in rather comfortable theater seats and choose to watch Ali's historic boxing matches of their choice. They may browse the selections by date, location, opponent, or outcome. Regardless of the fight or fights they choose to watch, in the end it is *their* choice that they see. They experience the history of Ali's boxing matches in the way that they choose.

The last two interactive exhibits on this floor share a common theme summed up in the area containing the*Hope and Dream Wall*. In the *Vision*interactive display, visitors use a collection of words to create a poem which can help "clarify [their] vision."[20] For those that may have trouble starting from scratch they have the words "Once I was" followed by a blank space, and then "But now I am" followed by a longer blank space.[21]While it is very temporary (until the next person takes it off), this allows visitors to put their thoughts and feelings directly into the display making them truly part of the exhibit. The other interactive display in this exhibit, *Reach for Your Dreams…One Step at a Time*, is a series of three puzzles where the pieces represent "examples of how a dream… can be broken down into smaller steps."[22]This is another attempt at adding a personal touch to interactive exhibits. Though not as personal as creating poetry, the connectivity is certainly there, and the engagement isnearly strong in this exhibit as in the *Vision* exhibit. What is special about many of the interactive exhibits in the Muhammad Ali Center is that they do more than just help facilitate learning; they also facilitate the use of one's body and emotions. The use of emotions and the body in these exhibits can

[19] Muhammad Ali Center, *Visitor Guide and Map* (Louisville:Muhammad Ali Center, 2012).
[20]*Hope and Dream Wall*, Muhammad Ali Center, Louisville, Kentucky.
[21] Ibid.
[22] Ibid.

heighten the experience and connectivity to the exhibit for the visitor. As shown in chapter one, experience is an important part of learning and information recall. If the experience here is greater and more meaningful, then the recall of these exhibits will be greater as well.

Louisville Slugger Museum

The Louisville Slugger Museum is the third museum in this study that is located on Museum Row in downtown Louisville.[23] It is part of the Louisville Slugger Factory and the museum is the first part of the factory tour. Although,it is not as large as the entirety of the Frazier History Museum or the Muhammad Ali Center, it should not be judged by its size alone. The exhibits of the museum tell the history of the Louisville Slugger baseball bat and a great deal about the history of the sport of baseball. Nearly every exhibit in this museum contains an interactive element.

Before the visitor walks into the main exhibit gallery, there is a simple exhibit that contains little information but a lot of hands-on activity. Visitors may examinethe same models of Louisville Sluggers used by famous baseball players,including Derek Jeter, Jackie Robinson, and Stan Musial. While this is an interesting and perhaps engaging experience for fans of these players, the display assumes that the visitor knows who these people are and why they are famous. Everyone who visits is not necessarily a baseball fan who understands the significance of these players.[24]While the display tells when Jackie Robinson signed on with Louisville Slugger, and it tells the length, weight and model of the bat, it fails to explain his significance to baseball or his place in African-

[23]The Frazier History Museum and the Muhammad Ali Center are also part of this Museum Row.

[24] I have never heard of Stan Musial. I only know about Derek Jeter because my wife is from the New York City area and happens to be a fan.

American history. Interactivity alone is not enough to impart a lesson without the necessary context. The most an uninformed visitor can take from this exhibit is that these are three bats used by three players and that they feel like baseball bats.

Fortunately, the exhibits inside the main hall provide more information than the first display. The first exhibit is a great illustration of how the exhibit outside the main hall should have been created. In *The Louisville Slugger*, visitors can handle and examine a bat. This time, there is context and a history along with the interactive element. A replica of an original Louisville Slugger is available for examination in front of the story of Bud Hillerich and how he made his "first professional bat for Pete Browning in 1884."[25]With the added information that this was made for a famous Louisville Eclipse batter, this is more than a piece of wood. What the visitor holds is now a replica of the first professional Slugger; a representation of a piece of history. The significance can be understood by a much larger audience now that contextual information has been introduced. Another example of the necessity for contextual narrative along with an interactive element is seen with the small display beside the replica bat. A butter churn that can be used by visitors stands beneath a text panel. The text panel explains that the Hillerich Company originally focused on churns, such as the one displayed, instead of bats. Without context, the churn is not a representative and tangible part of history; it is just a wooden box that feels out of place in a baseball bat museum.

A memorable interactive experience exists behind a contextual text panel located near the previous exhibits. In *Game Used Bats*, visitors can handle bats that were actually used by famous baseball players during their games. Gloves are necessary as visitors are allowed to pick up and examine an actual piece of baseball history. This is done in a

[25]*The Louisville Slugger*,Louisville Slugger Museum, Louisville, Kentucky.

highly supervised and gated area with a knowledgeable worker who acts as teacher and bat handler. Of course, this added security and protocol is understandable since these are the actual bats used by famous players.[26]This is one of the only museums examined that allows visitors to touch an actual artifact and not a replica in an exhibit. Doing so truly makes this a one-of-a-kind interactive experience. By having a game-used bat instead of a replica, visitors get the rare experience of handling something used in a major league baseball game. If an experience is an important part of learning, then this detail could augment the memory of what is learned, seen, and felt in this exhibit. While a replica bat could be used, it does not add the same level of importance or education experienced when the bat handler lets you examine these bats as they hear the history behind them.

An interesting characteristic of this museum is that the visitor must interact withmost of the exhibits to access much of the information they provide. Doors must be opened, drawers must be pulled out, and in one exhibit the artifacts are displayed inside of a toolbox and a safe respectively (both which must be opened to view). Hiding away these artifacts serves two purposes. First, the older items are protected from light until the visitor looks at them. Keeping them hidden away helps shield these items from light damage. Second, such exhibits add a degree of interactivity and even exploration as visitors "discover" these interesting items hidden away.[27]To paraphrase Falk and Sheppard, the use of discovery can make the visitor feel like the information they find was presented exclusively for them.[28]

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[26] The artifacts are not very old though. The oldest bat advertised on the text panel dates between 1980 and 1983, and was used by Johnny Bench. They do not have very historically significant bats such as those used by Babe Ruth, Ty Cobb, and Hank Aaron, for example.

[27] They are understandably not very well hidden since the museum wants them to be found, and in my observation many visitors were "finding" these items without trouble.

[28] Falk and Sheppard, 193.

Besides "finding" artifacts, the museum includes more traditional interactive exhibits. In the exhibit *A Tree's Journey,*visitors interact with a control panel to highlight the path a tree makes in becoming a batch of bats. The controls include a full-size chain saw, a billet, a simple lever, and a mini-bat. These controls represent the steps the wood goes through from tree to bat and each step is explained after the control is manipulated. For example, the chain saw control activates the information provided on the screen that tells about where the tree is cut down. This is a nice touch thematically and it adds to the interactive element since the visitor is taking an extra step in connecting to what the screen is teaching them. For example, hearing the roar of the chainsaw and feeling it in one's hands intensifies the experience of reading that loggers cut down certain kinds of trees to make these bats.[29]

The last interactive displaystudied here is the *Hot Topics*section. Visitors can vote on a number of questions where their answers are shown in a tally along with others who have voted previously. They may also write in thoughts on cards that may or may not be presented in the exhibit near the display for the questions and answers. Unlike the other displays in the museum, *Hot Topics* does not teach information provided by the museum but instead it is provided by the visitors. This form of audience engagement goes beyond merely interacting with the display. Much like the poetry creations at the Muhammad Ali Center, visitors can become part of the museum for a time.[30]This means

[29] Unlike most of the exhibits listed in this study, there is no historical context to this exhibit as this is the current process they use to obtain the wood necessary to create the baseball bats. However, this is still a great example on how to use theming to enhance interactivity, and should be mentioned alongside the other examples. Note: theming is the act of using a certain topic and making all objects fit within that topic in a design plan. It can be done on an exhibit, or an entire museum. Outside of museums, there are even theme parks and themed restaurants.

[30] Unlike the poetry exhibit at the Mohammad Ali Center, the thoughts posted here are on cards behind glass so they will be part of the exhibit much longer than what was seen at the poetry exhibit.

that there is a chance that their interactions with this display may be even more meaningful if they return to see their thoughts as part of it in the future.

The Museum of the American Printing House for the Blind

The Museum of the American Printing House for the Blind is located in the Clifton neighborhood of Louisville on Frankfort Avenue. The museum provides visitors with an "educational history of blind people and the historic contributions of the American Printing House for the Blind…"[31]Due to the nature of the exhibits and the usual audience of the printing house, interactivity is a constant within the museum. Braille writing is found near or even on every text panel. While those without vision difficulties can use their eyes to read the words and see the graphics, sight-challenged individuals can touch the same graphic and text panels to obtain the message in that way. Of course, this is an interactive exercise that must be used to read for any individual who has completely lost their sense of sight.

For those fortunate enough to not have any viewing difficulties, the first display allows them to experience what it would be like to have some sort of "serious vision impairment."[32]Nine sets of goggles may be tried on that imitate what an individual would see with certain impairments. These include glaucoma, cataracts, and diabetic retinopathy. While wearing the goggles, the visitor is then asked to attempt to find a listing in a phonebook or even distinguish between cans of soup.[33]It is a lesson that shows

[31]The Museum of the American Printing House for the Blind, "Our Mission," *The Museum of the American Printing House for the Blind*, http://www.aph.org/museum/museum_mission.html (accessed April 1, 2013).

[32]*Low Vision Simulators*, The Museum of the American Printing House for the Blind,Louisville, Kentucky.

[33] From firsthand experience, I can say that it is very difficult to complete these simple tasks with such impairments.

the difficulties that sight-challenged individuals face everyday even if they have not fully lost the use of their sight.

From a historical perspective, the most surprising part about this museum is its use of actual artifacts in their interactive exhibits. For example, one of the first items that can be touched, examined, and manipulated by the visitors is a Hall Braille Writer created in 1892. Sitting behind a text panel which explains the history of this machine, the buttons and levers of the braille writer can be pushed by the visitor. It is not stated whether or not it is in working order nor is it in the best condition (especially since it is out on display and is more than 100 years old), but it still has moveable parts and gives the visitor a truly hands-on experience with an item from the past. Many of the interactive elements of this museum rely on the actual artifacts from the history of sight-challenged individuals, but this braille writer is by far the oldest in any interactive display seen here.

