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Informing, Entertaining and Persuading: Health Communication at The Amazing You

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Informing, Entertaining and Persuading:
Health Communication at *The Amazing You*

by

David H. Lee

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
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ABSTRACT

This is a study of the communication environment at *The Amazing You*, an exhibition about health and wellness at the Tampa Museum of Science and Industry (MOSI). The purpose of this study is to describe a multi-media, multi-vocal health communication environment which incorporates forms of intervention from various medical communities of practice into a narrative about human life stages. Describing communication at a science center as circular, complex and multi-directional allows for notions of feedback to be considered in an otherwise unilinear and unidirectional process from sender to receiver. This research is about science center communication as an integrative, wrap-around process, from medical experts, to exhibit designers, to visitors, and back. In this study I have interviewed MOSI executives to find out about the purposes of the exhibition and the process of consultation, design and implementation. I have also conducted 72 surveys and 22 in-depth interviews with MOSI visitors to elicit feedback about the exhibition.

This ethnographic inquiry into a health communication environment shows how visitors are urged to identify with health promotion messages which interpellate them as disease candidates. Using theoretical concepts from frame analysis, classical rhetoric and speech act theory opens up new lines of inquiry for exhibit designers, museum administrators, visitor researchers and critical communication researchers interested in multimedia health promotion.

CHAPTER ONE:

INTRODUCTION

Prelude: Wit's Close Call

I am sitting in the office of Wit Ostrenko, president the Tampa Museum of Science and Industry (MOSI) interviewing him about a permanent exhibition that focuses on healthy living. He launches into a narrative about the life threatening experience that made him want to build a science center exhibition with a focus on preventative medicine.

It showed up after I was running across Gandy Bridge with the cross-country team, going really slow...couldn't figure it out. On Thursday about 3 am I woke up with that same....pulling sensation in my chest. I take an antacid, thinking it was...it felt like heartburn. So I read a book for an hour and then...it didn't go away. It had actually gotten stronger.

Wit explains that eventually he woke up his wife to drive him to the emergency room about five miles away to "check this thing out." By the time he got there he was feeling really sick but even still, he walked into the ER waiting room.

These are, like, all the classic things not to do. They just took one look at me, threw me in a wheelchair and...gave me the anti-coagulants (If I had called 911, they could have done that immediately, to try and break up a clot which was in my left anterior descending coronary artery.)

On this October afternoon, Wit has me on the edge of my seat, wondering what would happen next. I am paying close attention because I want to learn what it is I should do if and when I should ever get those pains.

It took a while for the anti-coagulant to dissolve the clot. As soon as it did the pain instantly went away. So I opened my eyes and said “Wow! That feels good. Can I go home now?” They said “Nooo, you’re going to stay here.” So, next day they put a stent in my heart. And the nurses in the ICU said “you know, 30% of you guys...you *people*...come in, and you are already dead.”

I am as surprised as Wit was that he this trim, highly educated cross-country runner— could be so blindsided by a life threatening cardiac event.

I realized that the medical system completely failed me. Did not detect my heart condition. I was eating well. I was doing triathlons. Running with my son at his high school. I was doing a stress test every five years since I was forty years old. So I was doing all this stuff that I thought needed to be done. I was 54 and had a heart attack.

During our interview, Wit, a middle aged man in seemingly good health, explained how a heart attack threatened his life, which in turn became the impetus for designing a science center exhibition about health and wellness. This became *The Amazing You* (TAY), a human anatomy exhibition with a focus on preventative medicine and screening technologies that could anticipate health problems before they became life threatening.

Some Preliminary Research Questions

Wit’s experience has been included here to help set up some of the research questions that this dissertation will investigate. Wit describes how the medical system had failed him in not

detecting his heart condition. Yet TAY exhibition is a form of intervention that seeks to correct this failure outside of medical practice, as such. Can a science center exhibition such as TAY help address the shortcomings of medicine with a focus on prevention and screening? While the doctor's office is the best place to seek qualified medical advice, the communicative encounter that patients have with their physician is usually quite brief and circumscribed within a predictable sequence. Where can people go outside of the doctor's office to assess their own health risk and have messages about healthy behaviors reemphasized and reiterated? Outside of formal schooling and the clinic, what are some public places where people can go to learn about staying healthy and discuss this advice with their family and friends? How does *The Amazing You* exhibition at MOSI provide an occasion for people to have face to face interactions and discussions around health topics? Does the exhibition influence guests to modify their behavior?

Wit's experience is an example of how behavioral profiles of risk are a probabilistic calculus that can sometimes miss individual outliers. He explained that as a trim, cross country runner who ate healthy and saw a doctor regularly, he did not identify himself as a candidate for heart attack, and because he didn't immediately call an ambulance upon getting symptoms he delayed the administration of important ambulatory treatments. This brings up a research question about the ways that people identify with risk-candidacy. Risk is by nature a probabilistic concept, and it varies for each individual who is confronted with risk-assessment discourse. How can an exhibition about staying healthy incorporate the many causes of disease and injury, from personal choices to structural factors beyond individual control? For many health problems there is both a determining element as well as an agentic one. Diseases arise due to factors outside of a patient's control (such as genetics) as well as resulting from behavioral choices (such as smoking or poor diet). How can a science center exhibition properly frame this

ratio of determinism and agency, which differs by condition as well as by patient? This research is broadly concerned with how museum visitors recognize themselves as candidates for disease within a sometimes complex and probabilistic calculus of risk. What are the ways that science center exhibits can address visitors as both the object of inquiry, as well as the subject who is being urged to make lifestyle changes? In the course of this dissertation, I will investigate these broader research questions and show how they bring up further questions that get closer towards understanding the meaning of persuasion, interactivity, and risk in a science center setting.

Overlapping contexts

This is research into “everyday meaning-making through media” (Bird, 2003, p. 8) where visitors go to a science center exhibition about health and wellness to talk about and co-interpret agency, determinism and risk. Health communication often takes place in private settings, such as in examination rooms between doctors and their patients, or within the privacy of the home between family members. Health communication shows up publically in television commercials for prescription medicines or in bus stop advertisements from local health departments, but these are unidirectional messages without feedback mechanisms. What are some public places where people can go to have conversations about health? During my interview with MOSI President Wit Ostrenko I realized that a science center exhibition about the prevention and treatment of disease gives people a chance to share their own stories about health—stories that are otherwise private.

The Amazing You (TAY) at the Tampa Museum of Science and Industry (MOSI) is a permanent exhibition with over 400 exhibits that focus on human anatomy, life stages, and

medical treatments for disease and injuries. On the MOSI website, TAY is described as a journey that takes visitors through the stages of life, from conception through death:

Within the exhibition, guests will explore what's amazing about each developmental life stage and learn what it takes to stay healthy at each stage and how to return to wellness after an illness, surgery or a disability (MOSI, 2014).

This dissertation, in addition to providing a detailed description of the TAY exhibition, will also describe the communication environment through interviews and surveys with MOSI executives, volunteers, and visitors. In the winter of 2012/2013, I conducted over twenty interviews and seventy-one exit surveys to describe the communication at TAY. In the course of this research I discovered that TAY provides a unique occasion to research health communication. Based on my analysis of the exhibition, along with the feedback provided to me from my interviews, TAY emerged as an opportunity to describe a multi-directional and dialogical instance of health communication which takes place across textual, verbal, audio, visual and face to face channels. What makes the communication environment of TAY unique is that the goal of the exhibition goes beyond simply informing and entertaining. With its emphasis on behavior modification, TAY is a health communication environment with an explicit persuasive purpose.

In this introduction I will introduce the TAY exhibition, as well as the process of my research and some theoretical resources that have gone into this dissertation. In order to design and build this exhibition, MOSI executives communicated with numerous medical experts and revenue sources, both public and private. The exhibition communicates to visitors as a chorus of different medical communities of practice. Visitors to the exhibition sometimes view TAY all by themselves, but usually in concert with family members, significant others, friends or classmates. These kinds of pairings of visitors require the consideration of communication that takes place at

various levels of analysis (such as person, dyad, triad, small group, and family). Researchers who study complex communication networks have proposed a multi-theoretical, multi-level (MTML) analytical framework (Monge & Contractor, 2003). The MTML approach has helped to guide this research, because it draws on a variety of theoretical traditions as they apply to different levels of analysis.

In their studies of museum environments, John Falk and Lynn Dierking (2000) assert that “all learning is situated within a series of contexts” (p. 10). These researchers call their approach the “contextual model of learning” because they view learning as taking place within three overlapping contexts: the personal, the sociocultural and the physical (Falk & Dierking, 2000). The personal context is a way to describe the unique “subject position” (Davies & Harré, 1990) which each visitor brings to their encounter with the TAY exhibition. This dissertation is not focused on learning outcomes per se, but rather on the variety of ways that people experience the exhibition and recognize themselves in the portrayals of health and risk. The experience that each individual visitor derives from an exhibition depends on personal factors they bring to the table, such as their prior knowledge and interests, their moods and receptivity to new information, as well as the relational preoccupations that they may have about other people they are with. Each visitor is also prompted to consider their particular relationship to the persuasive content of the exhibits, and is invited to either identify or dis-identify themselves as the addressee.

Personal factors overlap with the sociocultural context of the visitor experience. For Falk and Dierking (2000), describing the sociocultural context of a museum experience shows that learning is a social product of interaction with others. Museum researchers use Vygotsky’s (1978) concept of “zone of proximal development” to describe social learning that takes place

between beginners and experts (Ash & Lombana, 2010; Ash, Lombana, & Alcala, 2012; Falk & Dierking, 2000; Vygotsky, 1978). Falk and Dierking (2000) also note that the physical space where learning takes place is another contextual factor. TAY is an exhibition that is organized sequentially by wall panels that guide the visitor from one exhibit to the next. This can be contrasted with an exhibition where exhibits are located within an open space and there is no particular sequence for viewing them. The use of wall panels at TAY to guide the visitor makes the exhibition into something cumulative. The contextual model has helped to describe the overlapping contexts in which visitors experience the exhibition.

Using the SPEAKING Mnemonic to Provide an Overview

Describing an information-rich, multi-vocal environment such as TAY involves accounting for numerous different speakers, each communicating through different styles of address with different goals and outcomes. The communication environment also needs to be described in context, taking into account the type of setting and sociocultural norms and expectations where the communication is happening. The SPEAKING mnemonic is an ethnographic tool that is used to describe the multiple aspects of communication environments (Hymes, 1974). In addition to situations of “primary orality” where people are talking to each other face to face, the SPEAKING mnemonic can also be applied to situations of “secondary orality” (Ong, 1982) where the communication environment includes reading, viewing of models, videos and interacting with computer based exhibits. SPEAKING is an acronym for “Scene/Setting, Participants, Ends, Act Sequence, Key, Instrumentalities, Norms and Genre.” The SPEAKING mnemonic has allowed for a systematic way to describe the numerous aspects of

communication I encountered during this research. Each term in this acronym will be explained in what follows.

Setting and Scene

According to Dell Hymes (1974), “Setting refers to the time and place of a speech act and, in general, to the physical circumstances” (p. 55). MOSI, a science center in Tampa with “over 400,000 square feet of permanent interactive exhibits” is the setting for this research. MOSI is just across the street from the University of South Florida, a public research university with about 48,000 students. A pedestrian footbridge connects the MOSI campus to the USF campus across the busy Fowler Avenue. MOSI is open seven days a week to visitors who can visit other attractions on the premises besides TAY, such as Florida’s only IMAX dome theater, the Saunders Planetarium, and permanent exhibitions *Disasterville*, *Kids in Charge*, *BioWorks*, *Butterfly Garden*, and *Operation Moonbase*. In addition to offering visiting hours to the public, MOSI offers educational programs to school groups as well as home schooled students. MOSI is the scene where I spent many hours on the third floor cataloguing the TAY exhibition and observing visitors interacting with the exhibits. I interviewed MOSI executives in their offices on the MOSI campus. Some interviews took place on the fourth floor of MOSI’s main brick and mortar site, and others took place in the offices that are located in the west wing of MOSI, behind the *Kids in Charge* exhibition. I also set up a table at the exit of TAY to interview and survey MOSI visitors.

According to Hymes (1974) “scene” refers to the “psychological setting” or “cultural definition” of a setting, which includes characteristics such as the sense of formality and informality, or the sense of play or seriousness (pp. 55-56). The “scene” at MOSI can be

described as a hub of activity, where adults and children roam through exhibition halls, stopping at exhibits to press buttons, turn levers, and watch videos. MOSI is an immersive environment that engages visitor's senses. MOSI's website proclaims "We have fun down to a science!" a claim that characterizes the balance between seriousness and playfulness that the museum attempts to straddle. For MOSI there is a serious playfulness or playful seriousness at work at all times. The TAY exhibition, which was installed on MOSI's third floor around 2008, is a multi-vocal setting with many different "speakers," each offering advice about healthy living from the point of view of their particular medical specialty. Wall panels serve to guide visitors through comb-like interstices, each area in the exhibition containing exhibits pertaining to life stages, from pregnancy, to infancy, to childhood, adolescence, and onward to adulthood, old age and death. Depending on the visitor, one could easily spend an entire afternoon interacting with TAY's hundreds of different exhibits.

Participants

At TAY, participants include the "speaker" which is the exhibition itself, and "listeners" who include the museum visitors. This description of communication at TAY, while generally true, is overly simplistic. Based on interviews with MOSI executives who were behind TAY and through consulting the design blueprints of the exhibition, I hope to show that the voices that can be heard are a chorus of different interest groups and communities of practice. In order to construct the exhibition, the designers of TAY consulted with numerous medical experts and received funding from many different sources. Pediatricians, immunologists, audiologists, nutritionists, cardiologists and oncologists are just some of the different communities of practice who are heard at TAY. Sometimes a device manufacturer (such as West Coast Brace and Limb)

donates medical devices, and the result is an exhibit called “The Cybernetic Human” (which showcases prosthetic limbs, organs, hips, and other replacement parts). This exhibit offers a narrative about medicine that is specific to the devices on display and representative of a medical specialty with its own discursive features. The advice of a stem cell specialist is different in form and content than the advice issued by a developmental psychologist. The TAY exhibition is tasked with the unique challenge to make hundreds of different medical specialties speak as if issued from a single source. In addition, two of the exhibit’s major sponsors, Florida Blue and Met Life sell health insurance policies, and these funders also have a voice in the exhibition through prominent branding seen across TAY’s walls and even floors.

The “listeners” at TAY are the visitors, but these listeners can also be subdivided into different types. TAY interpellates a specific addressee, called “you,” for whom the exhibition is designed. However, this “you” who is being addressed differs according to the focus of each individual exhibit. Sometimes “you” are a pregnant mom who is being instructed about the best ways to care for the infant inside your body. At other moments “you” are an adolescent who needs help managing peer pressure. At other times, “you” are an elderly person who is urged to complete crossword puzzles in order to postpone the onset of neurodegenerative diseases. In other words, the second person, gender neutral pronoun “you” is being used throughout the exhibition to hail various classes of visitors. The concept of “deixis” is used to describe instances of speech where the referent is dependent on context. Take, for example, a phrase such as “I want him to come here now.” The meaning of this sentence is dependent on a number of contextual factors that are not contained in the directive as such. The *who*, *where* and *when* of this statement are all dependent on the speaker and context of the utterance. The “You” in TAY can be considered a deictic pronoun that can refer to mom, dad or baby, etc., depending on who

it is that is viewing the exhibition. “You” can be considered as a superordinate term that variously describes visitors according to context. Therefore, among the “listeners” at TAY there can be further distinctions between the addressee and other hearers for whom a particular exhibit may not apply to.

There is another reason that a facile distinction between “speakers” and “listeners” at TAY does not adequately describe the communication that is taking place. In this view, communication that is taking place is only of the “sender/receiver” type. In this dissertation I wish to complicate models of communication that are univocal and unidirectional. Inviting feedback from visitors about TAY has helped me to conceive of communication at a science center as a more circular and recursive process. The feedback from museum visitors, as summarized in this dissertation, is designed to help complete an arc of the feedback circle, from message makers, to audience, and back.

Ends

For Hymes (1974), “ends” refers to the purposes, goals, and outcomes of a speech act (pp. 56-57). When describing communication at TAY, the intended outcomes may be different for each of the numerous different interlocutors whose voices are being described. In the case of TAY there is the purpose of enjoyment and education—but also efforts to persuade people into adopting healthy behaviors. These three outcomes are not at cross purposes but the question is: in what ratio do these purposes work well together? An exhibit that is mostly fun and amusement may not contain much information regarding healthy habits. For example, the “Body Organ” exhibit at TAY is an exhibit designed mostly for the amusement of visitors. At this exhibit, visitors can play samples of burps and farts at different intervals on a keyboard. I saw and heard

plenty of kids having fun with this exhibit, but there doesn't seem to be much of a take-away message about health. Alternatively, an exhibit that is overly focused on risk and danger may be perceived as too didactic or assertive.

I have found it useful for heuristic purposes to describe each exhibit at TAY as an instance of one of four different purposes: To *describe*, to *prescribe*, to *diagnose*, and to *entertain*. Some exhibits impart knowledge for its own sake. For example, a male visitor can learn about what it is like to be pregnant, even though will never become pregnant himself. For such exhibits that I will characterize as “descriptive,” information transfer serves as a root metaphor, because visitors may be collecting information that doesn't necessarily have any bearing on their health at the present time. By contrast, exhibits that I describe as being “prescriptive” contain specific information for visitors about what they should be doing to stay healthy. In classical rhetoric, exhibits with a persuasive purpose could be described as “deliberative” because they contain messages that try to convince the audience to complete an action (Aristotle, 1991). Another category that I use to describe exhibits at TAY is “diagnostic” because these exhibits measure the visitor's weight, blood pressure, or vision and hearing abilities. An exhibit such as “Body Organ” described above, can be characterized as “entertaining.”

While many exhibits at TAY can be described as descriptive, prescriptive, diagnostic or entertaining, it is important to note that most of them contain each of these four purposes in different ratios. In fact, the four categories that I use are not really descriptions of the exhibits as such. Instead, they describe relational and indexical elements that emerge differentially during each visitor's interaction with them. Take the example used above about males learning about being pregnant. While males will never conceive a child, they may have a mom who is pregnant

with a baby brother or sister. Or, men visiting TAY also may one day inseminate a woman (or have already) and therefore their knowledge about pregnancy becomes indexical to their situation. In these cases, a man can learn about pregnancy in order to become a more sensitive mate, or to be able to recognize the symptoms of their mate going into labor. An exhibit that was otherwise only descriptive becomes prescriptive, because it contains implicit instructions to the man. To provide another example, children may not be concerned with developing Alzheimer's disease, but interacting with the Alzheimer's disease exhibits may help them to understand what is happening to a grandparent. Any young person visiting TAY may not be presently facing the degenerative diseases that are featured in the Older Adulthood content area, but they probably will have to deal with them once they reach old age. These examples have been provided to indicate that the purposes or ends of an exhibit are often dependent on the relational and indexical factors that each visitor brings.

Sue Allen refers to the "constructivist dilemma" (Allen, 2004) which relates to science center exhibits that wish to strike the right balance between entertainment, education and persuasion. Allen suggests that exhibits in science centers should offer "immediate apprehensibility" (Allen, 2004, p. 20) in order to be effective. This means that exhibits should contain elements that allow the visitor to make a discovery instead of simply telling them what the point is. In this view, one of the "ends" of TAY is to provide exhibits where the message is immanent in a visitor's interactions with it. Allen likens immediate apprehensibility to the concept of "affordances" (Allen 2004, 21) or those interactive properties of exhibits that contain implicit instructions about how they should be used. The idea of affordances is that objects contain properties that hail certain classes of actors into acting upon them. For example, if I desire to get a drink of water from a water fountain I place my mouth near the spout and press

the button—no instructions needed. While Gibson considered affordances to be objective properties of objects (Gibson, 1979) Norman posits a concept of “perceived affordances” which are constructs of actors (Norman, 1999).

Providing immediate apprehensibility can be considered as one of the “ends” of the TAY exhibition—an end that is superordinate to the goals of entertaining, informing, persuading or diagnosing. The concepts of immediate apprehensibility and perceived affordances highlight the visitor’s role as a self-directed participant who can get a variety of interactional experiences out of an exhibit. The categorization of any exhibit as being entertaining, informational, or persuasive also depends on the purposes, goals, and expected outcomes that each visitor brings to it. My research shows that visitors come to MOSI for many different reasons. Most people I spoke with do have expectations about an interactive experience that should be informative as well as fun, but the ends are not always clearly stated. Take, for example a woman who was supervising a Girl Scout troop field trip to MOSI. As she roamed the exhibition floor she seemed to be too busy keeping track of the twenty or so girls in the troop to take the time to view the exhibits. To this visitor, the exhibits in TAY may have had a different “figure to ground” ratio than it did for some of the girls in the troop who were clearly interested in the exhibits. This example has been provided to indicate a range of possible expectations or “ends” that visitors bring to TAY.

Act Sequence

“Act sequence” is a term used by Hymes (1974) to describe the form and order of a communication event. There are other expositions of human anatomy where the pedagogy is organized around bodily systems, such as the respiratory system, the digestive system, and the

lymphatic system, etc. TAY is organized in a way that marks a departure from this usual ordering of health topics, because it is organized around life stages. The sequence of explanation at TAY is chronological and temporal, starting in the Beginning of Life content area, and unfolding in separate content areas about Childhood, Adolescence, Adulthood, Old Age, and End of Life. Each life stage presented at TAY contains health information that is specific to that period of human life. While chronology is the overarching explanatory scheme used in the exhibition, each individual exhibit has its own informatic sequence. One of the explanatory sequences used in many different exhibits is that descriptions of health are followed by descriptions of pathology. For example, the Cardiology area of TAY is a whole suite of exhibits that begins by briefly describing the normal functions of the heart and circulatory system. Then the exhibits launch into a lengthy description of heart disease. Throughout the TAY exhibition, descriptions of normal, healthy bodies are often followed by descriptions of disease processes, the latter sometimes in greater detail than the former. As will be apparent in descriptions of the exhibits, the health/disease sequence can be seen as a formal feature of communication at TAY.

Understanding “Act Sequence” also involves viewing the TAY exhibition as an excerpt within a larger societal discourse about staying healthy. TAY is not the first occasion that visitors will have been instructed to control their health through behavior modification. TAY is a creative reiteration of a medical discourse about behavior modification that is issued by formal education, government agencies, clinical encounters and everyday knowledge. Communication research sometimes categorizes messages as containing both a “content” and “relational” element (Bateson, 1972; Watzlawick, Bavelas, & Jackson, 1967). According to this view, the “content” of a message is more or less what it is saying explicitly, while the “relationship” aspect is based on contextual information about the relationship between the speaker and the addressee. Appeals

to staying healthy are issued from authoritative sources that, as they issue a command, also issue information about the way that the hearer should interpret the relationship. When TAY issues suggestions, 'should' statements or explicit commands, these messages are making a tacit claim on behalf of MOSI's institutional authority. As an accredited learning institution MOSI has a reputation as being a fount of knowledge about all things scientific, and TAY issues suggestions and orders about healthy living by virtue of its authoritative position. Another way to make this point is to note that there are "felicity conditions" which govern speech acts (Austin, 1962; Holtgraves & Ashley, 2001; Searle, 1969). In order for health advice to be credible, it needs to come from an authoritative source. In addition, issuing directives serves to exercise and reinforce this very same authority. The "content" and "relationship" aspects of a message are a way to conceptualize the "act sequence" at TAY in terms of metacommunication.

There is yet another sense that a notion of "act sequence" describes a series of messages at TAY which are variously informative, diagnostic, entertaining or prescriptive. This dissertation will view all of these purposes as overlapping components of a rhetorical situation where the goal is to stay healthy. For example, the Cardiology suite of exhibits begins with factual information about the heart and circulatory system (informative). Later on there is a blood pressure monitor where visitors can assess their own risk for heart disease (diagnostic). Next, there is an exhibit called "Be Kind To Your Sweetheart" which urges visitors to refrain from smoking and salty foods (prescriptive) and prolong the health of their heart. Therefore, the different purposes at TAY co-exist as moments within a sequence of persuasion.

Key

According to Hymes (1974) “key” is a term that describes cues for establishing the “tone, manner, or spirit” of a speech act (p. 57). MOSI’s slogan “We’ve got fun down to a science” is emblematic of the polysemic “tone, manner or spirit” at TAY. Part of the “constructivist dilemma” (Allen, 2004) involves striking a balance between seriousness and playfulness when designing science center exhibitions. TAY is an exhibition full of colorful exhibits, clever puns, and aesthetically pleasing computer animations, but sometimes visitors experienced the exhibit as overly serious and even “depressing” (in the words of one survey respondent) because of its sustained focus on disease processes that affect individuals during each stage of life. The multi-paneled exhibit called “Laughter is the Best Medicine” that is located in the Adulthood area of TAY contains jokes from comedians along with information about the health benefits of laughter. “Laughter is the Best Medicine” was frequently cited by visitors as a welcome interlude to the serious tone at TAY.

The notion of “keying” (Goffman, 1974) is a term devised by Erving Goffman to elaborate on Gregory Bateson’s observations of animals engaged in play-fighting. Goffman (1974) describes play fighting as an activity that is closely patterned after real fighting, but with key differences—namely that unlike real fighting, the participants involved in play fighting don’t sustain physical harm. Goffman (1974) uses the term “keying” as a cue for understanding the element of “make-believe” during human interactions. Goffman uses a visual metaphor for keying, describing it as a “layer or lamination” containing information about the earnestness of any communicative situation (1974, p. 82). To provide an example of keying, during face to face communication sometimes an interlocutor will affect a change in their tone of voice in order to signify teasing or playfulness (Straele, 1993). When speakers use a sing-songy or higher pitched

tone of voice this is called “prosody.” Prosody is one example of communication cues that change the valences of messages.

The idea of “prosody” can be applied to the “secondary orality” communication environment at TAY. Based on verbal or visual cues, it is clear that sometimes the ‘key’ of an exhibit switches back and forth from earnest to playful. Take, for example, an exhibit at TAY that deals with the very serious topic of stroke. This exhibit contains detailed descriptions of the symptoms of stroke, including paralysis and numbness. While the disease condition that this exhibit profiles is serious, the title of the exhibit, “Stroke of Bad Luck” contains a pun that “re-keys” the tone of the exhibit to something playful. This example is typical of many other exhibits at TAY which try to balance the seriousness of the message with some form of cue that suggests mirth. Another term from the Goffman lexicon of frame analysis is the notion of “footing” (Goffman, 1981) which describes the ways that interlocutors perceive and experience shifts in key during a communicative exchange. Shifts in footing require interlocutors to be ‘light on their feet’ as they adjust their expectations about the tone or valence of a communication environment. In what follows I will describe two instances where shifts in footing were experienced as unnerving to visitors.

For example, an exhibit called “You, M.D.” located in TAY’s Adulthood area allows visitors to ‘play doctor’ and examine a simulated patient. The examination room and patient are simulated using computer graphics which appear to be similar to a first-person shooting video game. When the animated doctors and patients addresses the visitor, their voice can be heard but their lips do not move, which heightens the visitor experience of this simulated encounter as being unreal. The simulated characters onscreen stare at the visitor with an intensity of seriousness that one of my informants described as “disturbing.” These surrealistic elements at

“You, M.D.” produced a number of responses from visitors that expressed a feeling of uneasiness while interacting with the exhibit. I have provided this example, which I will elaborate on more in forthcoming chapters, to suggest how ambiguity about the proper ‘key’ of an exhibit can produce unsure footing for visitors.

In another exhibit, located towards the end of the TAY exhibition, videotaped testimony from a cancer survivor is shown where the woman describes how wonderful her medical staff was in treating her cancer. The difference in ‘key’ arises because the woman’s face is being projected on a mannequin dummy head that is fitted in front of a black velvet background. Visually, it appears to the visitor watching this video that this cancer survivor is nothing but a disembodied head floating in space. One visitor described this exhibit as being like “something out of the bad guy’s basement” in a horror movie. These two examples of unfavorable reactions at the TAY exhibition indicate some instances where notions of *key* and *footing* are useful theoretical concepts for this research.

Instrumentalities

Hymes (1974) uses the term “instrumentalities” to describe forms and styles of communication (pp. 58-60) but the term is also used to describe communication channels, such as verbal and non-verbal, or auditory and visual. In face to face communication, the content of any message is not characterized simply by its verbal form. People use gestures, facial expressions or other non-verbal channels of communication to convey the full meaning of a message. There are also auditory cues such as prosody that alter the valence of speech while not being verbal as such. The difference between earnestness and sarcasm, for example, largely depends on the style or register in which a message is uttered (as well as body language) rather

than solely the linguistic content. These examples of instrumentalities from speech communication can also be transposed to describe the “secondary orality” environment at TAY. With different instrumentalities being employed at TAY, the visitor is often obliged to recombine data which arrive from different communication channels into a meaningful message.

The two examples provided in the last section (the animated doctor and the cancer patient who appears to speak from a disembodied head, which I used to illustrate issues of “key” for TAY visitors) also illustrates how multi-media exhibits use a variety of communication channels. Exhibits at TAY usually have a textual component, combined with still photos, 3D models, as well as videos. Occasionally the combination of all these communication channels being ‘on’ all at once was noted by visitors, and not always favorably. For example, one visitor described their experience overall as “frenetic” and another used the term “disjointed.” These descriptors were used to describe the numerous sights and sounds at the TAY exhibition, and this kind of response can be interpreted as an overload of media coming across many different channels. In “You, M.D.” the ostensible purpose of the exhibit is for the visitor to conduct a simulated encounter with a computer-animated patient. My informant who described the thousand yard stare of the simulated patient as “disturbing” was noting how the purpose of the exhibit was to him being overpowered by ‘artifacts’ in the computer animation that reminded him of a first person shooting video game.

TAY is tasked with translating many different “discursive regimes” in medicine. These discursive systems range from medical specialties (such as the different terminology from cardiology when compared to oncology) as well as the general difference between specialist and lay discourse. In our interviews, MOSI executives told me that the design development process of the exhibition was the most time-consuming because it involved translating complex medical

information into messages that were written for a 5th grade reading level. In addition to being easy to read, the TAY designers also tried to make exhibits that are “actionable” in that the take-away message gave the visitor something specific to do. Repurposing informative messages for persuasive purposes can be considered as an important instrumentality at work for TAY. Science center exhibits often rely on a primarily factual presentation with no particular persuasive message to the visitor, and this research will examine the interesting ways that MOSI switches styles from information transfer to persuasive techniques.

Instrumentalities is a term that describes the form and sequence of communication much like the term “act sequence” except that instrumentalities describes form on a larger scale (Atkinson, 2001). Instrumentalities can describe the ways that the content at TAY sometimes needs to switch across various levels of explanatory abstraction. As an amazingly comprehensive presentation of human health, TAY needs to describe the “molar” as well as the “molecular” level. For instance, the explanations of genetics located in the “Exploring Our Molecular Selves” exhibit (located in the Beginning of Life area) uses computer graphics to represent interactions going on between protein molecules on a cellular level. In his historical account of the “medical gaze” Foucault (1975) notes how medical technologies such as microscopy allow medicine to make visible features that are invisible to the naked eye. The cellular goings-on that are being represented in the “Exploring Our Molecular Selves” exhibit are products of the human imagination which help visitors to understand DNA and RNA. This explanatory approach poses interesting questions for a realistic epistemology of the body, because the actual cellular events are being represented using imaginary and fanciful visual conventions (for example, RNA segments are represented in bright pink and purple hues).

When TAY is tasked with representing life on a microscopic level, the use of figures of speech such as anthropomorphism is evident. A suite of exhibits located in the Adulthood area of TAY called “The Stem Cell Story” features scientists on camera describing stems cells as miniature actors, complete with decision making capabilities which are even described in mentalistic terms. Stem cells are described as having to “choose” whether to replicate or become “specialists” in a certain kind of cell type. Other stem cells are described as “going rogue” or behaving badly in the event that they facilitate cancer cell growth. The use of anthropomorphism can be considered as another one of the explanatory instrumentalities at work in the TAY exhibition.

There are other instances where the focal point of TAY shifts from cells, to individuals, to populations. TAY sometimes has to negotiate medical advice that is geared towards specific, individual patients versus medical advice that is based on statistical inferences derived from epidemiology or population health. In her critique of health risk appraisals, Deborah Lupton (1995) argues that one of the shortcomings of calculating health risks for individuals based on population data is that individual results may vary (p. 82). Because epidemiology is a probabilistic discipline, personal health risk assessments may be limited in predictive capacity (Lupton, 1995). The “you” that TAY addresses is therefore in some cases a probabilistic you who is positioned as an instance of statistical probability. This is because visitors who recognize their behaviors in risk profiles (such as smoking and inactivity) are being urged to identify as candidates for a disease, even if they are otherwise asymptomatic. In its focus on statistical estimations of health risks (which include various lists of risk behaviors found at different exhibits) TAY is hailing subject positions from a diverse population of visitors and inviting them

to identify themselves as a disease candidate. This appeal to the individual based on a statistical inference represents a blending of population and individualistic forms of health promotion.

There are critics of public health interventions who note how placing the responsibility for a healthy society solely upon individuals serves an ideological purpose. In her study of the ideological subtexts that underwrite health policy, Sylvia Noble Tesh notes that individualism ...makes the individual the basic unit of social analysis. It supports a politically conservative predisposition to bracket off questions about the structure of society—about the distribution of wealth and power, for example—and to concentrate instead on questions about the behavior of individuals within that (apparently fixed) structure (Tesh, 1988, p. 161).

Individualism, as such, can be seen as one of the instrumentalities that is being negotiated throughout the TAY exhibition. One exhibit prescribes rugged individualism as a strategy which teens can use to resist peer pressure. The puppets at the beginning of TAY's Adolescence area are adamant that teens should make their own decisions and not simply cave in to pressure from their peer group. One puppet asserts "It's *my* life, and *I'm* the one in charge!" In this instance, individualism is being employed rhetorically in order to discourage teens from following the crowd. In this case, individualism is being used as a way to empower kids and therefore it doesn't seem to have the same kinds of politically conservative ideological bent that Tesh (1988) warns against. The puppets in the Adolescent area of TAY use the first person pronouns *me*, *mine*, and *I'll* to assert that they are capable of resisting the bad advice of peers. Yet later on, in the "Smoking and Health" video, teens are shown invoking the same kinds of first person, possessive pronouns to argue *against* quitting smoking. After the video testimony of Harry Nyce, a man who lost most of his face due to many years of smoking, a teen appears onscreen to say

“It’s *my* body! *I’ll* do what *I* want.” These examples from different areas of the TAY exhibition are meant to indicate that individualistic discourses are being employed for a variety of purposes, some promoting healthy behaviors and others promoting non-compliance. This investigation will consider theories for why the individual is made to be the focal point of the health interventions going on at TAY.

Looking at pronoun use provides clues for the kinds of instrumentalities that are being employed. I have already noted the use of the “you” pronoun in the title of the exhibition which I argue serves to personalize the message for each visitor. Consider a more unusual use of pronouns in a typographical error found in one of the exhibits about pregnancy: “But if **she** is aware of the potential for pain and takes appropriate steps to avoid it or relieve it when it occurs, **you’ll** go through the nine months in relative comfort.” The bolded words here show a disagreement in pronouns but even though this error was accidental, I argue that it serves a purpose. This single sentence is being addressed towards the pregnant woman herself (“you’ll”) as well as people in her family (“she”) who are tacitly being urged to identify with the second person feminine pronoun.

Norms

Hymes (1974) uses the term “norms” to describe the social rules which govern a communication event, as well as the ways that interlocutors react to and interpret messages. Because MOSI uses the word “fun” in its tagline, visitors are readily provided with an expectation about how their experience should be. As a setting of informal learning, MOSI is subject to fewer rules than could be expected in a classroom, where the norms of interaction include sitting still, listening intently, not interrupting, and deferring to the authority of the

teacher. With a focus on self-directed learning and hands-on activities, science centers are designed to subvert expectations about formal learning (Oppenheimer, 1972). TAY has interactive and ‘pseudo-interactive’ mechanisms for making this communication event into something that invites participation and collaboration. I observed kids at the TAY exhibition running freely throughout, occasionally stopping to operate one of the interactive mechanisms, and then running off in search of new discoveries. In terms of “dwell time” spent at each exhibit, these kids probably did not take the time to understand what each exhibit was about and what advice about healthy lifestyles was being offered. Nevertheless, they had clearly internalized the norm of “fun” which MOSI uses as a superordinate principle to set the tone of a museum visit.

One norm that was expected by visitors was that each exhibit should be functional. A major complaint I received from some visitors to TAY was that they experienced frustration when an exhibit didn’t work. From the point of view of MOSI design staff, the problem of non-functioning exhibits was a result of visitors being too rough with the interactives. Dave Conley, former VP of design, described to me the process of designing TAY’s robotic surgery exhibit, where visitors can operate a claw hand to pick up small objects.

Can we get a robot that stands up to a thousand kids a day using it, who are not going to be careful surgeons? They’re going to try to do everything they can to break it, misuse it, and do strange things with it.

Dave explained to me during our interview that “people are incredibly abusive to our exhibits here. Outright vandalism is rare, but it's just that kids get rambunctious here.” It is clear that these two norms I have described are in conflict, because while visitors expect exhibits to be functioning, MOSI expects that they will be treated rough and therefore non-functioning exhibits go with the territory.

When considering norms at the TAY exhibition, there is also an exciting sense that discourse which usually takes place in private (between a doctor and patient, or patient and family member) is out in the open. TAY deals with health topics in an open and straight-forward way—even some topics that are considered to be taboo, especially for kids. Some exhibits, such as the “Welcome to Our World” video which shows graphic footage of a baby being born, is partially walled off from the rest of the exhibition by opaque wall panels. The same is true for the STD focused exhibit “Risky Relations.” A lot of the feedback from visitors that I collected could be interpreted as commentary about how social norms are being respected (or nudged up against) at TAY. In the conclusion chapter I will relate examples of visitors who felt there were some age-appropriateness concerns, and other visitors who were deeply concerned with the provenance of fetal specimens in jars. To the extent that TAY sometimes deliberately pushes social norms it is an exhibition that provokes reflexivity about things we take for granted.

For Hymes (1974) a full analysis of norms would involve looking at the broader social structure within which a communication event takes place (Atkinson, 2001, p. 291). In this dissertation I note that the TAY exhibition has two private health insurance companies as its major funders. In the United States there are millions who don’t have any health insurance and millions more who are inadequately insured, so that a major medical problem would represent a big financial hardship to them. In all the explanations of medical procedures found at TAY, not a single one mentions the issue of cost, co-pays, deductibles, etc. Therefore, many of the life-saving procedures that are featured at TAY may be out of reach to the average visitor. In the conclusion I will argue that this is an aspect of TAY that fails to connect human health to the reality of structural limitations which determine it.

In order to properly account for social norms which influence the communication context at TAY, more research is needed into the ideological and historical context within which the exhibition is situated. Directions towards a broader consideration of political ideology will be a key theme of the conclusion where directions for further research are suggested. In particular, I elaborate on terminologies from critical studies of health promotion and museum studies. The terminologies I will cover include neoliberal governmentality, healthism and the post-museum. These are theoretical concepts that describe both health promotion and contemporary science centers in the context of market-centered ideology. The first concept, neoliberal governmentality, comes from critical studies of capitalist ideology (Bauman, 1998; Comaroff, 2007; Harvey, 2005) as well as Foucauldian ideas of self-governance (Brockling, Krasmann, & Lemke, 2011; Esposito, 2008; Foucault, Martin, Gutman, & Hutton, 1988; Foucault & Senellart, 2008; Rose, 2006). Briefly stated, neoliberal governmentality is a way of describing how contemporary audiences are cast as health consumers, with an obligation to make the right choices and govern themselves wisely using a cost/ benefits calculus. A related concept called “healthism” (Callahan, 2000; Crawford, 2006; Greco, 1993; D. Johnson, 2008; Rose, 1999; Skrabanek, 1994) is used to describe the ascendancy of a medical paradigm which casts otherwise healthy individuals as “pre-symptomatic” candidates for disease according to their behavioral risk factors.

Another concept, the “post-museum,” comes from critical museum studies (Hooper-Greenhill, 2000; Hooper-Greenhill & Taylor & Francis., 1994; D. Johnson, 2008). The concept of the post-museum describes a sea change in the way that contemporary museums have had to adapt to market pressures and a decrease in government subsidies. In response, museums have had to allow corporate branding of exhibits, while relating to their visitors using a customer

service approach. This is evident at TAY, where corporate brands emblazon the exhibition, and visitors are referred to as “guests” by MOSI executives and staff. The concept of the “post-museum” suggests that museums have adopted a market-oriented ideology towards funding and guest relations.

These concepts, which relate to the political and historical context governing the social norms of the TAY exhibition, are explicated further in the conclusion under a heading which suggests areas for further research for exhibit designers, visitor researchers, and critics of market-oriented ideologies. Neoliberal governmentality, healthism and the post-museum are terms that are useful in a broader description of social norms that can be useful in further considerations of the TAY exhibition in social and historical context.

Genre

Finally, we arrive at the last letter of Hymes’ SPEAKING mnemonic. In an influential essay, Mikhail Bakhtin came up with the term “speech genre” to describe utterances that are instances of a common thematic content, style and compositional structure (Bakhtin, Holquist, & Emerson, 1986). Hymes (1974) used the term “genre” to describe different types of communiques, such as poems, letters, or tales. The genre category has some interesting applications when it is applied to TAY. First of all, TAY clearly tells a “story” about human life and death, and it is a story that can be said to have some of the genre elements of a morality tale, including characters, setting, plot, and lessons learned. Making their way through the TAY exhibition, visitors will meet a number of characters who give the story its ‘human interest.’ Some of these characters are fictional and some are actual people. Visitors will meet the “MetiMan” and the simulated patient at “3D Body Exploration,” characters that are white

colored, featureless mannequins lying prone on slabs. In addition to these make-believe characters, visitors to TAY will also encounter some actual people, such as the real teen role models at “SuperKids,” and Mr. Harry Nyce, the ex-smoker who has had to have his eye and mouth removed when they became malignant. These colorful characters can be conceived as characters in the morality tale that is being told at TAY. The moral of the story is stay healthy—or else!