There are a wide variety of artifacts on display here that are interactive. Some of these artifacts for the sight-challenged include braille books, maps, an "APH Student Speech + Talking Calculator" from circa 1980, games, and other such tools used for education.A highlight for some may be the copy of *The Very Hungry Caterpillar* that is on display here. This is a familiar and widely read children's book that is shown here in a version containing the original text and illustrations along with overlaying transparent sheets containing braille. This connects something with which many are already familiar to something that is new and different. This, along with the hands-on aspect of examining this book, further heightens the learning process. As Joanne Cleaver stated, "…the key to making the past relevant today is to establish a direct relationship between

what the children see and their own life experiences."[34] (This is equally true for people of all ages.)This book is partially historic but the idea presented here is contemporary. Regardless, what Cleaver said applies to the notion of using this book to connect with the audience.

Many of the other items in the museum are used to inform the general public of the items used by people with sight problems. The written information on the text panels is always accompanied with the item referenced. For example, the display of the Miniguide US explains how it works and how it would be used by someone who needed it. It is a simple handheld device with only two buttons. It is used to detect the distance of objects and then relays that information to the user through vibration: a close object causes a fast vibration while an object in the distance would cause the device to vibrate more slowly. The visitor can then use this device firsthand to discover what it would feel like to use this device if they required it. Other items such as electronic magnifiers and guide canes are also available for examination for anyone curious about these items.[35]

One potentially educational and insightful display must be mentioned: an interactive display where the visitor can print out a braille message of their own by using a braille writing machine. By allowing the user of these machines to print out a message or their name, they can personalize this interaction. They would then have a paper of their own with braille writing which they created at the museum. This interactive exhibit

[34] Joanne Cleaver, *Doing Children's Museums* (Charlotte: Williamson Publishing Co., 1988), 21.

[35] Allowing visitors to examine these canes is a great idea. There may be some children or adults who are curious about these items as they are often associated with blind individuals. Unfortunately, the day that I was there, I saw no one working in the exhibit halls but I did see a couple of children using these canes as toys. They were sword fighting and running with them. These exhibits can be informative for both children and adults, but without adult guidance I think that this museum as a whole cannot impart the lessons it wishes to. This is especially true with the interactive elements that can become toys and playthings to children who do not know any better.

would create a memorable lesson with the visitor that he or she could take home as a souvenir.

Locust Grove Historic Home

Locust Grove contains a historic home, grounds, and a small museum. The farm wasoriginally owned by the brother-in-law of George Rogers Clark, William Croghan, in 1790. George Rogers Clark was the "founder of Louisville and [a] Revolutionary War hero."[36]Within the visitor's center is a small museum containing one large exhibit, *A Country Worth Defending: Land and Family in Early Kentucky*. This museum and its displaysare examined here.

The hallway into the main exhibit gallery represents the prehistory of Locust Grove and after exiting this greenly themed area, visitors encounter two interactive displays. These displays are comprised of articles of clothing near text panels describing their significance. The first interactive display allows guests to try on a shirt that is Native American with European influences. The other display in this part of the exhibit contains a shirt and a vest with an accompanying text panel that explains the warmth and uses of wool and provides information about Virginia State Line uniforms. Having a reproduction of a clothing item that may be examined, felt, or even tried on is an interactive experience that can bring what is said to life. A reproduction of a Continental Army uniform is seen soon after the aforementioned attire. A child, or even an adventurous and imaginative adult, may try this on and feel like one of the members of

[36]Locust Grove, "Main Page," *Locust Grove*, http://www.locustgrove.org/ (accessed April 1, 2013).

the Continental Army.[37]This can create a memorable experience and the visual and tactile experiences that come from these costumes convey information without having to read a text panel or watch a video. By examining or wearing the item, the visitor experiences the costume in a way that a text panel or other non-interactive element could ever hope to do. Furthermore, it is also a great photo opportunity for the visitor.[38]

A very interesting interactive item in this area is called *In Their Own Words*. Visitors may look through a book which contains reproductions of actual correspondence from the families associated with Locust Grove. As the visitor turns the pages and reads the letters of their choosing, they may be drawn in further by the coloration and material used to create this book. It is worn and feels aged. It is an obvious reproduction as the writing was printed by a machine and not handwritten but, as the letters are read, it is easy to suspend disbelief and allow oneself to feel like a historian looking into the past through the original letters.[39] This can enhance the experience because visitors control what they learn. Also, according to Gallace and Spence, "something touched is more 'real' than something seen" which may make "stronger and longer-lasting memories."[40]

Other displays found in this museum use interactive elements effectively, but they suffer from a problem seen in other museums like the Cincinnati History Museum (see below). Interactivity is something that should be used and useful for people of all ages. Unfortunately, the majority of interactive exhibits at Locust Grove are directed towards children. The first such exhibit is a tent that contains a canteen, a bedroll, and a few

[37] While this jacket would fit many adults, it does not accommodate the big and tall crowd.

[38] It should also be noted that there is not a gender bias on the historical clothing. Further along in the exhibit there are dresses and hats that may be examined and worn as well.

[39]By using reproductions instead of copies of the original letters, the font is easier to read by all of the visitors.

[40] Gallace and Spence, 164, 179.

others items. It is more of a play area and since the objects in this area are made for children they are smaller. This is interactive and can serve as a learning experience for the younger visitors but it has an age restriction set upon it. The interactive displays farther along after the tent can be enjoyed by visitors of all ages and while it is not explicitly stated the theming shows that this is also a children's area. The writing near the interactive displays in the final area is directed towards children with two stories tying the items together. These stories involve the children who once lived at Locust Grove. One story focuses on enslaved children,while the other story focuses on white children.

The exhibit tells the story in great detail and the overall section contains a variety of interactive elements. The text panels are very informative and can teach visitors of all ages a great many things about life at Locust Grove. The interactive elements found there augment the text panels, add to the experience, and enhance learning. One such interactive part of this exhibit has a plate that may be spun on its axis. On one side there is a drawing of a hearty and filling meal which represents what the Croghans of Locust Grove would eat at "the noon meal." The other side has a drawing of what appears to be cornbread and "pork fat," which represents what the enslaved people would have eaten.[41]This is a potentially jarring example of the differences between slaves and their masters. These are two examples of the strong interactive elements found in this exhibit.

Two of the interactive displays used in this area adopt a more realistic tone. Both involve opening doors to view artifacts behind glass. The first involves opening a cabinet door for sugar and a sugar snip. The importance of the door is even mentioned in the text

[41] *A Country Worth Defending: Land and Family in Early Kentucky*, Locust Grove Historic Home, Louisville, Kentucky.

panel when it explains that sugar had to be "kept… under lock and key."[42] The text panel describes what is seen and gives greater detail about spices and sugar. The other door is a barn door which opens to reveal nails, a portion of a chain, and half of a horseshoe that were found by archeologists at Locust Grove. They are greatly aged and deteriorated and anyone who interacts with the barn door can open it to find these relics from the past. Opening a door or drawer or anything of that nature is a simple trick which adds an interactive element to an exhibit. Locust Grove uses the idea interactivity with such a simple and effective device. As mentioned above with the Louisville Slugger Museum, this act of discovery and self-directed learning is what many visitors want in museums. Furthermore, these are all examples of useful tools for kinesthetic learners and as Allen argues, interactivity "can promoteengagement, understanding, and recall of exhibits."[43]

Museums outside of the Louisville area also offer interactive exhibits. These history museumsprovide a comparison to critique more accurately what visitors see in Louisville history museums. I chose five museums geographically close to Louisville and located in or near metropolitan areas about the same size as Louisville to offer comparison and measure the success of Louisville's interactive museum exhibits.

The Tennessee State Museum

The Tennessee State Museum in Nashville, Tennessee focuses on telling the history of Tennessee. This institution is much larger, more diverse, and contains an assortment of artifacts that are more valuable than those displayed at smaller museums in

[42] Ibid.
[43] Allen, 49.

Louisville such as the Derby Museum. The Tennessee Museum contains low-tech interactive displays such as the doors in the Derby Museum's bourbon exhibit. For example, two such exhibits contain displays that are hands-on in this way. One of these displays uses tablets which must be raised to find out what would be packed in a wagon if they were coming to the state in 1790. Another display has visitors identify fabrics and then use small doors to reveal the answers. There are a couple more exhibits like this as well as a stockade and a ship's wheel that can be moved, but the level of interactivity seen at the Louisville museums is lacking here. For example, both the Muhammad Ali Center and the Kentucky Derby Museum have many interactive exhibits and most of them are successful in being educational, entertaining, and engaging. There are not many interactive displays at the Tennessee Museum and these exhibits have a low level of interactivity. The level of interactive experience that takes place in these exhibits could have been done nearly as effectively through the use of text panels.

The remainder of the elements here that could be called interactive seem like more of an afterthought and not to par with what is seen in the other museums studied. Furthermore, they feel like they were put there just for the entertainment of children. These include checkers, Lincoln Logs, building blocks, and some sort of bowling-like game that feels as though someone just placed it in the play area with no real context. Without context, interactivity fails as a learning tool.

National Underground Railroad Freedom Center

Located on the north banks of the Ohio River in Cincinnati, the Freedom Center is dedicated to telling the history of the Underground Railroad, the informal network of

anti-slavery activists who shepherded escaped slaves to the North. It is fitting that the center is in this location as the northern shore of the Ohio River meant freedom to those escaped slaves. The Freedom Center also tells the history of slavery in America, from the days of the slave trade through its end during the Civil War, and even addresses slavery as it still exists in the world today. Thehistory of slavery and the Underground Railroad is shown through interactive displays (such as the display called *The Atlantic World During the Slave Trade Era*), a memorial for those who died during the Middle Passage, and displays such as text panels and exhibits (two interesting examples a text panel describing the Exoduster movement and a replica Ku Klux Klan robe representing the designs used following the Civil War.) Since this is only a comparison to the main subject of this paper, not as much can be said here about this museum as it deserves. As it is, this comparison will examine a few interactive highlights of the center.