Searching for other genre elements of the story being told at TAY, we see clearly that it has a beginning, middle and end, as shown in the life stages that are represented. A science center exhibition also has generic elements such as affordances (for instance, the operation of a track ball and roller mouse to access interactive features on a monitor). I have already noted how prescriptive exhibits at TAY (those exhibits that have a rhetorical purpose to convince visitors to alter their behaviors and adopt healthy lifestyles) can be considered as instances of deliberative rhetoric. There are some stylistic differences between the exhibits that I term “prescriptive” which are worth noting. Sometimes prescriptive exhibits suggest lifestyle changes in subtle ways, and at other times they are more direct. The notion of “indirect directives” (Mearns, 2013; Searle, 1975) describes speech acts which phrase a suggestion or command in the form of a statement or question. Take, for example, the phrase “You are standing on my foot.” In the speech context in which this phrase might be uttered, this statement of fact can also be interpreted as a request or command for the addressee to stop standing on the speaker’s foot. Another paradigm case of an indirect directive is the question “Is there any salt?” In the context of the dinner table, this question can be interpreted as a request from the speaker for the salt shaker.

TAY has some exhibits which issue a suggestion or command tacitly, making it the task of the visitor to reconstruct the advice that is being offered. In the chapters describing the exhibits, I will argue that some forms of visual rhetoric can be characterized as indirect directives, such as the photos of a child's body that is marked with small pox. This photo is shown within the context of an exhibit that is arguing for the importance of vaccination, and within context it serves as a powerful warrant in the argument that vaccination is a net social good. Similarly, graphic photos of herpes and AIDS victims at the "Risky Relations" exhibit serve as an argument for abstinence and/or safe sex, even if abstinence and safe sex are not focal points of the exhibit, as such. These are just two examples of the ways that injunctions about health are sometimes phrased tacitly in the TAY exhibition. The focus on indirect directives in this dissertation appears to offer new ways of understanding generic features of health promotion and persuasion in general. In the conclusion, I will use the notion of "genre" to characterize the common features of health promotion discourse.

Framing and frame flexibility

Setting, participants, goals, sequence, keys and footing, instrumentalities, social norms and speech genres are all descriptive terms that have helped me describe this multi-vocal, multi-channel communication situation. Another term that I use freely throughout this dissertation is frames, and its conjugations framing and reframing. In this section I want to introduce what I mean by the concept.

Framing can describe the ways in which health is presented in the TAY exhibits, and it can also describe the ways that visitors interpret them. Frames and framing can be considered as both a process and a product. The scholarship about media frames (D'Angelo, 2010; Gitlin, 1980;

Morreale, 1991; Tuchman, 1978) treats frames as products, residing, not in the interplay of conversation, but in ephemeral artifacts such as newspaper stories, television broadcasts or other media. This approach to frames can be contrasted with how it is used in discourse analysis, where framing is a process that takes place during speech and is less of a residual product (Ensink & Sauer, 2003; Goffman, 1974; Tannen, 1993). There is also the use of the “frame” rubric in cognitive research (Kahneman & Tversky, 2000), social psychology (Bowman & Goldberg, 1983; Denzin, 1981), policy analysis (Schön & Rein, 1994; Spector, 1995; Tuchman, 1978) and even therapeutic discourse, where it is sometimes called “reframing” (Bandler, Grinder, Andreas, & Andreas, 1982; Burns, 1980; Erickson, Rossi, & Ryan, 1985). In short, the meaning of frames and framing largely depends on which discursive community is employing the terminology.

The concept of “frame flexibility” (Steier, 2005) is a reminder of the root metaphor of framing, which describes the way that reality is constructed through communication when certain things are emphasized over others. Steier (2005) adopts the “binocular vision” of Gregory Bateson and pairs two of Bateson’s theoretical concepts, “frame” and “flexibility.” Steier (2005) points out that the concept of framing was implicit in Bateson’s observations of play-fighting, which served as Goffman’s (1974) inspiration to develop the frame concept. Bateson’s concept of flexibility is inspired by H. Ross Ashby’s “law of requisite variety” (Ashby, 1960). Summarizing Ashby’s concept, Steier (2005) states that in order for systems to be able to adapt, they need to have “an available store of uncommitted variation to allow for future change” (p. 44). The idea of uncommitted variation is that frames which are too rigid do not allow for the possibility of alternatives. Steier writes

We need to continue to exercise what might be called our “frame flexibility,” trying out alternative frames whenever possible—but also creating systemic conditions that allow for that kind of play (Steier, 2005, p. 46).

Steier’s concept of frame flexibility suggests the ways that frames can sometimes be over-specified. In the book *Frame Reflection*, Schön and Rein (1994) suggest that policy controversies can arise when frames are too rigid. By looking at reality from another angle, and reordering the sequence of its various features, problems can often be reframed in productive ways that allow for novel solutions to seemingly intransigent problems (Schön & Rein, 1994).

Frame reflection and frame flexibility are ways of directing our attention towards the constructedness and partiality of frames. When framing appears to oscillate between noun and verb forms it is suggestive of the ways in which the term itself can become overly specific, limited or reified. This study of frame flexibility looks at how accepted wisdom about health and medicine gets established, reiterated, and reformed in a discursive journey through medical communities of practice and through the stages of life. In addition, notions of framing can serve as a way of surfacing partial and limited assumptions which inform exhibit design or health promotion practices. This research is concerned with how framing is used to make sense of health and safety, highlight interventions, as well as shift a visitor’s concepts of learning and behavior change from something akin to a bad tasting medicine into something that is fun and enjoyable. The metaphorical concept of framing remains viable as long as the connotations of the visual metaphor don’t overly delimit the process and product. In addition to analyzing and reflecting on frames, this dissertation can also be seen as a frame, with all the connotations of selectivity and partiality included.

More research questions

At the end of this introductory chapter I would like to pose some more basic research questions that have emerged during the course of this investigation. These research questions apply to different fields of knowledge, including 1) message design, 2) visitor studies, and 3) communication theory. In addition, I also wish to address some questions about 4) organizational learning.

1. *The design process:*

TAY is tasked with summarizing health advice that is issued from a variety of medical specialties, including obstetrics, pediatrics, cardiology, oncology and others. The MOSI design staff consulted with medical practitioners in each of these areas. When it comes to health advice that is being issued in each exhibit, we can notice some commonalities across specialties. Not smoking, exercising, diet and maintaining a healthy weight—these are injunctions that appear across the exhibits at TAY and they are recommended in order to prevent a variety of diseases and injuries (including heart disease, cancer, stroke and others.) How do exhibit designers weave together these common threads into a consistent message about prevention?

Message design at science centers is usually modelled using ideas of information transfer. For example, when a ball hovers above a Bernoulli blower, there is no particular “take-away” message to the visitor about modifying their behavior. TAY is different because it is an exhibition with a plainly stated purpose to encourage healthy lifestyles. How do exhibit designers switch their strategy from information transfer to one of persuasion? How can a science center which is used to presenting messages informatively adapt to communicating persuasively?

2) *Visitor studies:*

In the course of surveys and interviews I have encountered many engaged MOSI visitors who have made thoughtful comments about the TAY exhibition. While there are quantitative studies of visitors which use metrics such as “dwell time” to seek to make inferences about certain “effects” of a museum visit, I have chosen a qualitative approach that considers visitors who bring a variety of frames to their MOSI encounter (including having fun, being informed, or being persuaded). In the course of this research I will consider some of the following questions that are of interest to visitor research: What is the experience of learning for visitors who encounter a persuasive context such as TAY? Is the persuasive intent of TAY designers congruent with visitor experience? (That is, do persuasive messages have an operant effect?) How does a consideration of framing—on the part of designers as well as visitors—mediate understandings of the visitor experience?

3) *Communication theory:*

I wish to emphasize that this research project is taking place within paradigm of communication studies that looks at museum studies and health promotion in a different way than quantitative research into the effects of media. One of the questions I wish to address is: what concepts from the field of communication are the most guiding? As I have suggested in this chapter, ideas from the ethnography of communication, classical rhetoric, frame analysis and speech act theory have helped to guide my approach. Beyond these formal explications of persuasive techniques, this research also will help to surface assumptions underneath health promotion messages. Namely, what is behind an individualistic approach towards health promotion? When health promotion messages emphasize personal responsibility, in what ways

does this downplay the role of structural factors in staying healthy (such as pollution, racism and socioeconomic status)?

A recurrent theme of this research is that health promotion messages, in their focus on individualistic reckonings with health advice, frame the problem of staying healthy according to a market-based ideology. Individuals are framed as consumers of health who seek to maximize their healthiness and minimize their risk according to a cost-benefits calculus. In the course of this project, I hope to show the shortcomings of this approach, which overemphasizes personal responsibility while downplaying the role of social determinants of morbidity and mortality. While this study is about a specific science center exhibition located in a specific museum, I believe that some of the insights about framing, indirect directives, and market ideology represent a unique contribution from the communication discipline to the study of health promotion and informal learning contexts.

4) *Organizational learning:*

Finally, there is at the end of this dissertation a possible opening-up of channels of communication between MOSI and its visitors. That is because in the next chapter I will set up a frame for science center communication which goes beyond a unilinear, sender-receiver model by highlighting communication as a back and forth dialogue. While this research is not intended as a formal evaluation of the TAY exhibition, the findings from this study may be useful to MOSI as evidence of visitor response. The question is, how can this research set up conditions for MOSI stakeholders (and a broader community of science centers) to hear this feedback? Because this research relies on qualitative methods such as ethnography, will it have the same status as quantitative research traditionally used to measure visitor response? How can science

centers use this qualitative research to help inform the process of exhibition design and revision? This is a question for further research beyond what is being presented in this study. In the conclusion, I will return to these questions in light of my research findings.

Chapter Summary and Preview of This Document

In this chapter I have posed some research questions and have introduced the site of my research. I have used the SPEAKING mnemonic to describe the different facets of communication that are taking place at TAY, including the setting; the participants; the purposes (to inform, to entertain, and to persuade); the sequences of communication; considerations of tone or key; the channels of communication used in a multimedia exhibition; as well as a consideration of social norms and generic elements of discourse. I have also introduced the theoretical concept of frame flexibility, which will emerge more concretely throughout this work in descriptions of museum exhibits as well as in interviews with MOSI executives, volunteers and visitors. I have followed up on this introduction with more basic research questions about the implications of this research for designers, visitor researchers and communication theorists, questions I will return to in the conclusion.

In chapter two I focus on research methodology, including ethnographic observation, rich descriptions, analysis of archival materials, and ethnographically informed interviews and surveys with MOSI executives, volunteers and visitors. This chapter will introduce an important conceptual model of science center communication which goes beyond information transfer. Conceiving of science center communication as a dialogic and circular process starts with medical expertise (as interpreted by exhibit designers) which is then interpreted and critiqued by museum visitors. In order to “complete the circle” from MOSI, to visitors, and back, I offer this

research project as a form of feedback to MOSI stakeholders. It is hoped that the trenchant feedback from the MOSI visitors that I surveyed and interviewed (as summarized in this document) may help MOSI better understand visitor reception of this ambitious exhibition. The simple circular diagram is also meant to set up a frame for dialogue between MOSI and its visitors. Chapter two also provides detailed accounts of interviews with three MOSI executives. These interviews provide behind-the-scenes background information about the TAY exhibition and the process of expert sourcing, design development, and corporate funding. In addition, through these interviews I learned some details about the framing process, and the ways in which MOSI presents medical issues, highlights their salient features, and provides “action steps” to visitors to encourage them to adopt healthy behaviors. Chapter two also introduces some of my primary informants among TAY visitors who will comment on the exhibition in the forthcoming chapters.

In chapter three and four I provide a detailed sequential description of the exhibition. These chapters combine detailed descriptions of the exhibits with citations of academic literature from medicine, health communication, and the sociology of health. In cases where visitors spoke about specific exhibits during our interviews, I have included their selected comments. Chapter three is a description of TAY’s Beginning of Life, Childhood and Adolescence sections. In the pregnancy and birth section I give examples of the ways that the maternal responsibility for the embryo and neonate are emphasized in these exhibits. I also describe the ways that cell biology is explained using visual conventions. A video showing childbirth uses a combination of euphemism and graphic imagery to portray the delivery process. This area of the exhibition also includes a collection of human fetuses in jars of formaldehyde, showing the stages of fetal development. This exhibit was mentioned most often by MOSI visitors, and the comments I

include in this part of the chapter show how visitors are concerned about the origins of these actual human remains—as well as ways these specimens might be properly framed for children. Another highlight of this chapter includes a description of an exhibit that uses photos of children who were disfigured by infectious disease. I argue that the photos serve as a form of visual rhetoric that urges parents to participate in vaccination programs. In describing this exhibit I elaborate on the notion of “indirect directives” (Searle, 1975) which are “hints” or suggestions that are issued tacitly in the form of information. The adolescent section of this chapter analyzes the sometimes paradoxical advice that is issued by puppets that populate this section of the exhibition.

Chapter four covers TAY’s Adulthood and End of Life sections. Adulthood is divided into three separate content areas: Early Adulthood, Adulthood, and Older Adulthood. In this chapter I analyze a powerful suite of exhibits that are concerned with the health effects of smoking. The testimony of one ex-smoker who had to have parts of his face removed (shown on a video) was cited by visitors as being one of the most memorable and persuasive moments of the TAY exhibition. After this man provides his testimony about the health effects of smoking, teens are shown onscreen who seek to dis-identify with this unpleasant outcome. This presents an occasion to consider the ways that people recognize their own behaviors as risky. An analysis of the Cardiology suite of exhibits shows how the heart is presented as a robust organ that is nevertheless constantly imperiled. An analysis of the Cancer suite of exhibits shows how considerations of communication channels and audible noise can sometimes interfere with the content of a message. Finally, an analysis of the End of Life section towards the end of the exhibition shows how visitors are urged to dis-identify with their mortal remains and instead take up the subject position of others who survive the loss of a loved one.

In chapter five I summarize some of the feedback about TAY from visitors. I begin this chapter by providing charts that summarize the results from 72 exit surveys that were conducted. These results show a largely strong positive response to the exhibition and those exhibits that were mentioned most. I also summarize the results from both surveys and interviews into subheadings. First, I note the largely positive response to TAY from visitors, and I indicate how they use metaphors such as dark/light and warm/cold to describe their interactions with the exhibits. At this point I mention some of the polysemic uses of the term “interactivity.” Respondents use this term widely but it isn’t always clear how they are using it. Computer/human interactive exhibits are the most self-evident use of the descriptor, but I provide examples to suggest that visitors may be seeking more human interactions with MOSI docents or staff. Also in chapter five I describe some of the criticisms that visitors had of TAY. These complaints included non-working exhibits, problems with noise, concerns about the age-appropriateness of some exhibits, and a lack of staff. I argue that these kinds of complaints may present the need for more staff or volunteers on the exhibition floor who can respond to non-functioning exhibits and even provide “framing” for some of the more sensitive subject matter. (Budgetary considerations may stand in the way of implementing this.) In this section I also highlight the criticisms of a small number of respondents who argued that TAY, for all of its focus on prevention, was still overly focused on treatments for preventable diseases resulting from diet, lack of exercise, overweight and obesity. I characterize these concerns as being about a distinction between “reactive” and “proactive” health, and a reaction to the biomedical paradigm at TAY that frames visitors as pre-symptomatic patients in waiting.

In the conclusion I offer a summary of this research and return to some of the questions raised in the earlier chapters. In particular I want to make clear the ways that this research offers

new insights to designers, visitor researchers and health promotion practitioners from the communication discipline. In summarizing the findings of this research, I consider representational strategies that the TAY exhibition uses to communicate behavior modification messages about health. I consider the entertaining, diagnostic, descriptive and prescriptive aspects of the messages as communicative acts, or alternatively, as purposes or ends of the exhibition that emerge differentially according to contextual factors each visitor brings to their encounter. Also in the conclusion I reiterate findings about the sometimes problematic representation of gender, race/ethnicity and socioeconomic status in some of the exhibits. I also argue how “indirect directives” may serve a rhetorical purpose to persuade visitors without being overly heavy-handed or paternalistic. The conclusion presents an opportunity to summarize my argument about the mixed messages that could result when gambling or contingency serves to frame behavioral health directives. I also address the issue of the effectiveness of the exhibition, namely, does it prompt visitors to modify their behaviors? I note how individualistic discourse at TAY can be used for different rhetorical purposes, and I also describe methodological individualism in health promotion discourse as constituting a genre of speech. I argue for a concept of interactivity that incorporates face to face communication in addition to computer-based interactive exhibits. Under a subheading “Terminologies for further research” I consider terms such as neoliberalism, governmentality, healthism and the post-museum as promising tools for expanding further on communication research into science centers and health promotion. In my summary remarks, I reemphasize the “wrap-around” nature of this inquiry (from medical experts, to exhibit designers, to visitors, and back) and how this research could help ‘complete the circle’ of science center communication.

Finally in this introductory chapter, I would like to offer some clarity about the ways in which I will introduce conceptual, methodological and theoretical resources in this inquiry. It will be noted that this dissertation does not contain a traditional literature review. This research draws on literature from science center and visitor studies, theories of health communication and persuasion, as well pieces from the ethnography of communication, framing and speech act theory. Rather than have a separate section explaining my use of this literature, I have instead opted for the citations to emerge along the way throughout the following chapters. This research process has been inductive in the sense that research questions and theoretical accounts have emerged during the course of the research process (as opposed to the theories being superimposed deductively.) In this sequential, experiential and inductive account, I hope to show how my key methodological and theoretical concepts are grounded in the research process itself.

CHAPTER TWO: RESEARCH METHODS AND PARTICIPANTS

Data sets and Research Questions

In this chapter I will describe my research methodology and process, and then summarize interviews with MOSI executives that help provide important context for this research. Finally, I will introduce some of my key informants whose commentary on the exhibition will be highlighted in the next few chapters. *The Amazing You exhibition* (TAY) represents the human life cycle in seven different content-areas that make up the exhibition: Beginning of Life (which includes fetal development and childhood), Adolescence, Adulthood (divided into three sections: Young Adult, Adult, and Older Adult), and finally, End of Life. TAY's "cradle to grave" journey has been designed to encourage MOSI visitors to make healthier lifestyle choices, such as eating right, exercising, and seeing a doctor for regular check-ups. There are about 400 hundred individual exhibits in this exhibition, a rich audio-visual environment containing models, interactives, photos, videos and quizzes. In addition to a "textual" reading of the exhibition I have also conducted ethnographic interviews at TAY with MOSI executives, volunteers, and a sample of some of the visitors who come and go from TAY each day.

Communication at a science center can be conceived of as the transmission of information from the exhibit to the visitors. In this research I will describe science center communication as a more multi-vocal and multi-directional form of communication. In this

dissertation I will describe a “circle” of health communication, from the message (the content of the exhibit and conversations with the lead designer and other MOSI executives), to the audience (as indicated by 25 interviews and 72 exit surveys) and back. This manuscript is offered to MOSI as a form of communication that helps complete the circle, from conception, to implementation, to visitor experience and back. The sources of my data come from the following:

- 1) Audio interviews with MOSI President Wit Ostrenko; former MOSI VP of Exhibits Dave Conley and Vice President of Research, Grants and Government Relations Judith Lombana.
- 2) The TAY “Design Development” document, a 700+ page spreadsheet which contains prototypes and mock-ups for many exhibits.
- 3) Approximately 50+ hours spent at MOSI on the TAY floor, cataloging the exhibition and observing visitors interacting with the exhibits.
- 4) Several hundred still photographs (.jpgs) and videos (.mov) documenting TAY.
- 5) 72 completed surveys from TAY visitors collected in January and February 2013
- 6) Audio interviews with 24 different MOSI visitors who had completed exit surveys and consented to be interviewed.

In this chapter I will describe these datasets along with methodological considerations.

First, I wish to highlight some of the following research questions that will be addressed in this chapter: What sets ethnographic interviews apart from interviewing in other contexts? How can communication at a science center be conceived of as reflexive and circular instead of a more simple process of information transfer? How does the TAY exhibition provide a chance for visitors to learn about health and discuss it within groups of family or friends? How do the exhibition designers go about obtaining credible information about health and translate it for a

general audience? How does the process of “framing” an issue involve selecting the most pertinent pieces of health advice for the visitor out of a vast amount of information? Did the perspective of medical experts from a variety of specialties influence the content and presentation of health issues? What about the role of corporate sponsors, such as Florida Blue and Met Life (health insurance companies)? Did these financial donors simply brand the exhibits, or did they have any editorial role in how the issues were presented? How did the TAY designers use changes in “key” or tone to make exhibits appeal to younger or older visitors? Can science center exhibitions be persuasive as well as informative or entertaining? What is the right combination of entertainment and information to make exhibits persuasive? How can healthy behaviors be promoted without coming across as too heavy handed or paternalistic? What is the advantage of making persuasive messages tacit or indirect? Is the process of tailoring exhibits to different age groups an art or a science?

In the course of this chapter, these and other research questions will be addressed. In the next section, I will describe my ethnographic approach to interviewing and the ways that it is different from interviews that elicit only directed, brief responses.

The Ethnographic Interview

Before I began my interviews at MOSI I consulted some of the literature about ethnographic interviewing. In this section I would like to distinguish ethnographic approaches to interviewing from other forms. In the book *The Ethnographic Interview*, James Spradley (1979) questions the strict delineation between questions and answers in interviews as they are commonly conceived (Spradley, 1979). By contrast, in ethnographic interviewing, “both questions and answers must be discovered from informants” (Spradley, 1979, p. 48). Spradley

explains that ethnographic interviews need to be based on an assumption that question/answer sequences are implicit in human interactions, even if they are not stated as such. In this view, each utterance can be seen as a kind of response. If the interviewer has specific, leading questions, the response of the participant can be overdetermined. For purposes of this research, I have tried to ask questions that are general, open-ended, and descriptive, allowing each informant to respond to or elaborate on the question as they see fit.

In order to initiate each interview, Spradley (1979) suggests that “rapport” must first be established. In order to achieve a “harmonious relationship” (p. 44) with each informant, trust is a basic precondition for the free flow of information. Spradley (1979) list the “four stages of rapport” as apprehension, exploration, cooperation and participation. Apprehension describes the feeling of wariness that arises in both the informant and the researcher as the interview commences. During the exploration stage both interviewer and participant venture beyond anxiety and begin to open up. The cooperation stage commences when rapport has been reached and both interviewer and informant have clear expectations about roles. In the participation stage, both the ethnographer and the informant are engaged in active dialogue.

Rapport can be summarized neatly in the four stages that Spradley (1979) lists, however, experienced ethnographers understand that establishing rapport is not simply a matter of ‘checking off’ each stage as if this sequence was rote for each ethnographic interview. Jorgenson has suggested that the “checklist” approach to establishing rapport may represent an instrumental approach to rapport building that can be conceived of at the expense of a more emergent and relational view (Jorgenson, 1992, 1995). With Jorgenson’s (1992, 1995) reservations in mind, the emergence of rapport in my interviews has been guided by Spradley’s (1979) working model of the stages of rapport building during the interview process.

Asking open-ended and descriptive questions of people at TAY has ensured that each interview transcript offers a richness of data for interpretation that otherwise may have been absent if all the questions were too specific and only elicited short answers. My interview approach has been guided by *openness, engagement, and commitment*—instead of detachment and over-specification of questions (Reinharz & Davidman, 1992). Openness refers to not over-specifying the interview sequence, an approach that allows for more spontaneity. Sometimes my informants would speak in ‘tangents’ that, while not directly related to the question, allowed for important background information to emerge. Engagement and commitment can refer to my efforts to have been fully present and attentive during the interview, relinquishing some control and allowing my informants to ‘co-pilot.’ The open ended questions that I used during these interviews took a variety of different forms.

Spradley (1979) describes a number of different ways that the ethnographer/interviewer can ask descriptive questions. Descriptive questions are posed so that the informant can describe, in their own words, the educational, visual and interactive aspects of TAY. A general, open-ended descriptive question might be “Tell me about *The Amazing You?*” This allows the participant to construe the setting. Another question that can elicit a rich answer is the question “Could you describe your day at MOSI?” Spradley (1979) suggests that it may be useful to include follow-ups to descriptive questions in order to get a more expansive answer. For example, instead of asking Dave Conley (former MOSI VP of exhibits) the question “Can you describe the *Amazing You?*” I instead asked, “I have walked through *The Amazing You* by myself before, but I have never had the ‘grand tour.’ Would you be able to walk me through the exhibit and explain to me what is going on?” It turns out that Dave Conley was happy to give me a walk-through of TAY and during our tour many questions came up that probably would not have in

the event that the interview only took place in his office. During “grand tour” experiences, Bradley (1979) notes that questions can arise within context about space, time, events and activities (p. 50).

In addition to descriptive questions, there are three other types of ethnographic interview questions that Bradley (1979) mentions that have proved to be useful for this research project. These questions are a) example questions b) direct language questions and c) hypothetical interaction questions. These question types will be phrased hypothetically below.

- a) “Can you give me an example of...?” (example question)
- b) “How would you refer to...?” (direct language questions)
- c) “If I was a guest, and I wanted to operate these buttons, how would I go about it?”
(hypothetical interaction questions)

During the interview process I tried to ask open ended questions in order to allow for research questions to emerge during the interview. “Grounded theory” (Corbin & Strauss, 2008; Glaser & Strauss, 1967; Strauss & Corbin, 1997) has helped me to see that research questions should emerge during the research process itself, instead of being preconceived and superimposed. This stands in contrast to scientific notions of research where a hypothesis is formulated inductively and then proven or disproven. In this respect, it is my informants who helped me to come up with the theoretical questions. In a reference to grounded theory, Michael Agar describes an ethnographic process where data collection is not separated from the analysis (Agar, 1980). During the research process at MOSI, I made an effort to bracket some of my presuppositions and not pose leading questions that might elicit the kinds of responses that may have confirmed or disconfirmed them. My interview transcripts also show some “reflection-in-interaction” (Steier & Ostrenko, 2000) where the process of collecting data was codeterminate with the

meaning making process taking place between myself and my informants. As a result more questions and directions have emerged from my interview transcripts, sometimes in ways that I didn't anticipate. Using an ethnographically informed approach to interviewing has allowed for a more complex, multi-vocal and multi-directional portrait of communication to emerge.

Completing the circle of communication

Conducting ethnographic interviews at MOSI involved speaking with two different groups of people: The MOSI staff and volunteers and the visitors. In the first stage I interviewed three MOSI executives who helped to design, raise funds for, and implement TAY. These are people who are committed to the success of this permanent exhibition. In addition to MOSI executives I also had occasion to interview several MOSI volunteers or “interactants” who I met on the floor of TAY. These volunteers are important intermediaries between the TAY exhibition and the visitors. The second stage involved collecting surveys from and interviews with visitors (who MOSI staff members adamantly refer to as “guests” in order to emphasize a customer service relationship) who are the end-user of the TAY exhibition. Interviewees provided informed consent as required and the participants have been given pseudonyms and are otherwise de-identified.¹

The two stages of interviews that I conducted at MOSI are patterned after a simple “sender/receiver” conception of communication, from the sender (MOSI) to the receiver (visitors). As thus described the circuit of communication at MOSI has so far consisted of a linear and unidirectional path from the exhibition makers to the audience. In order to complete

¹ The consent form was drafted based on a template from The USF Division of Research Integrity & Compliance (ARC). This is a “minimal risk” study because no private health information was collected from participants. I did not talk directly to any “vulnerable populations” such as children, although they were sometimes present while their parents were being interviewed. Informant's names have been changed to protect their privacy. My research protocol was approved by the ARC in the summer of 2012.

the circle of communication at MOSI, it is important to conceive of communication as a back-and-forth dialogue instead of a monologue. This research has identified already-existing “feedback mechanisms” that the museum uses to estimate the public response to the exhibit. For example, MOSI has contracted evaluations of at least some of the exhibits. There are other ways to indicate the success of exhibits, such as exit surveys, which I have conducted partially in order to provide feedback to MOSI stakeholders. The surveys will be described in more detail later in this chapter. In addition to surveys, in-depth interviews with MOSI visitors has provided a more detailed account of the visitor experience beyond the short, sometime one-word responses from the surveys. In consideration of a more dialogical and back-and-forth communication process, I have used a circular model for understanding how communication at a science center takes place.

Conceptual models for communication can use the metaphor of circularity to emphasize that communication is a back-and-forth process and not just a linear procession from message to receiver (Argyris & Schön, 1978; R. Johnson, 1986). Argyris & Schön (1978) Describe “learning loops” of communication in organizations, and Johnson (1986) pictures a circular model of communication processes that involves feedback. Based on these circular conceptions, this research will consider communication as a circle, from MOSI, to the audience, and back. This circle is pictured in the diagram in below:



Figure 1: A circular diagram of science center communication

It is a hope of this research that the thoughtful responses about TAY from the MOSI visitors (presented in this dissertation) will be considered by MOSI as a form of feedback in order to complete the left arc of the circle. While the present research is descriptive rather than evaluative, it nevertheless contains some summaries of interesting feedback that may be useful to MOSI, and perhaps even the broader community of science center stakeholders and researchers. It is hoped that this dissertation will help to “complete the circle” and contribute to a dialogical and multidirectional model for health communication in a science center context.

Overview of the research process

In this section, I will explain the process through which I first became introduced to MOSI and how I elected to conduct my doctoral research there. I will also describe how I went about collecting data at TAY, and describe some insights about the rhetorical situation at the exhibition which were derived from observing visitors interacting with each other and the exhibits. I will also detail the process of conducting surveys and interviews.

My experience at MOSI began around 2006 when I was involved in a group project that was part of Fred Steier’s Action Research seminar. For this project five USF graduate students conducted research at MOSI’s “Disasterville” exhibit, which is on the second floor right below TAY. It was during this research project that I first met Wit Ostrenko, Dave Conley and Judith Lombana. During this research project I first heard about an ambitious human health exhibit that MOSI was planning on building on the third floor. Our group of graduate students was asked to conduct some surveys with visitors to MOSI about what they would like to see in an exhibition about the human body. Some of the results of our survey research ended up informing the design and layout of what would become the TAY exhibition. Having played a small role in this

formative research ignited my interest in science center exhibitions that encourage behavioral change.

Over the next eight years I became a regular visitor to MOSI and I was present at TAY during its first few months of opening in 2008. In 2010 I participated in volunteer training at MOSI, where volunteers learn all about the MOSI brand and undergo the process of being “MOSIfied.” The training took a few weeks, meeting on weekend afternoons in the Coleman Science Works Theater on MOSI’s third floor. After training, I spent numerous days as a volunteer, assigned to different parts of MOSI such as the high wire bike, the wind generator that simulated hurricane strength winds just outside of the MOSI entrance, or the BioWorks Butterfly Garden. My official research at MOSI did not begin until the fall of 2012, after the completion of USF’s Human Research Protection Program (HRPP) training and the IRB approval of my doctoral research proposal. MOSI president Ostrenko provided me with a letter of support that I included in my IRB proposal. After approval I began conducting an in-depth study of the TAY exhibition, interviewing MOSI staff, TAY funders, as well as visitors to MOSI. Here is a short summary of the interviewing process.

MOSI president Ostrenko gave me an insider’s view of running a science center, during three forty minute interviews where we sat in his office and talked about TAY. These and all interviews were recorded on the “Voice Memos” app on my phone. After interviewing Wit, I began my interviews with Dave Conley, who was then MOSI’s VP of Exhibits. Dave was most generous with his time, explaining the process of exhibit design and fabrication in detail. Dave helped to illuminate the design process, as well as explaining to me the circuits of communication that are involved with building an exhibition on the scale of TAY. The process involved interactions with corporate underwriters, subject matter experts in medicine, and

numerous subcontractors. It was by interviewing Dave that I realized that the communication environment at TAY was complex.

Dave referred me to MOSI Vice President of Research, Grants and Government Relations, Judith Lombana, who I had met years before while doing formative data collection for TAY. During our interview Judith provided me with a wealth of information about the grant-writing process, relationships with funding sources, and many other topics related to TAY. These interviews helped me to formulate research questions and provided me with a great deal of inside knowledge about the process of museum administration, exhibit design, grant writing and funding. More detail about these interviews will be forthcoming, but first I will explain how I became familiar with the TAY exhibition.

By the time that these exploratory interviews were completed I was already spending at least a few hours a day on the third floor of MOSI, home to TAY. Much of my research was conducted by interacting with each of the hundreds of exhibits that make up TAY. Each exhibit was documented using a notepad and a camera phone, with which I took pictures and shot short videos of each exhibit. Some of these photos are included in forthcoming chapters about the exhibition. I spent many hours on the floor of TAY, documenting the exhibits and interacting with them as directed. The result of this documentary research has resulted in detailed descriptions of each of the life stages content areas at TAY which make up chapters three and four of this dissertation.

The time I spent at TAY was during regular MOSI business hours, and therefore I was also on the floor with visitors to TAY who were checking out the exhibition as I was. I could observe visitors operating the interactives, reading educational text, and engaging in diagnostic tests of hearing, vision, heart rate/blood pressure and others. I could also overhear conversations

that took place between kids and adults, adults and adults, or kids and kids. During this observational phase of the research I was guided by some of the ideas of Gaia Leinhardt and Karen Knutson (2004), who challenge the notion that learning happens at museums because people are simply in the presence of important objects (Leinhardt & Knutson, 2004). Against this “osmotic” (p. 3) perspective, Leinhardt and Knutson (2004) view learning as a participatory process in which person to person communication plays a key role. The emphasis on participation underscores the role of person-to-person communication as a key feature of interactivity.

In my observations of visitors interacting on the floor of TAY, I noticed visitors in groups who summoned one another, issued verbal interventions to enforce behavioral norms, and even complemented or consoled one another during the course of interacting with exhibits. I would like to characterize some of these instances of speech that I noticed and overheard as different types of “rhetorical instances” (Aristotle, 1991). The three “branches” of classical rhetoric are *deliberative* (to exhort or persuade), *judicial* (to accuse or defend) and *epideictic* (to praise or blame). There are speech situations that I noticed among TAY visitors that could be characterized according to these three types of rhetoric. Verbal interchanges of all sorts would take place between adults and children, or between two adults or two children, or in small and larger groups.

The kinds of verbal interactions that I would call *deliberative* are those instances where visitors would collaborate by giving each other orders or instructions about how to operate an exhibit. “Push!” or “Turn!” are the kinds of one-word operating instructions that I heard being exchanged. The kinds of verbal interchange that I would characterize as *judicial* are accusations (mostly from parents or teachers) directed at kids when their behavior got out of control. For

example, on one afternoon when a second grade class was discovering the TAY exhibition a teacher or parent could be heard telling kids to “slow down!” I also noticed how the expression “hey!” was also being directed at kids to draw attention to their behavior. When a group of kids are operating an exhibit at the same time, sometimes adult chaperones would draw attention to the need for sharing. “Let _____ have a turn!” is another kind of verbal intervention that adults would use to try and distribute the interactive experience of an exhibit evenly among a group of kids. Similarly, sometimes a child who was moving too fast through the exhibits would be summoned by name. Summoning, as such, was a kind of verbal interaction that I noticed between adults as well, such as when one person wanted to share an interactive experience or facteme with the person or persons they were with.

I also noticed interchanges where MOSI visitors who were at the museum with others would prompt each other about the answers to questions in quizzes and express congratulations when the answers were correct. “All right!” and “good job!” are the kinds of verbal replies that would be uttered upon answering a question correctly, and “huh!” or “awww” are the sorts of responses that could be heard if a question was wrong. These instances of praise or condolence can be described as an *epideictic* rhetorical situation. By characterizing these verbal exchanges rhetorically, clues are provided for the relational communication that is taking place between visitors.

Characterizing these instances of interaction as rhetorical shows that there are numerous side-conversations going on at the science center, even though none of these “rhetorical instances” are representative of TAY’s broader rhetorical mission (To persuade people to adapt healthy behaviors). Insofar as these characterizations are limited by the observational method, they can be considered as one possible interpretation of communication taking place. One of the

limitations of observational research is that inferences about communication are made solely on the basis of manifest behavior. Surveying and speaking with visitors allowed them to explain communication in their own terms. For this purpose, I conducted my surveys and interviews.

I arranged with MOSI to set up a table at the exit of TAY, and asked visitors leaving the exhibition to complete my survey. A researcher badge was provided to me by MOSI, and MOSI also generously provided me with 25 museum admission/movie tickets. Visitors who consented to be interviewed after completing the survey would receive a free ticket to MOSI, along with a free movie ticket to MOSI's dome IMAX Theater as compensation for their participation. Standing outside of the TAY exit (behind MOSI's third floor glass elevators) I was able to greet visitors just as they were leaving TAY when their impressions of the exhibition were still fresh. I would ask the guests "Hello, do you have time to answer a brief survey about the exhibition you just walked through?" (or something similar). Many guests declined, but the many who did agree to complete the survey provided me with a rich source of data about visitor reactions to the exhibition. This method of selecting respondents is non-probabilistic and can be considered as convenience or opportunistic sampling.

If a visitor agreed to complete the survey, I would direct them to the small table and two chairs that MOSI had let me use. On the table was a stack of blank questionnaires and some ball point pens. The exit survey consisted of seven questions. Each question was an open-ended prompt designed to get visitors to elaborate on their answers beyond simple yes/no responses. The questionnaire was one single sided page, and each question had a blank space underneath it for visitors to write their answers. The questions were:

- 1) What brought you to MOSI today?
- 2) What are some of your thoughts about "The Amazing You"?

- 3) Is there anything in particular you liked about “The Amazing You”?
- 4) Do you think “The Amazing You” might influence guests to make healthier choices?
Give examples.
- 5) Any feedback for MOSI about how to make this exhibit better?
- 6) Is there anything you would like to add?
- 7) Would you like to have a fifteen minute conversation about the exhibit? If you choose to participate you are eligible for a free MOSI pass and IMAX movie!

These survey prompts were designed to elicit answers about the visitor experience that allowed the respondent to define the purpose of their visit. I was seeking responses about visitor likes and dislikes, as well as responses about the behavior modification messages in the exhibition. Notice that I posed this question (4) in the third person. I decided to word the question this way in order for respondents to not feel any invasion of their privacy. If visitors wished to identify as the addressee of these messages, it was up to them to make the connection.

The last question of the survey contains an invitation to be interviewed. Visitors who answered ‘yes’ to this question continued to sit at my table and completed the informed consent form. After that I turned on my audio recording app on my phone, introduced myself and noted the date and time. Then I would begin the open-ended interview with my informant. I would usually use the questions and answers on the survey sheet as prompts to ask questions, giving the informants a chance to elaborate more on their sometimes short answers. Occasionally I would stop to pause the recording and begin a new one, because recordings that were between ten and fifteen minutes were easier to listen to and transcribe once downloaded. Visitors agreed to an approximately fifteen minute interview, but many of the interviews lasted longer (sometimes up to 35 minutes or more) because the conversation was flowing and the visitor did not object to

staying and chatting for additional time. I will describe some of the results of my surveys and interviews with visitors in chapter five. In the next section of this chapter, I will describe my interviews with MOSI executives in some detail because the information that they provide helps to establish the background of the exhibits described in chapters three and four.

Interviewing Wit Ostrenko

Interviewing Wit Ostrenko was a natural place to begin my research about TAY. Wit has been at MOSI for 26 years and his vision for the museum and his enthusiasm for learning about science in a non-traditional setting comes through in everything he says. For a man who commands an operation as big as MOSI, Wit is a soft spoken gentleman with a philosophical style of speaking and a wry smile. I began the interviews by asking Wit to describe his background in the science center business. Wit explained that in the 70s, while he was working on his master's at the University of Miami (studying clam shrimp in the tide pools of cypress swamps), a unique career opportunity came his way. In 1976 Wit was asked to recommend an education director for the Miami Science Museum by a board member. Although the salary was less than what biology post-docs were getting at the time, Wit decided to apply for the job himself.

Wit described his experience as education director as taking thousands of visitors on tours of South Florida: "Car trips, bus trips, boat trips, canoe trips... I even did a jogging tour of the architecture of Coral Gables." As a marathon runner, Wit could run and speak at the same time, as visitors would follow along riding bikes. Wit's recollection of this period of non-traditional learning indicated the opportunities made available by science centers that are not

available to traditional academic lecturers. Wit has a way of emphasizing process as well as content when it comes to learning:

Learning is as much the technique as the subject itself. Sometimes the technique can overshadow the subject and you get people to learn about almost anything if the technique is good enough. That's sort of the general...*joy* of science centers versus the formal system that I had just been through.

In this interview, Wit distinguished between learning about science and actually doing it. His emphasis of the joy of science centers can stand in contrast to discourse about academic learning that describes it in terms of studious drudgery.

Wit explained that in addition to serving as education director of the Miami Science Museum, he also became involved with building HistoryMiami (which was then known as the Historical Museum of Southern Florida) from “a hole in the ground.” The Historical Museum had lent a dug out wooden canoe to the Museum of Science and Industry in Tampa, and as a result of this connection, Wit learned that MOSI was looking for a new president. After the interview process, Wit became director of museums for Hillsborough County in 1988. Wit was in charge of three museums— a small science museum on the Hillsborough River in the Hyde Park neighborhood, an historical archives in the downtown courthouse, and a newer facility on Fowler Avenue across from The University of South Florida. The Hyde Park facility has since become the headquarters of the Tampa Parks Department, and the historical archives have since been moved to the Tampa Bay History Center in downtown. There is also a site on the river located in the Sulpher Springs area of Tampa which is “in limbo” according to Wit, as stakeholders figure out how it can be developed.

During his 26 years of service as MOSI President, Wit has overseen many changes in the MOSI landscape, including the new four story science center facility that was built in 1995 at the Fowler location, where MOSI is located today. An early exhibition focused mainly on Florida natural history and geology, although there was a component about human health that generated some controversy at the time. An interactive called “Dr. Detective” contained information about unprotected sex that could result in unwanted pregnancy or AIDS. Wit explained,

You know, many mothers did not want their sex education told to their daughters in that way. So...we got a lot of community input. We got together a panel of experts in the community. One of the husbands of one of the wives that was complaining about it was on the committee. He was also a board member. And, you know, we came up with a compromise to say, ok, we need to warn people that this subject matter could be sensitive...And the controversy died down.

“Dr. Detective” was an elaborate video interactive with live actors portraying patients and doctors. At certain prompts during the video, the visitor was asked to choose a course of action, and the simulated medical encounter would unfold differently according to the visitor’s choice. The controversy that erupted over this exhibit revealed that the portrayal of human health topics could touch a nerve in the community. In this case, the portrayal of teenage pregnancy as well as unprotected sex was objectionable to some, including one of MOSI’s board members. While this controversy was abated by providing a warning label to users, it was not the last time that MOSI had to deal with controversy with exhibits that represented the human body.

In 2005, MOSI hosted the *Bodies* exhibition. *Bodies* displayed actual dissected human corpses that are preserved from rot by a unique process called polymer preservation or plastination. The bodies in this exhibition are posed doing various activities, each with portions

of their skin and flesh removed to reveal organs and systems pristinely preserved. Wit and other MOSI officials went before Hillsborough County commissioners to request \$2.3 million in funds to procure this controversial exhibition. The exhibit was a blockbuster for MOSI, and hearing Wit speak about this exhibit indicates how TAY came about very much as a response to the popularity of *Bodies*. Wit explains how *Bodies* framed human life, and the ways that TAY was a response to it:

People were just totally mesmerized by just...*looking* at the anatomy of the human body. Had nothing to do...it didn't tell you what *not* to do, it didn't tell you how you grew up...about food, nutrition, exercise, it didn't tell you anything. People are just awed by...another systems approach again.

Science museum exhibits often present the human body as a superordinate system consisting of interlocking sub-systems (the circulatory system, the respiratory system, the digestive system, etc.) This framing approach, true as far as it goes, does not necessarily include information about developmental issues of health, including the role of nutrition and exercise for proper growth and development. MOSI placed a guestbook at the exit of the *Bodies* exhibition, and Wit explained some of the comments and questions that MOSI received from visitors:

The issue was, when that left, we put plans together to say, well, if people like that, our next follow up would be to do a permanent exhibit, and take a totally different approach other than a systems approach. Because, people begged the question well, which one of these are the old people? You can't tell. When a cadaver has been stripped of its skin and the internal organs it's hard to tell age...there were no infants or little people there. There was an embryology section and people were totally fascinated with that.

In this stanza of text, Wit is explaining the genesis of the TAY exhibition, and the temporal approach to life stages which represents a novel framing strategy for human biology in a science center environment. *Bodies* presents the human being objectified, as a sui generis instance of a person with little information about the provenance of the human remains. Wit notes that human remains without skin show few traces of age. Overall, the element of temporality and life stages was missing from the *Bodies* exhibition, a deficit that MOSI tried to address with TAY. Wit explained to me the beginning of the TAY concept:

So we decided to take the approach of the entire human life span. We set up three parameters. One, how does this whole system work?... (Which is not what the *Bodies* exhibit was about. But in there you got to see, you know, what the body does contain.) Two, how do you maintain that system in the best working order as possible? (the *chance* of genetics; nutrition; exercise; staying away from toxic materials...) The third area was, how do you detect things early while they are going on? You are supposed to go to the doctor and get an annual checkup.

In this stanza of text from our interview, Wit explains three explanatory parameters that were considered in the TAY exhibition. The *Bodies* exhibition did contain numerous examples of explanatory text that noted, to some extent, how these interlocking systems of human anatomy made a person live and thrive. The diseased lungs, the product of a lifetime of smoking, stand out as an exhibit that elicited numerous comments from visitors about behavioral choices that affect health. Yet arguably, the plastinated, posed bodies (the centerpieces of the exhibition) were primarily a visual or aesthetic medium, rather than a form of persuasion to stay healthy (Leiboff, 2005; Levy Guyer, 2007; Moore, 2007). Wit argues that the function of bodily systems was “not

what the *Bodies* exhibit was about.” In addition, Wit imagined a new exhibition that would focus on human behaviors that are implicated in health problems.

Wit notes the importance nutrition, exercise, staying away from toxic materials, as well as doctor visits as a way of screening for diseases before they get to be too big of a problem. Each of these are points of intervention which hail the individual patient into action as the primary agentic force of wellness (within a ratio of determining factors like genetics). Behavioral health interventions such as diet and exercise have been the focus of a “new” public health approach that emphasizes the role that individual volition plays in staying healthy (Baum, 2008; Lupton, 1995; Tulchinsky & Varavikova, 2009; WHO, 1989). Behavioral medicine is a relatively new discipline that emphasizes the agency of the patient and their responsibility to maintain their own health. Behavioral medicine has been described as:

...promoting a philosophy of health that stresses individual responsibility in the application of behavioral and bio-medical science, knowledge and techniques to the maintenance of health and the prevention of illness and dysfunction by a variety of self-initiated individual or shared activities (Matarazzo, 1980).

Health communication plays a strong role in behavioral medicine because the latter is largely concerned with persuading patients into taking an active role in modifying their behaviors in order to positively influence their own health outcomes. For a branch of medicine that emphasizes individual will and self-initiation, behavioral medicine is often in the business of issuing orders—orders to complete a course of antibiotics or orders to regulate cholesterol or blood pressure using medication. Yet often these orders are non-pharmaceutical, in that they instruct patients to care for themselves outside of medical settings. These forms of injunctions are to exercise, avoid salty and processed foods, and quit smoking. This category of injunctions

can be classified as both proactive as well as reactive. Exercise regimens and dietary changes can be prescribed to patients who show up in emergency rooms suffering from heart pains, diabetes or cancer. Yet eating right, exercising, and a healthy diet are also prescriptions to *avoid* the kinds of diseases that result from lifestyle.

From the beginning of its conception, Wit describes TAY as an exhibition with an implicit focus on behavioral medicine. Wit's interest in being an active participant in one's own health is hardly academic. After explaining the conception of TAY, Wit provided a narrative about his own health problems that gave him a lifetime appreciation of preventative medicine. Wit's heart attack, which I described in more detail in the introductory chapter, made him into a strong advocate for medical screening procedures, many of which are showcased at exhibits in TAY. Wit explained:

So that's why...one of the reasons why we did this exhibit. So you can learn that you have to take charge of your own health and you have to keep asking questions, you know. Why didn't I ask the question, are my coronary arteries blocked? Or unblocked? But they won't...insurance companies won't pay for it.

Sharing this story, Wit revealed to me that one of the impetuses for the TAY exhibition came from his own close call. It is significant that Wit did not really fit the profile for being a heart attack victim. He was and still is quite trim and is an accomplished runner. Even though he made periodic trips to the doctor and even received a stress test, his blockages went undiagnosed until his heart attack prompted a CAT scan. Wit's example is one instance of how risk profiles which are calculated on the basis of behavior are only statistical inferences based on populations which can sometime miss individual outliers who don't fit the profile.

One of the most revealing moments of my interview with Wit was when he uttered the last line: “insurance companies won’t pay for it.” This quote says a lot about TAY that goes unmentioned in the exhibit itself. It is important for patients to take initiative in their health and avail themselves of the most advanced detection technologies possible, but the cost of some of these technologies can be prohibitive. In Wit’s case, getting a CAT scan before his life threatening heart attack would have revealed that his arteries were blocked. But because these procedures are often not covered by insurance companies, a cardiologist may simply not recommend them. TAY is emblazoned with the logos of Blue Cross and Met Life, two brand name insurance companies that provided substantial funding for the exhibition. In the chapters about TAY’s content areas there are several exhibits described that focus on screening technologies for illnesses such as coronary artery disease, some forms of cancer and even Alzheimers. However, there is no information about the costs, copays, and deductibles of these screenings under the major sponsor’s health plans.

Wit’s passion about medical screenings is something that was realized in TAY (in exhibits such as “Thank God I Caught It Early”) but for some visitors these screenings may carry an unstated message to ‘look, but don’t touch’ because their insurance plans won’t cover them fully or at all. In the case of expensive procedures that are not covered by health insurance, the ratio of patient agency to determinism becomes recalculated. Patients with the strongest of intentions to take charge of their own health often encounter a major obstacle in the form of prohibitive cost. These, and other social determinants of health have a huge impact on morbidity and mortality, as poorer people consistently get sicker and die earlier than the more well-heeled (Farmer, 2003; Krieger, 2005; Wilkinson, 1996).

Interviewing Dave Conley

Dave Conley was the “lead designer” for TAY. His many years of service at MOSI sadly came to an end in 2013 when he was laid off due to budgetary constraints (personal communication, 10/17/13). Dave met with me several times during the fall of 2012 to discuss TAY and explain to me the many aspects of constructing a museum exhibition, from concept, to mock-up, to research, to contracting third party experts and vendors. This section is a summary of the highlights of three different interviews. Dave met with me in his office behind the “Kids In Charge” exhibition at MOSI. He also met me in the lobby of MOSI and together we walked through TAY as I asked questions.

Dave began his career at the Calgary Centennial Planetarium (later to become the Calgary Science Center, and now Telus Spark). He started in 1972 as a technician designing and building devices for the planetarium shows, and as he gained expertise his career moved towards immersive exhibit design and fabrication, working his way up to Manager of Exhibits. Dave was hired in 1993 by The Cumberland Science Museum (now Adventure Discovery Center) in Nashville as VP of Exhibits, where he managed a team of designers, graphic artists, and fabricators to design and install new exhibit experiences. In 1999 he came to MOSI as Director of Exhibits, and was soon promoted to Vice President of Exhibits. Dave was in charge of revisions to existing exhibits as well as the design and implementation of new exhibits throughout MOSI, most notably *Disasterville* and TAY. Dave is a kind, conversational person with whom I engaged in dialogues that went beyond the traditional question/response sequence of interviews as they are commonly conceived. One of my first questions to Dave was about the concept and purpose of TAY. Here is his answer:

Well, when we first started designing TAY we wanted to make a difference in people's lives. We wanted people to understand what it meant to keep themselves healthy and well. And when we got into it, we found that the typical...system approach that you see in text books and...other science centers is the digestive system, the cardiology system...the sorta 'how the body works'...doesn't necessarily keep people healthy. It's more about attitudes...about wanting to be healthy...about making wise choices for wellness and some of the things that are available to you to make wise choices. So we definitely have broken new ground here on the way we designed TAY, orienting it into a life stage approach, from the beginning of life to the end of life...and healthy choices that you make throughout life.

Here Dave reiterates the novel temporal approach of TAY that sets it apart from other science center exhibits. The approach to life stages, as well as the focus on choices, are themes that are also noticeable in the interview transcripts with Wit and Judith. Consistent with ideas from behavioral medicine, Dave argues that TAY "breaks new ground" in emphasizing the role of individual choices throughout the life cycle.

In addition to attention to aesthetics and layout, a considerable part of the design process involved consulting with experts from the medical community to source facts. Dave explained that designers had to be able to adapt complex medical information into a non-technical prose:

Of course all of the text panels that go into these exhibits all have to be researched. We met with experts all over the place. We would sit with them for hours, getting what they think is the quintessential message that the public needs to know about their specialty...and we would synthesize it down into very short paragraphs. We know that

the public is not going to spend much time reading any one exhibit, so we've got to get down to the quintessential paragraph.

One of the ways that Dave and the MOSI designers made sure that the short “stanzas” or paragraphs on the text panels effectively summarized the key messages from experts was to present information at a 5th grade reading level:

We have to be very careful about how we write things to make sure its comprehensible to the average person. Generally speaking we write to the 5th grade level. Because that's something that we find that is approachable for adults. And we try to keep things as short and concise as possible...make sure we're saying exactly what we wanna say without a lot of frivolous information. But we also want to make sure that we have enough. We want to handle it with enough depth that somebody who does take the time to read can walk away and say, 'that was very interesting to read.'

Walking a fine line between presenting information that is useful yet not too complicated is something that varies in each exhibit. Some of the visitors that I interviewed felt that the exhibition was mostly geared towards children, while others argued that the subject matter presented was often over children's heads. Dave explained that the goal of the explanatory text was to appeal to all age groups, yet was written at a 5th grade level which adults as well as kids find approachable.

I was curious about best practices in museum exhibit design that tailor each exhibit to a target audience. In the case of TAY, the “you” that is addressed in the title of the exhibition hails a large swath of demographic groups, including children, grown ups, and the elderly. I asked Dave “Do they have that down to a science as far as how to attract guests to a certain exhibit?”

Dave's reply indicated that the process of tailoring exhibits to visitors was more of an art than a science:

It is certainly not a science. There are a lot of concepts that are known in the exhibit design business—just like they are in the interior design business and in the architecture business—that you get to know a little bit about what people look for in certain things in the exhibit world. We know that if we're making this for a young child we make things very animated, cartoony, bright colors. Young children's books exemplify that. So, yes, the look of it, the coloration, can appeal to certain genders, certain age groups. Because MOSI tries to be all things to all people.

In this statement, Dave notes that there are specific ways to make exhibits appeal to kids, but because MOSI “tries to be all things to all people” TAY was intended as an exclusively kid-focused exhibition. As far as appealing to multiple audiences, Dave mentioned another approach that exhibit designers use about different learning styles:

Further along those lines of trying to address multiple audiences, we know that there are various learning styles. Some people are visual learners, and some people like to read text and absorb the information by reading the paragraph. Other people just want to get in there and see things, and they want to watch a video where all that information is spoon-fed to them by the narrator on the video. There are hands-on people. There are people that stand back and watch others do it. So, there's a lot of different learning styles. TAY is a great example of involving many learning styles throughout the exhibition.

Hymes (1974) concept of “instrumentalities” fits with Dave's description of how some people are attuned to different communication channels. TAY has rich visuals, detailed text and plenty

of buttons to push and knobs to turn. Dave and the MOSI design staff tried to appeal to a broad audience with different learning styles.

Dave provided me with an interesting perspective on how designers can help to “frame” exhibits. A visitor’s reaction to any particular exhibit is partially determined by what expectations are set up by the designers. A placard with text warning visitors that visuals may be “upsetting” may determine an upsetting experience, or it may help to prepare the visitor for one possible outcome of the experience, lessening the impact. Another way that exhibits can be framed is by parents explaining it to their children. During the walk-through of TAY, Dave explained this while we were standing at the exhibit which shows a live birth:

We find it so important for the adult to frame it properly for the children. If you have an adult that goes “Oh my god! Oh my god this is terrible! My kid should never see this sort of stuff!” ... Well, they get the child all alarmed. But if you have an adult who says “Well look at this. This is interesting, see? This is how it happens. This is real life. This is how the baby is born.” it frames it all properly for the child and it makes a much better learning experience...and a much better ...wholesome family experience.

Dave’s view of the framing process shows that frames can be flexible and mutable (Steier, 2005), meaning that the exhibits can be experienced differently depending on the ways that expectations are set up discursively. In this example, Dave explained to me the importance of interpersonal communication at TAY, especially between parents and kids. Before, during or after watching the birth video, an adult can help to frame the experience their child either in the direction of alarm or in the direction of a wholesome learning experience.

Later I asked Dave to expand more on the framing concept, which he explained it in terms of perspective. Dave used the example of Copernicus arguing that the sun doesn’t revolve

around the earth. Given our everyday perspective it may appear like the sun is circling the earth, but Copernicus explained that this appearance was an artifact of our limited everyday perspective. Dave explains:

I think that one of the things about going through TAY is that it helps you to frame things or put things in perspective where you look at it from a different point of view, or it adds to your knowledge base and allows you to think more comprehensively about something.

Dave's explanation of framing as a matter of perspective helped me to consider just what was included (and what wasn't) in the hundreds of exhibits that are found on the floor of TAY. This led to my next question, which had to do with the editorial slant of the exhibition's funders. Did the perspective of the underwriters influence the frame? In addition to Florida Blue and Met Life, there are many sponsors who have their logos at the top of each exhibit, including hospitals, group practices in oncology, cardiology and optometry, as well as device manufacturers and others. I asked Dave how much input these sponsors had in the design process. Dave explained:

Actually very little. They were proud sponsors of the ideas we came up with ...there are a couple of exhibits that Florida Blue had some closer interest in and we worked with them on, but generally speaking we had a lot of latitude to work within our own design criteria.

In his answer, Dave maintained that there was only minimal input from sponsors about what should be in the exhibits. Dave's assertion that sponsors had very little influence on the exhibits was not an entirely satisfactory answer for me, because many of the experts who were consulted were drawn from medical practices, and these experts provided approach to health care interventions from the point of view of their own medical specialties.

My interviews with Dave made me realize that framing was a going concern for MOSI when they undertook to create TAY. Dave noted that TAY places "you," the visitor, first and

foremost, and each exhibit about human anatomy is designed to provide *actionable* information that can be used to live a long and healthy life. As such, each exhibit at TAY issues a challenge. It is not so much about learning biology for biology's sake. Instead, the visitor becomes the addressee who has an opportunity to take away vital information about staying healthy. This visitor centered approach is evident in the blueprints of TAY, which will be described in the next section of this chapter.

Archival Research: The TAY Design Development Document

Ian Hodder asserts that records, documents and archival materials are a form of “mute” evidence that do not “speak back” to the researcher (Hodder, 1994). When I was researching TAY, I had access to a spreadsheet with prototypes of the exhibition. I don't consider this document to be entirely “mute” because it ‘told me’ plenty of information about the design process of TAY. Also, any questions that arose about it could be answered by Dave Conley. This electronic spreadsheet is called the TAY “Design Development;” it is an MS Excel file with descriptions of 307 different exhibits that served as the prototype for builders for the exhibition. The Design Development document was compiled by ADM Two Exhibits & Displays, Inc., a Tampa based full-service exhibit contractor that designs and fabricates tradeshow displays and museum exhibits, along with MOSI design staff. ADM is also the company that installed the exhibits.

Each page on the Design Development spreadsheet consists of the title of the exhibit, an illustration showing a mock-up of what the exhibit will look like, as well as the text of the exhibit and other notes about funding, design, expert advisors, sourcing, and fabrication. The title sheet notes that this document refers to “phase two” of the exhibit, which covers “young adult,

middle adult, older adult” and “end of life” content areas of TAY (note that phase one of the Design Development document, covering pregnancy, childhood, and adolescence was not made available to me). The second page of this, the “phase two” spreadsheet, lists “General Considerations” for the TAY exhibition. According to this page, the text of the exhibits will be “reviewed by our appropriate science advisor” and will be proofed before translation and printing. The titles for TAY are in English, but the instructional text is in English and Spanish. According to the “General” page, all exhibits are to be wheelchair accessible and all audio should be captioned for the hearing impaired. This page also notes that LED lighting throughout phase two will be brighter than it is in the pregnancy and childhood portions of the exhibition (a noticeably darker area.)

The third page of the Design Development document contains the floor plan, a mock up of the exhibition that turned out somewhat differently after it was implemented. The fourth page of the spreadsheet is entitled “Title Sheet” and consists of a list of 307 different exhibits that make up the phase two portion of TAY. Some of the exhibits on this page did not make it into the final exhibition. For example an exhibit that was to be called “The Ins and Outs of Air” (#413) contains an empty page on the spreadsheet. Text on this page reads “Remove from list. No sponsor and not one of the original concepts. 5/14/09.” While “The Ins and Outs of Air” did not make it into the exhibition, there is another exhibit in TAY that deals with air quality, called “How Clean is Your Air?”

Other exhibits slated to appear in the exhibition that are listed in the “Title Sheet” of the Design Development document also did not make the cut. A mental illness simulator (#404) where a visitor could “See the world through the eyes of someone who suffers from schizophrenia and paranoia” is nowhere to be found in the final product of TAY as it appears on

the floor of MOSI. In its place there is a much scaled down mental illness exhibit that has reproductions of art works by Edvard Munch and Vincent Van Goth. On the “Budget” page of the Design Development spreadsheet, the “Mental Illness Simulator” had a cost of \$13,800. Videos that simulated schizophrenia were going to be provided by Janssen Pharmaceuticals. As a result of budget shortfalls in phase two implementation of TAY, this and some of the other more elaborate exhibits needed to be scaled down. A collection of plastinated organs (that would follow up on the popularity of the *Bodies* exhibition) had estimated costs totalling \$16,800. An exhibit called “Ethics Forum” was also deleted for reasons of “Low priority with limited funding.” Unexpected shortfalls with funding TAY meant that the exhibit designers ended up having to do more with less. A footnote that appears underneath the itemized list of costs on the “Budget” is particularly telling in helping to understand the budgetary constraints that MOSI was working with:

Exhibit list is from original concept document. There are insufficient current funds to build all as designed (\$1.35 million budget compared to \$842,000 currently available). Certain exhibits (those with \$0 Current Budget) will be delayed until funding becomes available (TAY Design Development Document, budget page).

This footnote explains that MOSI was working with a budget that was significantly smaller than what they had originally projected. The “Budget” page of the Design Development document shows that TAY was a vision whose realization depended largely on cost. The “Budget” page has three columns, one for “current funds,” one for “contingent pledges” and one for “contingent funding and IK.” The initials “IK” refer to “In Kind” funds, meaning forms of funding that is provided in goods and services as opposed to cash.

Aside from these examples of deleted exhibits, the Design Development document contains mock-ups for hundreds of exhibits that were included in the final exhibition. Many of the individual pages in the document show a close correspondance between the mock ups and the exhibits that were built. The remaining pages in the Design Development document contain mock-ups for all the phase two exhibits, from pages #401 to #709. Each page has subheadings that explain the features of the exhibit. Underneath each subheading there is usually a brief stanza of text. These subheadings include:

- Educational Objective (what the exhibit is going to explain.)
- The Guest Experience (what, in particular the visitor is going to do at the exhibit.)
- Interpretive Considerations (underneath this subheading there is usually a description of the graphics used in the exhibit, along with the text to be included in the “instructional signage.”)
- Equipment (The hardware of the exhibit, including lighting, computer monitors and interactive features like a rollerball mouse and button to click).
- Special Considerations/ Prototyping /Research Needed to Be Done (under this subheading there is text explaining what the computer programmer needs to do in order to construct the interactive.)
- Outside Resources Needed (This the type of fabricator that needs to be contracted, often a flash programmer with computer graphics skills.)
- References (This subheading lists research that needs to be done. For example, “Life Mosaic” contains the instructions “Research how people around the world spend their days.”)

- Budget (Here is a itemized list of the materials and services required, and an estimation of their costs. There are line items for Wall/Structure, Electronics, Mechanicals, Software/Programming and Graphics.)

These subheadings are included on each page of the Design Development document exhibits. A template appears as one of the last pages in the spreadsheet which was used for each exhibit.

In conclusion, having a copy of the TAY Design Development document was an important dataset for the analysis of this exhibition, especially for understanding the “act sequence” and “instrumentalities” (Hymes, 1974) of exhibit design. The Design Development document often included the text of each exhibit, which I could consult to confirm the results of my extensive photographic and video records. In some cases, the Design Development document also included scripts that were part of the audio-visual components of the exhibit, as well as questions and answers that were used in interactive quizzes found throughout TAY. The artist renditions of exhibits were interesting to compare with the exhibit as they finally appeared on the floor of MOSI. Some of these illustrations look like they were done on a poster board in ink and then photographed. Here, for example is a designer’s mock-up for the TAY Cardiology exhibit (p. 502):



In addition to having access to the prototypes of TAY, I had an informative interview with Judith Lombana (MOSI Vice President of Research, Grants and Government Relations) who provided me with more insight into issues of funding and evaluation for TAY.

Figure 2: The Amazing You Cardiology exhibit mock-up from Design Development document

Interviewing Judith Lombana

As MOSI VP of research, grants and government relations, Judith is a key player at MOSI with a lot of insight into the “behind the scenes” processes of science centers. Judith met with me for almost two hours in her office next door to Dave’s in January 2013. Judith is a woman who projects confidence and strong belief in the MOSI mission. She did her dissertation about using various instruments to evaluate the implementation of science education programs, receiving a doctorate at USF in 1983. Before coming to MOSI in 2002 she worked for the Hillsborough County school district to coordinate efforts to secure grants, education and evaluation programs. While Judith preferred not to share her grant proposals, a search on the federal Institute of Library and Museum Services (IMLS) awarded grant proposals revealed that MOSI has received hundreds of thousands of dollars in competitive grants and awards since her time at MOSI from this single funding source.

In 2008 MOSI came up with the plans to build TAY, which initially had a budget of \$4 million but ended up with roughly half of that. Judith explained that funding came from MetLife, Florida Blue, Florida Hospitals, the Florida Department of State Cultural Affairs, as well as “tons” of smaller grants. One of my first questions about TAY was about the purpose and concept of TAY. Judith explained:

We’re not a collections museum—we are a hands-on, experiential museum. One of the things we do very, very well is take very complex issues and spend great lengths to determine how best to share that information with the public. It’s very complicated... We wanted to do a health exhibition, but there are a lot of them out there, and a lot of them just go with the different parts of the body, so you walk through the heart and the eye, and all that stuff. But it didn’t go far enough for what we wanted to do.

In this quote, Judith describes the genesis of TAY in similar terms as did MOSI's other two chief executives. Designing an exhibition that was different was clearly a concern for MOSI from the beginning:

We spent probably the first year-and-a-half not only gathering information from our advisory committee, but also really exploring how in the heck we were going to create this exhibition so that it was different and unique, but talk about the things that were personal—things sometimes people don't want to talk about, and things people *need* to talk about—and information we need to share, to keep the public healthy.

In this passage, Judith explains the focus on wellness that set TAY apart from other human body exhibitions. Presenting human life in the form of stages places an onus of responsibility on the visitor who is being instructed throughout about good and bad health behaviors:

You're moving through the stages of life, learning about the consequences of not doing stuff here, early on, and then later on in life you're going to reap the benefits of what you did that wasn't exactly the most healthy thing.

Because of the focus on instructive information about how to stay healthy, TAY was becoming an exhibit that was emerging from my interviews with MOSI executives as a rhetorical (and not just informative) exhibition. This led me to ask more questions about the evaluation process, which is Judith's specialty. Does TAY influence visitors to adopt healthy lifestyles?

Well, we pretty much think it does, because we've had a LOT of comments from guests about different parts of it, especially the smoking part, because the guy takes his whole face off—that prosthesis piece.

Judith is here speaking about the video of Harry Nyce, who lost much of his own face due to chronic smoking. This exhibit was often cited by the visitors that I surveyed and interviewed as

one of the most memorable and persuasive pieces in the entire TAY exhibition. In addition to citing this exhibit, Judith went on to note the success of other health promotion campaigns. Judith stressed that, in order to be effective, these kinds of campaigns should be ongoing and continuous.

I think that the wellness message just has to be a continuous, continuous thing. You know, in the early 90s, there was a huge media campaign that occurred on TV as well as everywhere, (papers), about the dangers of using drugs and what happens when your brain is exposed to drug. We saw a dramatic drop in drug use in adolescents at that time. Judith explained that, while this particular campaign was successful, the funding ran out, and now “we’re seeing a very different picture.”

I asked Judith to tell me about what kinds of evaluation instruments could collect data that would provide an evidence base to assert claims about exhibits influencing visitor behaviors. Judith explained:

Well, we have a variety of ways we measure feedback. We had an IMLS grant from the Feds in 2009 [and with] that we installed a variety of technologies in TAY to help people understand a variety of things related to health. And we did an extensive evaluation about that and how people responded to those particular technologies. It was a combination of interviews, surveys and observations.

Here Judith mentioned an evaluation that was conducted in 2009 by Bruce Hall, Ed.D. and Wendy Dickinson, Ph.D. entitled “Investigating the Amazing You Through Technologies: An Evaluation of IMLS-Sponsored Exhibits in MOSI’s The Amazing You Exhibition” (Hall & Dickinson, 2010). This 127 page evaluation (which was helpfully provided to me by Judith in a follow up email) describes eight “integrated technology” exhibits which were supported by a

federal grant from IMLS (award #MA-04-08-0156-08) entitled “Investigating *The Amazing You* Through Technologies (IAYTT). Excerpts from this evaluation will mentioned in chapter five and compared with responses which I collected from TAY visitors.

Judith also explained more about the process of working with medical experts to design the best persuasive messages for TAY:

We had 156 consultants that were part of our advisory team that we spent two years talking with, visiting their offices, sharing their research, and meeting. It was huge. We had people in ALL fields, including yoga, alternative medicines, health and wellness, mental health—just everything, because we deal with all those issues throughout the exhibition.

The description of a complex interplay of voices that existed between MOSI stakeholders, subject matter experts, corporate sponsors and evaluators helped to expand my impression of communication at TAY as something that was multi-vocal, multi-directional and reciprocal. Bakhtin (1986) writes about the “fiction” of the active speaker and the passive listener (p. 69). Judith reveals the complex conversational process of consulting with medical experts in a way which complicates the impression that TAY “speaks” from a unified voice. In this passage of the interview transcript, Judith stressed that the range of experts who were consulted included alternative medicine practitioners, yoga instructors, and other kinds of “non-pharmaceutical” interventionists who promote health and wellness outside of a strictly medical context. This suggests a holistic approach to human health that (according to some reactions which I will relate in the conclusion from TAY visitors) is less evident in the finished product of TAY—an exhibition which is sometimes perceived as being mostly focused on disease processes with a biomedical and clinical slant.

Judith also noted the role that science centers can play when it comes to talking about uncomfortable topics such as sex education with youngsters.

The schools actually depend on MOSI to share the messages that are uncomfortable for them to share. When families come through, and they go to those sections, they can talk about that in real practical terms with their kids. And since it's there, it makes it a little bit easier to talk about it...But they kind of leave that unspoken stuff to the science centers.

Science centers are very good at talking about things that the public doesn't talk about. In this quote, Judith explains that science centers can bring up topics that are so sensitive that even families or schools would rather not talk about. This can be viewed as a reframing of discourse from private to public.

In links and documents that Judith provided after our interview, I was able to learn more about some of the approaches to learning in her research. With her colleagues Ash and Alcala, Judith has published research about “scaffolding” which is related to Vygotsky’s theory of “zone of proximal development” (Ash, et al., 2012). “Zone of proximal development” or “zpd” describes experiential learning that takes place between students and mentors. The zpd is an intermediate stage of learning where a student cannot conduct a task or solve a problem on their own, but can do it with the help of a teacher or capable peer. The term “scaffolding” is a metaphor borrowed from construction that refers to the coaching, guidance and modeling necessary for students in the zpd to learn how to complete a task on their own. In the conclusion of this dissertation, I will speculate about how some of Judith’s research about zpd may be constructively applied to TAY in order to enhance the visitor experience.

Sometimes the impetus to educate and persuade others about healthy behaviors can come from a personal experience, such as Wit’s heart attack which made him into a strong advocate of

cardiovascular screenings. I was curious if Judith may have been willing to share any similar personal experiences in her own health care. Judith replied that she did have some stories that were related, for example back problems which for her began as an excruciating pain in her foot.

When we got *Bodies* in... they had one guy who was standing—the whole back spine had been dissected, so you could look at where it came out of the back and how it hit the sciatic nerve, and where that all went down into your foot. Well, it occurred to me, after looking at that and then doing studies, that the problem was not my foot: it was my back, although the pain was being manifested in my heel.

Judith explained that as her back conditioned worsened, she continued to research the sciatic nerve on the “Surgery on Demand” interactive database at TAY. She finally found a good neurosurgeon (through contacts she had made while sourcing the expert consultants for the exhibition) and obtained a procedure that that helped to ease her back pain.

But I wouldn't have thought about those technologies had I not been able to go through TAY and look at all the different kinds of things that they can do for hand reconstruction and all that stuff.

Judith also brought her sister (who had to have both knees replaced) to “Surgery on Demand” where they were able to find out more about the procedure that was being done. She also explained that TAY was helpful to her when her husband was undergoing heart surgery. “I mean, really, it has been a tremendous resource for me, personally.” she stated. Consulting the exhibits, in addition to obtaining expert contacts at nearby medical offices, has been an empowering journey towards greater clarity and improved health for this MOSI executive.

To summarize my interviews with the three executives at MOSI, each of the executives suggested that TAY was an exhibition that stood out from others that portrayed human anatomy.

The difference can be described as TAY having a unified theme and purpose, the exhibition being designed around stages of life and specific medical issues that arise during each stage. In addition, an emphasis on the personal related to the ways that TAY addresses each visitor as a particular kind of risk candidate who can obtain health advice to the extent in which they identify with the presentation of a risk profile. It was during these interviews that I began to conceptualize the exhibits as *descriptive*, *diagnostic*, *entertaining* and *prescriptive* in various combinations. These descriptions can be considered as flexible and mutable frames for understanding the “ends” of each exhibit.

Introducing the TAY Visitors

Because of the sheer volume of transcripts from my interviews with visitors, I have elected not to summarize each interview in detail. Instead, I have inserted selected comments about TAY into chapters covering the exhibitions content areas and in chapter five. The short descriptive paragraphs that follow are included to introduce these participants as recurring commentators in this narrative.

MOSI members Alannah and Chris are parents who were visiting MOSI with their eighteen year old son Mark (a USF student who volunteers at the Tampa Aquarium) as well as a sixteen year old daughter. In addition to being a mom, Alannah owns an agency that works in the area of health care. She has an M.A. in nutritional biochemistry, and a B.A. in psychology. Marc works as an environmental chemist at a small company, specializing in “macset” analysis of pollution monitoring. Alannah and Chris provided me with a lot of feedback about the functionality of some of the exhibits at MOSI as well as some criticisms of the “Stem Cell Story” exhibit.

A young married couple named Cecilia and Dominic met on Florida's west coast where they used to go to the Fort Lauderdale Museum of Discovery and Science. Cecilia works at the MacDill Air Force base in Central Command or "Cent-com" and Dominic works for a phone installation company in Pinellas County. These visitors were frequent attendees at other science centers and theme parks, and they had some extensive criticisms of TAY. Because of their positionality (Cecilia is a New Yorker of Jamaican and Puerto Rican descent and Dominic is Peruvian) this couple was especially sensitive to the representation of Latinos at the "Healthywood Squares" exhibit.

A young married couple who I will call Kent and Haley were visiting MOSI from Lakeland, Florida when I had the chance to interview them about TAY. Kent received a B.A. in English from University of Florida, and Haley was completing a Psychology B.A. at USF Lakeland. These young parents had left their two year old daughter with Grandma so that they could spend the afternoon visiting MOSI. These visitors had some suggestions about layout and noise at TAY (which will be included in the conclusion) along with an interesting relational experience at the "Mindball" exhibit.

Alexis and Bruce were visiting TAY with their two girls, ages eight and eleven. Bruce is a professor at a small college for undergraduates in South Florida. Before becoming a mom Alexis was a writer and at one time did public relations for the Harvard Medical School. This family was quite engaged by TAY as well as being strong advocates of exercising and eating local and organic food. These visitors were living the dream of a healthy lifestyle in an effort to avoid some of the serious health problems that are covered in TAY. Bruce described this as the difference between a "proactive" and "reactive" approach to health. In a proactive approach, preventative medicine is the key. Proactive interventions are often "non-pharmaceutical" in that

they involve efforts in exercising and nutrition—forms of intervention that take place outside of a medical context. Bruce and Alexis offered many comments both positive and critical.

Kay and Ronald are parents and MOSI members who have a strong interest in alternative medicine. Ronald works as an x-ray technician in a hospital and Kay takes care of two young children. Kay and Ronald were given a MOSI membership as a present from his parents, because they prefer to not get material objects as gifts in order to simplify their life. In the course of our interview, Kay and Ronald mentioned acupuncture and herbal remedies as just a couple of the alternative medicines that they use. Like Bruce and Alexis, above, both Kay and Ronald felt that there was an overemphasis on reactive medical procedures used to treat diseases and not enough emphasis on proactive ways to avoid invasive and risky medical procedures. One of the first issues that Kay had with TAY was the biomedical focus in the Beginning of Life section of the exhibit. Kay is experienced with home birth and notes that many women choose to have a child at home instead of in a hospital.

Paula brought her mom Betty to MOSI on one weekend afternoon in February. When they left TAY I got them to complete my survey, and then they stayed on to talk for over a half an hour to share their thoughts in more detail. Since it was Betty's birthday Paula invited her mom to come over from Titusville, FL for a visit. After Paula shared some specific feedback about the "Infant Roulette" exhibit and Fetal Alcohol Syndrome, I asked if she was in the medical profession. It turns out that she had worked for the Children's Board of Hillsborough County as a health educator, so she had some professional insight into health messaging. Paula is a smoking cessation specialist who works with physicians in Hillsborough County. Paula spoke about her job as a smoking cessation specialist, and the tendency of her clients to minimize the amount they smoked. She also had some interesting things to say about the "Cybernetic Human"

exhibit at TAY. Betty, an accountant, did not speak very much during our interview but she stayed engaged in the discussion the whole time.

A young woman I will call Ruby was visiting MOSI one afternoon with her boyfriend Joe. As the interview was in progress I noticed Ruby's braces, slurred speech, and elliptical style of speaking. It came to be revealed to me that Ruby had been in a motorcycle accident a couple of months ago in which she sustained major injuries. During three weeks in ICU at St. Joseph's hospital, Ruby's medical staff used titanium and extensive reconstructive surgery to reassemble her face, which she had landed on. Joe didn't speak much, but he sat at the table and listened to Ruby with a concerned expression. While Joe was not very talkative, he did make some important observations about the tone or "key" of some of the exhibits.

There are other visitors I interviewed whose comments are included in the forthcoming chapters, such as Jamela, who was visiting TAY with her 11 year old daughter, and Doug, Karen, and John, three young adult pals who worked for an air-conditioning company. I wish that there was more space to introduce all of the people I interviewed at TAY. Their comments and feedback were very important for bringing this research beyond simply a "textual analysis" of the exhibits at TAY. I found that visitors to TAY were often eager to share their opinions about the exhibit, including things that they liked as well as suggestions for improvement. In chapter five I will select and summarize their comments, both positive and negative.

I began this chapter by distinguishing ethnographic interviewing as a methodology that enables a co-creative process between the researcher and the informant. I then described the interview process in two stages, starting with MOSI executives and then moving to interviews that I had with volunteers and visitors to TAY. I also modeled my research on a simple circular diagram which posited that this dissertation may serve as a form of feedback to MOSI

stakeholders, completing the arc of the circle. Next, I described my background experience at MOSI and the process of observation, documentation, surveys and interviews. Then I provided descriptive summaries of interviews with three MOSI executives, Wit Ostrenko, Dave Conley and Judith Lombana, where I introduced background information about TAY exhibition, including its origin, design, funding, and the multi-vocal and collaborative process of message design. Finally, I introduced some of the MOSI visitors who were interviewed for this research, whose comments will appear in the chapters that follow.

In the two content area chapters that follow I have divided the exhibition in half. Chapter three covers the life stages from conception to adolescence, and chapter four covers adulthood to end of life. This sequential retelling of the exhibits had to go through a severe editorial process of elimination when the page count became too voluminous. When it came to editing it down, I had to eliminate summaries of many exhibits and instead focus on the ones that were rooted in the persuasive mission of TAY, as well as those mentioned most frequently by my informants. In these descriptive chapters I also focus on subtleties of each message, and where it is appropriate I consult academic literature to reveal how health messages are emergent, historically delimited, and sometimes contested.

CHAPTER THREE: BEGINNING OF LIFE TO ADOLESCENCE

This chapter is a detailed description of highlights from TAY's first three life phases. In order to describe the content of messages I have sometimes consulted academic literature as a way of researching the background medical discourses which informed the design process of exhibits. In order to describe the communication environment at TAY I have also included selected comments from visitors who I interviewed and surveyed. I will begin by describing the visitors' experience as they enter the exhibition hall, and then describe the first portion of the exhibition, called "Beginning of Life." Later I will describe the "Childhood" and "Adolescence" content areas that follow. Subheadings will indicate a new exhibit or group of exhibits.

Beginning of Life

Climbing the stairs from the second floor of MOSI, visitors first come upon *The Amazing You* exhibition (TAY). A series of nine 6 x 4 foot panel dividers signify the exhibit as marked off from the rest of MOSI. This type of modular paneling is used throughout the exhibition as the main informational frontispiece for each exhibit. Colored panels (without text or photos) are arranged to create a pathway through each stage of life. Each life stage has its own color scheme: "Beginning of Life" (red), "Childhood" (blue) "Adolescence" (green), "Young Adulthood" (teal), "Adulthood" (yellow), "Older Adult" (orange) and "End of Life" (grey). Each of these

content areas contains between ten and twenty exhibits that usually (but not always) pertain to that life stage.

Within a white cutout outline of what appears to be kids jumping with hands in the air, a list of sponsors is nested on the far left of the entrance to TAY. MetLife Foundation appears in bold most prominently, and below that is the name and insignia of Florida Blue. Gazing to the right we see black and white panels with faces of people of different ages, genders and ethnicities. Under each face is large white molded lettering spelling out “THE AMAZING YOU.” At the far right of the panels there is a white colored life-size statue of a naked pregnant woman, under the focus of spotlights, signaling the starting point of a human lifespan. The woman’s head is bowed down so that her face is obscured. She clutches her swollen abdomen with both hands, drawing attention to her precious cargo. A text panel greets visitors before entering that helps to frame what they are about to experience. The text reads, in a large font:

YOU begin here. During our journey through life we gradually begin to understand ourselves. In each life phase there are new wonders to behold and new discoveries to make. YOU are amazing. Welcome to the AMAZING YOU!

This text panel helps to establish the second person pronoun YOU who is being hailed in different ways throughout the exhibition. It also helps to establish the temporal narrative, with words like “journey,” “life phase” and “gradual.” It also serves to establish affective expectations for the visitor, describing “new wonders” and amazing discoveries.

Entering the threshold of the exhibition, visitors are greeted by a dimly lit space. Looking up they will see circular floating ceilings that seem hover over the exhibition in different areas. Looking down they may notice oversized blue footprints on the ground that are intended help guide visitors throughout the exhibit. Each of these foot prints, containing the logo of Florida

Blue Cross and Blue Shield, contains a facteme about the human body, such as the amount of water a person will drink over the course of a lifetime. Looking around at eye level, the visitor sees the first five or so kiosks, along with red wall panels signifying the first part of the exhibit, dealing with conception, gestation, and pre and post-natal health issues.

The “Beginning of Life” section is color coded as red (or burgundy), evident in the red panels that partition the exhibition and guide visitors in a mostly linear way. The red panels sometimes form part of the exhibits within the sections of the exhibition, containing the title of the exhibit, textual accompaniment, photos, illustrations and charts. The “Beginning of Life” area of TAY is full of “should” statements, sometimes unstated as such, and at other times worded overtly. The prescriptive aspects of these exhibits urge expectant mothers to modify their behavior for the sake of their own health and that of their offspring. Motherhood emerges as a subject position with a great amount of importance in all of the stages of life. The “Beginning of Life” area of TAY includes the following exhibits: Infant Roulette, Belly Vision, In My Womb, Where Did You Get Those Genes? *Exploring Our Molecular Selves* Video, *Welcome To Our World* Video, Hand Jive, Early Arrival, Pregnancy, Biocontroversy and Fetal Remains.