The exhibit *From Slavery to Freedom* focuses on the history of slavery from beginning to end in America. It is here that the majority of interactivity is found after walking through a very immersive replica of a coastal town with statues of enslaved people and through a darkened and watery area where a choir sings "Amazing Grace" as a monument to those who died during the Middle Passage. Almost every display in this exhibit is an interactive. Visitors may feel construction materials such as brick and wood. One interactive display shows the dangers of picking rice by having the visitors move artificial rice plants only to find a large snake ready to strike at them. Where interactivity is lacking, immersive environments take over. Yet in those instances of strong interactive exhibits, the Freedom Center succeeds in all of the three categories used to

examine Louisville history museumsbelow.[44]Beyond all of this, the Freedom Center has an "app tour" for smart phones which contains videos, "first hand interviews and archival photography."[45]

Cincinnati History Museum

Located in the Cincinnati Union Terminal building, the Cincinnati History Museum is part of the sprawling Cincinnati Museum Center which also includes the Museum of Natural History and Science as well as the Cinergy Children's Museum. The Cincinnati History Museum excels in immersive environments that can make a visitor feel as though they have stepped into the past. These environments include a reproduction of the city's "19th century riverfront community and… a 94-foot side-wheel steamboat."[46]As mentioned in chapter one, immersion may have a comparable effect to interactivity (experience heightens learning), it is not the same. This in no way implies that immersion is better or worse than interactive exhibits, it is just not the focus of this study. While the museum is effective in its use of immersion, it does not use interactive exhibits effectively. There are buttons throughout the museum which begin audio or video segments or turn on a light in a model, but this form of interaction is a very weak form by itself because in a way, these interactive features feel more like energy saving features on behalf of museums that use them. It feels as if they do not want audio clips or videos running continuously so they let the visitors choose when to start them. Still, this

[44]The three categories: amount of self-directed learning or level of interaction involved, contextual information available for the visitor, and information imparted to the visitor through the interactive experience

[45]*From Slavery to Freedom*,National Underground Railroad Freedom Center, Cincinnati, Ohio.

[46] Cincinnati Museum Center, *Cincinnati Museum Center Pamphlet* (Cincinnati: Cincinnati History Museum, 2012).

is an interactive task as the visitor chooses what they want to hear and see. The other highly interactive exhibits were created with only children in mind. Examples of these exhibits include a toy canal boat and two small "playhouses" for children. Adults are not forgotten though. There is a trivia game where the correct answer lights up a screen with a picture of the person or thing referenced.

The interactive exhibits at this museum give the impression that interactive displays and exhibits are mainly for children. This is far from true and by not embracing interactive features, it feels as though they are being neglectful to kinesthetic learners and the benefits that come along with interactive exhibits. However, it is difficult to judge them harshly for not having many fully interactive exhibits. Their use of immersive environments seems to be their choice on how to address the way that experience increases learning and memory recall. But, as mentioned above, immersion is not the same as hands-on interactivity and does not have the ability to address hands-on kinesthetic learning. So while they are successful in their use of immersive environments to create experiences and memories, the hands-on and interactive experiences are lacking here.

Indiana State Museum

Located in downtown Indianapolis within the White River State Park, this museum is a multifaceted institution that labels itself as a "center for science and culture."[47]To quote a portion of their mission statement, the museum is there to "collect, preserve, interpret and present the material record of Indiana's art, science and

[47] Indiana State Museum, *Indiana State Museum Map* (Indianapolis: Indiana State Museum, 2012).

culture…"[48]While human history is the primary theme of the other museums listed within this study, this museum shares its themes equally between natural history and human history. However, Native American history is grouped in the natural history section, along with an exhibit on archaeology. These subjects fit the parameters of this study.

Few interactive exhibits are used in the cultural history portion of the museum. There is an exhibit that uses lights and mirrors to make the visitor appear to have facial tattoos like the Native Americans who formerly inhabited Indiana. The exhibit explains what tattoos meant to them and then asks the visitors what tattoos mean today. There is another exhibit that displays how canal lock systems work by allowing the visitor to push buttons to manipulate the gates so that a boat may be moved along a canal. This is somewhat similar to the toy canal boat at the Cincinnati History Museum, but this one is more advanced and feels like it is for all ages and not just something to occupy children. While the museum has a few more interactive exhibits in the natural history section, but those noted above are the only truly interactive exhibits in the cultural history section.[49]

Conner Prairie Interactive History Park

With the word interactive in its name, that Conner Prairie not surprisinglyexcels at interactivity. This museum is so interactive and so immersive that it actually stands apart from the traditional category of what it means to be a museum. There are still artifacts within this sprawling 200-acre park located north of Indianapolis in Fishers, Indiana, but it is so far beyond anything seen in a traditional museum because of its use

[48]Indiana State Museum, "Mission," *Indiana State Museum and Historic Sites*, http://www.indianamuseum.org/about/who/miss.html (accessed April 12, 2013).

[49] This is even including the Native American exhibit mentioned above that is found in the natural history level of the museum.

of immersion and interactivity. It really does feel as though the visitor has stepped back in time and into the early to middle nineteenth century. As this is just a comparison, only an overview and a few examples of interactive elements will be given here.[50]

The first exhibit that visitors experience after leaving the welcome center is an area themed around the 1859 Balloon launch that occurred in Lafayette, Indiana. Besides riding in a hot air balloon, guests may dress in period clothing and have their picture taken in a replica balloon created in the exhibit area. Deeper within the park, in the Lenape Indian Camp, a tomahawk throwing contest takes place every day at four. At the Conner Homestead, visitors can make and take home both candles and baskets, touch different types of wools in the loom house, and encounter animals raised on an Indiana homestead between 1823 and 1837. In the 1836 Prairietown area, visitors may write on chalkboards in the schoolhouse, sort items in the general store, use a water pump, and even rope a bed.

Before entering the final area (1863 Civil War Journey: Raid on Indiana), visitors are given enlistment papers to fill out for the 103rd Regiment of the Indiana Militia. Besides this, there are not really any other hands-on interactive elements within the Civil War area as hands-on exhibits give way to extremely immersive shows and environments. Also, unlike most museums, there are not a large number of text panels to add context to the interactive experiences at Conner Prairie. Instead the park uses interactive interpreters and immersive environments to add the context where a text panel would normally be used. Regardless, the visitor can learn a lot and have memorable experiences with the interactive elements listed above. The setting is something that

[50] While immersion and costumed interpreters are a major part of this sprawling park, this study only examines and lists the interactive elements that are hands-on and fit within this study.

cannot be replicated fully at traditional history museums and it would be unfair to compare them to Conner Prairie, however, the interactivity at Conner Prairie can be replicated. Creating objects to bring home, wearing costumes, and interacting with hands-on exhibits are some of the interactive elements seen at Conner Prairie that are also seen at museums mentioned above in Louisville and elsewhere.

The museums examined in this study reveal that Louisville museums use more interactive elements than their counterparts in other nearby cities. Louisville is not as large as Indianapolis, Cincinnati, or Nashville. However, the museums in Louisville(the Kentucky Derby Museum, the Frazier History Museum, the Muhammad Ali Center, the Louisville Slugger Museum, the American Printing House for the Blind Museum, and Locust Grove Historic Home) contain interactive exhibits in numbers comparable to the National Underground Railroad Freedom Center and Conner Prairie. They surpass the number of interactive exhibits at the Tennessee State Museum, the Cincinnati History Museum, and the Indiana State Museum. Furthermore, there is a great variety of interactive exhibits at these museums ranging from highly technological and extravagant (*Place Your Bets* at the Kentucky Derby Museum) to simple and inexpensive (candle making at Conner Prairie). This provides evidence against those who believe that interactivity must be too expensive to implement in museums that are not funded as well as institutions with a great deal of interactive exhibits.

This chapter offers an overview of these museums and focuses on how many interactive exhibits exist within these institutions.Prior to analyzing the effectiveness of interactive exhibits in Louisville, I had to examine whether or not Louisville was using

enough interactive exhibits in its museums to warrant a closer inspection and subsequent analyses. The study presented in this chapter argues that these Louisville museums contain more than enough examples to warrant an in-depth examination of its interactive exhibits. The Louisville museums use interactivity in many of their exhibits, but this is not the sameas stating that their interactive exhibits are effective.

Regardless of how much interactivity Louisville museums employ, the effectiveness of the interactive exhibits still needs to be measured. While large number of interactive exhibits in Louisville seems promising, they may not be educational or add to the message of the museum. The following chapter provides a closer analysis of exhibits in Louisville museums toestablish their effectiveness.

CHAPTER III

INTERACTIVE EXHIBITS IN LOUISVILLE MUSEUMS

The interactive exhibits in Louisville history museums can be evaluated using three major measures:the amount of self-directed learning or level of interaction involved, the contextual information available for the visitor, and the information imparted to the visitor through the interactive experience.[1]This chapter categorizesLouisville's interactive exhibits using these three measures.

The first category, low level interactive exhibits, studies exhibits thatmeet one of the qualifications listed above. For example, buttons that start videos or pieces of wood that are lifted by visitors to reveal an answer fit within this category. Many times these exhibits are only remotely interactive, such as asking visitors to push a button to start a show. The second category, mid-level interactive exhibits, consists of exhibits that succeed in two of the above areas. The first exhibit visitors encounter in the Louisville Slugger museum,where they can examine reproductions of bats used by baseball players such as Jackie Robinson, fits this category.The visitor has an interactive experience and the hands-on nature of the exhibit is something that cannot be replicated by a text panel, but little contextual information is offered to visitors. The final category contains high-

[1] A difference exists between "self-directed learning" and "level of interaction involved." For this study they are classified together because they both describe the degree to which the participant in the interactive exhibit becomes part of the exhibit. At times the visitor is in charge of his or her experience; other times they interact with the exhibit to a great degree. In some rare instances, they may do both simultaneously.

level exhibitsthat adhere to all three of the criteria. The*Place Your Bets* at the Kentucky Derby Museum falls within this category. This exhibit is controlled by the visitor, offers plenty of contextual information about horseracing, and provides an experience that cannot be replicated through non-interactive means.[2]

Out of forty-three exhibits used for this study, five are classified under the low-level category, eighteen are classified under the mid-level category, and twenty are classified under the high-level category. The majority of interactive exhibits in Louisville history museums meet all three of the measures for such displays. However, high-level exhibits further the depth of historical understanding greater than those exhibits in the other two categories. If one exhibit lacks context, then it is at best entertaining and at worst confusing and out of place. If information is not gained through the interactive elements, then such exhibits offer little educational benefit. (There must be a reason for the interactive element to exhibit outside of being entertaining.)In exhibits with a low level of interaction or self-directed learning, visitors do not become a part of the exhibit and the experience is not as strong asit would be in an exhibit with greater interactivity. Low-level interactive exhibits are justifiable, but successful interactive exhibits meet all three criteria and create an experience for the visitors.