Infant Roulette and In My Womb

The first exhibit visitors come to once they enter the exhibition to the immediate left is called “Infant Roulette.” Visitors spin a vertically mounted chrome steering wheel, with each section of the circumference representing a different kind of post natal injury. The onus of guilt is immediately maternal, because this interactive exhibit shows the birth defects with which a baby can be born if the mother takes certain medications, has poor nutrition, smokes, drinks, or does illegal drugs, is overweight, or has an untreated sexually transmitted disease.

When a chrome steering wheel is spun, one segment at a time shows up in a display window. A visitor can attempt to spin the rather heavy wheel a few times to get the circle spinning and then let it stop on one of the segments, in an imitation of a croupier at a roulette game. Or the wheel can be turned more methodically so that the visitor can view each segment as it passes the display window. This exhibit contains a mixed metaphor that suggests two contradictory messages. The use of the roulette wheel emphasizes chance, yet this exhibit is also about deliberate choices that a mother must make so that her baby is born healthy (like not using drugs). The roulette wheel undermines the first-order message of this exhibit, namely, that a mother has to deliberately care for her own body and not harm her fetus.

Each segment of the wheel features a textual description of each abnormality and a realistic photo of a child suffering from the form of injury. For instance, when the wheel stops on “Drugs,” there is a photograph of an underweight baby in an incubator. A stanza of text above the photo explains that the consumption of illegal drugs during pregnancy can “cause miscarriage, premature labor, placental abruption, fetal death, birth defects and even maternal death.” The text explains that babies who are born addicted to drugs can suffer “withdrawal symptoms, such as tremors, sleeplessness, muscle spasms, difficulties feeding, irritability, convulsions, diarrhea, fever, sleep abnormalities, and joint stiffness.” This unsparing listing of symptoms, along with photorealistic visuals, combined with the nominal premise of a roulette game, is an example of the kinds of mutable frames that can be seen at TAY. The metaphor of the roulette wheel sends a second-order message along the lines of “don’t gamble with your child’s safety.” The roulette wheel implies pure contingency, yet the kinds of birth defects resulting from unhealthy behaviors require deliberate, volitional behavior on the part of an expectant mother. In this, the first exhibit of TAY, the frame of personal responsibility and

volition (a key theme of the exhibition with a focus on behavioral health) is being established. “Infant Roulette” is the first of many exhibits throughout TAY that highlights the horns of many behavioral health dilemmas. On the one side, there is self-control and self-discipline, represented by the deliberate exercise of the will to influence health outcomes (such as growing a healthy baby within the womb.) On the other side of this dilemma, health outcomes can be determined from without; the combination of factors (ranging from genetics, to environment, to contingency) that affect health outcomes.

One of the things not mentioned in “Infant Roulette” is the problem of legal drugs. The health educator named Paula who I interviewed described pregnant women who are on prescription pain medicines but don’t realize that their baby will be born addicted. The lack of mention of Neonatal Abstinence Syndrome (NAS) was noted by Paula, especially in the case of women who have already had one child:

...And that's actually probably the target demographic that you have coming through here: women who have children and may be getting pregnant for a second time. Maybe they're on some sort of opiate from a surgical birth, or a follow-up complication, and now they're pregnant and their baby will be born addicted.

Paula also indicated that the representation of Fetal Alcohol Syndrome at “Infant Roulette” was missing some details:

...When you talk about the FAS (the Fetal Alcohol Syndrome) it is really now like a spectrum of disorders. It also doesn't really say anything—doesn't really specify that a glass of wine a day could be considered—[that] there's no amount of alcohol that's actually been proven safe.

According to Paula, “Infant Roulette” omitted some of these details, such as presenting FAS as a single disorder related to heavy drinking on the mother’s part, instead of a spectrum of disorders.

In the corner of this first leg of the “Beginning of Life” area visitors come to a booth called “In My Womb.” A text panel states that the exhibit was sponsored by Morton Plant



Hospital Bay Care Health System. This video viewing booth has bench seating for three with a little extra standing room. Red-paneled walls lead to a flat screen video display that shows an interstitial motion graphic of

Figure 3: In My Womb

the silhouette of a woman’s hand, holding the silhouette of a human fetus between her thumb and index finger. At the foot of the screen there are five buttons, each of which plays a short video.

The first button initiates a motion graphic of the iconic yellow square that signals a National Geographic production. A lone flute plays as computer animation appears upon the screen, with a title reading “The Biology of Prenatal Development.” A female voice with a British accent is heard saying that the process of development from single celled zygote to trillion celled adult is “perhaps the most remarkable phenomenon of all nature.” On screen, a girl acrobat poses on the balance beam in slow motion amidst a white light. Each of these short videos provides a narration summarizing a period of gestation between conception and birth. Each video stresses, through the use of computer graphics, how formative the time before birth is to the rest of human development. The videos split the time spent in the womb into four segments: fertilization to four weeks; four weeks to eight weeks; eight weeks to three months, and three months to birth.

These videos use computer animations to represent the fertilization of an ovum, cell division, or how each organ begins to develop. These computer generated images are the first example of euphemism being employed at TAY. Lynn Morgan (2006) argues that digital

representations of embryos such as these are symptomatic of ambivalence towards actual fetal specimens. “In My Womb” does show microscopic images of embryo implantation and 4D ultrasound images of the fetus moving, grasping, stretching and preparing for birth. Each video returns to the image of a woman’s hand holding a fetus between her thumb and forefinger, emphasizing the precariousness of the fetus, and the agency the mother holds over her embryo. The hand symbolizes the power of the mother to affect the unborn child, as well as suggesting the gravity of her responsibility to deliver the child healthy after an optimal gestation period.

Where Did You Get Those Genes? and *Exploring Our Molecular Selves*



Just to the left of the “In My Womb” video booth, there is an exhibit called “Where Did You Get Those Genes?” This exhibit has five Mr. Potato Head dolls, two behind glass in a display case and the other three on the red table. The idea is to use the two already-made Mr. Potato Head dolls (one with male signifiers, such as a mustache, and the

Figure 4: Where Did You Get Those Genes?

other with female signifiers, such as eyelashes) as a model to create an offspring. Two square shaped recesses in the counter tops are basins for a bunch of colorful plastic eyes, ears, lips, noses, mustaches and feet. Recombining these “traits” on the blank plastic potato heads gets visitors to consider inherited characteristics and genetics.

Much of TAY is at the “molar” level of bodies such as our limbs, sense organs, and bodily systems. Sometimes TAY takes us on an imaginary visualization of the microscopic aspects of our human anatomy, such as chromosomes, which requires the representation of life at

a minute level that is invisible to the naked eye. It is at this cellular level that medical explanations are most often offered today (Rose, 2006). To the left of the textual and pictorial panels of “Where Did You Get Those Genes,” a TV monitor plays a short video entitled *Exploring Our Molecular Selves*. The video begins with two youngsters sitting on wooden steps posing for a camera. As the camera slowly zooms in for a close-up on the eyeball of the boy on the right, a woman’s voiceover intones over ambient music:

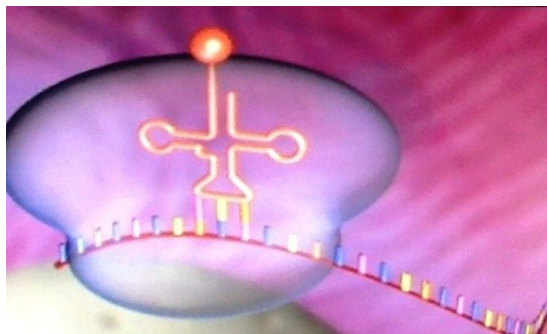
The human genome project is a way of exploring our molecular selves. Almost all of our cells—the muscle cells that let us smile, the brain cells that allow us to perceive humorous things; the cells of our eyes that take it all in—contain a complete set of all our genes.

Notice how the voiceover uses the causative verbs “let” and “allow.” Muscle cells “let” us smile and brain cells “allow” us to perceive, and the agency being exercised at this microscopic level allows us to use our own perceptual and executive functions.

Suddenly, synthesizer sounds are heard and the viewer enters a tunnel of twinkling lights, meant to signify we are shrinking to molecular size. This is where the video “Exploring Our Molecular Selves” uses computer graphics to portray the “visible invisible” (Foucault, 1975). In what follows, colorful and enchanting digital animations symbolize some key discoveries that cell biologists have made about the self-replicating genetic code that harbors the blueprints of life within each cell. Visually we traverse a pink background through the porous wall of a blob symbolizing a cell. Green squiggles signify “23 layers of chromosomes” packed into a nucleus, according to the voiceover.

In the images that follow, and in successive orders of magnification, a chromosome unwinds and frays into dual protein strands before our eyes. The iconic spiral of dual strands

(signifying a double helix) appears onscreen, as the voice-over lists the four “building blocks” of DNA (guanine, adenine, thymine, and cytosine). The letters GTCA appear onscreen surrounding the double helix. A messenger RNA molecule parts the intertwined helix and appears to replicate the color coded sequence of each strand. Appearing as a colorful centipede or monorail in outer space, the messenger RNA escapes through a hole in the cell wall, and out into the magenta shimmer of the unspecified interstices between cells. The voice explains that a complex “protein-making machine” called a ribosome replicates RNA.



Soon multicolored globules of protein are forming at the glowing light on top of a stylized shape representing T-RNA, which goes forth “out into the cytoplasm.” The voiceover describes a multi-lingual

Figure 5: Exploring Our Molecular Selves

exchange of information where “T-RNA molecules help translate the language of DNA and RNA into the language of proteins.” Here, in the use of the word “language,” cell replication is being described in informatic terms.

Briefly, the viewer rides the double helix like a twisting rollercoaster in slow motion. The screen fades back into the green squiggles symbolizing chromosomes. As the voiceover lists traits such as “our looks, personality and risks for diseases” the green chromosomes blink yellow simultaneously like Christmas lights at different sections. Then we go back into the whisking tunnel of lights and we are back with the two boys sitting on the steps. As the woman’s voice explains that scientists have three billion different letters that form the human genome, the camera zooms in on an eyeball, but as the camera pans out we see it is the eyeball of the boy on

the left, this time, instead of the boy on the right. This emphasizes the species-being of two boys, one black, one white, sharing the same genetic code.

Georges Canguilhem stated “the science of life no longer resembles a portrait of life...but it does resemble grammar, semantics and the theory of syntax.” (Canguilhem & Delaporte, 1994). “Welcome to Our World” is a video that describes genetics according to an informatic metaphor. The description of this video has also been included to show some of the representational strategies that the TAY exhibition uses to switch frames between the molar and molecular. Notice that the video represents the microscopic process of DNA and RNA using colorful and even “cute” visual conventions which are not, strictly speaking, felicitous representations of the process of protein replication. These embellishments upon microscopic processes can be considered an example of “the fictions of factual representation” (White, 1978).

Welcome to Our World

The next exhibit at TAY’s “Beginning of Life” section transports us from the molecular back to the molar. To the left of “Where Did You Get Those Genes” visitors come upon another video booth with a title that switches from a second-person singular pronoun (“you”) to a plural possessive (“our”). A red panel with white lettering reads “Welcome to Our World: Video Footage of Actual Human Births.” The “Welcome to Our World” booth is a bit smaller than the “In My Womb” booth and it has a bench for two or three visitors. Below the video screen are four arcade style buttons that play the short videos *The 3 Stages of Labor*, *Normal Birth*, *Cesarean Birth* and *Birth of Twins*. As in other videos throughout TAY these videos feature slick computer graphics, this time combined with jaw dropping realism. Birthing videos are an interesting footnote of exploitation motion picture history. *The Birth of a Baby* (1938) and *Mom*

and Dad (1945) were putatively educational films about having a child that culminated in actual documentary footage of childbirth (Schaefer, 1999). These low budget productions were commercially successful as a result of lurid marketing campaigns. As an indication of how norms of spectatorship have changed since the middle of the last century, audiences for these roadshows were segregated by gender. Today graphic childbirth videos can be seen on YouTube as well as in the “Welcome to Our World” booth at TAY.

In the first video, *The 3 Stages of Birth*, visitors watch a computer animation of the dilation of the cervix, contraction of the uterus and rotation of the in vitro baby. 3D animation euphemistically shows the pushing process and the crowning of the baby’s head, followed by the delivery of the placenta. The animation is not as sophisticated as the genetics graphics from *Exploring Our Molecular Selves* but it does present a less messy view of birth by using spare, colorful illustrations that are mercifully lacking bodily fluids. In the next video, the euphemism about birth will give way to graphic documentary footage, showing all of the amniotic fluid and blood that was lacking in the previous video. As *Normal Birth* appears on screen, a text box informs viewers that they will join “Debra” and “Jeff” and witness Debra delivering a child. The video begins with a shot of the mother on a birthing table in a hospital. She is being filmed from above from a ceiling eye view. Debra is heard saying “I don’t have the strength!” A man leans into the video who, it can be surmised, is the father, Jeff. Jeff mumbles “You’re doing great. You’re doing good.” while an off-screen female voice (the obstetrician) offers more encouragement. The video cuts from Debra’s wincing facial expression to the crowning of the baby. As the birth is taking place onscreen, Debra’s voiceover explains that, after the crowning of the child’s head, she began to feel some relief. The video of this childbirth is intended to have

the effect of demystification and normalization of the birth process. The father figure in this video (Jeff) serves to emphasize the supportive role that a father can play during birth.

The *Cesarean Section* and *Birth of Twins* videos also show graphic footage of both surgical and vaginal birth. The three videos appear to take place in a hospital, signified by blue hospital gowns and gloves worn by the obstetrical professionals. One of my informants, a knowledgeable mother called Kay (who was visiting MOSI on a weekend afternoon with her husband and two children) took issue with the exclusive portrayal of hospital birth in the “Welcome to Our World” videos:

You walk in, and the first you see is the pregnancy and birth part...It assumes “I’m going to go to the hospital.” There aren’t any other alternatives considered. “I’m going to have an OB” and, really, that’s not the way it really is in the world. They assume that everyone has the money to go through this whole hospital birth experience, and some people just choose not to. You know, I had her [daughter] at home, and everything was fine, and she turned out to be 10 pounds 6 oz., so she was really a big baby!

For Kay, birth is a process that has been going on for untold generations outside of a hospital setting. Kay noted that around the world as well as in the U.S., women often don’t have access to hospitals or choose to not give birth in one.

Kay’s reaction to the “Welcome to Our World” videos suggests that the exhibit was framed according to a medical conception of childbirth that may not be shared by all visitors. The reaction to this exhibit from other visitors was mainly that the subject matter was perhaps not appropriate for children. Dave Conley addressed these concerns during our interviews:

We hope that people come to MOSI with that attitude—that they say, “My mind is open, and I’m willing to learn, and I’m willing to share this with my child.” We try to make it as

comfortable as possible. We try to have certain sensitive subject matters where they're perhaps around the corner of a wall or something, so they're not right out there, in case a parent doesn't want their child to see it. But, we do want to address the reality of life and science.

This quote from Dave shows how MOSI has had to balance their educational mission with concerns about social norms. In order to address some concerns about the “Welcome to Our World” video booth, MOSI tried to shield the exhibit from sensitive viewers but surrounding the booth with physical partitions, and they also provided explanatory text that let visitors know what they are about to witness. While visitors should have a comfortable experience, Dave feels strongly that certain content should not be excluded or censored as long as it exhibits a reality of life (such as birth).

Early Arrival & Pregnancy



Figure 6: Early Arrival

Around the corner from “Welcome to Our World” visitors see an incubator, lit up, with an uncanny, realistic model of a miniature baby inside. The display below the plastic baby shows its temperature, heart rate and respiration rate.

On the wall behind the incubator, the red panel reads “EARLY ARRIVAL” in capital letters at the top. The panel of text defines preterm births as babies born any time before they reach 37 weeks old, and it explains that one in nine (or half a million) children in the U.S. are born premature each year. Such preterm babies face struggle with breathing, digestion, hearing and

vision, and may suffer from long term learning and behavioral difficulties. The “Early Arrival” exhibit also has stanzas of text (with subheadings “Mother’s Medical Risk Factors”, “Mother’s Lifestyle and Environmental Risk Factors”, “Treatment,” and “A Growing Problem?”) which emphasize the maternal responsibility for the preterm child.

Under the subheading “Mother’s Medical Risk Factors” the text panel lists medical conditions the mother may have prior to conception that can increase the chance of having a preterm baby. These include high blood pressure and diabetes, and being over or under weight. The next subheading is a bulleted list of “Mother’s Lifestyle and Environmental Risk Factors” that can lead to premature birth. Some of these are volitional, such as smoking, alcohol use, and “illegal drug use.” (Abuse of legal drugs is not mentioned.) Other risk factors on the list suggest environmental determinants that are less under mom’s control, including the lack of a social support system, working long hours, and stress. For “Early Arrival” the etiology of premature birth is not explored very much beyond the maternal role, mostly abstracted from societal and environmental factors.

Another stanza of text under the sub-heading “Treatment” lists high tech therapies for premature babies including ventilation systems, feeding tubes, and incubators. Such forms of intervention are “reactive” in that they address the problem “after the fact.” The last stanza, entitled “A Growing Problem?” notes that premature births have increased 30% since 1983, but it is suggested that this may be partly an artifact of a more stringent criteria for what constitutes a preterm baby. The last sentence is a plea for more prenatal care.

When the “Early Arrival” exhibit came up during my interview with Paula, she had some observations to make about the onus of maternal guilt that is emphasized in the exhibit. Paula,

who works as a smoking cessation specialist with expectant mothers, told me that some women actually prefer to have a low birth-weight baby.

In certain populations, I mean, it's desirable. Smoking causes low birth weight babies, so they think of that as a bonus—like, “Oh, the baby will weigh less. That's better for me.”

They don't want to have to carry or have to push a heavier baby.

Paula told me other things about her career experience that suggested she had heard many forms of rationalization that expectant mothers use to justify risk behaviors which present a danger to their unborn child.

Everybody thinks they're different; everybody thinks they're especially unique and their actions are not going to be the norm. The exception to the rule. Nobody's honest with me, especially when you meet women who are pregnant and smoking; if they tell you they're smoking four cigarettes, they're smoking 20.

I detected in Paula's description of her experience trying to get women to stop smoking a sense of resignation about the effect of educating expectant moms about the importance of not smoking.

Paula also noted that there are some key pieces of information about preterm birth that are not mentioned in this exhibit, such as maternal nutrition (and the importance of nutrients like iron and folic acid). Also not mentioned is that preterm birth is the leading cause of infant mortality worldwide, with an estimated one million babies dying each year. Looking at health promotion materials about preterm birth, it is possible to find different framing strategies, which focus less on the mother's deliberate behaviors and more on structural determinants that are often beyond women's control. According to the WHO website on preterm birth, the primary culprit is not women, but poverty.

In low-income settings, half of the babies born at 32 weeks (two months early) die due to a lack of feasible, cost-effective care, such as warmth, breastfeeding support, and basic care for infections and breathing difficulties. In high-income countries, almost all of these babies survive (WHO, 2013c).

Besides a lack of warmth and care, there are other causes of preterm birth that can be characterized as being beyond women's control. Air pollution (Darrow et al., 2009; Stieb, Chen, Eshoul, & Judek, 2012), lead exposure (Torres-Sanchez et al., 1999), and household chemicals (Fei, McLaughlin, Tarone, & Olsen, 2008) have been shown to impact fetal health, but these risk factors are not mentioned in "Early Arrival." But arguably, the most conspicuous missing risk factor is poverty. Even in the affluent United States, as of 2011, 46.2 million people live below the poverty threshold (DeNavas-Walt, Proctor, & Smith, 2012). In "Early Arrival" motherhood is a subject position that bears both agency and culpability. Moms are in control of premature birth, while structural factors such as poverty, environment, and access to prenatal care, are minimized. But is the responsibility solely the mother's? What is the role of significant others, family members, peers and the medical profession in supporting and assisting the mother, or perhaps even enforcing her compliance? The next exhibit tries to interpellate these other subject positions in a unique way.

The next exhibit is a single panel of text and pictures that visitors see just off of the hallway to MOSI's third floor restrooms, entitled "Pregnancy." Below a cross section diagram of an expectant woman's torso, there are photos of swollen feet and two taut, distended abdomens of expecting women close to their delivery date. The text on the exhibit describes the different changes a woman experiences during pregnancy, both visible and not. These include hormone imbalance, pain, constipation, hemorrhoids, increased frequency of urination and skin

pigmentation. The last stanza of text contains a decentering array of pronouns. I have bolded certain words in this stanza of text in order to highlight a grammatical error which arguably has an unintended rhetorical effect.

The changes of pregnancy can be uncomfortable. But if **she** is aware of the potential for pain and take appropriate steps to avoid it or relieve it when it occurs, **you'll** go through the nine months in relative comfort. Consulting with a health professional is the best way to find out what is best for the mother and her baby.

Notice how the pronoun shifts from the third-person singular pronoun (she) to a second-person personal pronoun (you'll) in one sentence. In the last sentence it is definite articles, not pronouns, that are specified (mother and baby). These shifts in pronouns and articles serve to address the variety of subject positions who will view the exhibit. The substantive we identify with as a visitor depends upon our gender as well as our relationship with the pregnant mother. By switching pronouns mid-sentence, the "Pregnancy" exhibit may unintentionally be heralding other subject positions, such as the father, children, or other people who, while they are not themselves carrying a fetus, may have a second-person relationship with someone who is. This ambivalent shift in addressee helps to prepare a visitor for the next exhibit, where the human subject becomes an object.

Fetal Remains Exhibit

On the outside wall of the next exhibit there is a large photorealistic picture of a fetus in vitro. Towards the entrance of this exhibit, a plaque announces that visitors are about to see a collection of fetal specimens on loan from the "Human Development branch of the National Museum of Health and Medicine, a part of the Armed Forces Institute of Pathology of the Walter

Reed Army Medical Center.” Around a glass divider visitors see seven clear cylinders, each illuminated from above by halogen floodlights. Within each of the cylinders there are seven fetuses suspended in liquid. Each specimen has pink skin, similar in color to the plastic baby in the incubator. The difference here is that these are actual human remains, and not plastic models. The collection includes a fetus at six weeks, ten weeks, eleven weeks, twelve weeks, thirteen weeks and the largest, a twenty seven week old specimen. At the bottom of each glass display there are short textual descriptions of what developments are going on at each particular stage. There is also a larger panel mounted on the wall that gives a description of these developments as well as the spatial measurements at each stage.

When I was on a guided tour of TAY with Dave Conley a woman came up to us and asked “Excuse me, do you work here?” When Dave replied, yes, he did, the woman asked “Are those babies in there real?” Dave replied, yes, they are real fetal specimens. The woman shuddered and walked away, wagging her head in amazement, back to her group that included children viewing the specimens. Dave explained to me that there has been some controversy about the fetuses, but in the spirit of scientific realism that underscores TAY, the fetuses have been obtained for the education of the public.

Representational technologies at TAY include illustrations, PET and CAT scan readouts, still photos, computer animations, videography, and finally, the realism provided by human remains. As the climactic exhibit of the “Beginning of Life” area, the collection of fetal specimens reaches a level of representation with an encounter with actual human tissue. The plastic premie baby from “Early Arrival” was perhaps realistic enough for the visitor to doubt the authenticity of the fetuses at first glance. One of my informants, a mom from Polk County who I will call Colleen, was surprised to learn that the fetuses were real. Colleen’s son Jason had got all

A's on his report card and as a reward, Colleen took him to MOSI for the afternoon and agreed to buy him something in MOSI's Elements Gift Shop. As Jason was exploring the magnets at the exit of TAY, I mentioned to Colleen that some other parents were concerned about the origins of the fetal remains. Colleen said:

No way! I don't think it actually registered just now that they were really... real ones! [laughs] you know? That might have flipped him out if he knew. But I didn't mention it, he didn't read it, I just kind of glossed over it. He said "oh yeah that's neat!" I said 'all right!' I think in his mind, he is thinking they were models. It's fine. Doesn't bother me. If he had a question about it I would just explain.

Other visitors I interviewed talked about the unnamed fetal remains exhibit as something interesting as well as unsettling. One mother said that there should be more of an enclosure to view the fetuses in a way that is more separated off from the halls of TAY. Another mom suggested that the fetuses were too disturbing for children, and that MOSI should provide more of a warning for parents.

An educated young woman without kids, who I have called Elizabeth, was curious to know the origin and provenance of these specimens. How were they obtained? Who were their mothers? Elizabeth mentioned that the *Bodies* exhibition was controversial because the human remains were possibly obtained from prisoners or others who had not provided their consent.

...Presumably the fetuses died of natural causes [laughs nervously]. A lot of things go through your head when you see a fully formed human fetus, like could it have been born prematurely but still survived?

Elizabeth was aware how the frame of make-believe had shifted somewhat abruptly. It is as if the implicit message "this is play" changed to "this is real" and Elizabeth found her sense of footing

being adjusted in order to adapt to the situation and ask a different set of questions about what she was witnessing. Elizabeth explained:

Because when you walk in there you see a statue of a pregnant woman, and you are learning about that, and then all of a sudden you are in the middle of these fetuses, and it isn't clear if they are models or actually real. So before I leave here, I think maybe that one of the employees here will be able to tell me if those fetuses are a depiction or actual.

In this quote, Elizabeth doubts my account of the fetal specimens being real. Another woman who I interviewed, Alexis, also called attention to the fetal remains exhibit.

I think that they should have something clearly written out that says these were babies that were unable to develop any further and they weren't killed to provide this display. They aren't like a real live person at all, so that people, especially children, can understand. "How did they get in the jar, Mommy?" I assume that they were fetuses who were naturally aborted or miscarried and they were used for this purpose after their lives had ended.

After Elizabeth and Alexis raised these issues with me I became curious about finding out more about the origin of the fetal remains. According to Dave Conley, the Walter Reed Medical Center was unable to provide any specific information about the provenance of the specimens. Dave did relate to me that some of the fetuses in formaldehyde may be over one hundred years old. While the specifics about these fetal remains are not available, the exhibit itself references a rich chapter in the history of embryology and scientific pedagogy. The initiative to collect and preserve fetal specimens in the United States is associated with the embryologist Franklin Paine Mall, who was director of the Carnegie Institution Department of Embryology, founded at John Hopkins Medical School in 1913 (Morgan, 2006). Mall obtained human embryos from doctors

whose patients had miscarried. The historical context of the fetal remains exhibit at TAY is suggestive of the ways in which frames are historically governed. The aura of scientism surrounding Mall's embryo collection represents a "key" (Hymes, 1974) or "lamination" (Goffman, 1974) that is superimposed on top of the exhibit. Because these specimens are used to explain fetal development, questions about their origin are moved from "figure" to "ground." The embryos that are found at the end of the "Beginning of Life" section of TAY are the stillborn harbinger of other human specimens to be found in the exhibition, including a human heart, lungs, and bones.

The fetal remains may signify what Linda Layne argues is a taboo topic for American parents: the memory or mention of pregnancy loss (Layne, 2003). Also sidestepped, but suggested in circumlocution is the reality of abortion, both spontaneous and intentional, which has been a controversial issue ever since the historic Roe vs. Wade decision. It is as if these fetal remains at TAY are gothic antiquities, symbols of a 19th century scientific curiosity that has been supplanted by neater, more palatable representation technologies such as computer graphics and 3D ultrasound. These unnamed, unparented fetal specimens obliterate various subject positions (such as daughter or son, sister or brother) and in their place establish the grand third-person, singular neuter pronoun: "IT." The dismaying switching of substantives in the pregnancy exhibit shows the differential and relational subjects who are being addressed at TAY. From a blastula of cells, to a child, to an adult, to a parent, an aunt or uncle, or to a grandparent—these are subjects we can inhabit depending on the exigencies of each visitor. The only bedrock subject is the "it" of being deceased, which is the destiny of all living beings. We meet the grand "it" again at various moments throughout TAY, but in the "End Of Life" area, "it" becomes the superordinate pronoun for our mortal destiny.

Childhood

The Childhood content area of TAY runs along the north facing wall of MOSI's third floor, and then enters a square cul-de-sac area where there are more exhibits. With seventeen different exhibits, the Childhood content area of TAY is one of the most extensive, although like other areas in TAY, some of the exhibits do not only pertain to childhood per se. "Hear Here" and "Eye Tracker" are diagnostic exhibits that test vision and hearing for all age groups. "How Clean is Your Air?" is an exhibit about air quality that is not specific to children. "Surgery 101" and "Surgery on Demand" are informational exhibits about surgeries that are performed on all ages. The names of the exhibits in this section are Brain Development, *Deliberate Design* Video, Body Armor, Hear Here, Milestones, Body Organ, How Clean is Your Air?, Now See Here, Eye Tracker, Mr. Bone Jangles, Brain Chain, Think Map Visual Thesaurus, Surgery 101, Surgery On Demand, Strange Neighbors and Nutritional Knowledge.

Body Armor

There is a whole suite of exhibits called "Brain Development" which focus on the importance of playing and talking with kids during the first three years of their life. Next to a giant dome which is painted to look like a brain, a video plays called *Deliberate Design* where developmental psychologist Stanley Graven of USF stresses to parents how formative the first three years of life are for the normal development of a child. The title for an exhibit about vaccination called "Body Armor" makes use of a metaphor to explain immune processes. White text on a blue background reads:

A vaccine helps your immune system learn to fight a certain illness.

It is made of the same or similar cells but it is weak or inactive and when it enters your body, the immune system tries to destroy it.

Your immune system learns how to fight the disease from the vaccine so if the real disease enters your body, your immune system remembers what works to fight it.

In this passage of text, notice three metaphors being employed: the *real*, *memory* and *learning*.

An attenuated or weakened virus has the same existential status as an unweakened virus, but the ambiguity between a disease agent and an attenuated injection of the same agent is too similar. In a simplified pedagogy of vaccination, the attenuated virus needs to be somehow distinguished from the actual or “real” virus in order to persuade parents that the vaccination is of a different substance than the disease agent. Therefore, the unadulterated disease agent is called “real” in order to avoid confusion. In order to explain the mechanism of antibodies, the “Body Armor” exhibit uses a mentalistic metaphor of the immune system “learning” and “remembering” to fight the virus after having been exposed to its attenuated counterpart.

A chart shown against a blue panel provided by the Centers for Disease Control (CDC) shows a schedule of recommended vaccinations and at what age they should be given. The next few panels show a gallery of photos that serve to answer the implicit “why” question about vaccination. These photos show children stricken with different infectious diseases that there are vaccinations for. Along with each photo is a description of the disease or infection, the symptoms, the history, fatality statistics and prognosis. This exhibit shows the visible symptoms of diphtheria, small pox, polio, haemophilus influenza type B, meningococemia and whooping cough.

The shocking images of children—their bodies having been disfigured by diseases such as smallpox—helps to perform a rhetorical function that can be classified as an “indirect

directive.” Indirect directives are a kind of illocutionary act where the command is not stated explicitly (Searle, 1975). The concept of “indirect directives” can be applied to situations of secondary orality, where, for example, a parent views photos of a child’s body marked by scars. This is because of a series of inferences the parent must make while interpreting the images.

In the case of the “Body Armor” exhibit I wish to argue that the photos of sickly children act as a form of public health intervention. These photos contain a powerful implicit message about the net social good of vaccination. In the case of smallpox, an aggressive international effort by public health workers has virtually eliminated the risk of this disease. By way of a connotational chain that links disease prevention with vaccination, the bodily testimony of child sufferers serves as a prescient warning about vaccine non-compliance. I would argue that the mute testimony of diseased children, as they appear in the photos at the “Body Armor” exhibit, serve as a tacit injunction to parents to get on board with childhood vaccinations. An “indirect directive” is a method of persuasion that cajoles by implication instead of explicit command. It is employed at the “Body Armor” exhibit productively, as it is in other exhibits in TAY.

“Hear Here” is an exhibit that contains information about hearing as well as a sophisticated apparatus that emits sounds at different frequencies to assess visitor’s hearing abilities. This exhibit has a descriptive and diagnostic purpose, but it also contains a directive to visitors who tested poorly to go and see a doctor. After “Hear Here” there is an exhibit called “Milestones” which focuses on developmental milestones for kids. The next exhibit “Body Organ” features two text panels and a piano keyboard. The text here describes the sounds the body naturally makes, like burping, gurgling, farting, sneezing, hiccups, coughing and vomiting. There is a description of what each sound is a symptom of, and what causes them. The interactive element here is a small keyboard with a row of buttons above it. The visitor presses

one of these buttons and can then play a sample of the sound at different intervals on the keyboard. There is a photograph of one Joseph Pugol at the end of this exhibit accompanied with a description of this fin de siècle Frenchman's special talent to emit music, at will, from his posterior. "Body Organ" was sometimes cited by visitors as a "fun" exhibit that provided a mini-intermission from the seriousness at TAY.

Surgery 101 & Surgery On Demand

Before visitors reach "Surgery 101" there are a number of exhibits that focus on sight and the anatomy of the eye. "Now See Here" along with related exhibits "Shifty Looking" and "Eye-Q" provide visitors with a wealth of information about our capacities for vision. "Now See Here" also contains a sophisticated apparatus which tests the visitor's vision abilities. The visitor also encounters "Brain Chain" (which focuses on the innate capacity for language), and "Thinkmap Visual Thesaurus" (an interactive that visualizes words and their synonyms spatially). An exhibit called "How Clean Is Your Air" suggests that the main way to prevent air pollution is to take brief showers instead of hot baths, or walk instead of drive to your destination, which is arguably a form of intervention that is focused on individualistic conceptions of sustainability. In the interests of page count I decided to leave out descriptions of these exhibits.

Towards the end of the Childhood life stage there is a rectangular area of TAY with a number of different exhibits. The most prominent exhibit in this cul-de-sac is a giant version of the kid's game "Operation." A blue panel with white lettering placed in the center of the floor displays the title of this exhibit, "Surgery 101" and a stanza of text that explains the roles of a surgeon. In describing this exhibit, I will suggest that using a combination of literal as well as euphemistic imagery helps make the reality of surgery less scary for the visitor.



Figure 7: Surgery 101

Next to each hole is a block of text in yellow that provides instructions about what the visitor should do. For example, at the top left of the patient's thorax, there is a hole in the table with two pieces of leather, each with three metal grommets. There is a string of leather laces, laced at the top. The yellow text box prompts visitors to use the tongs to thread the laces through the holes and stitch up the wound.

The "Surgery 101" exhibit allows for an interactive experience of the "operating room" relying on some of the same affordances as the best-selling Hasbro game "Operation." The similarities are apparent, but there are many differences between "Operation" and "Surgery 101." Besides the differences in graphic design and colors, the most prominent difference is that "Surgery 101" euphemistically symbolizes actual human body parts, while "Operation" only uses pretend ones. Using metal tweezers, "Operation" players can remove small plastic pieces, such as a "Bread Basket" or "Butterflies in the Stomach." The gag surgeries that kids can perform in "Operation" help to disassociate the toy with surgery on a real person. By contrast the TAY exhibit "Surgery 101" relies more on denotation even while retaining some euphemism in

visual representations. Visitors to “Surgery 101” are also attempting to remove things from the patient’s cavities, but the items denoted (at least nominally) are actual features of human anatomy, such as a heart or thyroid. Even while the items named are correct, “Surgery 101” often uses visual props that are not identical with their names. While a golf ball is a kind of euphemism symbolizing the thyroid, the rubber heart is a more denotative form of representation.

Like “Operation,” “Surgery 101” has a buzzer that goes off whenever the metal surgical tool touches the metal walls of the cavity, which emphasizes the steady hand that is required by surgeons. At the bottom corner of the “Surgery 101” operating table there is a small video monitor with an interactive picture of the inside of a knee that was taken during an arthroscopy. By manipulating a joystick just to the left of the monitor, visitors can view the inside of a knee from the left and the right. A text box just below the monitor explains that this is a “Knee Cam.” With the “Knee Cam,” “Surgery 101” gradually climbs higher on a representational hierarchy that began with body parts that were nominally parts human anatomy, even while appearing as euphemistic. With “Knee Cam” there is an orthoscopic glimpse into an actual human joint, and the visible evidence onscreen is more oblique and cloudier than the euphemistic symbols. From removing a golf ball meant to represent a human thyroid gland, all the way up to viewing the inside of a human knee, the “Surgery 101” exhibit allows visitors to climb a staircase of a representational hierarchy towards greater realism. The attenuation towards greater realism may help visitors to approach the next exhibit, which goes into greater detail about surgeries performed on the human body.

The next exhibit in sequence in this area of TAY is also about surgery, but in this exhibit, the realism quotient of the representational hierarchy goes up a number of notches. Where

“Surgery 101” prepared visitors for the reality of surgery with a combination of playful euphemisms, “Surgery on Demand” (SOD) is a deeper exploration into the reality of surgery, complete with more realistic representations of human anatomy— albeit with subtle visual euphemisms.

This exhibit (sponsored by health insurance company Aetna) features a video monitor, roller ball mouse and button to click, just to the right of the blue panel. After using the roller ball to navigate to the main menu, the monitor shows a graphic image of a man with his skeleton and organs showing under his transparent skin. There are two choices onscreen next to the human figure. One says “orthopedic animations” and the other says “other specialties.” Under the orthopedic heading there are clickable buttons “Spine,” “Hip,” “Knee,” and other body parts. Under the other specialties there are buttons for “Cardiovascular,” “Pain management,” “Cancer” and others. At the bottom right there is a faint water mark showing the logo of “ViewMedia,” an Orlando based web-development company.

SOD allows visitors to look up a number of different surgical procedures and picture them graphically. Clicking on one of the buttons opens up a new page with more menu options listed in tabs. The “surgical procedures” tab lists different types of operations that are performed. Clicking on one of the procedures displays another menu, offering a choice of “See step-by-step animation with full text” or “See narrated animation-self running presentation.” Watching the narrated procedure of an Anterior Cervical Corepectomy (an operation to remove bone and disks from the neck) I hear a calm, yet upbeat male narrator describe the reasons for this procedure (to relieve pressure on the spinal cord and nerves). Cervical vertebrae appear superimposed over a computer graphic illustration of a young man. An animation that accompanies the voice-over shows a thick green line appearing at the cervical vertebrae signifying an incision is being made.

An unnamed surgical implement is shown entering the neck and apparently suctioning out the disk between two vertebrae. This video is under a minute long and goes right to the point. The images are clean and realistic, yet rely on euphemism, in that they use visual conventions (such as a green line indicating an incision is being made) to spare the viewer from any blood and gore that would be witnessed in an actual operating room.

In my interviews, a number of museum visitors cited “Surgery on Demand” as being one of the most informative exhibits at TAY. Especially for visitors that may be undergoing one of these procedures, SOD may take the fear out of going under a knife, because they present the procedures realistically and clearly, although with a measure of restraint provided by visual euphemism. One feature that is missing from this exhibit is any explanation of the costs, co-pays or deductibles for these procedures.

Nutritional Knowledge

“Strange Neighbors” is an exhibit which explains the numerous different life forms which call our body home, from intestinal flora to lice. “Nutritional Knowledge” is an interactive exhibit in the same cul-de-sac area where “Strange Neighbors” and “Surgery 101” are located. This exhibit consists of a huge screen with a panel of buttons in front of it. Approaching the exhibit, a visitor notices the interstitial graphics that appear onscreen in standby mode. Onscreen, a candy bar sits alone on a white ceramic plate. To the right of the plate there is a large equals sign (=) and “200 calories” in a large font as big as the plate. Text in green below the plate reads “Three-Quarters of a Chocolate Caramel Candy Bar.” In a few seconds, the candy bar starts shape shifting into rapidly changing images of food, and it comes to rest on three quarters of a cheese burger. A moment later the cheeseburger turns into six cups of broccoli. The “=200

calories” stays the same, indicating that each portion of food is equivalent in calories.

“Nutritional Knowledge” is a multiplayer quiz about the nutritional content of various foods.

After pressing the start button nine different kinds of food appear onscreen. There is a piece of whole grain bread, a slice of pizza, a serving of broccoli, a fish fillet, a plate of fruit salad, and a piece of cherry pie, among other foods. At the top of the screen a question appears, such as “which food has the highest saturated fat content?” Using their track ball and button, each player can navigate to the picture of each food and choose the answer. After they choose they find out if their answer was right or wrong on a display to the right of the food items. This information resembles the nutritional information on a package of food, with black text on a white background. Of all the food choices, a slice of personal pan pizza contains the highest amount of saturated fat, and the accompanying text describes the pizza as a “forbidden food” that does not fit in with a healthy diet. “Nutritional Knowledge” lets the visitor guess which foods have the highest fat, cholesterol, vitamins and fiber. Playing the game had some surprises for me, such as learning that the bowl of fruit salad contained the highest amount of sugar of all the foods on the menu. Also, the two little pieces of fish had the highest cholesterol.

Diet, a key factor in health, is the topic of “Nutritional Knowledge” and this is the first time that food is a focus of TAY. This exhibit seems to be important in health promotion, especially since overweight and obesity are risk factors for heart disease, diabetes, cancer and other illnesses. This exhibit shows us some basic nutritional facts about our favorite foods, and encourages us to perform simple mathematics whenever we chow down. This exhibit teaches a basic logic of equivalence, measuring foods against each other in terms of equivalent content and demonstrating the differential contents of each. The burgers, fries, frozen pizzas, and candy bars that appear on the menu are probably typical fare for average Americans. Veggies are arguably

under-represented, with broccoli being the standard bearer of the vegetable food group. There is a sense that this exhibit highlights these particular selections of foods because they are majoritarian. Yet in another sense, the food choices pictured may be recapitulating the Standard American Diet and delimiting choices only within this narrow range of edibility. Also, figuring diet out solely on the basis of fat, calorie, and carbohydrate intake may give a mistaken impression that all foods are equivalent in their own measure. The fact that a candy bar is lower in sugar and carbs than a heaping plate of fruit salad makes it seem like a better choice, but this disregards the other nutritional benefits of fruit, such as fiber, vitamins, and antioxidants. TAY makes amazing connections between bodily systems and temporal changes of the human life span, yet arguably, the link between health and diet is under-explored.

Adolescence

The Adolescence portion of TAY is enclosed primarily within a square shaped cul-de-sac area somewhere roughly between one third or one half of the length of the exhibition. Green panels serve to enclose the exhibit and guide visitors, as well as being backdrops for the content of the exhibits. The Adolescence area includes the following exhibits: Zoltar, Unique Just Like You, Know How You Grow, Superkids, Puberty, Time Machine, Risky Relations, Healthywood Squares and Drunken Driving.

Unique, Just Like You

The Adolescence area of TAY is mostly situated in a rectangular shaped cul-de-sac with exhibits lining the outer walls as well as an island exhibit in the center. The Adolescence area strikes a consistently instructional tone that is primarily “prescriptive”—that is to say that

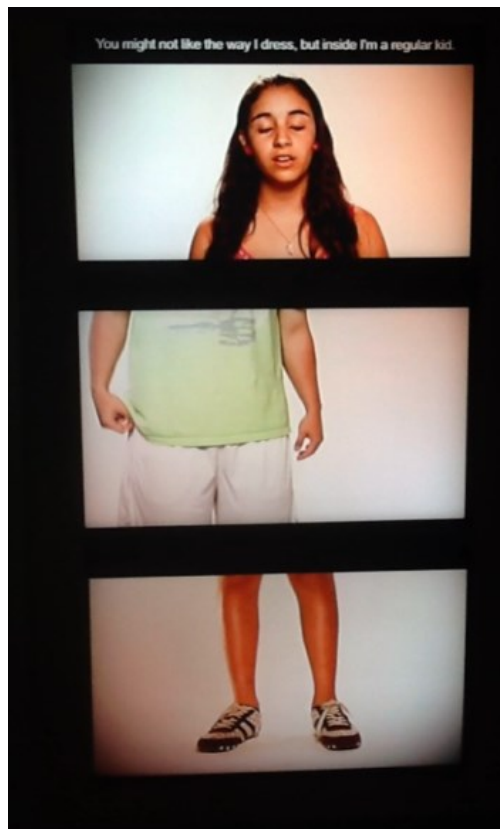
adolescents experiencing this section of TAY are about to be subjected to a lot of (unsolicited?) advice. I wish to suggest that some of the advice being issued is not without paradoxes of the Epimenides type (“All Cretans are liars. Epimenides is a Cretan”). The first exhibit against the wall panels is called “Unique, Just Like You” (UJLU). A panel of spare white text against a green background reads

Don't judge me by your first impression. Take the time to learn more about me than what's on the surface. Keep an open mind.

It may be easier to spend time with people just like you, but you can miss out on a lot.

You've probably met people who have something that sets them apart from the crowd.

All these people have feelings and deserve to feel accepted for who they are, inside and out.



To the right of the UJLU text panel there are three vertically stacked video monitors. The top screen shows the face of a teen, the second shows the torso and the bottom one shows the legs. Each screen changes to the head, torso or legs of a different young person, with the parts recombining at different intervals, and not necessarily matching up to the same person who is talking. Every time the top screen changes a new teenager issues an audible sound bite about their hobbies, what is important to them or their views on individuality. The video is on a continual loop and shows about ten different teens, boys and girls.

Figure 8: Unique, Just Like You

Some of the sound bites, which are also shown in subtitles at the top of the screen, include “Being smart is cool,” “I really want to belong,” and “Girls like sports too.”

UJLU is an exhibit that is geared towards teens with a message of interchangeable specifics. As the body parts recombine before your eyes, the implication is that differences between teens are superficial. As if to express the changing notions of identity that accompanies adolescence, the quadrants of the body change at different intervals to produce hybrid children with a mix of racial and sexual characteristics. Simone de Beauvoir writes “one is not born, but becomes a woman” (Beauvoir, 1953). This quote pertains to the process of gender identification that intensifies with puberty as children develop body hair, chests, and other secondary sex characteristics. In the title of the exhibit, “Unique, Just Like You” there is an ironic commentary on the sameness of individual difference. There is a double injunction to be a unique individual, just like everybody else. Throughout the Adolescence area of TAY, this somewhat paradoxical injunction to be unique just like all the other kids is repeated in different iterations.

On the other side of a wall panel there are a number of videos that shows teenaged puppets talking about teen issues. Below the video monitor there is a giant magic 8 ball. Visitors push a button in front of the magic 8 ball and a topic appears on the top of the ball, a corresponding video begins to play on the screen. For example, after pressing the button, a topic appears both on the 8 ball and onscreen:

YOU DON'T BELONG.

SO YOU WANT TO “BELONG”? IS THAT COOL OR IS THAT LAME?

Next, two puppets appear onscreen. One is brown and the other is off white. They both have the same black and orange shirt on. The puppets are voiced by two adult men who are caricaturing “cool” teens. In the course of this short movie, we learn that the white puppet is wearing the

same shirt as his peer because he is trying to overcome his insecurity by imitating the brown puppet. The brown puppet on the left begins the conversation:

Brown: Hey....what's...up?

White: Hey...what's...up?

Brown: You're dressed just like me. Even the same shirt. What's up with that?

White: I'm bein' cool! Just like you!

Brown: Say what?

White: Well, you're popular in school. You wear the best clothes. Have the most friends. I wanna be...like...you. Everyone says my clothes suck. They dis me because of my funky hair. My life sucks. I'm a real loser. If I dress like you, and act like you, I'll be cool too!

Brown: Now that's wack. Jackin' my look doesn't make you cool. It just makes you a poser. Originality is what makes you cool. Work on it. Claim your own style. And bag...that...shirt.



After the short video is over, text appears onscreen that says “SO, WHAT DO YOU THINK? FEEL FREE TO DISCUSS THIS TOPIC AMONG YOURSELVES, OR PUSH THE BUTTON FOR A NEW TOPIC.”

Figure 9: Adolescent Puppets

The takeaway message from this video is that wearing the same shirt as a peer constitutes an embarrassing breach of the demand that each teen be unique. Instead of trying to imitate a peer who has attributes you like, you should just be your own person.

The next short puppet show that appears on my reference video also reinforces this

injunction to not imitate others. The title that appears onscreen reads:

DO AS I DO.

SOMETIMES FOLLOWING A GROUP IS OK, AND OTHER TIMES IT CAN GET YOU INTO TROUBLE. LET'S TALK ABOUT PEER PRESSURE.

This video features another pair of puppets, one also white and the other one also brown. The length of the puppet's hair and their voices signify that they are girls. The white puppet who appears on the left side of the screen gives a rationale for peer pressure. The brown puppet disagrees. The puppets are voiced by two adult women, with slightly less of the affected style of speech that was in the last video. Italics have been added to show emphasis on certain words.

White: Hey, if all the other kids are doing it, it can't be that bad. And if I'm doing it with my buds, we would all get in trouble at the same time! It might be fun. One time we all started throwing stuff at cars out the window of the bus on a field trip. The driver had to pull off the road to make us stop! Hah. It was *cool*.

Brown: Hey, I don't do bogus stuff just cause my friends are all doin' it! *I* have a mind of my own, so I use it. Hey, if I think what they are doin' is ok, than I go along with them. If I don't, then I just walk away. It's *my* life, and *I'm* the one in charge.

The takeaway message from this video is that mindless conformity can often get a kid into trouble. The brown puppet, in her emphatic declaration of individuality, emerges as a more self-directed kid who does not cave to the mob mentality of her peer group. Note also that in both examples, it is the brown puppet who is arbiter of what is truly "cool."

There are two explanatory concepts that can be used to understand the almost militant emphasis on thinking and acting as an individual in the "Unique, Just Like You" exhibit. The first is Rene Girard's concept of mimetic desire (Girard, 1977; Nagilla, Hankey, & Nagendra,

2013). This concept is used to explain how desires are often mediated by others. Girard (1977) writes “In desiring an object, the rival alerts the subject to the desirability of the object” (p. 145). As the popular, confident brown puppet dons the groovy orange shirt, he alerts his white peer that this shirt must be “cool” and, because he has low self-esteem, the white puppet imagines that simply by wearing the same shirt he can ‘cop’ some measure of his cool brown skinned peer.

In this exhibit, mimesis of a certain kind is being strongly discouraged among kids, because not all behaviors are worth imitating. This brings us to the second explanatory concept, what Austin (1962) calls “infelicities” (p. 14). If we can understand directives as kinds of speech acts aimed at changing behaviors, then the credibility of the issuer becomes a factor. Here, speech act theory focuses on the felicity conditions of speech acts, meaning the institutional authority that backs any kind of command. For example, if I were to pronounce two persons husband and wife, it would not be binding. But if the pronouncement was made by a priest during a wedding ceremony, this utterance would bring about a new social relationship.

When MOSI suggests healthy behaviors, it has institutional authority based on its status as an accredited learning institution. However, when a kid in the lunchroom tells his friends to throw their french fries, this kid is not issuing an injunction with the same kind of authority. Therefore, the felicity conditions of his injunction should be suspect (Austin, 1962). This exhibit is trying to teach teens how to discriminate between injunctions, and reject bad advice from peers because it is not coming from an authoritative source.

UJLU contains a prominent meta-message to be an individual. But much like the paradoxical injunction to “act spontaneously,” heeding the primary injunction involves violating it on a second-order level. If we really want to be individuals we would not let others dictate our behavior and do what we want, but sometimes doing what we want is doing what others want us

to do. We should act according to our individual impulse, but not if it happens to coincide with the impulses of others. The puppets seem to be implying that children should evaluate the authority of an injunction contextually. We should want to heed injunctions issued to us by authorities because these injunctions accord with our individuality.

Know How You Grow

The next exhibit deals with anatomical facts about adolescent growth in a way that differentiates it from the moral injunctions of the previous exhibit. Yet while the “Know How You Grow” Exhibit can be considered a primarily diagnostic exhibit, it also has strong prescriptive components, as I will show. A plaque announces that “Know How You Grow” exhibit was sponsored by St. Joseph’s Children’s Hospital Bay Care. This exhibit consists of two green panels and a scale. The first panel has KNOW HOW YOU GROW in big block letters, with the subtitle “Being overweight is the #1 detriment to your long term health.” Underneath there is a list with the heading “being overweight significantly impacts your risk for...” Underneath this heading there is a bulleted list of 18 different health problems that are associated with being overweight or obese, including heart disease, type 2 diabetes, cancer, high blood pressure, joint problems, gout and premature death, among others. At the bottom of the panel there is a multi-colored chart called a Quetelet index where Body Mass Index (BMI) can be determined.

The middle panels of “Know How You Grow” contain a step-on scale that gives a numerical value for each visitor’s height and weight on a red LED readout. Visitors can then take the two numbers and locate themselves on the BMI chart. This exhibit also includes a waist to hip ratio chart for both men and women that shows in which category the ratio should fall for

each. On the wall there is a flexible measuring tape that can be used to measure waists and hips. The diagnostic capabilities available to help visitors determine BMI works in concert with the explicit cause and effect statement about overweight and comorbid health problems. This serves as a powerful injunction to keep one's weight within the "correct" range. The takeaway message may be "be a unique individual, just don't get overweight."

Super Kids

"Super Kids" is an exhibit that profiles some real Florida teenagers who, because of their astounding accomplishments, are meant to serve as role models. This exhibit features a video monitor with several buttons in front of it. Each button shows a slide of a different Super Kid, who appears in an onscreen photo along with scrolling text describing what makes them worthy of imitation.



Pat Pedraja is the first "Super Kid" we meet. Scrolling text below his photo explains that Pat lost his hair because of leukemia and sells his bald head to advertisers. With the money he makes from his very own dome-shaped human billboard, Pat supports his family charity that enlists bone marrow donors.

Figure 10: Pat Pedraja, Super Kids

Pat's method of enlisting bone marrow donors is in accordance with a medical system that relies on market mechanisms to finance health care. Because he sees income potential in his bald head, Pat is held up as an example of a "Super Kid."

The next Super Kid who is profiled is Deeksha Bhat who “seems to exemplify what we hope for from the next generation” according to the text scroll. Deeksha raises money for foster children and attends many youth leadership organization meetings. With the focus on individual initiatives to raise money for the needy, Deeksha’s endeavors also serves to reinforce market-based models of interventions that relieve the burden on the government. The next Super Kid, 11 year old Jack Davis, is responsible for a letter writing campaign that brought “The Jack Davis Florida Restaurant Lending a Hand Act” into law. This act allows restaurants to give perishable foods away to food banks and homeless shelters without any liability risk. Apparently one barrier to restaurants giving unsold, perishable foods away is the risk that food banks may incur a liability risk. Jack’s Act, which was signed into law by the Florida legislature, allows eateries to dispose of unsold food without fear that they may be held accountable should the food result in food poisoning of recipients. The next, and last Super Kid, is 13 year old Kristie Serrano. The scrolling text explains that Kristie has lived in Florida, Boston, Texas and Costa Rica while her single mom struggles to provide for her and her younger brother. Kristie qualifies as a Super Kid because “she is preoccupied with making the right choice versus the cool choice.” Kristie plays on several varsity athletic teams and has been cast to perform in her high school musical.

The take away message from “Super Kids” is that adolescents need role models among their peers as well as from responsible adults. All these children are extremely high achievers, but as the example of Kristie shows, kids don’t necessarily need to raise thousands for charity or bring new laws on the books in order to be ‘super.’ The children are celebrated for finding innovative adaptations within a market paradigm to address “externalities” that result from that same market paradigm. Pat sells ad space on his dome, Deeksha raises money for foster kids and Jack provides restaurants with a rationale for disposing of unsold food. It is interesting to note

the entrepreneurial elements of these efforts.

Time Machine

After an exhibit called “Puberty” (which consists of two interactives, one for boys and one for girls, explaining the hormonal changes that are going on during puberty) we reach the “Time Machine” exhibit, which is an amazing computer program that takes a visitor’s picture then ages the image in ten year intervals. This interactive uses some kind of computer algorithm to add realistic wrinkles, sagging flesh, and grey hair to one’s visage. First the visitor is prompted to input their current age. Then the visitor is directed to sit on a stool, resting their chin on a sturdy metal stand. Then, after centering the face onscreen using grid marks, a button is pressed. After about two minutes a photo of the guest appears onscreen. Clicking on different buttons shows a photo-realistic facsimile of the face as it ages. You can also choose to see what effect smoking, obesity and sun exposure can do to the skin as you age. A green panel of text explains:

Aging is a very individualized process that depends primarily on your genetics...But it’s not all out of your control. Watching what you eat, using sunscreen, and getting enough sleep may not seem to be important to you now, but it makes a big difference later in life...Especially when you look in the mirror!

In this piece of text, the “Time Machine” exhibit helps to articulate the ratio of agency and determination involved in the aging process. Genetics are listed as a major determining factor, but not the only one. This focus on lifestyle choices, such as avoiding too much sun, is a theme that becomes increasingly prominent as the visitor enters the adulthood sections of TAY. The ratio between agency and determination is a frame that can be found throughout the TAY

exhibition, right up to the end of life. The importance of behavioral choices in maintaining good health is also emphasized in the next exhibit. This time, the focus is not on diet or sun exposure, but on sexuality.

Risky relations

The next exhibit, “Risky Relations” (RR) is in the center of the rectangular area where the Adolescence section of TAY is located. On the front green panel of RR there is a plaque that warns “Images may be graphic to some. Viewer discretion is advised.” On the outside of this exhibit there is a green panel that rank orders STDs according to the amount of new cases in the U.S. each year. The STDs listed here include HPV, Trichomoniasis, chlamydia, genital herpes, gonorrhea, Hepatitis B and C, HIV and syphilis. There is also the statistic that 1 out of every 4 sexually active teens gets an STD.

In order to enter the main part of the “Risky Relations” exhibit, visitors have to enter a small, claustrophobic area that is walled in on three sides with green panels. Once inside, there is a green panel last lists the symptoms of each STD. There are pictures of a human eye with the yellowed jaundice indicating Hepatitis, and a cancerous cervix resulting from untreated HPV infection. There is a photo of an HIV positive man’s lip showing chronic herpes lesions. Finally there is a picture of a condom, with a subtitle that explains that latex condoms can reduce the risk of STDs when used properly. The right facing panel explains the health effects of STDs, such as cancer, pregnancy complications or infertility. “Risky Relations” stresses the importance of safe sex and regular exams to catch STDs early and treat them before they cause further infection and complications.

Like other “prescriptive” exhibits found throughout TAY, “Risky Relations” is an exhibit

that conveys health risks through the illustration of negative examples. As everyone remembers from shocking VD videos that were shown in middle school, the image of a body disfigured by disease can serve as a powerful form of warning that has clear behavioral implications. Nobody wants to wind up with the kinds of sores marking the lower extremities that are portrayed in these kinds of health messages, and we adjust our behavior accordingly. Because the injunction is “phrased” informatively in the form of photographic evidence, “Risky Relations” is an exhibit that can be categorized as an “indirect directive.” “Risky Relations” does not mention another risk of sexual intercourse, namely unwanted pregnancy.

Healthywood Squares



Figure 11: Healthywood Squares

Having walked around the circular cul-de-sac where the Adolescence section is found, visitors notice a huge exhibit up against the south facing periphery of TAY, called “Healthywood Squares.” This is probably one of the largest exhibits at TAY, and it is an exhibit that many visitors mentioned during their exit surveys or interviews. A take on a popular television game show, “Healthywood Squares,” has nine cubby holes where the puppet ‘stars’ of the show sit facing the audience.

Each square features a different puppet that has their own name and personality; they move herky-jerky in their chairs as they answer each question. Facing the approximately fifteen

foot tall panel of squares head on, two visitors at a time can press buttons that select a yes or no answer to questions issued by a puppet moderator who appears on the left, just outside of the tower. The visitor chooses one of the squares and the puppet moderator asks a question. Each player has the choice to agree or disagree with the answer issued by one of the puppets.

The rules of “Healthywood Squares” are not immediately apparent, and I observed many visitors giving it a try with puzzled expressions. It also proved to be a controversial exhibit for Cecilia and Dominic who had an issue with what they perceived to be racial stereotypes exhibited by the puppets. The panel of puppets is of various genders and ethnicities, as signified



by their names, accents or skin colors, although their skin colors are not like any person's. “RB” is apparently an African American puppet, based on his affected “urban” tone of voice and the brown fabric that is his skin. Based on her affected accent, “Juanita” is apparently a Latina, except that her skin is beige and her hair is orange. (The fact that her orange hair covers her eyes completely does not inspire confidence.)

Figure 12: Juanita, Healthywood Squares

In what follows I will describe some of these puppets in action in order to get a sense of what it was that Cecilia and Dominic found objectionable. On my reference video, I was both player one and player two. The first square that I picked was Juanita's, because it is in the center of the board. After a marked pause, the host (H) poses the first question. In my transcription, below, I have used a phonetic spelling of Juanita's (J) answers in order to try and capture the contrived Spanish accent that is voiced by the puppeteer.

H: Juanita...smoking is the *second* worst thing teens can do for their long term health.

So...what is the *worst* thing for your long term health?

J: Gettin' the school girl mad at you! [laughter and motion from other puppets]
Aiiite...lemme think...Number one worst thing teens do for dey long term helf? Imma hafta say that bein' overweight is the worst thing for dey long term helf. Chaa hood obesity is on the *rahz*. Too many kids eat too many fattenin' foods! An' extra weight is *really* hard on ya whole body. So I say...bein' overweight is number one.

H: Guest "O"...do you agree that it's true? Or disagree that it's false?

After a long pause, I press the "agree" button several times. After an extra-long pause, Juanita's square flashes twice and the letter O appears illuminated in her square.

H: That's correct. [Long pause. Then puppets make noise and move around in celebration] It's is the worst thing you can do for your long term health. Its effects increase the risk of heart disease, diabetes, joint problems, and *so* much more! So watch your weight. Guest X, choose a square.

In this question and answer, Juanita has answered the question correctly. Her answer is clear, except for the fact that the puppeteer who voiced Juanita used an exaggerated inner city "Latina"



accent. Cecilia described Juanita's Hispanic accent as "really offensive!" Her husband Dominic felt that Juanita was given a "Rosie Perez" accent that was "very inappropriate." Cecilia said "It was like...c'mon! We do not talk like that!" She also noted that in the top right corner there was a puppet that "had a really offensive Asian accent." They wanted to see how RB talked but the exhibit "stopped working" for them.

Figure 13: RB, Healthywood Squares

As Guest X, I select "RB" the brown skinned puppet with glasses and a worried expression, sitting in the square just to the left of Juanita. The host begins the questioning.

H: RB... True or false... you can tell by looking at someone that they have an STD... you know, a sexually transmitted disease.

[After a long pause, the puppet in the square above RB named Chris, says “oooh, he looks worried!” Other puppets can be heard making comments and laughing.]

A: Yo, stop lookin’ at me like that. You think I have an STD? That ain’t right. Me, worried? No way. Well, I’ll say it’s true. Someone who dresses well and takes care of themselves is just more likely to *not* have a STD. It’s true!

H: Guest X, do you agree that it’s true? Or disagree that it’s false?

This time, I move over to the Guest X panel and press the disagree button. RB’s square flashes one time and the X in his box lights up.

GS: That’s correct. [puppets make noise and movements.] You have no way of knowing if an individual has an STD just by looking at their appearance, such as how they dress and how clean they look. Most STDs show few or *no* obvious signs at all! Be careful!

Abstain, or use a condom correctly. That’s the *best* advice. Guest O, choose a square.

RB answered the question wrong, implying that, not only did he appear to the other puppets as possibly having an STD, he also thought that this diagnosis could be made solely on the basis of outer appearance. Based on these examples, I am persuaded by Cecilia and Dominic’s assessment of the “Healthywood Squares” exhibit as culturally insensitive. The message “this is play” doesn’t lessen the perception of racism for these two visitors.

Drunken Driving

The last feature of the Adolescence section is an interactive exhibit called “Drunken Driving,” sponsored by The American Automobile Association (AAA). Outside of this exhibit

there are three text panels that explain different driving impairments: drowsy driving, distracted driving and drunken driving. There are also statistics about automobile accidents that occur as a result of such impairments. The instructions invite the visitors to wear a pair of goggles which impair the vision and perception of the wearer, similar to what they would experience if they were drunk. With the goggles on, the visitor tries to walk along a straight line painted on the floor. At the end of the straight line there is an illuminated picture of the dashboard of an automobile. If visitors can make it across the threshold, they are instructed to put an imaginary key in the ignition and check their speed and gas level.

When I was observing visitors interact with “Drunken Driving” it seemed to be a lot of fun, indicated by laughter, exclamation, and stumbling. During my surveys, several visitors listed “Drunken Driving” as one of their favorite exhibits. John said “It’s amazing that just a pair of goggles would do that!” John’s friend Doug followed up with “Yeah, you put on those goggles, and you think you are walking straight, and it’s no problem but then—” Karen completed his sentence. “—but then you see it’s a problem! [laughs]” Jamela pointed at her daughter and said “She couldn’t even make the goggles—she couldn’t even make the line! [laughs]” Drunken Driving is an exhibit about a serious topic with visual affordances that make it fun. Having experienced what it is like to “walk in the shoes” of a drunk person, visitors leave the Adolescence area of TAY to soberly enter the Adulthood area.

CHAPTER FOUR: ADULTHOOD TO END OF LIFE

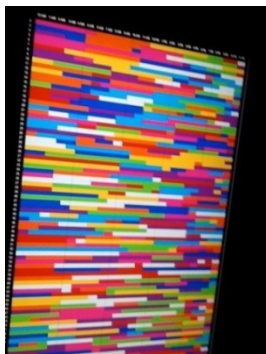
Young Adulthood

The adulthood area is divided into three content areas: Young Adulthood, Adulthood, and Older Adulthood. The first section has a green color scheme. These exhibits are located in the Young Adulthood area: Life Mosaic, Allergies, Headaches, Choices for Longevity, Smoking and Health, Mental Illness, Mindball, Stress, Cybernetic Human, 3D Body Exploration, Inventors, Spinal Cord Injuries, Sugar, Sugar, Diabetes and a 3 Screen video installation.

Life Mosaic

The first exhibit in this section is called “Life Mosaic” sponsored by Tampa Digital Studios. Here visitors can code activities in their life to create an abstract collection of colorful rectangles on a screen. Using the trackball and button, this exhibit asks visitors to select various activities and estimate the amount of time they spend doing them throughout their week. “Life Mosaic” also lists statistical averages among US citizens. Some of the activities include TV watching, school, internet, playing sports and working. After visitors input their daily activities and estimated times they get a color-coded grid of their entire day.

What is interesting about this exhibit is the abstract and even artistic output. While other “diagnostic” exhibits at TAY measure hearing, vision or other capabilities using standard



metrics, “Life Mosaic” provides a colorful output that, while aesthetically interesting, is of limited diagnostic import in and of itself. Chris said “There was the one about the color coded life style. It had no explanations!”

Figure 14: Life Mosaic

“Life Mosaic” can be interpreted at a different level, however, when the prescriptive dimensions are considered. In this interactive, visitors have to take some time to consider what it is they spend their lives doing. In effect, they have been engaging in self-monitoring, a ‘technology of the self’ that experts maintain is a powerful tool in health interventions (Michie, Whittington, Abraham, McAteer, & Gupta, 2009). Keeping a diary that lists foods consumed, or time spent exercising or refraining from bad habits helps a patient to draw attention to their own behaviors. In the dialectic of control and determination that is found throughout TAY, “Life Mosaic” is an example of a behavioral intervention that can build reflexivity and may increase a person’s sense of agency.

Choices for Longevity

After “Headaches” and “Allergies” (two descriptive exhibits about the causes and treatments for these conditions) the next exhibit is called “Choices for Longevity” which links lifestyle choices with morbidity and mortality. The teal panel begins with an upbeat stanza of text that states “the average lifespan in the United States has increased 30 years... This is the greatest increase in the last 5000 years of human history!” The text goes on to explain that the change in life expectancy is mostly due to the decline in infant mortality rates and an uptake in vaccination against deadly diseases. Due to the rise in obesity among young people, “Choices for

Longevity” notes that average lifespan may be dropping for the first time in decades.

“Choices for Longevity” also has an interactive element called “How Long Will You Live?” which estimates the life expectancy of visitors based on the answers they give to certain prompts. Using a roller ball mouse and button to click, visitors answer a series of questions about their family health history, their current health conditions and lifestyle habits. The first page of questions asks “do you use cigarettes?” and “how do you feel about your weight?” Other pages to follow ask about sleep; dental flossing; exercise; eating red meat; cancer, diabetes or heart attack in the family; and coping with stress. At the end of this questionnaire, each visitor’s life expectancy is estimated onscreen. The “Choices for Longevity” exhibit makes explicit the link between behavioral choices and life expectancy. In this exhibit the behavior of the visitor is framed as the sole determinant of life expectancy, all other factors (like genetics) being equal. The “Choices for Longevity” exhibit is a good primer for the next exhibit about smoking, which was consistently cited by informants as being one of the most memorable and persuasive at TAY.

Smoking & Health

On the north facing wall of the Young Adult section of TAY, there is a mini-exhibition sponsored by the Florida Department of Health that deals with the dangers of smoking. The first exhibit in this section features a screen with the picture of a healthy middle aged woman. Visitors are invited to push a button next to the screen to see what she looks like after years of smoking, and the result is grotesque. The photo morphs to show wrinkles, darkened skin around the eyes, skin discoloration, yellow teeth and eyes and cheeks that appear sunken.

Below, there are two jars that have two different human lung specimens in them. One is



Figure 15: Lung Specimens

from a healthy person who did not smoke, and the other is from someone who had smoked during their life. Both specimens look terrible, refracted by the murky brine that surrounds them. Yet the non-smoker’s lungs appear to be decidedly pinker, puffier, and intact than the smoker’s grey and shriveled lungs.

On a teal panel of to the left of the human specimens, text reads “SMOKING AND HEALTH: What’s In Those Things!” A stanza of text reads

There are about 600 additives that the United States government allows cigarette manufacturers to put in cigarettes. While these ingredients have been approved as food additives, they may not have been tested by burning them. There are over 4000 chemical compounds created by burning cigarettes, many of them toxic and/or carcinogenic (cancer causing).

Beneath this short stanza of text there are three columns listing hundreds of different chemicals. Some of the chemicals include ammonia, arsenic, benzene, butane, carbon monoxide, cadmium, cyanide, DDT, lead, and formaldehyde. The rhetorical impact here is an avalanche of evidence about the dangers of smoking. “What’s In Those Things” is an indirect directive which allows the visitor to infer the take away message about smoking, based on a characterization of the ingredients as toxic and carcinogenic.

The rhetoric becomes more explicit in the next panel, which announces “Smoking is NOT cool.” This text panel argues that smoking is uncool insofar as it is harmful to the smoker and those unfortunate enough to be around them. It also makes the argument from the financial perspective, noting the annual costs of cigarette smoking to the user.

Smoking is NOT cool.

A new mindset: You really don't look cool smoking.

Just don't start. Addictive chemicals in cigarettes make it very hard to stop.

What would you say to someone to convince them to stop smoking or never stop?

If you want to quit smoking, talk to your doctor about methods that may work for you.

At a pack a day, smoking costs about \$1600 per year. What else could you do with that money?

This stanza of text seems to be groping for the illocutionary force required to discourage smoking. Some of these statements take the form of indirect speech acts or contain covert commands to modify behaviors. "You really don't look cool smoking" can be interpreted as a way of stating the directive, "therefore, do not smoke." Who doesn't want to look cool? Then, this stanza of text begins thinking aloud about the kinds of strategies that would be effective in persuading others to not smoke. "What would you say to someone to convince them to stop smoking or never stop?" This line reflexively draws the reader's attention to the rhetorical situation. The last line appeals to the would-be smoker at the level of personal financial cost. "At a pack a day, smoking costs about \$1600 per year. What else could you do with that money?"

After this stanza of text, there is an indentation, and some bulleted points follow. The anti-smoking rhetoric is stepped up, appealing now to population-level mortality concerns. According to these bullet points:

Smoking kills hundreds of thousands of people per year and accounts for more deaths than accidents, wars, murders, and HIV combined. Lung cancer, one of the worst cancers, would almost be eliminated if smoking were to cease. Smoking also causes other lung diseases, resulting in difficult breathing. The cost to the health care system is immense.

Smoking not only damages your lungs, it also contributes to heart and artery damage in the body, and causes premature births in pregnant smokers. Second hand smoke affects the health of children and people near smokers. Chewing tobacco causes sores in your mouth and throat that can become cancerous.

This itemized list of facts—imbricated with indirect directives—runs the gamut of discursive appeals found in anti-smoking rhetoric. Such an adumbration of the dangers of smoking is surely persuasive, but “Smoking and Health” still has other interventionist strategies to come—including powerful first person video testimonials from ex-smokers.

The next exhibit in “Smoking and Health” consists of a video monitor showing a short video on a continuous loop. Sponsored by the American Lung Association, Moffitt Smoking Cessation Clinic and the Florida Department of Health, this video features adolescents and young adults speaking on camera, stating their opinions about why smoking isn’t that bad. Each of these is then juxtaposed with the testimony of ex-smokers who have suffered serious health consequences as a result of smoking.



Figure 16: Smoking and Health teen

The video features a blonde haired girl wearing glasses and a black V neck sweater who appears to be in her early to mid-teenage years. She says “my parents smoke. I’m around smoke all the time. It’s kind of like a family tradition. It’s not even frowned upon so...”

An interstitial video effect appears onscreen where the blonde teenage girl appears to turn bright yellow, and then fizzles off the screen, accompanied by a whooshing sound effect. Next, another teenage girl appears onscreen with long, dark brown hair, wearing a cardigan sweater.

With a smirking expression on her face she says, “I guess maybe when I’m 60 I’ll quit but you

only live once right?” With the same fizzle effect, the video immediately cuts to a young teenage boy with dirty blonde hair wearing a smile. He says “My mom smokes, and she doesn’t want me to smoke because she doesn’t want me to be like her. But...I kind of *am*.” The boy turns yellow and in a whoosh, quickly disappears, morphing into yet another teenage girl wearing a black jacket with brown hair parted on the side. This girl says,

Yeah every time I hear the ‘don’t smoke, don’t smoke’ thing I really just kind of roll my eyes. I mean me and my friends laugh about it. Because it’s not a big deal. It’s not like we’re doing drugs. It’s not like we’re doing anything that’s really illegal. I mean, we’re old enough now so we really don’t think it’s a big deal.

The video then transitions to another teenage boy wearing a blue plaid shirt. He looks straight into the camera and says, matter-of-factly, “It’s my body. I’ll do what I want. It’s my choice.” The video repeats the phrase “It’s my body” three times, with the audio being pitch-shifted successively lower until his voice sounds very low. With each repetition of the phrase, the camera pans in closer on the boy’s mouth, so that the last repetition is just a shot of his mouth, saying the words in slow motion.

The words issued from the succession of rapidly changing talking heads are examples of the rationalizations that teens may use to justify their smoking habit. If a parent smokes, this can serve as a ready-made excuse. Another type of rationalization is to minimize the dangers of smoking. Another form of rationalization is typified by the boy who says “It’s my body I’ll do what I want. It is my choice.” In this statement, this unnamed teenager uses the first person pronoun to reveal the ugly, non-compliant side of the individualist mantra. This is an appeal to freedom and the domain of individual human agency. The sovereign self, as enshrined in libertarian axioms, can be a gauntlet for rejecting any admonition to modify behavior. The

“Smoking and Health” video won’t challenge these types of rationalizations directly. Instead, the next speaker who appears onscreen will offer his own disfigured body as a form of refutation.

The video will now segue into a personal narrative with persuasive (if gruesome) visual aids.

The screen becomes momentarily blank, signaling a transition. Text appears on screen against a black background with wisps of blue smoke. The text reads “Nobody was born to smoke. Teens learn how by watching and copying people they admire.” This text remains onscreen for several seconds, and then the screen fades to an old man against the black and blue



background. The man is completely bald wearing large glasses and a white V-neck sweater. He appears, at first, to be a healthy, normal old man. Harry’s speech is somewhat halting and slurred, and his head tilts from side to side as he makes his recollections.

Figure 16: Smoking and Health, Harry Nyce

My name is Harry Lincoln Nyce. I started smoking when I was 13. I did it because I was running around with the group of boys and girls and *they* all did it. So to fit in, I did it to. Boy, am I sorry. My mother never smoked. My father never smoked. My mother never chewed. They wanted me to quit but I thought, I’ve smoked, and it’s what everybody else was doing. Why can’t I? And I thought “I’m my own boss, it’s my body, okay?”

As Harry tells his story it is apparent that his dialogue has been spliced together or montaged from different utterances during the video shoot. Text appears onscreen that reads “40% of smokers try to quit every year.” Harry continues “Very, very addictive...Very! I have wanted to quit at least 10 times and I’m not stretching that either.”

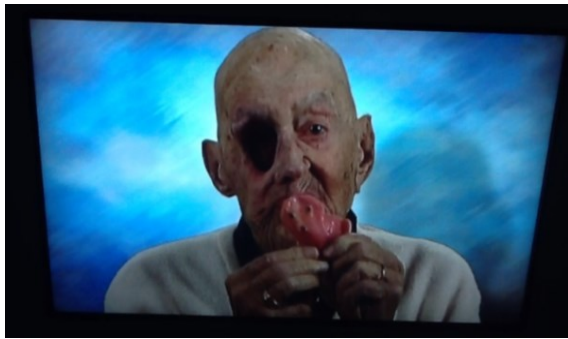
As Harry is speaking that last line, text appears onscreen that reads “more than 90% fail without help.” Then, the video camera zooms in on Harry for a closer shot.

I went to the doctor because I was having trouble breathing and I just didn’t feel good. He said you’re going to lose this eye. [Points to his right eye]. You’re going to lose the sinus in your nose. [Points to either side of nose]. You’re going to lose your teeth on this side of your mouth. [Points to mouth].

The camera cuts away to an ever tighter shot of Harry’s face. As he takes off his glasses, Harry says “I’m going to remove my glasses and I’m going to remove my prosthesis of my eye...”

As he positions his hand over his right eye, the viewer might expect for Harry to pop out a glass eye, but instead he does something even more shocking. He lifts off a rubber prosthesis that simulates his eyeball, but also his eyelids, eyelashes, and all of the flesh surrounding his eye.

What he reveals on his right side is a gigantic gaping cavity in his face. Occasionally he turns his head from left to right, revealing the cavity to be an abyss in the right side of his head. After removing his eye prosthesis, Harry says “I am going to take out my teeth on the upper side of my mouth.” With both hands, Harry reaches into his mouth and a clicking sound is heard. The



viewer might expect Harry to take out a small upper plate. Instead Harry pulls out a large piece of dark red, wet plastic prosthetic, making up not only his upper teeth but most of his upper jaw.

Figure 17: Harry Nyce removes prosthetics

The removal of prosthetic parts changes the integrity of Harry’s face, producing groans and shudders among visitors to this exhibit. Harry makes a garbled attempt to speak that is practically inaudible. Fortunately subtitles provide the words that Harry attempts to utter. “I can’t

talk very well now but this is the face that I have from smoking. Now I'm going to put this back." Harry puts his jaw prosthesis back in his mouth. With his voice more audible, he repeats his point. "And this is the face I used today because of smoking for 30 years." Piano notes can be heard in plaintive minor chords. As Harry fades from the screen, a handsome teen boy appears with a full head of hair and blonde highlights. His youthful face is confident as he nods his head left and right, saying "Nah... That won't happen to me. I'm not worried about it." Then the video screen fades to grey.

The general consensus from visitors was that the "Smoking and Health" video could serve as a powerful deterrent against smoking, but some visitors had their reservations. For example, Bruce had some observations about this video's obvious use of scare tactics:

I think it can backfire. I think it has to be thoughtfully presented so that it is not so much in your face that it turns people off. For example on the video, they were talking about the serious consequences of smoking and the kids were saying "well, that's not going to happen to me." I think it is easy to have people freak out, and think well that's not what I want to hear.

In this portion of my interview transcript, Bruce is noting a kind of meta-commentary about scare tactics that is found in the content of the video itself. After Harry removes his various facial prostheses, the next teen that appears onscreen is shown dis-identifying with Harry's outcome. It is as if the "Smoking and Health" video almost anticipates the kinds of rationalizations that viewers (especially younger viewers) may be making. Bruce's partner, Alexis, agreed with him but also noted that the reception of the video may depend on contextual factors, such as the age of the viewer:

I think it is age-dependent, because teen-agers are going to rebel against scare tactics, whereas a younger child will get frightened. And also I think we get protective, and we think, for heaven's sake that's scary, and the kids say "I don't want that to happen to me, Mommy." It doesn't work with teenagers, but with younger kids it might be too strong a message.

Bruce and Alexis, having visited MOSI that day with two girls (ages eight and eleven) were sensitive to some of the exhibits at TAY that may have been scary to their kids.

The Amazing You is an exhibit that has been named after *you* the visitor. This eponymic figure of speech invites each visitor to identify with the bodies presented in at exhibition that manifest symptoms and diseases. This is a body that is parceled out into pieces, yet not in exactly the same way as museum exhibitions such as *Bodies*, which took dismemberment rather literally. Using the technique called plastination the exhibitors were able to show the body in pieces. TAY uses a different set of representational apparatus when it tries to hail a plural collection of body parts into a singular "you." TAY also hosts human remains, the lung specimens being one example. But without the technique of plastination, the lungs in a jar of formaldehyde—bloated and indistinct— only vaguely resemble our own mental pictures of the respiratory system.

Yet TAY offers another form of embodied, verbal information that, in the case of a pair of human lungs preserved for our viewing through plastination, would remain mute. If those lungs could talk, what would they say? Here the video recorded testimony of Harry Nyce provides the narrative component that is lacking. Nyce reveals to us that he is in fact only a threadbare human face, his conventional accoutrements of humanity provided by prosthesis. As Harry removes parts of his face we have a dreaded recognition of ourselves as a collection of

component parts. Nyce does the disembodied plastinated corpses of *Bodies* one better: He speaks to us as if already pieced out into body parts, almost only a brainstem and a gaping maw.

The video technique used in the “Smoking and Health” video—where one teen seems to fizzle and morph into the next— is a reminder that each of the well-worn rationalizations offered reflects our own human capacity for denial, with interchangeable genre elements. Each teen blends into the next with an almost statistical invariance. We are invited to identify with the teens, even beyond the context of smoking, and their rationalizations become ours in other contexts. These teens, in their petulance, so unbowed by the evidence before them, are that aspect within the human condition that struggles against a motivational deficit about the better advice we have inherited. “Smoking and Health” is saying *this is you* which makes actual the poetic truth “Therefore, send not to know for whom the bell tolls.”

Mind Ball

There is a sparse exhibit about mental illness which, as I noted in my methods chapter, was scaled down considerably because of budget restraints. The next exhibit to the left teaches visitors an amazing form of biofeedback that can aid in relaxation. This is an interactive, two player game called “Mind Ball.” The idea of this game is to use the brain’s ability to remain calm. Two participants sit down at a light brown wood laminated table, with a large backdrop of human brains in phosphorescent blue against a dark background, with neurons firing. A ball is encased in a tube that runs from one side of the table to the other. The participants wrap sensor bands around their head and try to relax. The calmer the person is, the better he or she will be able to send the ball through the tube. There is also a description of what is going on, which involves the head band reading the Alpha and Theta waves from the neural activity in the brain.

There is a monitor that the visitors can look at that represents this brain-wave activity.

“Mind Ball” is a product of Interactive Product Line IP, a Swedish company. According to their website “our mission is to contribute to people’s mental health by making EEG biofeedback training easy and fun.” (InteractiveProductlineAB, 2013). The principle behind biofeedback is that users can monitor readings given off by their bodies and gain the ability to affect these readings using relaxation techniques. What makes Mind Ball somewhat unusual is that it is designed as a competitive sport. While competing in a sport often involves excitement and adrenaline, you need to be relaxed in order to win at Mind Ball, which indicates the frame flexibility of the exhibit. Mind Ball was one of them most mentioned exhibits by visitors to TAY, and the experiences related are entertaining.

MOSI visitors Kent and Haley began smiling as soon as I asked them about their interactions with Mind Ball. They looked at each other and appeared to be suppressing some giggles as they explained their experience.

“It was really tedious, because we weren't really evenly matched, so it was taking forever, and then his patience, once again, eventually prevailed. We were doing it—how long were we doing it?” Haley asked her husband.