Using these measures, this study will analyze interactive exhibits more fully than in chapter two. The previous chapter examined the whether or nothistory museums in Louisville had their embraced interactivity. It showed that those museums are using interactivity as much as (or more than) history museums in other select cities. It also

[2] The high-level exhibits here are educational. Information is gained through the experiences described in those exhibits. While these exhibits and displays can be entertaining, they are all appropriately placed within the galleries of these history museums. For example, *Place Your Bets* may feel like a game, but it gives the visitor a unique educational experience that is approved by the Kentucky Derby Museum.

revealed the variety of interactive exhibits used. Finally, it argued that no correlation can be found between the use of interactivity and the size of the city or the size of the museum. This chapter focuses on interactive exhibits in Louisville museums and analyzes their effectiveness.

Low-level Interactive Exhibits

The exhibits found in this category are interactive, but they cannot be fairly compared to high-level interactives. These attractions are useful and informative. The five exhibits described below have three things in common. First, they are not highly interactive nor do they allow for self-directed learning. Second, visitors do not gain much from the exhibit's interactivity. The exhibits could all easily be replaced with text panels or video screens. Third, they do succeed in providing information to the visitor using interactivity.

The collection of doors seen in the *Urban Bourbon* exhibit at the Louisville Slugger Museum fits this category. The visitor opens five separate doors to read highlights of the chronological history of bourbon, along with some other events, in Louisville and Kentucky. For example, when visitors open the first door, they learn that bourbon production began in the 1770s and Even Williams, "credited as Louisville's first distiller," began making whiskey in 1783.[3] The use of doors, drawers, cabinets, lockers, or any other item that "reveal" information when opened by the visitor constitutes one of the easiest and least developed interactive exhibits. The exhibit *A Country Worth Defending: Land and Family in Early Kentucky* at Locust Grove Historic Home contains a similar feature, but the doors opened by visitors there reveal information as well as

[3]*Urban Bourbon*, Kentucky Derby Museum, Louisville, Kentucky.

items and artifacts relating to the subject matter of the area. The interactivity of these exhibits only works because of the information provided. At Locust Grove, visitors can open a small replica barn door. A chain and a few nails provide some examples of the artifacts discovered during archeological excavations at Locust Grove. The corresponding text panel provides information about blacksmiths at the farm. It explains to visitors that the blacksmith was "probably a slave who was responsible for making and repairing" these items.[4]

The drawers, doors, toolboxes, and other items that visitors open at the Louisville Slugger Museum expand the idea of placing information behind doors. Though signs alert visitors to open and explore,the objects and information at this museum are hidden. "Hiding" these items and information in a variety of containers adds a degree of interactivity and even exploration as visitors "discover" these interesting items. As Falk and Sheppard note, the use of discovery can make the visitor feel as though the information they find was presented for them alone,giving the task of opening the door an added bonus not present in the other "door" exhibits examined in this study.[5] Visitors are aware that they are not completely alone and they are in a museum, of course, but it is still an individual "discovery" that is self-directed and one-on-one between the "hidden" objects and the visitor. This "discovery" by the visitors is one of the reasons behind the interactivity. The information provided is given to the visitor on a personal level as they open the door. The second reason to "hide" these items is to protect them from light damage. In the safe within the display, "Grandpa Bud's Attic," there exists a signed photograph of Babe Ruth that he gave to Bud Hillerich, founder of the Louisville

[4]*A Country Worth Defending: Land and Family in Early Kentucky*, Locust Grove Historic Home.
[5]Falk and Sheppard, 193.

Slugger, as well as a rose from Babe Ruth's casket that was sent to Hillerich and Bradsby Co. "by one of Ruth's friends in 1948."[6] Opening the safe to view these historic items displays the value and significance of these items, protects them from light, and provides a personal learning experience to the visitor as they bend down and peer into the contents of the safe.

Low-level interactive exhibits often contain buttons that begin videos or other multimedia. Many museums contain such buttons,but they are barely interactive and are not included in this study. However, the "buttons" at the Muhammad Ali Center do more than the comparative exhibits. To begin a multimedia presentation, visitors do not push buttons but instead touch items related to what is shown on the screen. One memorable example of this process is experienced when visitors touch the seat of a bicycle. This activates a video that explains that Ali's bicycle was stolen in 1954. Ali reported the theft to a police officer who happened to be the director of boxing for the Louisville Recreation Department. The officer suggested that Ali learn boxing. "Six weeks after taking up boxing," he won a local fight that was aired on the local NBC affiliate.[7] He was twelve years old. This bicycle that visitors touch to begin the video is representative of the object that started Ali's path to becoming the icon he turned into.

Another example of interactivity within this category is seen in the exhibits in which visitors place their hands in the handprint of Ali to start the presentation. While a low-level of interactivity, the visitor measures his or her hand against Ali's hand and experiences the feel of his handprint compared to their own. One of the historical lessons learned through this activation is that Ali is a humanitarian who has traveled the world in

[6]*Grandpa Bud's Attic*, Louisville Slugger Museum, Louisville, Kentucky.
[7]*Dedication*, Muhammad Ali Center, Louisville, Kentucky.

an effort to do good deeds. In 1977, he helped raise money for a "small-town boxing club" in England.[8] In 1990, he traveled to Iraq to "seek freedom for hostages of Saddam Hussein's regime," and he returned with fifteen"released hostages."[9]Perhapsit is not the most interactive way to turn on an exhibit, having visitors place their hand in the handprint of Ali definitely supersedes pushing a button. It represents where Ali put his hands across the world during the past decades to help others.

Another exhibit in this category is in *A Country Worth Defending: Land and Family in Early Kentucky* at Locust Grove. The plate that visitors may spin on its axis that shows the "noon meal" constitutes a low-level interactive exhibit. On one side, the artwork depicts what slaves ate while the other side shows what the Croghans ate. The information for this exhibit is provided in the text panel located above the plate. It states that enslaved workers would have eaten a simple meal such as cornbread with "some pork fat or dried meat," the Croghans "would have eaten a more varied meal, with vegetables..., one or two kinds of meat, and biscuits or cornbread," while "the enslaved women who prepared the meal would probably have [eaten] leftovers…"[10]While it is an interactive element that displays the contrast effectively, there is no information here that could not be presented by having two pictures side by side near a text panel.There is nothing of substance added by making this plate interactive.[11]

The information found behind doors (or on the spinning plate, or in the drawers, or even on screens after touching a contextual object) gives visitors the sense that the exhibit is part of a personal experience as they discover this information on their own. In

[8]*Giving*, Muhammad Ali Center, Louisville, Kentucky.
[9] Ibid.
[10]*A Country Worth Defending: Land and Family in Early Kentucky*, Locust Grove Historic Home.
[11] If the food items were three dimensional or more realistic in some way then that would allow for greater interactivity as visitors could better see the differences between the two sides.

addition, it gives visitors a hands-on experience that can augment learning both for kinesthetic learners and others. As Gallace and Spence argue, "information that is gained through multisensory stimulation… may provide stronger and longer-lasting memories."[12]However, these exhibits are one step away from text panels. The doors in the *Urban Bourbon* exhibit open to reveal text panels. In addition, while this study did not include buttons that started multimedia, the interactive elements described as low-level at the Muhammad Ali Center are closely related. Still, the differences between text panels and doors, and buttons and handprints change the experience of the user by using interactivity, albeit to a small degree. These exhibits are not complicated or highly interactive, but they succeed by bringing a simply made and hands-on experience to visitors.

Mid-level Interactive Exhibits

Exhibits categorized within this section only possess two of the three measures used to categorize these exhibits. Four of these exhibits do not allow much (or any) self-directed learning. Six are interactive but do not provide enough necessary contextual information to meet the highest standard of interactivity. The final eight exhibits offer context and enable for self-directed learning and freedom but do not justify their use of interactivity and no additional lesson or experience occurred because of the interaction itself.

The first set of exhibits do not allow much self-directed learningor do not involve a high level of interaction. While they contain contextual information and succeed as interactive exhibits in their use of interactive elements, the effect created is strictly

[12]Gallace and Spence, 179.

controlled by the museum and directs the visitor to learn a specific experience. The ideal interactive exhibit (or exhibit in general) allows the visitor to think that it is created solely for them and that "it's designed just for [them] and [they] get to control what [they] do and what [they] learn," then this is an area of utmost importance that the following exhibits do not embrace.[13]

At the same time, an experience can be as engaging and informative in a group, as when visitors "ride horses" while playing a horseracing video game in *Riders Up* at the Kentucky Derby Museum. The contextual information lies within the experience of the video game and corresponding text panels near the display. For example, one text panel explains to visitors that jockeys do not sit but crouch forward and that the form used to ride a racehorse is a very physical activity. Another text panel tells the different categories of running styles for horses: "the Frontrunner, the Stalker, and the Closer."[14]The text panel provides information on the differences between these style as well as winners of past Kentucky Derby races that used these styles including War Emblem in 2002 (Frontrunner), Assault in 1946 (Stalker), and Gato Del Solin 1982 (Closer). This lets visitors know that category has multiple wins in the Derby regardless of the style. The information gained from playing the game is not as straightforward as the text panels.

While history is not taught through the game, it provides an experience where visitors view a simulation of the track as they race. The experience of riding at this racetrack in the Kentucky Derby is a tradition that has existed since 1875. With this exhibit, visitors can feel as though they are part of this historical tradition. The

[13] Falk and Sheppard, 193
[14] *Riders Up!*, Kentucky Derby Museum, Louisville, Kentucky.

interactive experience of riding the fabricated faux horse cannot be replicated through a text panel, video clip, or other non-interactive exhibit. This experience is memorable and they will not soon forget what it felt like to be in that position. But, while players control the game, they have little freedom and the game is not very in-depth or complicated. While there is some freedom allowed in the experience as the visitor plays the game, the learning is not very self-directed as what is on the screen is all the visitor gets without any real options.[15] For what it is, it is an impressive exhibit. The only way to upgrade and update technological exhibits such as this is through heavy financial investments. However, there is not much room for growth in this exhibit as there is not a lot of control and freedom when simulating a race on a track like that.

Another exhibit that limits the possibilities of the visitor is seen in the first interactive exhibit on the main gallery of the first floor at the Frazier History Museum. The exhibit contains three levers. Two of the levers offer contextual information about gun weights while the levers themselves teach the visitors the weight of some firearms. This hands-on experience enables visitors to grasp fully the information presented. For example, one lever allows visitors to discover the heavy weight of a rifle used against buffalo herds in the West "during the 1870s and 1880s."[16]It explains that the rifle was heavy ("nearly 14 pounds") to reduce "slight movements" that could cause the shooter to miss.[17]When visitors lift the lever, they experience firsthand the weight of this buffalo rifle. When they see the actual rifle on the second floor of the museum, they will know the weight of the gun that the buffalo hunters had to carry. This gives visitors a

[15] Visitors do have control over their horse as they must control its movements and are allowed to use a riding crop multiple times.

[16]*Why Is This Rifle So Heavy?,* Frazier History Museum, Louisville, Kentucky.

[17] Ibid.

connection between their experiences and the knowledge provided about the buffalo hunters and their heavy guns. Therefore, while the exhibit does not enable much self-directed learning, it succeeds elsewhere.[18]

The Frazier History Museum adds a third display in this category with a text panel titled*Right Eyed vs.Left Eyed Experiment*. This displayexplores eye dominance and uses interactivity to teach visitors which of their eyes is the dominant eye. It uses a bull's eye to teach this and is adjacent to the *Bows* exhibit. This display makes sense and used interactivity to convey information about eye dominance and how archers must use their dominant eye when taking aim.However, visitors have little freedom within this exhibit.Still, while the exhibit does not meet all three criteria used here, it is still successful. Furthermore, it is part of an overarching exhibit area that includes *Mail Call* and *Bows*.Altogether, the interactive displays within this exhibit area educate the visitor about the warriors in early England, specifically those at the Battle of Hastings. It was during this battle that the Anglo-Saxon King Harold was killed by an arrow to the eye. A nearby text panel describes the battle that took place on October 14, 1066 in England between the Saxons and the Norman invaders. It further explains how the Saxon defeat led to the rise of Norman power and William of Normandy was "crowned King of England" a mere "two months later."[19] As the bow and arrow played such a pivotal role in this historic battle, it makes perfect sense to include to interactive displays about how to fire a bow and how to find your eye dominance, respectively, as they provide a hands-on connection to the historical information provided by the text panel.

[18] The third level reveals information and is a low-level exhibit like the doors described above.
[19]*The Battle of Hastings*, Frazier History Museum, Louisville, Kentucky.

Anotherinteractive display that does not enable user-direction is*ATree's Journey* at the Louisville Slugger Museum. *A Tree's Journey* consists of four items that activate illumination behind pictures and texts. The screen shows visitors the steps a tree must go through before it is made into a bat. Unlike the low-level buttons, this exhibit offers lessons through the interaction itself. Visitors move levers in the shape of billets, bats, and even a chainsaw. For example, by interacting with the chainsaw, visitors are provided with the information that loggers "cut ash and maple trees from forests in New York and Pennsylvania [before trucks] take the logs to a mill."[20] Afterwards, the logs are made into billets ("round lengths of wood"), shaped into bats, branded and finished, and then delivered to baseball players.[21] While this process is how bats are produced now, this process has not changed throughout the history of the corporation (although, technological additions to the process have made it easier). This added hands-on interaction and movement goes a step further than the items at the Muhammad Ali Center by using levers that represent the stepsand activate the multimedia for each step progressively. This allows for a greater experience through the use of interactivity.

The second set of exhibits within this category consists of those that do not use contextual information as well as they should. Interactive exhibits can be entertaining and educational, but only if they contain an educational element. Such exhibits may even be enjoyed by visitors, but if the museums fail to offer context, these exhibits fail to meet their full potential.

Lack of context occurs twice in the War of 1812 exhibits of the Frazier History Museum. In the exhibit *Drumbeats and Drills*, visitors can use drum pads to play certain

[20]*A Tree's Journey*, Louisville Slugger Museum, Louisville, Kentucky.
[21] Ibid.

rhythms such as "Taps" and "Roast Beef."[22]This interactive experience allows visitors to play along on the drum pads with a video of their choice. While the exhibit offers contextual information about drums used in early American wars, the video tells nothing about the rhythms played by the visitor. The text panel explains that military commands were once issued through drumbeats so that soldiers could hear these commands "over the raucous noise of battle."[23] In 1775, "six companies of expert riflemen" were created in to formation of the U.S. Army, and each company included "either a drummer or a trumpeter" to relay commands.[24] This is very informative, but the meaning of"Taps" and "Roast Beef" are never explained. Visitors will wonder why they interacted with an exhibit that fails to give information about the interaction they are expected to perform.

Next to *Drumbeats and Drills*, a trunk contains period costumes. While trying on costumes is self-directed (visitors choose what to wear and have the freedom to do what they wish) and an experience occurs through the interaction itself, without context these exhibits overlook a crucial element. Visitors can deduce that these costumes represent what people wore in the early 19th century, but they cannot know what each costume represents and who would wear such clothing or the significance of a particular uniform. Without a text panel to add this context, such knowledge is never imparted to the visitor.

Elsewhere in the Frazier History Museum, visitors may do rubbings of medieval figures. Visitors may choose what sort of rubbing they would like to do. The interaction allows them to createa souvenir they can take home. However, the context is not very strong here. While the theming and artwork arerelated to the crusades, no text panels describe these characters for the visitor. The text panels give a brief overview of the

[22]*Drumbeats and Drills*,Frazier History Museum.
[23] Ibid.
[24]Ibid., The musicians also provided music for both marching and entertainment.

crusades from the first one in 1096 until the "Ninth and final crusade" in 1272 which ended "Christian power in the [Middle East]."[25] Also, the map on the main wall of the display shows the path crusaders journey during the Third Crusade. But the connection between this information and the interactivity is not clear. Visitors may recognize that one of the characters is a knight, but what sort of knight exactly? Is this based on a famous piece of art? Was this knight a real person with a story? This is an enjoyable exhibit that gives information about the crusades and the feel of the period through its environment and art design, but under closer inspection it is incomplete. Greater context is needed in this exhibit to further connect the rubbings to the information in the text panels. It is easily fixable and would transform this exhibit into a high-level interactive exhibit.

Alack of context and a reliance on visitor's pre-existing knowledge are the problems found in the other exhibits within this category. The Louisville Slugger Museum entry exhibit,the tent exhibit that represents a tent on the American frontierat Locust Grove Historic Home and the Native American clothing items all allow for self-directed learning with the objects in these exhibits (also at Locust Grove). All threealso create experiences that can only be done through the use of interactivity. Yet, they lack text panels and additional information to enable visitors to understand and enjoy the exhibits to their full potential.

In the Louisville Museum entry exhibit (*Bat Vault*), visitors may hold and examine six models of bats that were once used by famous baseball players. However, the only information given about the players are the description of their bats and the date they signed with Louisville Slugger. One text panel provides information about Babe

[25]*Franks and Saracens*, Frazier History Museum, Louisville, Kentucky.

Ruth's bat length (35"), weight (37-42 ounces), and model (R43). But while it is informative to know that he signed with Louisville Slugger on July 9, 1918, it offers no additional information about why Babe Ruth is an important figure in the history of baseball. While it can be argued that most visitors who go to the Slugger Museum already know much about Babe Ruth, the museum should still offer a small text panel that quickly describes this legend. If the museum is willing to display the famous players who used their bats through history, they should provide information about those players to give greater context that explain the significance of holding these replica bats.[26]

At Locust Grove, the tent display is an interactive play area for children. The display teaches children the sort of items one would use in the wilderness of Kentucky during the years before it was settled by white men. These lessons are taught by replica items such as a bedroll or canteen. Children may learn from playing with these items, but the contextual information accompanying the tent is severely lacking. The text panels in this area explain the timeline represented here. This area describes the years at the end of the Revolutionary War when William Croghan surveyed the land. This tent is not out of place here, but without information about the items within the tent (or a more direct link between Croghan and the tent display), the display is not as strong as it could be. History is learned through the text panels within this exhibit. Yet, without a firmer connection between historical information and the tent, the interaction does not provide the educational content that it should.

The other exhibit mentioned at Locust Grove suffers from the same problem as the tent. With the Native American shirt that visitors may wear, historical information is

[26]*Bat Vault*, Louisville Slugger Museum, Louisville, Kentucky.

provided by the text panels. The text panel located to the right of the shirt states that "Native Americans had adopted many of the habits and dress of the colonists," and displays some images that show examples of the adopted styles.[27] As with the tent, this information explains why the interactive item is located in this area, but it does not fully explain the existence of the item. It does not state who would wear this shirt, when this style existed or for how long, or even which European country influenced this particular item. Information on another panel explains that the Iroquois Confederacy "ceded thousands of acres of land in the Ohio River Valley" to the British around the time of the French and Indian War, but this does not mean that the images in the other text panel or the shirt itself is representative of garments wore by the Iroquois.[28] As it is, the shirt needs more information pertaining to it explicitly.

The thirdset of exhibits within this category consists of exhibits thatdo not impart knowledge through their use of interactivity. In such exhibits, the interactivity felt superfluousand unnecessarywith little value added through the addition of interactive elements. These exhibits succeed in employing user-directed features and contextual information, but no extra lesson or experience was created through the use of interactivity itself.

The first two exhibits within this classification are touchscreen menus that allow the visitors to watch videos. In the Kentucky Derby Museum at the *Warner L. Jones Jr. Time Machine*, visitors can watch select interviews and Derby races of their choosing. The earliest Derby video is from 1928 (when the horse Reigh Count won) and most years are available for viewing until 2012 (when I'll Have Another won). The races can be

[27]*European Influence*, Locust Grove, Louisville, Kentucky.
[28]*Native American Alliances*, Locust Grove, Louisville, Kentucky.

categorized by the visitor by close finishes, long shots, runaways, filly winners, and Triple Crown winners. The display also provides Winner's Circle interviews although not as many videos of the jockeys from this timeline (1928-2012) are present.[29]

In the Muhammad Ali Center in *Ali All the Time*, visitors can watch fifteen of Ali's famous fights of their choosing. These range from his fight with Sonny Liston on February 25, 1964 to his fight against Leon Spinks on September 15, 1978. The historical information about each fight is given on the control screen while the fight itself is shown on a larger screen in front of the visitors. This historical information includes the fight's date, building location, geographic location, outcome, and the number of rounds it lasted. Other important information is provided as well. For example, in his last fight available (against Spinks), the control screen shows visitors that even though Ali regained his World Championship title for winning this fight, it was Ali's "final victory inside the boxing ring."[30]Obviously, both *Ali All the Time* and the *Warner L. Jones Jr. Time Machine*have a high degree of freedom and user-direction. The context is equally successful. Yet while interactive, the interactive element is an expanded version of the exhibit that uses a button to start a video. The only difference is that there are many videos and many buttons to start the exhibit. The amount of interaction here is no greater than at the exhibits that use Ali's handprints to begin the multimedia items. Little is gained through the experience of pushing the button itself.