“At least ten minutes straight.” Kent replied.

Then prosody inflected Haley’s voice when she explained “And, I would just like to point out that for the majority of the ten minutes, that ball was on my side—for a large portion, very far on my side. And then, once it got to the middle, and then we started talking and it started going over, I was, like, ‘Whatever, I don't care’ [laughs].”

“Yeah, I just started talking to you, and after I started talking to you, you were, like, ‘I wanna leave, now’ [laughs].” Kent recalled. Haley and Kent’s recollection of Mind Ball made it

sound like this interactive allowed for relational issues and even play fighting to emerge. Based on their description, it sounds like Haley was winning the game until Kent began talking, and the ball gradually started moving over to his side. At this point, it sounds like Haley lost interest in playing. They had obviously enjoyed and even flirted while engaging in Mind Ball, and despite Haley's expression of frustration, it seemed like both had enjoyed it.

With Mind Ball we are reminded that stress is a risk factor for numerous health problems, with relaxation the antidote to being stressed out. Just beyond Mind Ball there is an exhibit called "Dealing with Stress" that reinforces the impression that stress is the enemy of health and longevity. This exhibit teaches visitors that stress is not only hard to cope with, but that it can also be damaging to our health, as it is implicated in a number of problems ranging from being overweight to high blood pressure. There are also some relaxation techniques given here, such as: listening to music, smiling, breathing deeply and slowly, closing the eyes and thinking of a peaceful place, as well as practicing meditation or prayer.

The Cybernetic Human



Figure 18: The Cybernetic Human

The next exhibit, which is the focal point of this area of TAY, is called "Cybernetic Human" (sponsored by West Coast Brace and Limb.) At first glance the "Cybernetic Human" appears to be some sort of super hero or robot behind wraparound clear acrylic. He is a sleek silver colored mannequin with a variety of appendages and openings. His face features a prosthetic nose and ears and a pair of dentures fastened into bright red gums.

He also has a leg prosthesis, an artificial heart, replacement joints and a myoelectric

hand. This hand can be controlled by visitors as they place their wrist into a vice like device and open and close their hand. As they do this, the “Cybernetic Human” is supposed to mimic the action on his own prosthetic hand behind class. (Sometimes, guests had trouble getting this function to work.) There is a low, wide railing that goes around this exhibit, with descriptions of each type of prosthetic as well as how they have changed over time. The “Cybernetic Human” is a reckoning with the proper limits of the pronoun “you.” When “you” are an augmented collection of body parts as well as prostheses, where do “you” end and where does “not you” begin? Donna Haraway writes “...we are all chimeras, theorized and fabricated hybrids of machine and organism; in short, we are cyborgs.” (Haraway, 1991, p. 150).

Paula, the health educator I interviewed, noted on her survey that the “Cybernetic Human” was one of her favourite exhibits. During our interview I discovered that her boyfriend was a combat veteran who had lost an unspecified body part in the most recent Gulf War. Paula helped me to understand that operating the myoelectric hand was something that some amputees found tiring or it was otherwise unfeasible for them. Paula explained:

I think there's more expending of energy, especially if you're trying to actually manipulate the fingers and grasp things. So, a lot of times when you see double amputees (or if the amputation is too high up on the body and they don't have a stump on which to attach the electrodes) you'll have those people using their body mechanics to manipulate the hooks [Paula moves her body back and forth to demonstrate].

Paula suggested that MOSI should place a video in the “Cybernetic Human” exhibit area that shows someone learning how to adapt to prosthetics. Especially since now many combat veterans survive losing a limb, an injury which in previous wars could have been fatal.

I mean, in Vietnam and World War II, those people just didn't come home. Now they're

coming home, and they're living a life, and their families have to adapt with this new modification in their life—especially when they have children. I've seen double amputees come home, and they have no arms with which to pick up their children.

Paula felt that instead of focusing so much on the device, “Cybernetic Human” should profile individuals who are learning to adapt to life without the body parts that a standard issue human has. “Cybernetic Human” shows how technology is enabling new concepts of the self, at the same time that it is enabling new ways to look inside of the body, as in the next exhibit.

3D Body Exploration



The next exhibit visitors come to is another life-sized model of a male human lying prone, face up, beneath clear acrylic. Like “The Cybernetic Human” this man is also baldheaded but he has realistic characteristics that the cybernetic human did not have.

Figure 19: 3D Body Exploration

For instance, this model has a slack jaw with jowls and other middle-aged features on his face and a ghostly white/yellow pallor. His hands are placed on top of his abdomen at his waist, and he is wearing green gym shorts. Above the model there are two video monitors separated by a panel of white text against a blue background. The title reads “3D Body Exploration” with text below:

Visible Human Project: in the 1990s, the National Library of Medicine and University of Colorado researchers sliced both a male and a female frozen cadaver into sub millimeter thin ‘slices.’ High resolution photographs at each slice were digitized into an enormous

data set. Computer reassembly of the data allows us to “see” inside the human body. Notice how the textual explanation, above, avails itself of punctuation. “...researchers sliced both a male and a female cadaver into sub millimeter thin ‘slices.’” The single quotation marks around the word ‘slices’ signify what are, in fact, quite literally slices (no ‘scare quotes’ necessary). This nonstandard usage of single quotation marks indicates that the intrusiveness (of using a meat slicer to slice human remains much like a ham) is here being reframed as a medical way of seeing. A second use of quotation marks appears here, this time with double quotation marks. “Computer reassembly of the data allows us to “see” inside the human body.” Here double quotation marks are being used also in a nonstandard way. Each bisected image of the cadaver does provide an image of the cross section of a corpse. So what we are seeing when we scan the plastic model are photos of actual horizontal slices of a person. The use of punctuation marks can be seen as a way to explain the unusual visions enabled by the medical gaze.

In his study of the medical gaze, Foucault (1975) highlighted “the visible invisible.” Medicine enables new ways of seeing and the 3-D Body Exploration exhibit is an example of these new ways. Consider the metaphor used to frame this type of vision in the title of the exhibit, *exploration*. In this usage, exploration connotes a journey within the familiar topology of the human body, yet from a brand-new angle. Exploration is a superordinate frame that reframes the intrusiveness of the medical gaze, even as it downplays the gory practical details. These collections of slices are then used to reassemble a whole “person” (represented by the mannequin) who can be scanned at the “3D Body Exploration” exhibit. While “seeing” is used metaphorically in this exhibit, the next exhibit relies on the metaphor of communication to explain the nervous system.

Spinal Cord Injuries

“Spinal Cord Injuries” (SCI) consists of three teal colored wall panels with white text.

The text on the first panel reads:

Like a bundle of wires that fit inside a tunnel in the spine, the spinal cord is a collection of nerves transmitting between the body and the brain. An injury to the spine can damage the nerves, cutting off communication to parts of the body resulting in paralysis.

In this text, the “bundle of wires” that is the spinal cord here connotes signal path in solid state electronics. The next subheading, entitled “Occurrence” details the incidence of SCI. According to the panel of text, nearly 200,000 people in the US live with a disability related to an SCI. Males are more likely than females to sustain an SCI, with 85% of all spinal cord injuries occurring in males age 13 to 30.

The second panel of the “Spinal Cord Injuries” exhibit contains more text, as well as what appears to be skeletal remains of an actual human spine (or a realistic model) placed behind clear acrylic. The human spine is juxtaposed over a dark blue silhouette of a man’s body. A stanza of text beneath the heading reads

Spinal cord injuries can stop brain communications. The spinal cord is the communication hub of nerves telling our body what to do. Spinal cord injuries stop the nerve signals from going from the brain to the body and vice versa. Without a signal the brain is not able to sense and the body may not move or function.

In this stanza of text, agency is being ascribed to nerves that relay signals to the body. Such signal relay is described in terms of speech, where the communication hub is “telling our body what to do.” Corresponding to areas of the spine, there are circular text boxes with information about that section of the spinal cord (cervical, thoracic, lumbar and sacral). For each section there

is a description of what symptoms and complications an injury in that particular location might have on the person who sustained the injury.



The last part of the “Spinal Cord Injuries” exhibit is an interactive called “Taking a Chance with Your Spine.”

Figure 20: Taking a Chance With Your Spine

Visitors approach a kiosk that resembles a slot machine, and they are invited to push a button that starts the game. When it stops it lands on a selection of images, each one representing a different method for winding up with a spinal cord injury. Some of these methods include a horseback riding accident; a gunshot wound; a car crash and a diving accident. “Taking a Chance With Your Spine” is an exhibit that uses gambling and contingency as a metaphor. As in other exhibits where it is used, this is an ambivalent metaphor, because the content of the interactive is focused on behaviors that are governed, at least in good measure, by acts of will. The focus on high risk activities such as horseback riding and diving suggests that such activities can be avoided to lessen risk to the spine. As such, it is not purely chance at work. Gunshot wounds or car accidents are events that are more governed by chance in that they are less avoidable. Perhaps one can avoid gunfights by not electing to be involved in combat situations, but victims of gun violence probably wouldn’t choose to get shot in the back. In our car oriented society, being a safe driver can go a long way in preventing crashes, but getting broadsided by a more reckless driver is always a possibility on the road. Yet “Taking a Chance With Your Spine” suggests that the chance of getting hurt is as random as a slot machine, reframing the ratio of control.

Adulthood

When the color of the exhibits turns from teal to yellow, visitors know they are now in the Adulthood section of TAY. Within the Adulthood portion of TAY there are two major exhibits (almost mini-exhibitions) that are focused on Cardiology and Stem Cells, respectively. Other exhibits focus on screening and imaging, alternative medicine, laughing and exercising for preventative health. These are the exhibits in the Adulthood portion of TAY: Spin Doctor, Options, Options, Patient Simulator, Scanning Technologies, Robotics, Cardiology, Thank Goodness I Caught it Early, You, M.D., Stay Active, Laughter Is The Best Medicine and Stem Cells.

The Spin Doctor

The first exhibit in the Adulthood section is an interactive called “The Spin Doctor” which is one of TAY’s forays into the realm of alternative medicine. The video interface is a colorful candy cane of red and orange stripes. In the foreground there is a list of “alternative” medicine categories. “The Spin Doctor” appears at the far right of the screen. He is a cartoon character wearing a head mirror and a white lab coat.



Figure 21: The Spin Doctor

Using a roller ball mouse and button, visitors click start to spin a wheel on a video screen that lists a wide variety of ailments including head lice, dandruff, nausea, heartburn, canker sores, acne, psoriasis, arthritis, warts, migraine, toothache and earache.

Visitors can either let the wheel spin and land on an ailment at random or click the up or down arrows to make their own selection. On the right of the screen there appears an arrangement of playing cards, each one with the label of a different type of treatment including western/traditional medicine, aroma therapy, acupressure/acupuncture, hydro therapy, homeopathy, herbal, Eastern and Folk. Each card can be flipped over for the treatment for the selected ailment using that form of medicine. “The Spin Doctor” presents a treatment regimen for each type of therapy. For example, for an earache, “The Spin Doctor” suggests the following herbal remedy: “Wet a cotton ball with Mullein oil, a plant in the spinach family, and gently insert into the affected ear.” For cough, “The Spin Doctor” suggests the following homeopathic remedy: “Spongia tosta, a prepared sponge helps a dry cough, especially when used following belladonna.”

In conversations with MOSI visitors, several people noticed that Western Medicine is the dominant paradigm at TAY. “The Spin Doctor” is exceptional because it focuses on other treatment modalities. The design and interface of “The Spin Doctor” contains a symbolic positioning of non-Western medicine within a pantheon of treatments. As such, there can be detected a certain relativism about different treatment modalities in the orbit of a dominant traditionalism. Notice the root metaphor of a “spin” of the wheel suggests a random element of chance, such as that found in wheel spinning game shows. Like other TAY exhibits modeled after games of chance, “Spin Doctor” highlights the ratio of contingency versus deliberateness in human health. The implication of randomness suggests an equivalence of competing paradigms. At the same time, “Spin Doctor” may insinuate that it is a ‘gamble’ to dabble in other treatment modalities.

In addition to the randomness associated with spinning a wheel, there is the flipping over

of playing cards, as in a game of chance like solitaire. These features of the user interface could be interpreted as suggesting arbitrariness as a property of alternative treatments. There is also the polysemy of this exhibit's name. The term "Spin Doctor" is sometimes employed as a term of derision to describe political pundits and public relations professionals. "Spin" as a verb can connote selective representations of the facts in order to promote a partisan viewpoint. The exhibit designers probably did not have these connotations in mind, yet the semantic implications of the term "Spin Doctor" are noticeable. Namely what "spin" on alternative medicine is suggested by this exhibit? Some of the treatment modalities mentioned in "The Spin Doctor" exhibit have more credibility than others. Take, for instance, homeopathy. One often cited meta-analysis claims that homeopathy doesn't show any clear benefit over placebo (Linde et al., 1997). Another reviewer (Ernst, 2010) notes that six different reviews in the prestigious *Cochrane Database Systematic Review* did not reveal any clear clinical benefits for homeopathy. The implication for the "Spin Doctor" exhibit is that treatment modalities with varying degrees of benefit are being presented as equivalent. Viable treatments may suffer "guilt by association" by having been positioned next to discredited treatments.

It also appears that there are some categorical problems with the itemized list of alternative medicines at "The Spin Doctor" exhibit. For example, under the term "Traditional Medicine," there are treatments within the Western biomedical paradigm, but not other forms of traditional medicine such as Indian and Chinese (traditional medicines that have been around a lot longer than Western medicine.) The umbrella term "Eastern Medicine" refers to a wide variety of traditional Chinese and Indian healing techniques, including yoga, acupuncture and herbal remedies found in traditional Indian Medicine called Ayurveda. As such, "acupressure/acupuncture" and "herbal" could be regarded as subcategories of Eastern medicine

instead of separate treatments. Strictly speaking, these treatments are also “traditional.” This confusion appears to be of the order of a class/ membership distinction (Bateson, 1972).

Within the umbrella term “Eastern Medicine” there are some forms of treatment that are better regarded than others. Studies have shown clear benefits for at least one of these techniques, yoga (Hartley, Dyakova, Holmes, Clarke, & Rees, 2012; Mearns, 2013; Ross, Friedmann, Bevans, & Thomas, 2013). Herbal medicines can be hard to define, according to a World Health Organization report (WHO, 2005). This is because of different standards for what counts as food, functional food, dietary supplements and herbal medicines (WHO, 2005, pp. iii). Meanwhile, some herbal medicines marketed as Ayurvedic have been found to contain toxic heavy metals (WHO, 2005, p. 41). In short, “Eastern Medicine” is too vague a term, especially when it comes to basic health education. It is also arguable that, by focusing on categorically ambiguous individual remedies, “The Spin Doctor” misses an opportunity for a more holistic approach to these paradigms. What are the underlying assumptions that inform each perspective, and what are the historical circumstances that shuttle them to the sidelines of an intricate exhibition such as TAY?

Options, Options

Some of these questions are addressed in the next exhibit, a yellow text panel entitled “Options, Options.” This panel contains a picture of seven acupuncture needles sticking into a nondescript part of the human body. A hand is reaching in and inserting or removing one of the needles. The white text against a yellow background reads:

Alternative Options

There are many options for healthcare other than traditional “western medicine.” Some

may be less risky or less intrusive. Some have gained wide acceptance, but some have unproven benefits. Even “western medicine,” though widely reliable, can have numerous side effects and risks. Educate yourself and assess everything carefully for your own use.

The text here points out how complementary and alternative forms of medicine that are not considered “traditional” in a biomedical sense have become popular choices. However, some of these treatment modalities have not been subjected to the gold standard of Western medicine (the double-blind, placebo-controlled study) which means they could actually cause more harm than good. By the same token, Western medicine has many risks. This text panel equivocates about recommending or dismissing alternative approaches, urging visitors to do their own research and become educated on any alternative treatments before trying them. Underneath the Spanish translation of the above text, there is another stanza of text underneath the heading “Snake Oil.”

The term snake oil is often used in a derogatory manner, referring to a con man’s sale of hoax remedies. In fact, oil used from a water snake has been used for centuries in China, effectively relieving joint pain. The key ingredient, EPA, is a natural anti-inflammatory.

This stanza of text alludes to an old term of derision applied to patent medicines that were sold in newspapers and magazines in the days before the Food and Drug Administration became a body of federal oversight and regulation. Before the enforcement of truth in advertising regulations, manufacturers of patent medicines could sell anything in a bottle and claim that it had any number of curative and therapeutic properties. While the historical context has been largely forgotten, the term “snake oil” remains in the public lexicon, referring to any manner of dubious cure. In this short stanza of text it is pointed out that snake oil contains long-chain omega-3 fatty acid called eicosapentaenoic acid (EPA). This ingredient, also found in fish oil, has been touted as dietary ingredient that shows promise for the prevention and treatment of heart disease

(Villani et al., 2013) and other degenerative diseases associated with inflammation including cancer and arthritis (Cleland, James, & Proudman, 2006).

The implication is that, in its paradigm case, the colloquialism “snake-oil” is not necessarily what its name connotes (being a hoax without clinical merit.) The case of snake oil serves as one anecdotal example, but by implication, the visitor is left wondering if other remedies that have been derisively dismissed may actually have merit. “Options, Options,” along with “The Spin Doctor,” can thus be seen as a symbolic acknowledgement that Western Medicine is not the only game in town. At the same time, “Options, Options” also contains skeptical digs at some more dubious cures.

Underneath the stanza of text about Snake Oil there is another portion of text that lists dubious folk remedies. The heading reads, “Remedies that make you say ‘Hmmm?’” This list includes animal dung as a treatment for pain, epilepsy and jaundice; crushed ants to stimulate sexual interest; bat blood for blindness and spider webs for malaria. In this itemized list, the “Options, Options” exhibit issues a *caveat emptor*. Having introduced the ironic fact of snake oil’s nutritional benefits, this list of factemes suggests the forms of specious reasoning that result in folk cures with dubious benefits. Even if there is no explicit disapproval of these remedies, the comic frame helps to cast doubt on them. Therefore, as each museum guest goes out into the medical marketplace, they are encouraged to approach folk remedies with a good dose of skepticism. In the Design Development document, on the “Options, Options” page there is a comment in red text from an unknown commentator that asks “(Dave: will this material offend people because it suggests alternative treatments are bunk?)”

Two of my informants, Kay and Ronald, were advocates of alternative treatments. In our conversations about “Spin Doctor” and “Options, Options” they spoke approvingly on behalf of

acupuncture and herbal medicines which have had health benefits for their family. Kay said that:

My idea is to try home care and gentle care before we go putting anything in our bodies. Well, we do acupuncture, and chiropractic care. We do echinacea for colds, arnica for sores and bruises, elderberry for flu...Most parents, if they have a baby that is teething, will give them aspirin or Tylenol or Motrin or something to help with the pain. But there are other things out there that are natural, like chamomile.

Both Kay and Ronald indicated that they appreciated how TAY gave some information about treatment alternatives, but they both wished that there was more throughout the exhibition. They were never outright dismissive of Western medicine, but they stressed the role of the patient/consumer in being an active participant in the health care process. As Ronald explained:

I think it is important to have your own values, and know your own body. There are a lot of things you can solve with alternative medicine and a lot of things that you can solve with Western medicine, and it is your job to evaluate the choices you have. You have to know which one is appropriate and when.

Kay followed up this statement with her own view about questioning sources of medical advice:

Yeah, and you can't be afraid to question the authority-type figures, you know? And ask them "is this my only choice?" Most people think "well this guy is the doctor and he went to school so many more years than I did, so I have to do what he says." But he doesn't know for sure what it is, and he doesn't know much about you as a person. There are other factors that you may know about, and it's your body, so sometimes it is easier to do the research and know what the other options are before you go talk with a doctor.

What Kay is recommending here are the benefits about being in tune with one's own body, as well as the importance of conducting research about symptoms before going to talk with a

doctor. The suggestion to “question authority” is important, because of the high incidence of medical errors. Yet the suggestion to “question authority” also brings up some relational issues about the doctor/patient encounter that have to do with authority as a precondition of a functional relationship. Part of what characterizes the doctor/patient relationship is “complementarity” (c.f. Bateson, 1972)—where the patient is in a subservient role—as opposed to a “symmetrical” relationship where both patient and doctor vie for dominance. “Questioning authority” in an examination room can have some unintended consequences, such as a doctor becoming defensive. Some of these relational issues in a medical encounter will be covered further in an upcoming exhibit in this content area of TAY, called “You, M.D.”

MetiMan



Figure 22: MetiMan Patient Simulator

The next exhibit features another life-size white male, who is horizontal, balding, and eyes closed, head tilted back, with a look of resignation on his face and sporting white knee-length shorts.

An accompanying panel of white text against a yellow background informs us that this exhibit is entitled “Patient Simulator.” The plaque introduces us to “MetiMan” a simulated patient developed by the METI Corporation of Sarasota. This patient simulator, which is also available for medical training purposes, is controlled by a computer that can simulate a wide variety of conditions and emergency medical events. This exhibit explains how those training to become paramedics and medical responders use MetiMan to simulate medical conditions.

By use of a trackball and button, “MetiMan” allows a visitor to choose a condition or medical emergency to be simulated. Those visitors expecting MetiMan to spring to life animatronically will be disappointed, because the body doesn’t move or manifest any outward symptoms. The statue remains frozen while LED readouts indicate his bodily state. After clicking on a condition or medical emergency, a brief description of it appears on the screen along with guidelines for how to determine if 911 should be called. Above the horizontal bed there are a number of lighted display panels that show vital signs, including temperature, heart rate, blood pressure and oxygen saturation as the event progresses. The conditions available to choose from include allergic reaction, asthma attack, heart attack, seizure, spontaneous pneumothorax and stroke. According to the panel of text:

Medical responders can feel the pulse, use a stethoscope to listen to the heart, jolt the heart with real defibrillator paddles, watch the vital signs on the monitor, and even observe realistic reactions to injected medications.

MetiMan, who is visible on both sides of a clear plastic tube, is a reminder that the practice of medicine has to be learned like anything else. In the trial and error process of learning to administer ambulatory care, better to have a mistake happen to a plastic dummy than on a real-life patient. MetiMan presents symptomatology as a secondary and not primary phenomenon. Ailments are indicated by numerical readouts of vitals instead of any outward indicator (such as being blue in the face, convulsing, rapid breathing or the like.) MetiMan presents the medical gaze numerically— the body of MetiMan is mostly a prop to frame the experience, but the calculations the visitor makes are on the basis of the LEDs.

MetiMan is a patient who cannot speak, and cannot provide much information about his medical condition via outward appearances. A conscious patient can tell a story about what is

wrong, point to parts of the body, and exhibit pain intensity with facial expressions. Not so much with the unconscious or comatose. Like the unconscious ambulatory patient, MetiMan is far more opaque than a conscious patient. MetiMan does not communicate (verbally or behaviorally) and the task of the helping professional involves “reading” the patient using technical means that “make the invisible visible” (Foucault, 1975). MetiMan represents a disabled subjectivity both on the part of the patient (who is unconscious) as well as the medical professional, for whom the avenue of diagnosis has become numerical and reliant on technological adjuncts. Here, the cyborg metaphor (Haraway, 1991) becomes symbolic of medicine’s state of the art.

The visitor to MetiMan comes to a more cybernetically-enhanced message about the meaning of the “you” pronoun. MetiMan is not a “you” but an *it*. He lacks volition or agency yet still issues his narrative *autonomically*, intuited by medical scanning technologies that monitor vital statistics. The consideration of automatism continues in the next exhibit about the most important organ in the body, the heart. While the heart beats automatically there are some leverage points of agency for both the patient (such as exercise) and the doctor (such as drugs and surgeries).

Cardiology

In the Adulthood section of TAY, we come upon the hearthstone of life, located in the heart of the exhibition. The Cardiology area is a series of exhibits with its own corner of the TAY Adulthood section. Numerous text panels line the walls around the center, each one packed with information in the form of white text against a lemon yellow background. In the center of the Cardio area there is a multi-sided exhibit that features various representational models of the



heart. Each model is illuminated behind glass, set against a black velvet background. The cube shaped glass exhibit sits on top of a horizontal tabletop shaped like a stop sign and colored red. The table top sits on an octagon shaped brushed aluminum table with yellow panels. Text below each model introduces us to a robust, reliable organ that is nevertheless always in danger.

Figure 23: Cardiology Centerpiece

The first illuminated chamber of this multi-sided exhibit contains a colorful, anatomically realistic model of an entire heart, neatly excised at the aorta, pulmonary artery, and vena cava.

Underneath the model there is text that reads:

Cardiac muscle— unlike normal skeletal muscles, the heart muscle almost never fatigues. It keeps pumping blood even during the most strenuous of exercise. A heart attack can kill parts of the heart muscle.

This short stanza of text is an example of the theme of robustness coupled with precarity that surrounds this exhibit. The heart is portrayed throughout as a tireless pumper of blood—that is, until it tires, or worse—attacks.

Moving to the left of the tube, the next window shows an anatomically realistic model of the heart valves. These two models are a fraction of the heart in the first window. Text reads:

Cardiac valves— one way valves keep blood flowing in one direction, to pick up oxygen and nutrients and deliver them to the body and then back to the heart again. If the valves fail to work the heart becomes inefficient.

Like the short stanza of text in the first window, this one reminds us that the heart is a reliable mechanism, that is, until it stops being so reliable. This is another example of the health/disease “act sequence” of explanation at this exhibit.

The last window exhibits not a realistic model of a heart, but an actual human heart in a jar of formaldehyde. Red hued lighting makes this heart appear macabre, with less of the clear characteristic than were seen in the models. In the exhibits that follow, the exhibit designers communicate about the heart and the circulatory system using various representational strategies. The first exhibit against the side wall focuses on the sounds the heart makes.

The first panel against the walls in the Cardiology area is entitled “In a Heartbeat” and it features a photograph of an MRI scan of the heart. Next to this there is a comprehensive description of the sounds that can be heard while listening to the chest cavity through a stethoscope. This panel describes the sound of the heart beat as “lub-dub” and explains what actions cause each of these two sounds. The “lub” is described as the sound of the mitral and tricuspid valves closing simultaneously to prevent blood from going back into the atria. The “dub” is described as the closing of the aortic and pulmonary valves. Having established these sounds as being normative, “In a Heartbeat” goes on to describe “defects in the system,” such as “lub-dub-wheeshh” or “lub-ssss-dub” which can indicate valve leakage, blockage, or clogs.

The next exhibit is a video monitor that features a series of videos on the heart and heart conditions. Visitors can select electrical system conditions, heart basics, heart failure, valve disease, congestive heart failure, heart attack and atrial fibrillation. As still images and animation appears onscreen, a voiceover describes each condition. While the short videos allude briefly to the normal functions of the heart in the first two videos, the focus in the remaining five videos is on disease conditions, starting from the third video and going to the seventh. From this point

forward, the Cardio exhibit focuses almost exclusively on heart disease, starting from the narrowing of the artery walls resulting from plaques, and culminating in life threatening heart attacks, which are sometimes described more euphemistically as “major cardiac events.”



Against the back wall of the Cardiology exhibits there are two oversized 3D models of arteries that have been sectioned in half so visitors can see what the inside looks like. The left model shows a normal, healthy artery which stands in stark contrast to the unhealthy model on the right (pictured).

Figure 24: Clogged Pipes

The yellowish globules signifying arterial plaque are seen beginning at the bottom left of the artery and building up to the right, until it narrowly constricts the passageway. Accompanying the 3D models is a panel of text entitled “Clogged Pipes.” This metaphor, comparing the arteries to a drainage pipe, is attention grabbing in its bluntness.

“Clogged Pipes” has a stanza of text which lists medical symptoms and behaviors indicating “signs that you may have clogged arteries.” The list includes pain in chest (angina) or limbs (suggesting PAD or Peripheral Artery Disease), shortness of breath, palpitations, weakness, dizziness, sweating, and lack of morning erections and ED (erectile dysfunction) in men. On the same bulleted list (without any break denoting that there has been a categorical change) there are other risk factors related to lifestyle that, that are offered as being indicative of clogged arteries. These behaviors include smoking, a high fat diet, lack of exercise, overweight, high blood pressure, and stress. Symptoms and lifestyles are conflated on this list as having the same diagnostic status.

This exhibit therefore casts a wide net for visitors to identify with. At once, the blurring

of symptomatology and risk factors allows for a semantic range, hailing visitors to identify even without medical symptoms. Visitors are not provided with too many occasions to ‘dis-identify’ with the interpellation of cardiac risk. Having adumbrated the symptoms and risk conditions leading to clogged pipes, visitors are primed for an action-step, and “Clogged Pipes” has them readily at hand, such as “eating well” and exercising, monitoring blood pressure and cholesterol, and obtaining a picture of one’s arteries from medical imaging technologies.

The next exhibit along the wall is a panel entitled “Heartware Store.” This panel features photographs and descriptions of the various cardiac implants that are used to repair or restore heart function and prolong life. The items showcased here include pacemaker, Implantable Cardioverter Defibrillator (ICD), stent, replacement valves, artificial heart and Ventricular Assist Device (VAD). Appearing where it does in the Cardiology section of TAY, “Heartware Store” offers a kind of comforting imagery of a “gift shop” for the visitor who has just been educated about the onset of coronary artery diseases that can culminate in a cardiac arrest. If the heart attack isn’t fatal, the “Heartware Store” advertises a wide variety of cyborg mods that can sustain and prolong life for the heart disease patient, as long as the patient has access and financial means to adopt one of these costly high tech interventions.

So far the Cardiology section of TAY has been characterized by a rather ominous building of dread. Injunctions about preventative heart health have been inserted almost parenthetically, in the midst of describing a seemingly inevitable process towards acute coronary syndrome. The “Heartware Store” seems to find some resolution in listing some high tech “reactive” technologies for heart health, including pacemakers, stents, replacement valves and even artificial hearts. Within the field of preventative medicine, this kind of narrative about heart health could seem as a proverbial “closing the barn door after the horse gets out.” That is to say,

the succession of exhibits found in the Cardiology section of TAY seems to emphasize expensive and high tech interventions used after the fact of heart disease. With the next exhibit, such an undue emphasis on after-the-fact interventions is augmented by a focus on prevention.

The next exhibit carries a bold heading entitled “Caring for Your Sweetheart.” This exhibit focuses on the prevention of heart disease, and its comorbid syndromes, diabetes and arteriosclerosis. A stanza of text beneath the “Caring For Your Sweetheart” heading reads:

You are more likely to die of heart disease than any other reason. It is the number one killer of men and women....So it makes good sense to take good care of your heart for a long and healthy life.

This text introduces the concept of *care* into the major themes of the Cardiology Section of TAY. In a playful way, the title, “Caring for Your Sweetheart” introduces a notion of otherness or exteriority to into the idea of self-care. Caring for your sweetheart becomes a metaphor for giving the same kind of care and support that you would give to a loved one such as a child or life partner. By the same family metaphor, the extent that you are beloved by your family is all the more reason to stay healthy to them.

Here, visitors will see a large chart with three columns. Each column has a row of behaviors. The left column is an ideal patient who does everything right. The middle column is a patient who tries to eat healthy, exercise and avoid bad habits, but falls short about half the time. The right hand column is somebody who does everything wrong. This patient smokes, is overweight and has a “hatred” of exercise. The chart invites visitors to identify with one of the three columns. The behaviors listed on this chart are diet, amount and frequency of exercise, smoking habits, salt consumption, body weight, blood pressure, cholesterol and regular checkups with a doctor. This list constitutes the “state of the art” injunction for preventing heart illness.

Indeed, the suggestions listed here may constitute an instance of the behavioral cardiologist “speech genre” (Bakhtin, et al., 1986) because the chart contains generic elements and key words (such as “Five servings of fruits and vegetables”, “Limit salt intake”, “good cholesterol”, etc.) that are uttered and reiterated in countless health promotion messages, as well as during millions of one-on-one conversations between doctors and their patients.

Just as arterial plaque builds up in the arteries, the Cardiology section of TAY builds up from clogged pipes, to heart attacks, before delivering its primary ‘prescriptive’ payload: Prevention. We are left with a strong prescriptive message to take care of our circulatory system through exercise and avoiding tobacco, high salt and high fat foods. The Cardiology exhibits frame the human heart medically, yet arguably in a paradoxical way. For a sturdy, robust organ that tirelessly pumps blood, the heart is portrayed as being constantly imperiled, mainly by behavioral transgressions against it. While the heart is an organ governed by the autonomic nervous system, human agency is being stressed in the frequent appeals to behavioral health.

Thank Goodness I Caught it Early

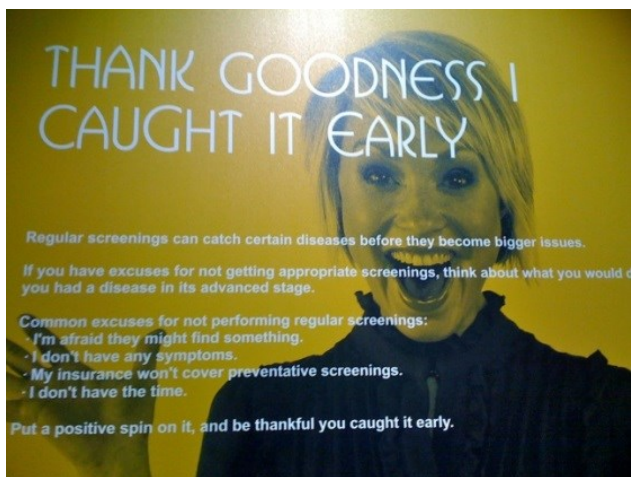


Figure 25: Thank Goodness I Caught it Early

After an exhibit called “Targeted Drugs” (which is about nanomedicine) there is an exhibit called “Thank Goodness I Caught it Early” (TGICIE) which is about identifying diseases early through blood work and other recommended screenings.

In the center panel there is a young woman with blonde hair, her palms outstretched at

shoulder level, wearing an excited expression. The white text overlaid on her face lists some excuses that people use to avoid getting screened. Common excuses that people use for not performing regular screenings include: Fear, being asymptomatic, lack of time and lack of health insurance coverage. TGICIE attempts to reframe health screenings by countering some of these excuses. The excuse about health insurance not covering preventative screening is arguably one of the most “symptomatic” pieces of text in the entire TAY exhibition. The exhibition is a true cornucopia of medical procedures, many of which millions of Americans will never receive—not because of lack of need, but lack of insurance. The mention of health insurance in the list of excuses at TGICIE is one of the few mentions of prohibitive cost in the entire exhibition. When a normative authority such as MOSI issues an injunction to get screened for disease, and prohibitive cost is listed as an “excuse” along with irrational fear about finding something, this is an example of *anomie*, where something is prescribed as being actionable yet the means to complete the action may not be available (Merton, 1957).

TGICIE also offers an information bank about various types of screening procedures. Should a visitor be willing and able (financially) to avail themselves, a plethora of preventative screening technologies is offered in a database. The interactive element here is a screen with a roller ball mouse and button to click. First the visitor chooses if they want to look at adult or pediatric screening information. Once a visitor chooses adult or pediatric screenings, a number of file folders appear onscreen, with each tab having a different type of screening. Some of those listed include clinical breast exam, prostate exam, hearing evaluation, blood pressure, eye exam, cholesterol screening, pap test, bone mineral density test, pelvic examination and also testicular and mole self-exams. Once a tab is clicked the monitor shows three choices for each topic: “What is the test like?”, “What does this screening test look for?” and “Excuses” which reiterates

the kinds of excuses people will come up with in order to avoid screenings.

You, M.D.

The purpose of TGICIE is to inform visitors about the variety of screening techniques available, as well as to persuade them to stop making excuses and overcome fears.

Notwithstanding financial limitations, this is one of the first times that TAY addresses apprehension about clinical encounters. Research on health communication is often concerned with the brief time that a patient gets to spend with a physician, and problems that often occur with this form of encounter, such as nervousness, miscommunication, or a feeling of alienation (Ainsworth-Vaughn, 1998; Hewison, 1995; Kaufert & Putsch, 1997; Kreps & Kunimoto, 1994; Mattingly, 1998). Complaints about doctor's "bedside manner" have enough common features to constitute their own "speech genre" (Bakhtin, et al., 1986). The doctor is too busy; their deportment is too impolite, impersonal or rushed. These and a whole litany of similar genre elements are present when talking with people about their own experience in the examination room. In a study of doctor/patient encounters in an emergency room setting, Eisenberg et al. (2007) explain these kinds of patient complaints as a collision between two kinds of discourse: The patient's narrative versus the technical rationality of the clinician (Eisenberg et al., 2007). While a patient wants to tell the doctor a story about their bodily health and sensations, a doctor is often more interested in the signs (overt symptoms as well as numerical readouts or other technical data provided by medical imaging, etc.) that are exhibited by the patient. This clash of discursive modalities can potentially make for an alienating encounter for the patient.

Sponsored by the National Science Foundation and the University of Florida, "You M.D" allows visitors to take part in a computer-simulated clinical encounter. This exhibit is in a semi-

enclosed booth. On the outside wall there is a yellow panel with white text. Underneath “You, M.D.” there is a stanza of text that reads:

You be the doctor. You are responsible for your own health. Do what you can to stay healthy. When you see a doctor, communication is key: Be your own advocate. Speak up for your wellbeing. Have questions written down before you go. Ask the doctor questions. Make sure you understand the answers. Be brief, but it is your right to know. Research your condition.

The above is a list full of direct directives. Of these directives, the one that appears paradoxical is the first one, “You be the doctor.” This statement can be interpreted as a way of saying to the visitor, in effect, ‘be *like* a doctor by being attentive to the signs and symptoms issued by your body.’ Or is it a suggestion that patients should become ‘their own doctor’ and treat any symptoms or diseases without the help of a medical professional?

The directives that follow are about being a patient (be responsible, do what you can, ask the doctor questions, etc.) These suggestions for the patient, following an injunction to BE the doctor, sets up a polysemic frame for the visitor as to what their role is in this exhibit. Doctor/patient encounters can be characterized by their complementarity, where the doctor is the authority who issues orders and the good patient accepts the authority and complies with their orders. Bateson (1972) describes situations where, instead of adopting dominance/ submission behaviors, the interlocutor who is slated for a submissive position instead challenges the dominance of the other, initiating a figurative “arms race.” This competitive one-upsmanship is described by Bateson (1972) as “symmetrical schismogenesis” marked by instability and lack of reciprocity. The injunction to “be your own doctor” could be interpreted as a rejection of the complementary doctor/ patient encounter. The meaning of the injunction will become apparent

once the visitor begins using the exhibit (although not right away.)

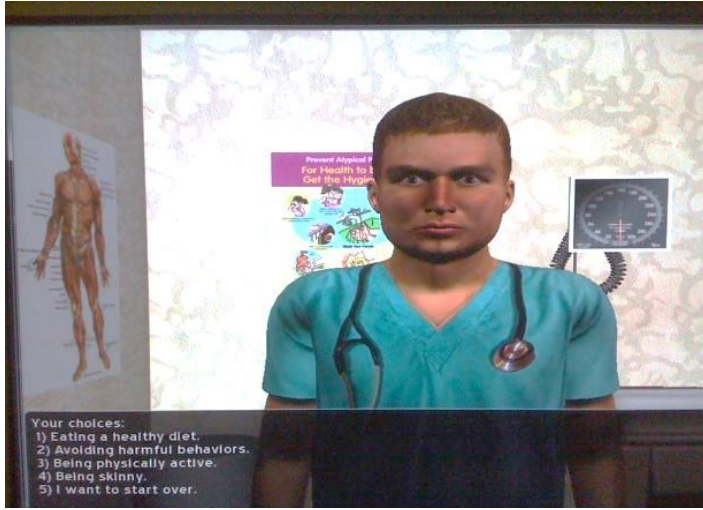


Figure 26: You, M.D.

Subtitles onscreen correspond to his audible voice: “Welcome to the MOSI clinic. I’m Dr. Jones. Can you spare about four minutes of your time to help us with our research?” While the questions are heard audibly, Doctor Jones lips do not move, giving the uncanny impression that his questions may be telepathic. At waist level there is a control panel with five white buttons labeled 1 through 5 and a green start button. Once the start button is pressed, visitors are asked a series of questions by the animated doctor on the screen. The questions include what type of patient the visitor wants to see and what kind of condition they want the patient to have. It gradually becomes clear that Dr. Jones was merely the liaison for “You, M.D.” to conduct a patient encounter. Dr. Jones isn’t addressing you as a patient; he is addressing you as a colleague who will provide you the kind of patient that you wish to see. “You, M.D.” hails the visitor as the diagnostician, although the available diagnoses are already prescribed within a list of available choices. Dr. Jones explains “To talk to your patient, you will choose between the list of numbered responses.”

Once inside the “You, M.D.” booth, a computer animated man wearing turquoise scrubs appears onscreen in the dimly lit interior, peering at you with an intense, thousand yard stare, blinking occasionally. As you approach the screen, a fey, disembodied male voice can be heard overhead.



Figure 27: You, M.D. patient

Next, another computer animated character appears onscreen. This young man has a similar piercing, intent stare as Dr. Jones, but instead of scrubs he is wearing a skin tight grey t-shirt. A voice heard overhead asks “Are you the new doctor?” but this patient’s lips also don’t move.

In subtitles, the patient describes a strange mole on his back that appeared after he went to the beach. As “You, M.D.” the visitor in the booth gets to choose between five different responses by pushing the corresponding button. The options include emergency surgery to remove the mole or running some tests and removing it if needed. After choosing text appears which the visitor is presumably invited to read aloud. After the encounter there is also an exit screen urging visitors to be “your own health advocate” and have “good communication with your doctor.” The exit screens shifts the subjectivity of “you” back to the role of a patient.

Joe, my interview subject (who visited MOSI with his girlfriend Ruby) described the “You, M.D.” exhibit as “creepy.” Here is a portion of our interview transcript:

Some of this stuff is just kind of creepy. Not just about the body. It’s how they set up the display. It’s like a horror movie. Like the bad guy’s basement, or something. That one doctor... The surgeon guy? And he’s animated? That’s like, weird. He has this like, almost homicidal look on his face! [laughs] I don’t understand. Just record an actual person doing all the dialogue, and use that.