In *My Spot* at the Kentucky Derby Museum, local celebrities offer quotes about the where they prefer to sit when they watch the Derby. This is shown through a series of disks that the visitor rotates that have the picture of the celebrity on one side and their

[29] There are no interview videos from 1933 through 1969. The next video after 1928 is from 1970 when Dust Commander won the Derby.

[30]*Ali All the Time*, Muhammad Ali Center, Louisville, Kentucky.

quote on the opposite. Visitors have the freedom to choose which celebrity they want to read and the context of the exhibit is within these quotes. The design is eye-catching, but what does the addition of interactivity bring? These quotes could have been printed alongside pictures of these locals. However, the exhibit does connect history to the present successfully through their use of historical context alongside the contemporary statements. The accompanying text panel explains that there are a "variety of spots to take in the action" and it has been this way since the first Derby in 1875.[31]It argues that this has not changed over the years (although people no longer pay ten cents "for access to a ladder to hop the fence."[32] This is a wonderful way to connect the past to the present by pointing out the consistencies of Derby viewers, but the spinning discs really do not bring any additional lesson through its use of interactivity except its intriguing design.

At Locust Grove Historic Home, the same questions can be asked of the section*In Their Own Words*. This book consists of a collection of reproduced letters from the families associated with Locust Grove. One such letter is from John Croghan to Major General T.S. Jesup that was written at Locust Grove on May 15, 1841. The letter describes a duel that took place at Locust Grove between two men: Cassius Clay of Lexington and Mr. Wickliffe junior.They both survived the duel and reconciled. Other small details are also mentioned in the letter. This provides visitors with a glimpse into the personal lives of the founding family of Locust Grove and allows for further connection to this site. However, while the interactive component here enables the user to choose which letters to read, they could also do that if the letters were posted on the wall in text panels. The original letters could also be displayed in a case if they were not

[31]*My Spot*, Kentucky Derby Museum, Louisville, Kentucky.
[32] Ibid.

given this hands-on and interactive design. While historically informative and allow the visitors to flip through the (faux) worn pages of the book by their own accord, it is indeed interactive. But it is too easy to wonder if much is gained by being interactive at all.

The final four exhibits examined here lie in a grey area. While the interactive element is not as strong as those seen in the high-level category, the lessons learned through interactivity and the argument for interactivity within these exhibits can be made. For instance, in *Bows: Strength and Skill* at the Frazier History Museum visitors use a bow to find out how "accurate" they would be if they fired a real arrow from a bow. While the experience of "firing" a bow can be entertaining, the exhibit is unrealistic and problematic. The visitor "fires" their bow towards a wall a few feet in front of them (no arrows are used), and the gauge that determines the accuracy of the visitor's shot seems random with no true test of skill involved. This blunts the interactive experience. As a result, the exhibit meets all three standards of this study in conception, but the execution only meets two. Since the text panel near this exhibit describes the significance of arrows at the Battle of Hastings, this display gives visitor some idea of what it would be like to fire an arrow much like those at the battle. (The historical context related to this exhibit was mentioned above in the examination of*Right Eyed vs. Left Eyed Experiment*.)

In *Reach for Your Dreams…One Step at a Time* at the Muhammad Ali Center, visitors put together puzzles thatrepresent "examples of how a dream… can be broken down into smaller steps."[33]As a puzzle, the visitor has control over putting it together, but the results of the interaction are unclear. Some visitors may conclude that the interactivity is necessary to understand how to bring smaller pieces together into a greater whole much like the lesson of the exhibit. Others may argue that the act of putting the puzzle together

[33]*Hope & Dream Wall Area*, Muhammad Ali Center, Louisville, Kentucky.

is only a fun activity and does not offer any additional lessons. Both of these arguments hold some validation leading to the conclusion that the use of interaction in this exhibit is not effective. The contextual information provided here is not historical, but instead it is through the lesson imparted: "We're inspired by our dreams, but sometimes ambitious dreams can be daunting. Identifying specific goals and working on them – one at a time – can help you achieve your dream."[34] This lesson is in context to one of the themes the Muhammad Ali Center wishes to teach and fits within its mission. While it is not historical, it is a decent exhibit that teaches a lesson within the range of the museum's core beliefs and serves as an example of interactivity within this museum.

The final two exhibits are located in the Louisville Slugger Museum. In *Hot Topics*, visitors submit written statements responding to a question asked by the museum or they push a button to vote on multiple-answer survey questions. Since the votes and comments are user-generated and the questions about baseball have the necessary context, two of the standards of this study are met. The text panel provided the visitor with some background information and then questions are asked pertaining to the text panel. For example, one text panel explained that pitcher Cole Hamels purposely hit Bryce Harper in the back with a fastball and was "fined and suspended for five games."[35] The text panel relates this to history by stating that in 1939, Ted Williams was "knocked down twice in one game" before getting up and hitting a home run in "much the same" way Harper did.[36]The exhibit asks visitors if Hamels' behavior was "acceptable" or

[34] Ibid.
[35]*Hot Topics*, Louisville Slugger Museum, Louisville, Kentucky.
[36] Ibid.

"unacceptable" and was the suspension "too excessive" or "not enough."[37]The third measure is more difficult to ascertain. Lessons are learned through the process of interacting with the display, but the interactive experience itself does not bring greater understanding or give the visitor a heightened and memorable experience. In short, this could be replaced with a survey card and a bulletin board that regularly updates the results. It would not be as presentable and it would not give results as quickly, but the interactive element of this display could be replaced.

Finally, the interactive display about butter churns provides contextual information about these items. J.F. Hillerich once made butter churns but his son Bud wanted to produce baseball bats. According to the corresponding text panel, by the 1900s the sale of "butter churns declined and Louisville Slugger bats eventually became the company's most important product."[38] This is an important and pivotal artifact in the company's history and provides visitors with a more complete history of the Louisville Slugger. Visitors are free to explore and move the butter churn at their leisure. However, not much is gained through the interaction with a tangible butter churn. What interactive lessonsjustify the presence of a butter churn here? The curator of the Louisville Slugger museum argues, "What is a person more likely to remember: Reading about how a swing butter churn was made and used, or holding the churn itself and swinging it while listening to its narrative history?"[39] While the interactivity alone does not provide additional historical information, the curator makes a strong point: interacting with the historic artifact does leave a stronger memory indeed.

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[37]Ibid.,The votes were pretty similar with unacceptable behavior and not enough in the lead when I visited the museum.

[38]*Hillerich Butter Churn*, Louisville Slugger Museum, Louisville, Kentucky.

[39]Stalvey, e-mail to author.

High-level Interactive Exhibits

Thetwenty exhibits in this category meet all three standards identified in this study and will be categorized by the four different ways in which they use interactivity. Six of these exhibits rely heavily on technology. Seven use touch as a main component of their interactive experience. Three involve the successful use of costumes. The last three described here use highly interactive elements that also use a low level of technology to create the visitor's experience.

Four out of the six exhibits in this category that use a high level of technologyare at the Kentucky Derby Museum. The first exhibit is *Place Your Bets*. This allows visitors to choose their own horse on a touchscreen and print a ticket with their choices. The visitor then watches a historic race. Afterwards, they scan their ticket to see if their choices would have paid off had this been a real bet at a real race. Contextual information is provided in every part of the process as the experience teaches visitors the steps in betting on horseracing. The text panel next to the interactive display explains the history of the wagering system used at Churchill Downs. The process, invented in 1865, has "bettor [wagering] against each other" in a way that sets odds mechanically so that "the track has no interest in the outcome of the race."[40] It is this form of betting that is shown in the interactive displays. The interaction between placing a bet and watching the race is a form of interactivity comparable to experiencing actual gambling at the track. This exhibit excels in all three measures. The fact that a ticket is printed out only heightens an already wonderfully fabricated exhibit.

Near *Place Your Bets*, the exhibit *Call the Race*allows visitors to call a race, record their voice, and hear it in playback. Visitors enjoy a self-directed experience

[40]*Betting the Races*, Kentucky Derby Museum, Louisville, Kentucky.

through calling the race as they become the caller. The context is provided in two ways. First, it is inherent in the interactivity and the act of calling the race. As the words scroll across the bottom of the screen and the race plays before the visitor, they obtain information on the act of calling, the race, and the style of words that are used by callers.Second, a text panel explains how callers identify horses and jockeys (saddlecloth color on the horse and silks on the jockeys). It also states that callers must "read the program well in advance… to avoid mistakes [while calling]."[41]While more information about the people and history of track announcers would enhance the exhibit, it stillsucceeds with interactivity in its current state. The exhibit lacks a hands-on element, butsince the exhibit is focused on the voice alone, this is not an issue and any hands-on additions would feel out of place.[42]

In the display *Design Your Own Silks* at the Kentucky Derby Museum, visitors use a touchscreen to create their own jockey uniform or "silks." In creating something of their own, visitors take part in a highly user-directed experience. Their interaction with the touch screen makes this possible. The text panel provides information about what silks mean. For example, Thoroughbred owners design the silks that identify them as the owner. The text panel across from *Design Your Own Silks* provides the history of jockeys in America. Horseracing can be traced back to the Colonies, and by the time Churchill Downs opened many jockeys were African American. In fact, African Americans "won 15 of the first 28 Kentucky Derbys" before they were "pushed out of the

[41]*Call the Race*, Kentucky Derby Museum, Louisville, Kentucky.

[42] This is the second example of an exhibit without direct historical information provided. However, the act of calling is a large part of the race and is part of the culture of Churchill Downs. The videos shown in the *Warner L. Jones Jr. Time Machine* give evidence that callers were around since at least the 1920s. Calling is not historic, but it is a part of Churchill Downs today and through most of its history.

sport by white hostility."[43] The text panel explains that women are now becoming jockeys and that much has changed since the sport came to America. The silks display allows visitors to create their own silks which, according to the exhibit, is something they could not do unless they were both the owner and jockey. By creating their silks, they create a connection to jockeys and horseracing; a sport that has existed in America for hundreds of years.[44]

The next high-tech exhibit in this area is a trivia game called *Test YourDerby IQ*. In this game, up to three visitors can compete with one another by watching a video screen and answering the questions using buttons labeled A, B, or C. The game is controlled by how the player answers, and is thus user-directed.[45]The player learns through interacting with the game as they try to answer correctly. The context is provided through the questions and answers themselves. For example, "In 1875, how many folks showed up for the race?"[46] The answer is 10,000. In another answer it also provided visitors with the information that "[through] history, around 40% of post-time betting favorite horses end up winning the Kentucky Derby."[47]These three exhibits could not exist without modern technology and computers. They are expensive exhibits that cannot be replaced with low-tech equivalents, especially non-interactive exhibits.

The final exhibits that use high-tech components are*Train with Ali*and *You Can't Come In*, both located in the Muhammad Ali Centerat the Muhammad Ali Center. *Train with Ali* contains a series of hands-on interactive activities, including shadowboxing with

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[43]*The History of Jockeys in America*, Churchill Downs, Louisville, Kentucky.

[44] Visitors may purchase a 5"x7" print of their creation to take home. This souvenir can act as a representation of the information they learned about jockeys at the museum.

[45] More freedom could be given if answers could be typed, but that is a bit much for a trivia game for the general public. The multiple-choice format is the best in this setting.

[46]*Test Your Derby IQ*, Kentucky Derby Museum, Louisville, Kentucky.

[47]Ibid.

a silhouette of Ali, a punching bag that recreates what it feels like to when a professional boxer punches it, a speed bag that has multiple settings, and a boxing ring where Ali's daughter gives boxing tips from an overhead screen. Each one of these interactive displays is performed by the visitor. The experience and lessons are learned by performing the physical activities, and since the visitors choose their own movements and their own level of physical interaction, the experience is their own. As this is a museum and not a gym there are plenty of informative text panels that describe the activities within this exhibit. For instance, next to the punching bag, the text panel explains that the punch of a heavyweight boxer "can land with a 1,000-pound force."[48] It also shows that in 1974, Ali claimed that when George Foreman's "trainer holds the heavy bag, George can punch a hole through it."[49] Historic quotes from Ali pepper this exhibit along with non-historic information such as detailed instructions on how to punch, how to shadowbox, and how to use the boxing equipment featured in this exhibit. The information along the walls justifies the interactive displays and makes the experience of using them more meaningful.[50]

In *You Can't Come In*, the context is provided by a book that contains newspaper articles and other information that the visitor reads while the audio and lighting creates an environment of racism that African Americans faced in the 1950s. Interacting with the "newspaper" in the diner adds a sense of realism, heightening the experience and increasing learning. The exhibit may direct the visitor to the newspaper, but the visitor's

[48] *Train with Ali*, Muhammad Ali Center, Louisville, Kentucky.

[49] Ibid.

[50] This is another exhibit where history is not in the forefront. However, it is an interactive exhibit that teaches a very important part of the life of Muhammad Ali. It makes sense to learn about his boxing career and the details of boxing when a visitor goes to a museum that features the history of a boxer. As such, this is a successful interactive experience that heightens the educational experience of the visitors.

learning is self-directed once they reach the newspaper as they can choose which articles to read as a voice reminds them that they have to leave. The pages of this book give an overview of African American segregation. It provides information about slavery and how Kentucky was a slave state. After emancipation, Louisville practiced "'polite racism,'meaning that there weren't any problems as long as blacks remained 'in their place.'"[51]Beyond the "newspaper," a quote from Muhammad Ali is tied to the information presented in the display: "I used to walk down the main street in Louisville, Kentucky, looking at how the negroes couldn't go to this show, looking at how negroes couldn't eat here, or how the whites'd look at 'em…"[52]

The difference between this exhibit and *In Their Own Words* at Historic Locust Grove is in the presentation of the display. The interaction between the "newspaper" and the visitor occurs while the audio and the lighting create a hostile environment. Reading the replica news articles under these circumstances heightens the interactive experience. The use of interactivity here creates a stronger experience for the visitor that is not felt with *In Their Own Words*.

The next set of exhibits use touch as their primary means of interactivity. *Buffy the Buffalo* at the Frazier History Museum contains a variety of replicas that visitors can handle, including a buffalo skull, a pelt, a jawbone, and a necklace made of buffalo teeth. Information about the uses that Native Americans made of buffalos is provided above each item. For example, Plains Indians used tanned buffalo hide to make "clothing, packing cases, and bedding," while hair was made for "lining in moccasins and braided

[51]*You Can't Come In*, Muhammad Ali Center, Louisville, Kentucky.
[52] Ibid.

into rope."[53]The text panels also provide information about the buffalo's teeth and bones. It states that the teeth could be used for necklaces while the bones were used as "tools, war clubs, knives, and arrow points."[54]Feeling these items is an action that cannot be replicated successfully through text or photographs. Visitors can learn and experience the feel of buffalo bone and hides as they were once used in the West. The text mentions that the Plains Indiana used buffalo teeth to make necklaces and below that panel visitors can examine and touch such a necklace. A buffalo hide (with hair) and a jawbone are also provided for the visitor to examine and feel the objects mentioned in the text panels. Firsthand exploration allows visitors to learnin their own way. Touching artifacts firsthand enables a high level of interaction. The experience is heightened and becomes "more 'real.'"[55]

The same argument is true of the exhibit *Mail Order,* also at the Frazier History Museum. Context is provided in the form of a video that explains chain mail in detail as well as a text panel that describes the Norman knights. The video shows how armour was made in the medieval period and argues that it is such a complicated task that it was made in sections. Victoria and Albert Museum conservationist Simon Metcalf states in the video, "…there are stories of whole towns employed in making mail."[56] The text panel provides visitors with the history of Norman knights and explains how they would wear "a mail shirt or *hauberk*, which weighed about 30lbs."[57] The visitors may touch and explore the chain mail to feel the texture and weight of the heavy armour. While the text panel gives the history of Norman knights and the video explains how it was made,

[53]*Buffy the Buffalo*, Frazier History Museum, Louisville, Kentucky.
[54] Ibid.
[55]Gallace and Spence, 164.
[56]*Mail Armour,* Frazier History Museum, Louisville, Kentucky.
[57]*Norman Knights*, Frazier History Museum, Louisville, Kentucky.

visitors can experience it more fully when it is in front of them and interaction is possible.

Two exhibits at the Louisville Slugger Museum use touch the same way: *The Louisville Slugger* and *Game Used Bats*. The main difference here is that the bat in *The Louisville Slugger* is a replica while the bats used in *Game Used Bats* are authentic. Both exhibits use elements of interactivity and self-directed learning and both are hands-on (both exhibits involve examination). However,how the experience differs between the real and replicated bat is unclear. Visitors may have a stronger personal experience and greater recall of the time they held a piece of history in their hands. This heightened experience stays with visitors longer than holding a replica hanging from a display in the lobby of a museum. The contextual information is prevalent in both exhibits.

In *The Louisville Slugger*, the text panel provides information on Pete Browning, the first professional baseball player who received a bat from Bud Hillerich. He was nicknamed the "Louisville Slugger." This connection is why the company named their bats after him. In *Game Used Bats*, the text panels and the bat handler both act as sources of contextual information. The text panels give a description of the bat, the player that used it, the years in which they used the bat, and a list of accomplishments. Famous names in this exhibit include Mickey Mantle, Johnny Bench, David Ortiz, Derek Jeter, Cal Ripken, Junior, and Joey Votto. Mickey Mantle's text panel explains that the bat they may hold was used between 1961 and 1964, is made of northern white ash, and is a B220 model. It also states that he won twenty All Star games, three MVP awards, and was a Triple Crown winner in 1956. This additional context about the player is what *Bat Vault* is missing from their display. Even if the visitor does not know about these honors

in detail, they can tell that Mickey Mantle was an impressive baseball player. Without this information, the experience of holding Mickey Mantle's bat, or a replica of Pete Browning's bat,is not as meaningful and certainly not as educational. Without this information, they are just old baseball bats.

Finally, all of the artifacts that may be touched at the Museum of the American Printing House for the Blind fit within this category. This museum allows visitors to touch and examine many of its artifacts, and every one of these items is accompanied with contextual information describing them in detail and they may be explored and examined at the leisure of the visitor. It is one of the most hands-on and interactive museums in this region. Examples of these exhibits include the Hall Braille Writer from 1892, the APH Student Speech + Talking Calculator, and Cane Do!

One remarkable detail about the Hall Braille Writer is that the museum allows guests to examine the actual artifact from 1892. The text panel provides visitors with the information that it was invented by Frank Hall, superintendent of the Illinois School for the Blind, and "paved the way for universal acceptance of the braille code."[58] Visitors may push the buttons and examine this artifact firsthand as well as read about its significance. The APH Student Speech + Talking Calculator was "available between 1978 and 1982" and according to the text panel it was a joint venture between the printing house and "Telesensory systems, a leading accessibility technology firm…"[59] Visitors may use this calculator and hear the electronic voice say the numbers and answers to math problems as the corresponding buttons are pushed. Hearing a talking calculator might not be as fascinating today, but in 1978 it was cutting-edge technology.

[58]*Hall Braille Writer*, Museum of the American Printing House for the Blind, Louisville, Kentucky.

[59]*APH Student Speech + Talking Calculator*, Museum of the American Printing House for the Blind, Louisville, Kentucky.

Finally, in the exhibit *Cane Do!*, visitors are invited to take "a cane from the bin… and study its form."[60] This hands-on activity allows guests to study the different varieties of canes that are used by those with visual impairments. For many, this is a unique experience that they would not have otherwise and allows the visitor to learn about this subject in an educational environment. The text panel provides information about the different parts of canes and how they may differ. For example, the color of the cane is "usually white… to comply with safety laws,"aluminum is a common material used, and handles "come straight or with a hook."[61] However, the exhibit could use more information about the history of canes. As it is, it only provides one nugget of historical information: that the "steel disk 'glide tip' was introduced in the 1960s."[62] Part of the mission of the museum is to provide the "educational history of blind people and the historic contributions of the American Printing House for the Blind…"[63] That is why a lack of history on any exhibit is somewhat surprising.