Joe also said that the characters look more like they are derived from a first-person shooter video game than from a doctor’s office. “You, M.D.” is an exhibit that was otherwise described as being “disturbing” and “unsettling” by a few of my other informants besides Joe. The focus of

this exhibit is communication, but because the answers are chosen by multiple-choice, “You, M.D.” is only a crude caricature of face-to-face communication that goes on in an examination room. This exhibit is an example of what Heath and von Lehn (2008) describe as “so-called interactives” which “create highly constrained sequences of action” (p. 63). For an exhibit that is supposed to simulate the face to face interactivity of a medical encounter, there is really only a pseudo-interactive user interface that allows a selection from a limited range of responses. Even if a real-life M.D. were to enter the booth, their own “bedside manner” would be narrowly circumscribed by the range of available answers.

The character who complains about a mole on his back doesn’t show the mole to the doctor, yet the doctor has to issue a diagnosis anyway. In addition, aside from their slight movements, these characters are wooden and distant interlocutors whose lips don’t even move. “You, M.D.” exhibit is a simulated medical encounter that seems other-worldly, and lacking in the spontaneity, examination, touch and mutuality that would characterize a doctor visit. The shifts in subject position sets up a frame that says “this is play” but the stern facial expressions of the electronic interlocutors provides for an ambiguous key and footing. But perhaps even more unnerving is the attempt to shuffle subjectivities in this simulated encounter. The visitor is briefly hailed as a physician during an abrupt encounter, and then the exit screen reminds them that they are, in “real life,” a patient. Maybe “You, M.D.” is an (unintentional?) form of meta-commentary on the alienating aspects of being both a patient and a physician?

According to the design development spreadsheet, “You, M.D.” came about thanks to a NSF grant from “University of Florida, Gainesville researcher Dr. Ben Lok and his team.” I contacted Dr. Lok (a computer simulation specialist) to find out more information about “You, M.D.” Dr. Lok referred me to his graduate student, Diego J. Rivera-Gutierrez, who informed me

that “You, M.D.” is equipped with height and weight sensors to obtain measurements from each visitor, as well as photos of visitors that are taken by Microsoft Kinect. The photos taken were used “mostly used to clean the data set of sensor errors” according to Diego (Rivera-Gutierrez, 2013).

After an exhibit called “Stay Active” (about the importance of exercise for preventative health) there is a series of modular wall panels with text and visuals on each side. The panels are arranged at tilted angles so that they form a saw-toothed line, lined up side by side. This exhibit focuses on another form of non-pharmaceutical intervention: Laughter. Providing needed relief from the grim investigations of health risks that have preceded it, “Laughter is the Best Medicine,” (LITBM) is an exhibit that takes the idea of fun seriously. It starts out with statistics about how increasing laughing can improve our health. The factemes about laughter (retrieved from the TAY Design Development spreadsheet) are as follows: Laughter releases endorphins, boosts the immune system, stretches muscles, and helps to counter anxiety and pain.

Underneath a heading in the Design Development document that reads “Special Considerations/ Prototyping /Research Needed to Be Done” there is text that reads “Find Jokes and video clips that are not copyrighted.” On one panel there is a video monitor playing a clip of Abbot and Costello doing their famous “who’s on first” routine (with audio). On the other side there is another video that features adults and children telling their own favorite jokes. There are also cartoons, sight gags, cute animals and pictures of comedians like Ray Romano and Bill Cosby. This chuckle-worthy intermission is a welcome relief to the information-heavy exhibits of TAY that are often focused on medical procedures.

Alannah wrote that LITBM was her “favorite” and when I asked her about her response, she said “...there were different jokes around. I liked that, that was fun.” An informant named

Jill said she liked the “Comedy Wall” best, and when I asked her about this she said “Yeah, I read every word of that and looked at every comic.” Phillip said about LITBM “they don't really talk about the biological and physiological aspects of laughter; it's really is just a big old joke wall. A lot of them are really funny, but it's not super-educational.” If the frame of “You, M.D.” was somewhat ambiguous, LITBM was singled out by at least a dozen visitors as an exhibit which prescribed a healthy dose of guffaws to ease the tension.

Stem Cell Research

Tucked within the Adulthood section of TAY there is an extensive exhibit about stem cells. This suite of exhibits is descriptive about the science of stem cells, as well as prescriptive in the sense that it contains numerous rhetorical appeals designed to win the visitor over and to appreciate the prospective cures and treatments that are emerging in this medical frontier. The exhibit is practically an exhibition unto itself, with exhibits constructed of three yellow wall panels made into islands in the middle of the exhibition floor, along with more exhibits against the back and side walls. This mini-exhibition is sponsored by CryoCell International, a blood bank that stores and separates stem cells. This exhibition is a chance for visitors to learn about this new and promising area of medical research.

The first part of this exhibit is called “The Stem Cell Story.” The wall panel shows a 3D image of a man with a visible skeleton. At the top is the question, “Did you know you started life as stem cells?” This is followed by a series of other questions that help to grab the visitor's interest and entice them to increase their knowledge of stem cells, such as “Did you know the first embryonic stem cell wasn't isolated until 1998?” and “Can you image a world where accidents, birth defects, paralysis and other life-altering illnesses could be treated using stem

cells?” There is a video monitor at about eye level where “The Stem Cell Story” is detailed in five informational videos. Visitors choose from the videos which are split into chapters, by pressing the button for each. In what follows, the first chapter of the “Stem Cell Story” video will be described, with special attention to the figures of speech that are employed. These figures of speech include metaphor, analogy, and anthropomorphism.

The first video begins with fast motion graphics of a magnifying glass scanning a screen full of fast moving text. As the magnifying glass comes to rest on words such as “embryonic” and “adult stem cells” these words freeze against a background of fast moving text. Next, the screen shows scenes of vehicles moving through urban landscapes in fast motion. Briefly, cars are shown going in different directions at a fork in the road. A man sitting in his vehicle is shown reading a newspaper in fast motion, flipping the pages as if they were flapping wings on a bird. A synthesizer soundtrack can be heard, oscillating between two notes in a low register, complimenting the fast images onscreen. Soon, a voiceover begins speaking. It is a woman with a British accent who says “Inside our bodies there is a microscopic world, busy and complex like the world around us. Stem cells build and maintain this world.” As the woman is speaking, the visuals begin to morph from fast motion scenes of human life into microscopic imagery of cells moving through blood vessels in fast motion. This is faded into a video of a train pulling into a station, and the passengers pouring out onto the platform in fast motion. Then an animation of a sperm swarming around an ovum appears onscreen, suggesting the primal scene of genesis. The fertilized egg quickly divides into four, then eight, then sixteen, then innumerable other cells. Soon an embryo is developing, represented by a line drawing at 37 days, 39 days and 43 days, etc. Once the line drawing of the embryo resembles something like a human fetus, the voiceover explains that at certain stages, cells “stop making copies of each other, and start to specialize.”

At this point, the animated line drawings of cells start to differentiate. Nerve cells appear with spiky dendrites pointing in different directions from the cell bodies, and a long tail representing the axon pointing off to the right. Red blood cells are drawn as plates with round centers, and muscle cells are drawn as segments of a cylinder. A man appears onscreen, with short, cropped hair, a light blue button down shirt and an intense facial expression. The man, identified as “Prof. Austin Smith, Edinburgh” starts speaking in a reverential tone:

Cells are very beautiful things when you see them down under a microscope. Normally they are so miniscule that you can’t really see them...Even though they are what makes us...Some types of cells will grow together...very close together... and form beautiful patterns. Other types of cells will move away from one another. Some cells become big, others become very small. It depends on what type of cell they are.

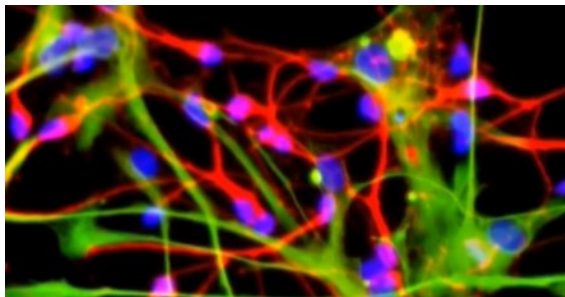


Figure 28: Beautiful Stem Cells

Onscreen, microscopic photography shows clusters of cells illuminated in bright blues, greens, yellows and reds. The still photos are slowly rotated, panned, and cross faded into one another. The pace of the video has become less frantic and more focused on motionless cells. The insistent synthesizer music has stopped at this point, leaving only the images of these cell clusters, one fading out into the next. Again, the woman’s voice can be heard.

These different cell types work in specialized teams. Some carry oxygen through the blood system. Some instruct contracting in our muscles. Some carry messages between

In this voiceover, Dr. Smith uses the word *beautiful* to convey an aesthetic appreciation of the cells, not only in their appearance, but in the diversity of interactions that they have with one another.

our brain and the rest of our body.

The voiceover is drawing from rich metaphorical resources, describing cells as specialists who are assigned to various tasks within the body, some acting as messengers and some act as instructors. This anthropomorphic imagery is right out of conceptions of human division of labor.

Having described specialized cells in terms of coworkers operating a corporate system such as a human body, Dr. Smith appears again onscreen to describe the special role that stem cells play in this pageantry. As he explains the process by which stem cells are dispatched in order to replace specialist cells, the visuals pan in to the top end of a femur. From inside of the bone, three round circles representing nondescript cells spring out of the bone onscreen, pause for a moment, and then quickly flutter away off screen to other parts of the body. The screen shows Dr. Smith once again, who explains

So a stem cell has to make a decision. Every time it divides, it produces two delta cells...and those delta cells can be new stem cells, or they can be specialized cells. Here, stem cells are even curiously described as having the agency to decide a dilemma to replicate or become specialized cells.

After the video ends an interstitial slide appears onscreen with the information “A EuroStemCell Production with support from JDRF.” EuroStemCell is a consortium of research labs with a staff of “science communicators.” JDRF used to stand for Juvenile Diabetes Research Foundation, but according to their website, their research about Type One Diabetes is to benefit sufferers of all ages. This short summary of the video shows the figures of speech that are being used to explain stem cell research. The use of metaphor, analogy, and anthropomorphism suggests stem cell research can be best explained using more familiar conceptual territory as a

comparison.

After a few other descriptive exhibits which explain how stem cell research is a going concern internationally, the next panel to the left is an interactive entitled called “Cell Talk.” In this exhibit a pun is being employed about cells. A black and white photo of a middle aged woman takes up most of the panel. She has a broad smile on her face, and is holding a cell phone up to her right ear. In an anthropomorphic vein, the text on this panel compares the human activity of speech communication to the molecular exchange that goes on between cells in the body. Before beginning the activity here, visitors read about cell communication and how it is vital for cells to “know” when they should divide and how they should specialize. The text reads:

Cell communication is essential so that some stem cells know when they should continue to ‘divide’ or to become specialized. They use electricity, body contact, and other ways that are less tangible. Imagine, it’s like your mother is looking at you in a certain way... and you just know what to do... now that’s communication.

This stanza of text appears just to the left of the woman’s head. Cells are being described as communicating with one another in a way that is analogous to communicating with our moms.

In a thought provoking essay, philosopher Michael Polanyi noted how much human communication takes place tacitly (Polanyi, 1967). People in close, intimate communication come to recognize subtle signs such as tone of voice and body language that allows them to anticipate what their interlocutor is going to say next. The “communication” between cells (which is strictly speaking a chemical reaction) is described by “Cell Talk” as a family affair. Indeed, cell replication is described scientifically using gendered and kinship terminology. For example, scientists describe obligatory asymmetric replication as the process by which a stem cell splits into two. One is called the “mother” cell and the other is called the “daughter” cell.

The implication at “Cell Talk” is that cell division is somehow akin to the *complete-each other’s sentences* intimacy that takes place between mothers and their offspring.

When this analogy is developed for the communication that takes place between cells, notice how the psychologistic verb “to know” becomes operative. (Cells “know when they should continue to ‘divide’ or to become specialized.”) Curiously, cells somehow “know” when they should either replicate or become specialized. A conception of the “tacit dimension” is that sometimes “we know more than we can tell” (Polanyi, 1967). Yet, unless these cells are in possession of a mind, this analogy seems stretched. Interesting that the word “divide” comes complete with scare quotes, as if the asymmetric replication of a stem cell (a splitting off into two cells, one identical and another that is differentiated) was not a *literal* use of the verb “to divide.” In this case, the use of single quotation marks serves to make a literal process of cell division into something figurative—while the cell “knows” to divide as if in some literal sense of having a mind. The effect of the syntax is that the anthropomorphic communication analogy is being helped along through subtle contrivances that efface distinctions between metaphorical and literal language.

There are functions of the physical universe that take place without any communication literally taking place—self-correcting mechanisms (such as a thermostat or a toilet tank), for example. The thermostat switches off at the point that a certain ambient temperature is reached, and the tank fills with water only to the level that the shut-off valve has been reached. These are mechanisms where the analogy of communication seems strained. This is also the case with the use of the verb “to know” that has been noted in “Cell Talk.” An apple falls of the tree once it becomes ripe. Does the apple “know” to fall off the tree? Or had it become so swollen with juice that the stem could no longer withstand the force of gravity? The text on the “Cell Talk” panel

continues with this communicative analogy:

For researchers, listening in on the conversation and understanding what a cell has to do and when it is not following instructions is very important. It will help them discover more about cellular biology and the ways stem cells could be used.

Again, the molecular level is being described according to anthropomorphic terms such as having a “conversation” and “following instructions.” As researchers “listen in in the conversation,” there is an assumption that a dialogue is taking place between two cells, and eavesdropping on the conversation might yield insights into the mystery. The idea that there are some cells that don’t “follow instructions” portrays cells as interacting within a hierarchical command and control matrix of communication. Unlike an apple falling from a tree, the metaphor of the errant cell suggests that there is something more than mechanics taking place when cells divide. The next exhibit takes this anthropomorphic analogy even further, describing cell behavior in moral terms.

So far, the Stem Cell exhibit at TAY has introduced visitors to the idea of living cells with some characteristics that resemble human agency. In “The Stem Cell Story” we are introduced to the curious, wonderful cells who “make a decision” to either replicate or become specialized. In “Cell Talk” there was the suggestion that, much like errant offspring who neglects to communicate with their mother, there are those “daughter cells” that “go rogue” and do not behave correctly. The next exhibit focuses on the behavior of such errant stem cells. “Caution: Bad Cell Behavior” is about the ways in which stem cells do not always behave according to expectations. A stanza of text underneath the title of the exhibit reads:

Scientists have theories about how a cell will react, but they don’t always get the results they want... Sometimes things go wrong from the get-go, while sometimes it takes a

while for the cells to behave in a way they didn't expect or want.

Apparently, once they are transplanted, stem cells may not have the intended effect. Cell biologist Paul Knoepfler describes this cell behavior as “scandalous” and writes on his blog:

If you transplant a few million stem cells into foreign “territory” of a patient, it is reasonable to expect that perhaps a few thousand (0.1%) will not do what they are “supposed to” (Knoepfler, 2012).

Knoepfler uses double quotation marks to signify that the very notion of what cells are *supposed* to do is a figure of speech. Yet the framing of stem cell behavior in moral terms (“bad”) is also a euphemism for the kinds of effects stem cells can have in cancer biology. Cancer Stem Cells (CSCs) are tumorigenic, or tumor causing. Traditional forms of cancer treatments, such as radiation or chemotherapy, kill a sizable fraction of tumor cells, but not all of them. If CSCs survive the treatment they can generate new tumors (Willyard, 2013). Therefore the moralistic label of “bad” comes to signify a stem cell with a more menacing profile.

Across from an exhibit called “Cool Science” (which explains some interesting research and discoveries) there is an exhibit entitled “Why Are Stem Cell Projects Questioned?” (WASCQ). This exhibit explores ethical arguments that have been made against stem cell research. This large informational video monitor begins with a reiteration of why embryonic stem cells show so much promise for devising new treatments. But in order to obtain these embryonic cells they must be extracted from a developing blastocyst (or embryo) which destroys it. The text explains that people who believe that life begins at conception (i.e. anti-abortion activists) have a problem with embryonic cells.

The Stem Cell exhibit at TAY, having been sponsored by CryoCell, a leading stem cell research company, has to mount a defense on behalf of the company's research. They do so by

fashioning this controversy as something that is open for debate, and the visitor is framed as the arbiter who will decide based on available evidence. The rest of WASCQ features various speech bubbles, each containing a fact about embryonic cells under a heading that reads “Some points to consider as you decide what you think.” Some of these points include:

- most embryonic stem cells come from donated blastocysts and are typically the by-product of in-vitro fertilization (IVF) where the egg is fertilized in a lab;
- multiple blastocysts are created in labs but they are rarely implanted;
- NIH estimates that nearly 400,000 IVF blastocysts are in frozen storage but may someday be thrown out as medical waste;
- not all religions consider the developing cells of the blastocyst or early embryos a person.

The appearance of these rationalizations in speech bubbles gives them the symbolic form of an utterance, albeit issued from interlocutors who are not identified. The visitor is being steered towards making the following inferences: “If the eggs were fertilized in a lab instead of a woman’s body, then the donors were not intent on having a child. If there are already hundreds of thousands of frozen blastocysts that will never become people it is a shame to throw them away.” The last speech bubble, bulleted above, uses a different kind of argument: that not all human value systems consider a fertilized egg to have human status.

Of course, embryos are not the only source of stem cells. The next exhibit focuses on stem cells that can be harvested from the placenta. “Freezing the Future” is a text panel which explains how scientists can deep freeze umbilical cord blood for future research. Then visitors get a break from reading and are invited to watch a video sponsored by CryoCell that is run on a loop. The testimony of the speakers on this video help to add a human element to this rhetorical

situation that, as presented so far, has relied on abstract, anthropomorphic discourse about specialist cells. This video features several people who have received stem cells to treat various conditions. The speakers on this video are shot in front of what appears to be a beverage bar that is set up at a reception. A man and woman bartender can be seen in the background, mixing drinks and flirting with each other as the speakers tell their stories. The first speaker is a man who received stem cell therapy from stem cells within his own body. The second speaker is a woman who beat cancer thanks to adult stem cells, and the last speaker is a woman who suffered from scleroderma (a chronic immune disease that causes fibrosis of the skin) until she received an effective stem cells transplant.

These videos have the virtue of being first-person testimonials from patients who offer thoughtful explanations of the science and also claim to have benefitted from stem cell therapy. The unnamed male patient who received his own stem cells as a form of treatment appears to be middle aged. He is bald, wearing a striped suit jacket, with missing teeth, and speaks with confidence about the benefits that stem cells have had for him:

The stem cells come from your own body and heal your own body. Your own body heals itself anyway. It comes from *my* body, *my* blood. It goes back into my own body. And it works. Today. Not tomorrow, today.

This speaker uses first person possessive pronoun (“my”) to stress that he is not benefitting from the stems cells of any third party. In the man’s narrative, the stem cells that come from his own body help to establish a rhetoric of selfhood that sidesteps any ethical controversies about fetal tissue. In the testimony of one of the female patients who appear on the video, the polysemy of the word “adult” is highlighted. This woman appears to be middle aged, with short cropped grey hair, circular glasses and pale green earrings. She wears a light green shirt with black lettering on

it that reads “Adult Stem Cells.” This woman explains:

They don’t know what adult means. They think it’s because I am an adult, and that’s why I have this [she gestures to her shirt with her hand.] So I have to explain to people the difference between adult stem cell therapies (that are seventy two in number; that have helped four hundred thousand people like me)—and then there’s the embryonic stem cell research with *zero* [makes a zero with her thumb and forefinger] human therapies, that has not helped one single living human person.

According to this woman’s testimony, the distinction between adult and embryonic stem cells is of key importance. This woman is suggesting that the putative controversy over stem cell research has been moved from “figure” to “ground” because of viable therapies that have been developed using adult stem cells.

What the “Stem Cell Story” exhibit indicates is that rapid advances in medicine threaten to render a museum exhibit outdated. Much of the initial controversy about stem cell research had to do with the use of blastocyst tissues that were, according to some critics, on the wrong side of the boundary between medical waste products and sentient life. In the relatively recent history of stem cell research, the dialectic of discovery and reaction can be seen on a timeline of events. As recently as 1998, University of Wisconsin scientist James Thomson isolated human embryonic stem cells, showing their potential to specialize into new tissues (Thomson et al., 1998). This discovery also began the ethical debate on embryonic stem cell research because Thompson’s lab destroyed human embryos in the process of deriving stem cells. In 2001 President Bush prohibited federal funding of human embryonic stem cell research, which effectively turned the focus of research away from embryonic stem cells and towards “somatic” or adult stem cells. By the time that President Obama issued an Executive Order (#13505) to

remove barriers to “responsible” scientific research involving human stem cells in 2009, advances in adult stem cell research had drawn attention away from the blastocyst controversy (Kolata, 2007).

What these examples indicate is that scientific progress is historically delimited. The “Stem Cell Story” exhibit at MOSI captures a glimpse of a nascent field where yesterday’s controversies are tomorrow’s non-starters. As such the Stem Cell exhibits at TAY may even become outmoded as advances in stem cell research continue to be made. In addition to straddling historical junctures, “Stem Cell Research” also exhibits at the boundary between proven science and wide-eyed scientific speculation. Without the latter, many scientific discoveries would not even happen.

Alannah, the nutritionist who was visiting MOSI with her husband Chris and two teenage children, had some personal experience with cord blood stem cells because she lost a son who was only a year and a half to Leukemia.

Because he had that condition, I am very aware of some of the studies that are going on. I know that embryonic stem cells were isolated a lot sooner than 1998. My son was ill in 1992, and when my second son was born we had his stem cells from the umbilical cord harvested and stored, and that was 1994. So it struck me when the exhibit said that about 1998, and I just happened to know about that.

According to Alannah stem cells were not discovered in 1998. In my research, it appears that 1998 was the year that Thompson (1998) published his controversial paper about using human embryos to harvest stem cells. Alannah’s claim was perhaps a comment that embryonic stem cells had been isolated in animals first? Alannah sounded very similar to the woman on the video above when she told me “People just don’t make the distinction between embryonic and fetal

stem cells and stem cells in general. People don't understand the difference!"

Older Adulthood

As visitors round the corner after visiting the "Stem Cell Research" exhibit they enter the Older Adulthood portion of the TAY exhibition, where the color scheme becomes orange. This section of TAY is mostly focused on degenerative diseases that accompany the twilight years, including arthritis, osteoporosis, stroke, macular degeneration and cancer. Exhibits about nutrition and sleep help to round off the sharp edges of this section that is otherwise heavy on medical procedures. The exhibits that are featured in this portion of TAY are: The Golden Years, Sleep and Sleep Disorders, Live Forever, Stroke, Alzheimer's, Inside the Brain, Arthritis and Osteoporosis, Cancer Answers, Eye Care and Mosaic Food Exhibit

Live Forever

The first exhibit in the Older Adult section of TAY is called "The Golden Years." This exhibit features six panels, each with a back-lit, illuminated color photo of an older adult engaging in an activity, hobby or other aspect of life. The photos show a grey haired woman wearing glasses reading a book to a girl about 10-14 years old, an elderly couple sitting on a beach, and an older woman wearing a broad brimmed hat and an apron, smiling upon some violet colored roses. Each of these photos represents an idealized trope of the elderly. They are white, smiling, well dressed and well fed. These idealized depictions stand in contrast to the substantive content of this section of TAY that otherwise deals with time consuming, painful and costly medical issues that disable older adults and portend the end of life.

The "Live Forever" exhibit shows a photo of an older couple who are either jogging or

walking briskly. There is a panel of white text against an orange background listing the factors that contribute to living a long life, including genetics, maintaining a positive attitude, making healthy diet choices, not smoking and staying physically active. The title of this exhibit, in its hyperbole, contains an injunction to reach for immortality while settling for a long life of many decades or even a century. The first portion of the panel is mostly descriptive, in that it recounts facts about people who have lived a long time, such as Jean Calment of France who lived to be 122 years. Underneath there is a subheading “Centenarians” which notes that Japan, Spain, Italy, Canada and the United States have the highest concentration of centenarians, and that female centenarians outnumber males by 9 to 1. After these descriptions the tone switches to a primarily prescriptive focus on lifestyle. The bullets read urge visitors to “eat right,” exercise, don’t smoke, don’t over eat, stay positive and challenge your mind— admonishments are identical with other behavioral interventions suggested throughout the TAY exhibition. The next exhibit (about stroke) issues these same mandates from within a sometimes contradictory locus of control² which, as I will indicate, conflates hereditary and behavioral factors within a racial frame.

Stroke & Alzheimer’s Disease

The center panel of the “Stroke” exhibit has a subtitle “Brain Attack” with a stanza of text that explains what a stroke is and how clogged arteries in the head and neck can lead to a stroke. Underneath there is a listing of risk factors, under the subtitle “Are You At Risk.” Notice that this title, syntactically in the form of a question, doesn’t have a question mark. This serves to emphasize the framing of the ratio of agency and determinism that is present in the “Stroke”

² “Locus of control” is a concept that is used to describe the feeling of control that people have, versus the feeling that situations are beyond one’s control (Lefcourt, 1976, 1982; Rotter, 1954). As I have been using the term, I wish to divest “locus of control” of its psychologistic connotations. I am interested in how TAY frames health problems. Are they something beyond or within our control?

exhibit. For “Stroke” accounting for risk factors is an equivocal statement about probability, and not a definitive answer to a question about causality. One list is about factors we cannot control, and the other is about factors we can control with behavior modification.

Under the sub-heading “Things that you have control over that increase your risk for a stroke” there is a list that includes high cholesterol, high blood pressure, smoking, not enough exercise, being overweight or obese, diabetes, and having cardiovascular disease (especially atrial fibrillation). This list inscribes the visitor as an agent with a good degree of volition in determining their own health outcomes. Exercise and diet is the answer for many of these risk factors, including overweight, high cholesterol, high blood pressure, and other kinds of cardiovascular disease. High cholesterol, blood pressure and diabetes can also be controlled by medications. Smoking is perhaps the risk factor that people have the most control over (even though quitting the highly addictive substance nicotine can be difficult and some people cannot control the fact that they are around second hand smoke.) At the TAY Stroke exhibit, these are all “things that you have control over.”

Underneath the list of things you have control over there is a subheading “Things you don’t have control over.” The bulleted items on this list include family history, aging, gender (Men more than women, but more women die of stroke), race (African descent more than twice as likely to have a first time stroke as Caucasian) and Sickle Cell Anemia. Here on the list of things we can’t control are factors related to genetics and heredity. However, the inferences being made about race appear to contain some logical inconsistencies, as I will describe.

It is unfortunate that this exhibit lists being of African descent as something “you don’t have control over.” The explanation for the staggering statistic (that African Americans have twice the mortality rate from stroke than Caucasians) is not entirely clear in this exhibit. The

National Stroke Association website accounts for the higher incidence of morbidity and mortality among African Americans from stroke using a circular definition. Because African Americans are more likely to smoke, be obese, and have high blood pressure than Caucasians, they have a higher incidence of stroke, according to the National Stroke Association (NSA, 2011). If this is the explanation for the higher statistical rates of strokes among African Americans, then we are back at the behavioral factors that were listed under the “Things that you have control over” column. Being black is a factor beyond the visitor’s control, but smoking, being overweight, having diabetes and high blood-pressure—these are behavioral hazards being attributed to blacks in a higher proportion than whites. African Americans are not more susceptible to stroke because of their skin color. Rather, people who engage in risky actions happen to be black. Paradoxically, being black belongs in the “Things you do have control over” column because this statement about race turns out to be a statement about behaviors. If race were simply jettisoned as a risk category, then the higher incidence of stroke could also be accounted for using income inequality and lack of access to primary care as determinates (Shi, Macinko, Starfield, Xu, & Politzer, 2003). Race, an inherited characteristic, is confusingly associated with risky behaviors—as if to imply that an unhealthy lifestyle is a racial characteristic. The list of risk factors in the “Stroke” exhibit is an example of how race (and racism) can reify as heredity something that is behavioral.



The third panel of the Stroke exhibit is another interactive called “Stroke of Bad Luck.” To complete this activity, visitors press a button on the exhibit to spin a roulette wheel that appears on a video screen.

Figure 29: Stroke of Bad Luck

This wheel lands on a tile which has either a risk factor for stroke (including, high cholesterol, poor diet, follow doctor's orders, active lifestyle, smoking, obesity, diabetes, excessive alcohol) or a healthy behavior which prevents stroke (such as following doctor's orders and an active lifestyle.) The visitor gets 6 spins and after the wheel lands on a tile, a status shows up on the right side of the screen. The scale ranges from "well" to "warning" with "so-so" in the middle.

Where the "Are You At Risk" panel framed risk factors in terms of things we can and can't control, the "Stroke of Bad Luck" interactive introduces a frame of randomness and contingency. We are rewarded with blue pop-up messages such as "NICE JOB!" when the wheel lands on "Healthy Weight" but we are scolded with red pop-up messages saying "WARNING!" when we land on "Poor Diet." Yet where each spin will land is up to chance. Having had our risk factors explained in terms of things we can and cannot control, "Stroke of Bad Luck" suggests that luck is the superordinate factor governing both, setting up a frame conflict. Lifestyle choices are here being framed as something we fall into, accidentally and by chance, rather than a choice that we deliberately decide to do. "Stroke of Bad Luck," like other TAY exhibits that use games of chance as a metaphor, tend to confuse the ratio of agency and determinism when it comes to deciding to make healthful lifestyle changes. These kinds of decisions don't happen altogether accidentally. There is at least a strong component of deliberate, conscious action that musters human will power.

While it doesn't attack as suddenly as stroke, dementia can slowly take away the very rational agency that has been recommended as a deterrent to old age. For well fed, affluent people, medical science has helped to extend the duration of human life. While a person can expect to stay alive, on average, for many years longer than their ancestors, there is no guarantee

that they will be fully present, mentally, to appreciate the experience. Neurodegenerative diseases such as Alzheimer's have increased dramatically along with life expectancy. Patients with dementia suffer from memory loss, confusion, and lack of executive function. The burden they place upon their caregivers is often heavy. The injunction to "Live Forever" should perhaps contain the caveat "but be careful what you wish for" because a long life is often associated with neurodegenerative disease.

The next exhibit in the "Older Adult" section of TAY deals with this ironic tragedy of prolonged life. Somberly titled after the disease it covers, the "Alzheimer's Disease" exhibit features a large black and white photo of an elderly man looking puzzled and scratching his head. Superimposed over the photo there is text which lists facts about the prevalence, cause, and risk factors of AD, along with a description of research being done in search of a treatment and a cure. The second orange panel entreats visitors to practice mental exercises to help prevent or slow Alzheimer's disease. This panel reads:

Use it or Lose it. Brain exercise may be as important as physical exercise. Problem solving, planning, and creativity all stimulate activity in the brain to keep it healthy and lessen the risk of getting dementia. Activities like crosswords, thinking games, reading, and social interaction keep interconnections between neurons stimulated and healthy.

The injunction to "use it or lose it" is a prescription for averting neurodegenerative disease that is not without skeptics. One researcher argues, on the basis of epidemiological studies and clinical trials, that evidence for the benefit of mental exercise is limited (Gatz, 2005). Gatz (2005) argues that the injunction to "use it or lose it" may sometimes actually do more harm than good, because it can offer false hopes and blames the victim of Alzheimer's for not getting enough mental exercise. When morbidity and mortality is linked to overweight and obesity, there is a stigma

applied to the overweight person about not getting enough physical exercise or limiting caloric intake. But the innuendo of not getting enough *mental* exercise could be equally (if not more) hurtful, because of the value that is placed on intelligence and mental diligence.

After the TAY “Alzheimer’s Disease” exhibit urges visitors to “use it or lose it” there are bullet points underneath that focus on other preventative measures. Under the heading “Lessen your risk” we are advised to stay healthy, in general, because “A healthy lifestyle is as good for the brain as it is for the body.” In this portion of text, visitors are advised to focus on eating healthy foods and getting physical exercise. The “foods that keep arteries healthy” are listed as “fruits, vegetables, low cholesterol, low-fat, high anti-oxidants.”

The advice about cholesterol in both the “Stroke” and “Alzheimer’s” exhibits is suggestive of a new approach towards dietary fats that may represent a “paradigm shift” in the hypothesis that cholesterol is bad (Taubes, 2008). There are papers that appear to implicate *low* cholesterol in diseases such as Alzheimer’s (Stefani & Liguri, 2009), stroke (Wang, Dong, Qi, Huang, & Hou, 2013) violent behavior (Golomb, 1998), suicide (Deans, 2011), and just plain irritability (Golomb, Kane, & Dimsdale, 2004). An article in *Psychology Today* with the subtitle “Your brain needs cholesterol—don’t go too low” (Deans, 2011) explains that the brain is composed primarily of fat, and cholesterol is essential for neuron cell membrane structure. In 2012 the FDA issued a warning that cholesterol lowering medications can cause cognitive side effects such as memory loss and confusion (FDA, 2012). These examples are included here to suggest that the link between cholesterol and cognition may still be evolving. This is one example of how ad-hoc and emergent medical advice can be presented as scientific fact for the sake of parsimony in a science center setting such as TAY.

Cancer Answers

Cancer is a leading cause of death worldwide (WHO, 2013a). While cancer risk is inferred on the basis of a complex interplay between genetics, exposure to carcinogens, and lifestyle choices, it is a disease that can be attributed to behavioral and dietary choices about 30% of the time (WHO, 2013a). Because of this element of behavioral volition involved in the causation of cancer, it is a disease where health promotion offers strong warnings to modify lifestyle. When it comes to cancer, it can be empowering for cancer candidates to learn that they have some modicum of control when it comes to determining the outcome, but there is also the possibility that cancer sufferers can be “stigmatized” because they are perceived as people who did not take the proper behavioral measures to avoid the disease (Chapple, Ziebland, & McPherson, 2004).

Sponsored by Florida Cancer Specialists (a large oncology/hematology practice with locations across the state of Florida) the “Cancer Answers” exhibit is a room full of noise due to an open air audio broadcast that is on a continuous loop. There are several exhibits stationed in the center of the room and about a dozen lined up against the walls. When the wall space ran out, MOSI decided to project some videos on the floor, giving the impression that the floor is in motion. The cacophony of sounds and images, combined with the distressing subject matter of cancer, makes the “Cancer Answers” exhibit something that was described as “unsettling” and “creepy” in the words of some of my respondents.

The aura of menace at the “Cancer Answers” exhibit is initially established by the first exhibit at the center of the room. This exhibit consists of a mannequin head that appears to be floating on a sea of black velvet. A video projector is trained on the mannequin head, playing a series of recordings of talking heads. This gives the uncanny impression



that the disembodied head is talking, although sometimes the features of the real people on the video do not align correctly with the features of the mannequin head. A woman whose head is being projected onto the mannequin wears her hair slicked back, perhaps in a ponytail.

Figure 30: Cancer Answers disembodied head

Her right eye appears to be disfigured because it is being projected on the lower eyelid of the mannequin. She appears to have double nostrils, and her lips move according to the following audio track:

Being diagnosed with cancer is a frightening experience. But I felt more at ease because I had a *great* team of nurses and doctors to support me. I also think attitude becomes a big part of how you get through the cancer experience. It was *very* important to me to live my normal life, and *always* stay positive. I'm Bambi Davis Kane and *I'm* a survivor.

Bambi Davis Kane is a patient who speaks highly of her team of doctors and nurses. She notes the importance of a positive attitude and a "normal life." While the "first-order" level of her message begins with an acknowledgement that cancer is scary, it progresses to a hopeful message about staying positive and living a "normal" life. Meanwhile, the second-order message of this exhibit keeps pedaling the scariness, simply because of the incongruousness of a floating head trying to be reassuring about cancer. After Bambi speaks, other people's heads are projected onto the decapitated dummy, including oncologists as well as other survivors.

Along the walls of the "Cancer Answers" exhibit there are about six different exhibits that explain cancer pathology in more detail. The first exhibit along the north facing wall is an

interactive entitled “Whac-A-Cancer-Mole” which was removed from TAY. Under a sub-heading “Catch it Before it Catches You” the text exhorts visitors to watch for signs of skin cancer, check with a doctor and have regular screenings in order to catch it early. At the bottom of the text there is space for the interactive piece of the exhibit which had to be removed because it kept breaking. Similar to the “Whac-a-mole” type exhibits found on carnival midways, this exhibit provided a hammer to whack ‘moles’ that would protrude from circular holes. According to Dave Conley, this exhibit had to be removed because the rubber mallet would go missing, and kids could use it to whack other parts of the multi-million dollar TAY exhibition.



Figure 31: The Skinny on Skin

The next exhibit is about skin cancer. Tens of thousands of Americans are diagnosed with skin cancer each year. The harmful effects from the sun are especially a concern in the sunshine state, Florida, although statistically the rate of skin cancer is lower in Florida than it is for eight other states that are further away from the equator, according to the next exhibit.

“The Skinny on Skin” (TSOS) shows the prevalence of skin cancer in the United States, where one in five people will come down with different forms of the disease. In addition to the risk presented by sun exposure, this exhibit links unnamed chemicals found in some sunscreens to melanoma, the most deadly form of skin cancer. TSOS has an interactive feature that allows visitors to see how sun exposure has affected their skin. To complete this activity, visitors sit on a plastic stool in front a wooden box with a circular hole in it. They are instructed to place their face in the hole and close their eyes. Then, with the touch of a button, an ultraviolet picture is taken of their face. After a few moments, the picture can then be viewed on a screen next to the box. The visitor is asked to look at the amount of dark melanin spots on their face. Above each

visitor's own photo there is a photo of a man's face that has quite a bit of melanin discoloration. A text panel explains that these dark spots are abnormal skin cells that absorb sunlight differently and have a higher risk of becoming skin cancer.

Because it displays patches of melanin using ultraviolet photography, this interactive can be seen as an exhibit that is diagnostic, but with a prescriptive feature for visitor to go see a doctor if they a lot darker spots signifying "abnormal skin cells." It is up to that individual to devise any other prescriptive subtext of this exhibit such as wearing a hat or sunscreen. This exhibit was sometimes cited by visitors as behavior-modifying.

"Check Yourself Out" is an exhibit that instructs visitors on how to conduct self-exams for lumps or spots. The next exhibit, "Do This Not That" consists of two columns showing the do's and don'ts of behaviors that are correlated with cancer risk. Under the "Do This" column there are the following commands: Eat healthy, maintain a healthy weight, don't smoke or chew, exercise, guard against certain viruses and bacteria that may be associated with cancer, limit sun exposure, limit alcohol, guard against carcinogens in the environment such as air pollution and chemicals you may work with or be exposed to (for instance, insecticides in your yard), and above all, be happy and "maintain a positive attitude."

All of the edicts, above, are provided without any further explanatory context, except for the "Eat Healthy" row which contains some specific suggestions about what it means to have a healthy diet. Bullet points urge the visitor to eat lots of fruits and vegetables, plus whole foods, foods high in antioxidants, high fiber foods, adequate folate and lean portions. Visitors are also urged to slow cook, poach, or steam meats instead of grilling. While the injunction to "Eat Healthy," all by itself, can be too vague, lacking an operational definition, this exhibit provides some specifics. Also in the cancer area there is a suite of videos called "Cancer Answers" which

represent radiation, chemotherapy and oncological surgery using colorful and euphemistic computer graphics in a way that has already been described in other videos of this type.

There is also a whole suite of exhibits called “Eye Care” which explains degenerative eye diseases and contains a graphic video of eye surgery. Back out into the center of the “Older Adults” section, against a south facing wall just before the exit, there is a three-part interactive exhibit called “More Than Just Nutrition” which is sponsored by Mosaic, a mining company based in central Florida that provides potash (water soluble potassium) and phosphate for agricultural purposes. This exhibit issues plenty of dietary advice about the nutritional content of foods. The advice to avoid processed foods, salt and fat while eating plenty of fruits, vegetables, whole grains and lean meats is reiterated in “More Than Just Nutrition” but in greater detail than in other instances where this advice appears at TAY. At this point in the exhibition, all of the advice about staving off death must finally rest its case, because visitors have made it through the life stages, and now they are on the threshold of TAY’s final content area, End of Life.

End of Life

As visitors round the corner after they exit the Older Adults section of TAY, the wall panels, having gone through a full spectrum of colors from blue to orange now become a stark grey. As the exhibition passageway narrows to a corridor about one quarter of the size of the rest of the exhibition, visitors have entered the last section of TAY, which takes the biomedical inquiry beyond the living organism that is “you” into the post-mortem. The “End of Life” section features two walls with exhibits on either side, with a compact two-sided exhibit on an island in between the two walls which bisects the area. “You” is a subject position that undergoes a final transformation in this area. You the visitor are invited first of all to identify with a sentient being

that will sooner or later be drawing their last breaths. After death, “you” becomes identified rather starkly as an “it,” that is, as collection of viable organs that can be used, nestled in an otherwise useless cavity of decaying matter. After the “you” subject position is obliterated (and the corpse that you once were is buried, its vital organs having been parceled out to the needy), “you” are invited to identify with the survivors—family members and friends. These are the “them” who must somehow dispose of your earthly remains and find hope and comfort as they grieve your passing. The exhibits that are contained within this area are: Stages of Dying, Cultural Death Rituals, Organ Donation, Causes of Death, Grieving and Healing and The Legacy Station.

Stages of Dying

The first exhibit in the “End of Life” area is along the right side wall, entitled “Stages of Dying.” This panel of white text against a grey background text matter-of-factly itemizes the bodily processes that occur as a person dies. This list first describes death as a process rather than an event, which begins when the heart stops beating and commences in a “cascade of cellular death” beginning with brain cells and ending with skin and bone cells, as cells are deprived of oxygen. Having described the death process, there are bullets which follow on this same list, describing some tell-tale signs which indicate that someone may be on the verge of dying. These include long periods of sleep, confusion, speaking to people in the room who are not there, clammy skin, loss of bladder control, decreased appetite, noisy breathing, and detachment from relationships.

This bulleted list contains some categorical confusion, because it conflates physiological death with behaviors or symptoms that precede death. In this list of symptoms, the dialectic or

control versus the jurisdiction of the uncontrollable (a theme we have seen throughout the TAY exhibition) still dances the tango up until the final letting go. In the “act sequence” of this message, physiological death comes first, and the behaviors and symptoms paradoxically come afterwards. It is almost as if there is some conceptual equivocation about sequence of the terminus.