The third area among the high-level interactive exhibits focuses on the successful use of costumes. The reason some costume-based exhibits fell with the middle level is their lack of context. However, the three exhibits described here provide sufficient context. The threecostume exhibits in the high-level categorystand near two of the mid-level categorycostume exhibits in the same museums. At the Frazier History Museum, medieval costumes may be tried on. Unlike the costumes in the War of 1812 gallery, an obvious and clearly seen text panel next to the trunk of medieval costumes

[60]*Cane Do!*, Museum of the American Printing House for the Blind, Louisville, Kentucky.
[61] Ibid.
[62] Ibid.
[63]The Museum of the American Printing House for the Blind, "Our Mission," *The Museum of the American Printing House for the Blind*, http://www.aph.org/museum/museum_mission.html (accessed April 1, 2013).

offerscontextual information about the clothing. It provides information about three different styles of dress: a knight, a man, and a lady. For example, with the knight, the text panel explains that "[knights] in the early Middle Ages wore a cape and surcoat with their tunics. A surcoat, a robe belted around the waste [featured] the coat of arms or symbol of the knight."[64]Much like the costumes in the War of 1812 gallery, trying on the costumes allows for self-directed learning and is highly interactive. The visitors can have a more educational experience as historic information is imparted to them through the text panel. The visitor now knows who would wear these items, when they wore these items, and even why some items were created with certain styles. The historical context is what sets a learning experience apart from playing around with costumes.

This is seen again at Locust Grove Historic Home (directly across from the Native American shirt mentioned above), visitors may try on a vest representing a piece of a Virginia State Line uniform as well as a wool coat recreated in a pre-Revolutionary War style. Unlike the aforementioned display, text panels explicitly identify and explain what can be worn. One text panel explains that the shirts were "made from a checked and coarse fabric woven in Virginia."[65] The vest underneath the text panel is clearly associated with it. The same is true in the other text panel that describes the warmth of wool and how it was the "primary fabric used for cold climates… until the 20th century."[66] The heavy coat beneath the panel may be worn and visitors can feel the warmth of the coat. The exhibit focused on "Women's Dress" offers similar context. The exhibit explains that a "radical change" happened with women's clothing starting in France "in the 1790s, and moving through Europe and America…. [it became] lighter

[64]*Princess Nook*, Frazier History Museum, Louisville, Kentucky.
[65]*Virginia State Line Uniforms*, Locust Grove, Louisville, Kentucky.
[66]*Wool's Warmth*, Locust Grove, Louisville, Kentucky.

and less structured…"[67] Visitors may try on and examine representative sample of this new style of clothing that the Croghan women would have worn during their years at Locust Grove.

The exhibits within the last area of this category contain creative uses of low-tech and simple items to create successful interactive exhibits. At the Kentucky Derby Museum, the *Urban Bourbon* exhibit contains snifters that visitors can squeeze to expunge a series of smells from different containers each containing a different kind of bourbon. This simple contraption allows visitors to experience the smells of a variety of bourbons. Visitors determine how they use the snifter and the experience can only be created through an interactive exhibit. The context for this interactive display is provided directly above the snifters and explains how to "savor the taste of bourbon" and shows how smelling is part of the process of enjoying the drink.[68] Bourbon has a strong connection to Kentucky's history. While this exhibit does not directly address the history of bourbon, the text panels within the exhibit do so (see above). This display allows visitors to experience a part of the bourbon culture mentioned within those text panels by experiencing the different scents of four different types of Four Roses bourbon: small batch, single barrel, yellow label, and distillate "White Dog."[69]

The next interactive display in this category is *Vision* at the Muhammad Ali Center. Using magnetic tiles with words that are sometimes seen on kitchen refrigerators, visitors are invited to create poetry from the tiles. Visitors can create poetry to express whatever they may feel or think (using the allotted words of course). The instructions for the exhibit explain that a "poem can tell your story" while a nearby text

[67] *Women's Dress*, Locust Grove, Louisville, Kentucky.
[68] *Urban Bourbon*,Kentucky Derby Museum.
[69] Ibid.

panels ask the visitor, "What gives your life meaning? Do you know your purpose?"[70]The freedom allowed in this exhibit is something that could only occur through interactivity. The content of the exhibit cannot exist unless the visitor creates it. This activity is in line with the Muhammad Ali Center's core principle of spirituality. Any lesson that is truly learned here is gained through the self-reflection of the visitor.

Another exhibit that can be fully appreciated and experienced through interactivity is found at the Museum of the American Printing House for the Blind. With *Low Vision Simulators*, visitors can find out for themselves what it is like to have an eye disease such as macular degeneration or cataracts. The diseases are described in the text panel (glaucoma, cataracts, diabetic retinopathy, and macular degeneration are all explained in detail) andthe goggles worn by the visitorsmimic the effects caused by these diseases. They are then asked to attempt to find a number in the phone book or differentiate between cans of soup. The visitor chooses which pair of goggles to try on (there are nine different goggles) and for a moment they experience what some individuals go through every day. The lessons learned here will not be soon forgotten by visitors, and interactivity performs a large role in making that happen. These goggles give a replication of how people see the world when they have these diseases. This transforms the information on the wall into a firsthand experience. Furthermore, since this is the first main display that visitors encounter when they enter the museum, they can have a better idea of the difficulties sight-challenged people face. This is an important lesson to learn before exploring the rest of the History in the Making: APH Past to Present area. It gives an example of blindness before learning the history of the

[70]*Vision*, Muhammad Ali Center, Louisville, Kentucky.

American Printing House for the Blind so that visitors can better relate to those the organization helped throughout the years.

Analyzing these exhibits based on three criteria and using this analysis to separate the exhibits into three major categories enables an evaluation of how each exhibit performed individually and alongside other comparable exhibits. The high-level exhibits were the strongest with their use of interactivity and more effective than the low-level exhibits. The low-level exhibits were effective as teaching tools, and their presence in the museums did not heighten learning more than traditional non-interactive exhibits. By dividing the mid-level exhibits into three sections, the weaknesses of interactivity within these exhibits wereanalyzed and similarities noticed between exhibits about what caused their weaknesses. Most weaknesses were eitherdue to of a lack of context ornot being able to justify their use of interactivity. Last, it shows that some flaws exist in interactive exhibits in Louisville in all three categories. If the interactive exhibits are judged by the three-level scale employed in this paper, then theexhibits that do not meet the standards of the high-level category have room for growth. Many of these exhibits need a few changes (the mid-level exhibits) while the majority of these exhibits (high-level exhibits)successfully use interactivity in their current state.

This does not mean that these exhibits cannot be improved even when they met the standards in the three categories. Some imperfect exhibits are classified as high-level. However, none of the exhibits examined in Louisville museums failed as learning tools or failed to meet at least one category out of the three. The existence of every interactive

exhibit in Louisville examined in this study is justified, although a few necessary changes need to be made in the near future, especially in the exhibits within the mid-level category.

CONCLUSION

Implementing interactive exhibits in history museums is no longer a task for the future: it is occurring in the present. Since interactive exhibits are a part of history museums, studies such as these must be made to examine such exhibitscritically. This study reveals the success and failures of Louisville interactive exhibits compared to regional museums and to one another. It argues that interactive exhibits in history museums are an importantpart of the museum culture of the twenty-first century and that to differing degrees they benefit many visitors at these museums.

The use of interactive exhibits is important for history museums. Louisville history museums embrace the use of interactivity more than most of the history museums in the region. Furthermore, the majority of the interactive exhibits studied in these Louisville museums successfully meet all three measures of interactivity even if they have some room for improvement. Compared to a sample of history museums in nearby metropolitan areas, Louisville history museums appear to use interactive exhibits more often and more successfully. Additionalstudies in other cities should examine how they use interactivity and how well their history museum exhibits further historical understanding. This study sampled museums from cities geographically close to Louisville, but it is not a full study of any of these cities and all of their museums.

While interactive exhibits are an important part of history museums, this does not mean that they are inherently perfect learning tools that enhance the visitor's experience.

The mid-level exhibits discussed in this study reveal the flaws that separate them from those categorized as high-level interactive exhibits.[71]When an exhibit is created with only entertainment in mind and contextual information and education is not involved, then that exhibit has no place in a museum. When an interactive element becomes more of a distraction than a teaching tool, then it has no place in a museum. The checkers and games in the Tennessee State Museum may fit in with the theming of the area, but it is anunsuccessful interactive exhibit because it offers only a distraction to children visiting the museum. Lastly, when a button is pressed to begin a multimedia presentation or turn on an exhibit, it is not a successful interactive exhibit, but simply an "on" button. The addition of more interactive elements can transform this simple button into a memorable part of the experience (as seen at the Muhammad Ali Center). Though some may see this as an insignificant difference, placing one's hand into the handprint of Muhammad Ali to activate the exhibit is an experience that cannot be replicated by pushing a button or flipping a switch. Furthermore, this paper is not arguing that traditional museum exhibits need to be replaced with interactive exhibits. It is arguing for the responsible inclusion of effective interactive elements into history museums. This is arguing that up toten or twenty percent of a museum's exhibits should have an interactive element. It is not saying that half or all of the exhibits should incorporate interactives.

While interactive exhibits can be memorable and educational, they should not exist without the necessary context provided by more traditional exhibits. Without text panels and other static sources of information, context is missing. Without context, the interactive exhibits cannot teach visitors effectively. Furthermore, interactive exhibits are

[71] Low-level exhibits are barely interactive and do not belong in the same category as the others, but they also serve a purpose that warrants their existence as well.

not for everyone. Some people will never be interested. Museum visitors have multiple learning styles and multiple interests. Neglecting visitors' interests and learning styles goes against the purpose of museums.

This paper also reveals limitations in the museum field on how to judge interactivity. To complete this task, I extrapolated more precise measures from ambiguous statements regarding what makes an exhibit "interactive" and "successful." The definition of interactivity for this study is just one of many since this term can be malleable and used to describe many exhibits. Standardized measuresand a firmer definition must be created to more accurately judge the effectiveness and success of interactive exhibits in history museums. I created the three measures used in the third chapter to examine these exhibits, but another researcher could do a study on interactivity using the same exhibits with different measures and come to a different conclusion. However, the three measures used in this study hold the interactive exhibits to the high standards expected of museums and can even be used by other researchers to judge interactive exhibits in other history museums.

In an ideal future, set standards and guidelines of what it means to be "interactive" and "successful" will be created. Ideally, more studies will focus on designing experiences in history museums, and interactivity will continue to become more commonplace in history museums. The successful interactive exhibits seen in the history museums of this study offer examples of how history museums should embrace interactivity. Even so, history museums must be mindful of the responsibilities and problems that come with interactive exhibits, and every museum has room for improvement.

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