At the far right end of the “Stages of Dying” exhibit there is a panel that warns visitors that the next exhibit contains graphic images and descriptions that may be upsetting. On the other side of the wall panel there is a partially enclosed booth with three different videos: *Funeral Vessels*, *Embalming* and *Decomposition*. Unlike some of the sophisticated three-dimensional motion graphics that appear in other TAY videos, the “Stages of Dying” videos are noticeably sparse, even draconian. While the right hand of the screen shows an image, text appears on the left side of the screen in all capital letters, white against a greyish-black background. The first screen of text on the *Funeral Vessels* video reads: “THE USE OF VESSELS TO BURY THE DEAD DATES BACK AS MUCH AS 70,000 YEARS AGO IN BURIAL SITES OF NEANDERTHAL MAN.” To the right of this text there is an incongruous color photograph of an elaborate ancient Egyptian tomb painting. The jackal headed deity Anubis is leaning forward in front of an elaborate sarcophagus. The next slide shows a modern, blonde colored wood coffin, with the text “VESSEL CHOICE IS GENERALLY A COMBINATION OF SUPERSTITION RELIGIOUS BELIEF, CULTURAL TRADITION AND PERSONAL PREFERENCE. VESSELS CAN RANGE CONSIDERABLY IN COST AND DESIGN” and there is a succession of pictures of coffins followed by a plain white box with an open lid that resembles a Styrofoam cooler. Then, the video is over.

The details provided here about the *Funeral Vessel* video are included to provide the

Spartan style of this suite of videos at the “Stages of Dying” exhibit. The second video is equally minimalist as it explains history and process of embalming. But the last video trumps the first two in terms of starkness and brutality. The *Decomposition* video (which contains no text or explanation) consists solely of a time lapse video of a pig decomposing in the space of thirty seconds. The video of the pig sagging, darkening, and melting into a skeleton lying abjectly in a dark slick of black slime is a stark portrayal of the animality of death, standing in shocking contrast to the other two videos that are focused on the cultural decorum involved in preparing a corpse for its final resting place. But some of the most shocking visuals that TAY has to offer are still yet to come.

Cultural Death Rituals

On the other wall towards the entrance of the “End of Life” section of TAY there is another cylindrical booth with wall panels and videos dedicated to “Cultural Death Rituals.” The walls inside this exhibit feature copious images and text that explore how death is handled in different cultures. The first wall has a timeline of various historic and prehistoric cultures with a description of their beliefs and rituals surrounding mortality. These include the ancient Egyptians, the Mayans, the Norse Vikings, and the Australian Aboriginals. The other walls show a sparsely arranged collection of black and white photographs with a title indicating a certain culture. Each of these also has a button, that when pressed, plays a video about that cultural death ritual plays on a monitor. Visitors can choose *Roman Catholic, Balinese Hindu, American Protestant, Islamic, Day of the Dead Mexican Catholic, Judaism, Russian Orthodox Christian* and *Tibetan Buddhist Sky Burial*. Each short video shows still images and motion pictures of funeral practices around the globe.

In one of the more eye-popping videos, *Tibetan Sky Burial*, monks in red robes are shown trekking up a mountain with a dead body on a primitive stretcher. The body is covered with a multi-colored blanket. The monks uncover a naked corpse on a grassy plateau, and make incisions in the pale colored remains with a knife. After the monks depart the scene, vultures begin tearing off hunks of skin and flesh from the corpse with their beaks until a red skeleton



Figure 32: Tibetan Sky Burial

with only wisps of gore is all that remains. This death ritual is a striking reminder of the fate of the body, and the necessity of distinguishing between the person and their bodily remains.

The “Cultural Death Rituals” exhibit is an example of cultural relativism, where ethnocentric norms are bracketed for the plain explication of difference. The astonishing, gory visual of the sky burial is juxtaposed with the Western funeral practices among American Protestants and Roman Catholics. In these latter cultural death rituals, there is far more emphasis on the preservation and denaturing of the human body after death. American practices that are concerned with the preservation of human form after death are exhibited side by side with the sky burial where, on the basis of Buddhist beliefs, the empty vessel of a departed person is used as an offering for the birds. The “Cultural Death Rituals” exhibit is noticeable for its lack of moralizing about different practices. Curiously, cremation, a process of burning a corpse that is found in numerous cultures goes unmentioned in this exhibit. The subject of TAY, a body occasionally augmented by microbiological and cybernetic agents, now succumbs to the final dismemberment.

Organ Donation: Don't Take Them With You

Moralizing about the proper disposal of human remains is something that is mostly avoided in the TAY End of Life section. The exception to this is the following exhibit, which urges people to consider donating their vital organs to living persons in need of replacements. Just outside of the circular video booth that houses the “Cultural Death Rituals” exhibit is an exhibit entitled “Organ Donation” which contains an unambiguous plea to donate organs in the event of death. The “Organ Donation” exhibit has video that features different people on camera who have benefitted from donor organs. This first-person testimony features men and woman speaking frankly (and sometimes emotionally) about their experience with organ donation.

The video begins with a young woman sitting on her back porch, legs crossed, arms folded in her lap. She says “From our side of organ donation it has been hard. It was an unexpected, sudden loss of my child.” The video fades to a still photo of a boy, about ten years old, sitting on a four wheeled all-terrain vehicle, beaming a big smile. The video fades back into a tighter shot of the woman speaking.

However, knowing that he is living on...and doing wonderful things...and being the fireman he always wanted to be...it just warms me in such a way...knowing that an eight year old girl received his heart.

The video cross-fades back to another still photo of the boy. In this photo he is shown holding a puppy, with a sweet, toothy grin on his face. The woman continues in a voiceover:

She is gonna grow up and hopefully meet a wonderful person and have grandchildren for her mother. His legacy can continue to go on and move on. To know that we were able to allow people just to go back to work every day. To know that people saw the Christmas tree for the first time in a long time...It's just amazing.

In this video, the woman who has tragically lost her son suddenly in an unspecified way is shown discursively reconciling his premature death with the gift of life he was able to provide to a little girl who received his heart. Her discourse of continuation, anticipating the life course of this donor child, evidently helps this young bereaved mother to reframe her son's death into something meaningful. She continues:

Because Austin was going to go, no matter what decision I made. So anybody who has received an organ, please know that us donors are so happy that you're happy. And it makes us extremely happy.

The idea that the tragic loss of a child could in any way become a wellspring for extreme happiness serves as a powerful form of rhetoric in favor of organ donation. In the last quote, above, the woman is framing her loss in terms of an event beyond her control (“no matter what decision I made...”). At the same time, she identifies herself as a donor (“us donors”), perhaps because the bodily boundaries between a mother and child are not so separated conceptually. In the “Beginning of Life” section of TAY, the subjectivity of the fetus and neonate was closely linked to that of the mother, and here we see a return to this.

The second video portrays a family that benefited from not just one, but two donor organs, one for the dad and one for the daughter. The video testimony shown in the “Organ Donation” exhibit, while it doesn't issue any explicit ‘pitch’ to the visitor about signing up as an organ donor, can be viewed as an indirect directive because it remains up to the visitor to reconstruct the appropriate take away message. At the bottom right hand side of the video screen there is a small plaque that reads “For more information text ORGAN to 24453. Standard text messaging rates apply.” This message is a hint about an appropriate reaction.

One visitor who tried to text ORGAN to this number told me “yeah, but I never got a text

back!” Twice I have tried texting “ORGAN” to the number this number but I did not receive any response either. After the persuasive testimony of the families, it would be worthwhile for the “Organ Donation” exhibit to leverage the attention that visitors are paying to this issue. Visitors should be provided with a way to find out more about organ donation and even sign up to become a donor. Unfortunately, the motivated visitor only sends a text message into a communicational abyss.

The second panel of an exhibit called “Causes of Death” features an interactive video screen entitled “Killers Lurking in Your Future.” A command placed at the bottom right of the video screen reads “Push a button to find out what killers are lurking in your future. And be active in keeping yourself healthy to a ripe old age.” This interactive shows the top ten causes of death for various age groups. Each fourteen year age group is selected by the visitor who presses a corresponding button. The take-away message of “Killers Lurking in Your Future” is that death befalls people of all ages. Looking at the top ten causes of death forces visitors to identify themselves as mortal beings, for who even the most careful heeding of healthy-lifestyle injunctions will not prevent the ultimate succumbing to mortality. Having established those “Killers” lurking within the futures of each individual, the End of Life corridor at MOSI now turns its attention to the living; those survivors who are destined to outlive their loved ones, if only temporarily.

Grieving and Healing

The hospice movement in the United States represents something of a sea change in the acceptance of death and an alternative to high tech, expensive medical measures that may prolong life even when the writing is on the wall. The focus of palliative care is to make a person

who is near the end as comfortable as possible as they spend their last few months, weeks, days or hours alive. Hospice care acknowledges that death happens, and rather than engaging in emergency procedures (such as force-feeding or cardiopulmonary resuscitation) to revive a dying person, hospice care workers instead focus on pain medication for patients so that their last moments may be less uncomfortable.

The second to last exhibit at TAY is entitled “Grieving and Healing,” sponsored by Suncoast Hospice Foundation, an organization that provides palliative and hospice care in three different facilities in the Tampa Bay area. The “Grieving and Healing” exhibit features a table with a large monitor placed inside of it, facing upwards. Visitors can stand around this interactive kiosk and, using a trackball and button, navigate a number of different topics including: abnormal reactions to death, normal reactions to death, crying, assets, security, death certificate and meeting with the medical examiner. When selected, each of the seven choices contains text and visuals relating to topics that affect those persons who are left behind when a loved one dies. In a delineation of “normal” versus “abnormal” grief, this exhibit explains that it is “normal” to feel sadness and unhappiness after a loved one dies, but grieving becomes “abnormal” when it interferes with a survivor’s life, causing prolonged depression or unresolved feelings of guilt. The “Grieving and Healing” exhibit also has some very practical pieces of advice for grieving persons. For example, the “Security” page urges survivors to take special precautions to protect their belongings while everybody is at the memorial service or gravesite. “Security” warns that unscrupulous criminals read death notices and then target a house for burglary once the deceased and their family are away at the funeral.

The last exhibit of the “End of Life” section (as well as the last exhibit of TAY) is called the “Legacy Station.” This circular booth has a large, clear acrylic tube with hundreds of pieces

of paper continuously being blown around inside. There is also a bench and a shelf that has a plaque on it which reads, in all caps, “WRITE THE NAME OF A LOVED ONE THAT HAS PASSED ON ONE OF THE SLIPS OF PAPER. SLIP THE PAPER INTO THE LEGACY TUBE THROUGH THE SLOT ON THE LEFT SIDE OF THE TUBE. HAVE A SEAT AND CONTEMPLATE THE LEGACY OF YOUR LOVED ONE.”

The slips of paper, each containing the name of a loved one written in pencil by one or more of the MOSI guests, accumulate at the bottom of the tube because of the centrifugal force of the winds which stacks the paper on the bottom. It is as if each soul were clinging to life, its wonder, its enjoyments, as well as its diseases and degenerations. Once the stack of paper on the bottom of the tube hovers long enough, it begins to show signs of budging, as if, en masse, its staid location at the bottom of the tube is something only temporary—much like the long lives of affluent visitors to TAY. In an instant, the tipping point arrives, and suddenly the papers burst into the air, as if fired from a cannon. Finally the drama is over, and control has capitulated to determinism.

Situated at a table just at the exit of TAY, I observed visitors entering the semi-private booth and staying for short or longer periods. One day two women entered the Legacy Station and stayed in there for a while, leaving the booth with smiles and flushed cheeks. They declined to be interviewed, but in the field on the survey where visitors were asked if there was anything in particular they liked, both of them wrote “Legacy Station.” In the field where they were asked “Is there anything you would like to add?” One of the respondents wrote “More exhibits like the legacy station.”

CHAPTER FIVE: VISITOR FEEDBACK

Chapter Preview and Research Questions

In this chapter I will summarize survey and interview feedback that I received from visitors to TAY. First I will provide charts summarizing what survey respondents liked and disliked about TAY. Next, I will summarize the positive impressions of the exhibition as described by my interview respondents and focus on some of the descriptors they used to describe what they liked, such as interactivity and eye-openers. Following these positive descriptions, I will turn my attention to the various forms of criticism that my informants provided. This variety of complaints will be grouped under the categories of functionality, noise, concerns about the age-appropriateness of exhibits, and the need for more staff on the exhibition floor. Finally, I will focus on the feedback of a small minority of visitors who felt that TAY was overly focused on medical procedures to prevent disease and not focused enough on preventative measures to stay healthy, such as diet and exercise.

Here are some of the research questions that this chapter will address: How do visitors describe the exhibition using idioms and metaphors? What do visitors care about most of all in their interactions with exhibits? Is the descriptor “interactivity” mainly used to describe computer based interactive exhibits? Or does the term also apply to human interactions experienced during the visitor encounter? How does TAY offer exhibits that appeal to a variety

of age groups? What are some of the exhibits that visitors felt may be inappropriate for kids? Finally, how can science centers highlight best practices in medicine without excluding or marginalizing alternative approaches?

Summary of Survey Results

I conducted surveys with 72 adult visitors to TAY. N=6 were MOSI volunteers, and n=9 stated that they were MOSI members. Results from these surveys are represented in tables below. First I will provide a chart of common adjectives that visitors used to describe the TAY exhibition. Note that these positive descriptors indicate a largely favorable response to the exhibition.

Table 1. Top descriptors used (n=72)

<u>Descriptors</u>	<u>Mentions</u>
Informative	18
Great	13
Enjoyable	10
Interesting	8
Fun	6
Educational	4
Cool	3
Nice, wonderful, engaging, love, wow (n=1 per)	5
Negative	5

These descriptors appeared under the “What are your thoughts about TAU?” field on the survey form. The most common kind of descriptor was that TAY was entertaining, using descriptors such as great, enjoyable, fun, cool, nice, wonderful or engaging (n=37). Others described it as informative, educational or interesting (n=30). The negative responses included “biased in some areas,” “A lot to take in,” “Should be updated,” “Many exhibits didn’t work properly and were extremely old and low tech” and “More differentiated areas would help keep attention high.”

The second chart shows the kinds of exhibits that were mentioned the most. Sometimes visitors cited specific exhibits and other times they used the “interactive” descriptor to cite a broad category of exhibits.

Table 2. Most mentioned exhibits (n=72)

<u>Exhibit</u>	<u>Mentions</u>
Interactives	10
Fetal remains	7
Cancer Answers	6
Hands-on	4
End of Life Area	4
Prevention	4
Mindball	3
Others (n <= 2)	7
No response	27

These mentions were made under the “Anything in particular you liked?” field on the survey form. The most common mention (n=10) was interactivity or interactives, a general description of a category of exhibits. Some responses indicated that interactivity was a term used to describe the computer-based exhibits where visitors used a trackball mouse to answer quizzes or tests of visitor knowledge. In one response, a visitor mentioned the diagnostic tests of hearing and vision as an example of interactivity. In addition visitors liked “hands-on” exhibits (n=4) which is an alternative descriptor for interactives. Visitors also mentioned the fetal remains (n=7), Cancer Answers (n=6), End of Life (n=4) and Mindball (n=4) by name. Under the category of “Prevention” visitors mentioned food (n=1), exercise (n=1) and “Laughter is the Best Medicine” (n=2). “The Stem Cell Story,” “Drunk Goggles,” Childbirth, “Body Organ,” “Healthywood Squares,” “Cardiology,” and Sleep were also mentioned (n <= 2).

The next chart summarizes the answers that visitors provided to the question “Do you think TAY might influence guests to make healthier choices?” This survey question tries to get at the perception of TAY as being a positive influence on visitors.

Table 3. “Do you think TAY might influence guests to make healthier choices?” (n=72)

<u>Response</u>	<u>Number of responses</u>
Yes	47
No	5
Maybe	15
Don't know/ No response	5

This chart shows that a majority of respondents (n=47) felt that the TAY exhibition would have a positive influence on visitor behavior. Some of these responses cited specific exhibits such as the stroke, asthma and cardiology exhibits. Many “yes” respondents mentioned the “Smoking and Health” exhibit specifically (n=13). Among the “maybe” respondents there were a variety of reasons offered for why TAY might or might not influence visitors. “Depends on the guest” wrote one “maybe” respondent. Another wrote “It might, it might not. Depends on the person really.” Another wrote “If already considering life changes- it is a source of information to make people consider making changes/ evaluating current lifestyle.”

The next chart summarizes the kinds of suggestions that visitors had to make the exhibition better. Note that a majority felt that it was just fine the way it is or did not respond.

Table 4. Suggestions for improvement (n=72)

<u>Suggestion</u>	<u>Mentions</u>
Fine as is	20
No response	18
Other (n=1)	10
Non-functioning exhibits	8
Too noisy	6
Needs more interactive/ hands-on features	4
Lighting	3
More staff	3

These responses were provided underneath the question “Any feedback about how this exhibit could be better?” on the survey form. Over half (n=38) of respondents said it was great just the way it is or left the field blank. There were a variety of individual responses in the “other” category (n=8), including “skeletons,” “more information about healthy food,” “remove

Healthywood Squares!” and “be more interesting.” One respondent wanted to know more about the origin of the fetal remains (an issue that emerged with more frequency in the interviews). Another wrote that the exhibition should be cleaner. One issue that respondents mentioned (n=8) was that exhibits that were not working. Specific exhibits usually were not mentioned, except for one respondent who wrote “More RAM for some of your machines— I ran the Doctor survey out of memory. Crashed with error D3D9 I believe.” Non-functioning exhibits, along with complaints about the need for more staff (n=3) can be considered as requests for MOSI to be to offer more chances to interact with people.

Most of the survey responses to TAY were positive. Visitors liked the interactive and hands-on features of the exhibition most. Heath and von Lehn (2008) note the polysemic uses of the term “interactive” in museum contexts, which can be either a description of human interaction or computer based exhibits. Most visitors used the words “interactive” and “interactivity” as if the meaning of the term was self-evident. The key words that visitors used to describe interactivity were games, quizzes, and tests, which refer to the computer-based interactive exhibits. When the descriptor of interactivity was used without examples, it wasn’t clear in each case if they were referring to computer-based exhibits or the ways in which the exhibition facilitated collaborative interactions between other visitors. It was only during interviews that visitors who completed my survey had a chance to elaborate more on the short responses they provided on the survey form. The next sections describe these interviews in detail, starting with positive responses and then followed by more critical feedback.

Interview Summaries

Positive feedback: Interactivity and “eye openers”

Of the 72 surveys that I collected from TAY visitors, 22 agreed to a more in-depth interview in exchange for free passes to MOSI along with an IMAX movie. During interviews I attempted to elicit more information about what was signified by the “interactive” descriptor. It became clear that the computer-based interactive games and quizzes (along with diagnostic tests of hearing, vision and blood pressure) gave visitors a chance to participate in the exhibition instead of merely being passive receivers of information. Doug said “I also just liked the whole interactive thing. It’s not just looking at stuff...you know?” His friend Karen chimed in, “Like it’s not just cold...not just looking at things.” Karen described the interactivity in a sensory way, using a descriptor of temperature to describe how TAY had buttons to press and games to get involved in. For Colleen (the MOSI member who brought her son to MOSI as a reward for all A’s on his report card) the interactivity of TAY showed thoughtful considerations on the part of designers. Colleen explained:

I think a lot of time and care went into making it. I think it’s really informative...but it’s more than that. I like that it’s hands on. It’s got a lot of sensory input. So it’s not just reading a bunch of stuff. You can push knobs and turn buttons and I think that’s good for kids. So the interactivity I like.

Colleen went further, describing people who go to MOSI as the kind of people that she and her son preferred to interact with, compared with those who visit an outdoor festival.

Not too long ago we went to one of these outdoor festivals, and there are so many different kinds of people. Some are kind of jerky, loud and obnoxious. But generally speaking at the science center you are dealing with people that are already interested in

science. Learning how things work. Curious, friendly. Usually the people we meet at the museum are really nice.

Colleen used my question about interactivity as an occasion to address the polysemy of the interactivity descriptor, using the term to talk about people as well as exhibits. Paula, the health educator, also explained what she liked about TAY in terms of interactivity, and her description was focused on how families interact with exhibits as a group. She made a distinction between how adults and children could enjoy the exhibits:

I liked how interactive it was. It seemed like it would keep children and adults engaged—probably not in the same activities. There’s a lot of adult-oriented activities. I think a lot of times you have the parents who are bringing their children to exhibits like this, who maybe do have a higher education, and they tend to get bored or distracted, and want to just keep on moving; you know, novel things aren’t that entertaining for them...

In this quote, Paula seemed to be saying that interactives at TAY helped to get adults interested, whereas children were more entertained by novelty. I thought this description was intriguing, because usually it is the kids at a science center who are framed as easily distracted and eager to rush through.

Other respondents used visual metaphors to describe a social learning process that they experienced during their visit. For Jamela (a mom who was visiting MOSI with her high-achieving twelve year old daughter) TAY provided a safe space for visitors to explore health issues that may have otherwise been private. Visiting TAY could potentially help visitors who felt that they were in the dark about a medical issue, according to Jamela:

I think that the exhibits are able to give a “light” and help some people that may travel through some exhibits and have certain conditions that they’re not comfortable enough to

talk about with their doctors. Being able to pass through the exhibits that are on display allows people to know that they're not the only ones that have gone through certain situations. It will make it a lot easier to discuss situations with their doctors, so that better health is the end result for what we're looking for. The exhibits here can give you information on how to better take care of yourself and on how you can help other people take care of themselves, too.

This excerpt from our interview shows that Jamela thinks TAY is a great opportunity for people in dyads or groups to explore private health topics in a public setting. Jamela really appreciated bringing “light” to the darkness. By making a public display about private health matters, TAY was bringing a communicative atmosphere to topics that are often unmentionable. Jamela describes a social learning process combined with compassion and support that can help an individual sufferer to realize that they are not alone:

Communication is the key—to be able to know how to articulate what you want to say and how you want to say what I'm making you feel—you know, embarrassed or alone. And I think by this having a family atmosphere, everyone here is able to engage and say, “This is what we all know, and this is all we can help you with.” We can all help each other and everything.

Jamela is articulating the ideal of social learning, and she even hints at the notion of a public sphere where people can go to interact and discuss topics in an environment that is safe and open. Jamela's comments were an example of frame flexibility and mutability at TAY, because they indicate how discourse which is sometimes framed as “private” comes out into the open.

The metaphor of light and vision that was used by Jamela in her description of TAY was also used by other visitors to describe their response. People used the term “eye opener” to

describe their learning experience using visual metaphors. One survey respondent wrote “The part of the exhibit that talks about how smoking affects the body is very eye-opening.” Another one wrote “It really opened my eyes to the things that could happen if you don’t make good choices.” During our interview Doug used the expression when he described the “Infant Roulette” exhibit: “One of the greatest eye-openers in there was what happens when a pregnant woman drinks and what happens when she smokes...” The metaphorical phrase “eye-opener” is used to describe learning that takes place in a startling, surprising, or suddenly enlightening way (Merriam-Webster.com, n.d.). The use of this descriptor to describe the TAY experience indicates that science center communication elicits affective responses such as being startled or surprised in order to heighten the informative function of exhibits.

Visitors often described TAY as an experience that was both informative and enjoyable. Such responses combined informatic descriptors about learning with affective descriptors about enjoyment. For example, Andrew told me, “I really enjoy it; it's really educational.” Such positive responses to the TAY exhibition show that visitors appreciate the affordances which are offered that allow them to discover the messages through their interactions with exhibits. In addition to describing TAY as illuminating, visitors also provided feedback about what would make the exhibition better.

Critical Feedback: Functionality and Noise

Overall there was a lot of good will towards MOSI as an institution and community resource. As noted in the survey summaries, many visitors said that TAY was fine just the way it is, and many others left the field blank. Some survey respondents participated in the follow up interview where they were able to elaborate on some of the responses in which they indicated

room for improvement. In this section of the chapter, I will try to summarize these criticisms in the hope that they may provide helpful feedback to MOSI stakeholders. With that said, these criticisms should be seen for what they are: Answers to prompts on a survey form (or answers to interview questions) that were given by museum guests who may have not left the house with their “evaluator badges” so to speak. Sometimes visitor criticisms may be interpreted as “artifacts” of unknown personal factors, such as mood or blood sugar levels, etc. Then there are criticisms that appear to be grounded and legitimate, if sometimes stated with hyperbole.

Nine respondents complained that exhibits were not working. Some provided examples such as “Healthywood Squares” and the inflatable lungs in the smoking exhibit. Cecilia is the TAY visitor who was unhappy with the way that “Healthywood Squares” portrayed a Latina woman. This clearly influenced her overall negative appraisal of MOSI, which included complaints about non-functioning exhibits at TAY:

Some of the ones, when you walk up and it’s some kind of interactive activity... Where it says press start they are pushing the button over and over and it won’t start. That happened for at least three or four different exhibits. So I just ended up walking away from them... It’s pretty frustrating.

Chris, the MOSI visitor who was visiting TAY with his wife Alannah and their two teenagers, wrote on his survey about “technical problems.” When I asked him about this response during our interview, Chris had this to say:

Oh, there were just quite a lot of them that weren’t functioning. One of them would ask a question and when you pushed the button it would start over. We noticed that there were some quizzes where my wife and I got totally different scores for pretty much the same life style answers, and there was no explanation for why that would be. That leaves the

person who is trying to understand it frustrated. You went to all that effort, and you end up saying “what is my reward?”

In this passage from our interview, Chris describes his difficulty with some of the TAY exhibits in terms of frustration, as did Cecilia, above. His complaints about the exhibits are geared towards those which he thought were non-functioning (such as the quiz that kept starting over) but also about exhibits that may have been technically working but lacked explanation. Chris wondered what the take-away message was from the “Life Mosaic” exhibit. That exhibit asks the visitor to input the time that they spend engaged in daily activities, such as work, commuting, exercising, or lounging. The result is a colorful readout that, while aesthetically nice-looking, doesn’t really provide any explicit normative message about healthy lifestyles.

Another pair of visitors who described non-functioning exhibits in terms of frustration is Bruce and Alexis, the couple that was especially invested in a healthy lifestyle of exercising and organic foods. Bruce compared MOSI to a museum in their town south of Tampa bay:

In a high class complex exhibit like this, it just has to be maintained, no matter what. In our town, we’ve got a museum, and it’s small, and it really needs to be maintained.

Everything that you are interested in is kind of lost when it isn’t maintained.

Alexis followed up on Bruce’s statement by saying “When it doesn’t work, it is just so frustrating.” This affective descriptor of frustration suggests to me that these visitors bring to MOSI clear expectations about their visitor experience. It is almost as if non-functionality (or at least the perception of non-functionality) is like receiving a meta-message about the exhibits and the visitor experience as being unimportant.

Six surveys contained a complaint about the exhibition being too noisy. Some of these complaints were “Lots of noise from multiple stations,” “Too noisy for senior! “I think it was

great. Probably needs a little volume control, but that's it.” “A little more soundproofing. Some of the noise from exhibits overlapped.” “The acoustics of many of the exhibits create a lot of noise pollution.” and “The noise levels should be better balanced.” Even when noise wasn't mentioned on the survey, some interviewees brought up the subject during the interview without any prompting. Kent first noticed how noisy it was when he was in the soundproofed booth trying to test his hearing:

I noticed it the most in the hearing test, and then I kept noticing it after that. There was so much ambient noise that it made it a lot harder to do that test. And then, once you were kind of thinking along those lines, you noticed that some of those exhibits are SO loud—the people are just yelling. Like, the tic-tac-toe one with the nine boxes and the puppets? It's just SO loud when you have it on. I was too embarrassed to actually do it, because it was so loud, and I thought I was disturbing people.

In this passage from our interview, Kent identified “Healthywood Squares” as a loud exhibit that interfered with his hearing test in the soundproofed “Hear, Here” booth. The noise levels at TAY may actually be “by design.” A noisy environment can help to frame the environment as one of excitement and activity, as in the case of an amusement park midway. In the event that the noisiness at TAY is not a design feature, adjusting the volume levels or adding more noise barriers may help address these complaints.

Critical Feedback: Age Appropriateness

There were a variety of opinions about the age appropriateness of TAY. While some of the young adults seemed to think that TAY was “kid's stuff,” there were others who felt that the exhibition (or parts of it) was not well suited to young children. One of my respondents who

stressed this point was Phillip, a 19-year-old former MOSI volunteer who I met while he was doing community service.

The one thing I feel they should improve is that I feel like it's geared more towards teenagers or pre-teens. A lot of the stuff is probably going to go over the heads of a lot of the younger kids, unless they have adults there to explain everything to them.

When I asked Phillip to provide some specifics about the exhibits which he thought were over kid's heads, he specified the STD exhibit "Risky Relations."

Kent and his wife Haley were the young couple who chose to visit MOSI while their daughter played at home with Grandma. If their choice to not bring their daughter to MOSI that day is any indication, it suggests that TAY offers an informative and fun experience to adults.

Kent explained:

One thing that I noticed is that it's not just geared for kids, necessarily. There is that kind of approach—it being accessible to younger people—but it's also very good for grown-ups [laughs].

I asked Kent and Haley how old their daughter was. Kent replied "She's two. Probably not their target audience yet [laughs], but pretty soon she'll enjoy running around and getting up." Haley had a comment about the way that TAY was organized that related to different age groups who visit the exhibition:

It had a lot of stuff that's all reading in a row—and then all that activity—clustered together, which does make sense, I think, for children. Because I think that if you just bring your kids, if you have rambunctious kids who like a little activity and stuff [laughs], that may be why they designed it that way.

Based on Haley's response it appears that she was aware that the exhibition had been designed with different age groups and learning levels in mind. Haley was tuned into visual cues that help to frame an exhibit as either playful or serious, or either child or adult oriented. Haley's comment, above, indicates that this visitor found her "footing" by categorizing exhibits as either/or.

When I asked Doug, Karen, and Bill (the three friends who work for an air-conditioning company) which age group they thought the TAY exhibition was designed for, Doug responded "I'd say adult. It might be a bit too much for kids." Karen followed up Doug's response with her opinion about the sex-education exhibits that were geared towards pre-teens:

I did like the way that they would touch on some dirty stuff for kids, mixing it up for boys and girls, so maybe if they aren't really comfortable talking it over with their parents, they could talk about it with other kids. They might feel unsure about asking someone about some of these things, but in the displays there it is, right in front of them, and they can take their time and figure it out.

Karen seemed to be saying that the sex-education exhibits could be helpful to pre-teen kids who were curious about "dirty" topics but were reluctant to talk about them with parents. Talking to peers and consulting the factual exhibits at TAY might help them to answer questions about their changing bodies. Doug was quick to follow up Karen's statement with a caveat about the age-appropriateness of TAY's exhibits:

Yeah, but you've got to keep certain stuff separate like that, because you don't want a kid walking through the cancer stuff, and the disease stuff, and then having them lose sleep and be all worried about stuff like that the rest of their lives. If they saw a picture of a kid that had whooping cough and a kid that had smallpox, now they are losing sleep.

Based on Doug's response, he felt that some of the imagery from TAY might be upsetting for children. I forgot to ask these young adults Doug, Karen or Bill if they had kids of their own.

Coleen, who was visiting MOSI with her 11 year old son, said that overall TAY was appropriate for kids but there were some exhibits they decided to skip:

I think all that was appropriate. I think some things... Like for instance, I never took him in the past to the birth exhibits. I wasn't sure if he was ready for that. I asked him this time, you want to go see anything? And then there is the death...Grieving and all that. When he was younger he hadn't experienced that or been to a funeral or anything. So now that he's older, and he's had some experience with...life events. So, he's got more questions than he would...I think that very young kids might skip, maybe the beginning and the end? I don't know, below elementary level, for this exhibit, might be a little much. It just depends. I don't know. It depends on the child, really.

I didn't inquire further, but it sounds like, based on Coleen's response, that her son had some experience with "life events" that may have included a funeral.

On the surveys, some respondents noted that TAY had activities that appeal to both adults and kids, while others felt that TAY was more oriented towards adults. One respondent wrote "Maybe a few more 'child' friendly stations. Our daughter (5 yr. old) did enjoy it, though." A man who was visiting the museum with his grandchildren wrote "Some of the interactive stations were more for adults than children." Another mom who spoke highly of TAY in her survey ("Loved it." "Enjoyed all of it.") provided some feedback that was specific to the fetal remains exhibit. She wrote "The fetal development stages were so interesting but scared my daughter a bit."

Elizabeth (the marketing professional who I met while she was volunteering at the Einstein Food and Wine event) also stated her concerns about the fetal remains exhibit, especially regarding the tacit communication that she noticed going on between parents and kids:

I think they could do much more educationally about where these displays came from. I can't help feeling, through and through, that all of the adults were trying to figure out whether it was real or not. I probably watched seven or ten of them of them coming through, and then instantly the kids look to their parents or to an adult nearby to see how they are reacting. I think for kids it is a little bit hard to understand, and for the parent or care-taker, if they don't understand it, it is probably very hard for them to quickly explain to their child. And of course learning about life and death for kids is something that I feel can be very jarring. And they have to ask, where did that body come from? [laughs nervously].

Elizabeth, who is not a parent herself, seemed quite concerned about how parents and kids were interpreting the fetal remains exhibit.

The response from MOSI visitors and volunteers about age appropriateness shows that visitors are tuned into the frames that surround certain health topics as being for either adults or children. Notions from frame analysis are useful for describing these visitor's reactions, because each adult visitor brings a perspective or set of expectations about the ways in which they anticipate how kids are likely to react to exhibits that deal with sex and death. The concept of keying suggests ways that the tone of an exhibit can be tacitly geared towards either adults or children using colors, cartoon characters, or other signifiers. Keying is also a way of talking about the ways in which parents talk about exhibits with their kids, while footing is a way to describe expressions of ambiguity about the "correct" way to handle these conversations.

Another suggestion that I received was to have MOSI staff or volunteers on the exhibition floor that could provide instruction about operating exhibits as well as being able to answer medical questions that emerged in the course of visitor's interactions. I would speculate that criticisms of this kind may be a semantic cousin of complaints regarding non-functioning exhibits. In both of these complaints, visitors expressed a wish for a more human interaction and responsiveness. When visitors such as Cecilia, Chris and Alexis describe their frustration with getting stuff to work, I could hear an implicit plea for docents who could perhaps provide the necessary "scaffolding." One survey respondent wrote "More direction on some of the exhibits would make the engagement more successful." Another respondent wrote that they wish there was "a lot more staff on the floor." Another indicated that "more personnel inside" would be a welcome improvement, while another suggested "more thorough instructions."

Critical Feedback: The Need for More Staff

The feedback which I received from TAY visitors about noise, functionality, age-appropriateness and lack of staff can be grouped together so that they can be interpreted as different iterations of the latter complaint. These complaints could all be addressed by having more human interactants, docents or volunteers who could help to facilitate the learning and enjoyment process by providing more "scaffolding." "Noise" describes the audible sounds at TAY, but it is interesting to consider the noise concept according to information theory notions of "semantic noise" which can overpower the meaning of a message (Bar-Hillel, 1964; Blois, 1984; Shannon & Weaver, 1949; Terranova, 2002). In this view, complaints about audible noise can also be interpreted as meta-commentary about signal to noise ratio at the TAY exhibition. When visitors describe a noisy or frenetic environment, they appear to me to be expressing

frustration or disorientation. Complaints about functionality can also be considered as an iteration of this complaint, because having someone to address these problems on the floor of the exhibition could provide a channel for feedback to address visitor issues. Similarly, concerns about age appropriateness can be interpreted as indicating a need for scaffolding which could bring inexperienced learner into the zone of proximal development. Complaints about the need for staff are an explicit articulation of these concerns.

Grouping this complaint discourse together using notions of “zone of proximal development” (Ash, 2003; Ash, et al., 2012; Pass, 2004; Vygotsky, 1978) can help uncover some common themes between them. The theory of “zone of proximal development” (zpd) and the notion of scaffolding emphasize that learning takes place in a face to face social environment and is aided by a more experienced teacher or mentor who can provide modeling in the form of demonstrations and other hands-on activities. This social conception of the learning process in face to face settings is similar to museum research that emphasizes the important role of conversation and other forms of person to person interaction (Falk, 2009; Falk & Dierking, 2000; Knutson & Crowley, 2004; Leinhardt & Knutson, 2004).

An evaluation of some of the exhibits at TAY articulated the need for more human interaction on the exhibition floor which could mediate the learning process between visitors and MOSI as an institution. This 127 page evaluation (which was helpfully provided to me by Judith Lombana) was conducted in 2009 by Bruce Hall and Wendy Dickinson and was entitled “Investigating the Amazing You Through Technologies: An Evaluation of IMLS-Sponsored Exhibits in MOSI’s The Amazing You Exhibition” (Hall & Dickinson, 2010). This evaluation describes eight exhibits that are found in various content areas of TAY which contain electronic measuring devices to record the inputs of visitors using the interactives.

Hall and Dickinson (2010) employed a variety of instruments in order to evaluate the eight exhibits that were funded by IMLS. In addition to unobtrusive observations of guests interacting with exhibits, the evaluators conducted interviews with visitors and gave “post, then pre” surveys where visitors self-reported on their own learning outcomes. The evaluators (Hall and Dickenson, 2010) suggested some general recommendations about the exhibits, such as brighter lighting, more descriptive instructions, and lighter colored foot stools that could prevent potential mishaps. One of the general recommendations of Hall and Dickenson’s (2010) evaluation of TAY was that:

During heavy traffic periods, consider staffing the floor of the exhibition with someone with medical knowledge/training, who can provide visitors with medical knowledge specific to the exhibits (p. 84).

This recommendation indicates that the metaphor of “scaffolding” could be productively brought to bear on the TAY exhibition itself, which contains many sophisticated exhibits that would benefit from a docent or interactant on the floor who could help facilitate ease of interaction and learning from the exhibits. Providing MOSI staff or volunteers who could “people” the TAY exhibition could add an element of feedback and accountability that might improve the visitor experience. Unfortunately, given budgetary restrictions a staff member may be out of the question but one or two unpaid volunteers could add a great deal to the TAY experience.

Critical Feedback: “Proactive” Versus “Reactive” Health

A small number of guests argued that TAY, for all of its focus on health and wellness, was an exhibition largely focused on invasive and expensive operations to treat diseases instead of prevention. Although they were proportionally small in number, these kinds of comments

were some of the more thoughtful and informed feedback that I received about the exhibition, and for this reason I will now summarize them in some detail. Bruce and Alexis were visitors who seemed especially aware of what they perceived to be lapses in the presentation of information about preventing disease and injury. In answers to questions during our interviews, I asked Bruce and Alexis if they could characterize the distinction between preventative health and other forms of health care where diseases are treated “after the fact.” Bruce responded “Proactive as opposed to reactive” and I have adopted his nomenclature to describe these different approaches to medicine at TAY. Reactive medicine is a term that describes medical procedures (such as hip replacement, or coronary bypass surgery) that are given to patients after they have come down with a disease or health condition. Proactive medicine can refer to activities that help prevent disease, such as exercise and nutrition. These proactive interventions often take place outside of a medical context.

During our interview, Alexis was the first to bring up prevention regarding the “Cybernetic Human” exhibit. Alexis, a lean and fit woman with two children noted that overweight and obesity puts stress on joints and that this leads to the need for replacement parts:

Yeah, inactivity is a cause. You really need to talk about the exercise and the flexibility that is needed in joints, how important stretching is, moving your limbs every day, just like working your brain. Some of these repairs could be avoided if people kept themselves more fit.

Bruce followed up on his wife’s comment by proposing an exhibit that would simulate overweight and obesity:

Yeah, I'd like to see a display that shows how it feels to lift twenty pounds for a healthy person, and how it feels when the joint is injured or worn out. We should have strategies to fight ailments from the position of health.

Alexis followed up Bruce's suggestion with more detail about health education activities which enable people to imagine what it might be like to experience a condition.

Yeah, like when boys are in school in health class and they have to wear a suit that mimics being 9 months pregnant, so that they get empathy for women. Physically, they can't even imagine what that is like, but in health class they learn to experience what different conditions feel like.

In this section of our interview, Alexis is describing activities that simulate health conditions (such as pregnancy) so that people can experience empathy for others. Bruce continued to elaborate on a kind of learning that would take place by simulating conditions:

It's the physical feeling, the data, the mental state of someone going through something. There is no more powerful learning experience, I think, than to know what it feels like to be in the shoes of another person. You can do this with vision, for example. Let's just say I had cataracts or glaucoma or something, it might have been tied to diabetes or tied to obesity...It would help to experience what that would feel like.

Bruce agrees with his wife's suggestion about engendering empathy through the simulation of health conditions, imagining an activity where people with normal vision could experience what it is like to have cataracts or glaucoma related to diabetes or obesity. He indicates that such a simulation may be persuasive for others to try and avoid becoming overweight. Bruce's suggestion reminded me of the "Drunk Driving" exhibit at TAY, where visitors could wear a pair of goggles to simulate perception under the influence of alcohol. Exhibits that simulate health

conditions could serve to interpellate different classes of subject positions other than those who are candidates for a medical condition or disease themselves.

Alexis and Bruce are advocates of organic foods because they contain less pesticide residues. They realized that the choice to eat organic foods was not available to everyone because of their higher costs. Bruce explained “It’s a vicious cycle. There are people who cannot afford to buy an organic salad because the costs just aren’t economical.” Bruce’s comment also emphasizes the fact that making healthy choices are not entirely a matter of free will. My interview with Alexis and Bruce made me think that proactive, prevention-based messages need to take structural limitations such as socioeconomic status into account. Alexis indicated that the highlighting of reactive care over proactive approaches was partly indicative of the way that medicine is paid for.

Well, Western medicine, it just seems to be so flat. We are always reacting to serious problems, and insurance companies are always rejecting paying for preventative care. This statement by Alexis is suggestive of some of the ambiguities over personal responsibility when it comes to being a proactive participant in one’s own health. One possible response to people who don’t properly avoid lifestyle-related disease is “blaming the victim” (Adler & Stewart, 2009; Crawford, 1977) but Alexis’ comment suggests otherwise. Sometimes insurance companies do not cover preventative screenings that would help patients to discover a disease before it needed costly interventions (Fineberg, 2013). Anecdotally, this was the experience of Wit Ostrenko who was unaware that his arteries were blocked until a heart attack prompted a CAT scan.

Another couple with strong viewpoints about what they perceived as too much focus on reactive (instead of proactive) interventions at TAY was Kay and Ronald. Kay, a mother of two,

in particular felt that the biomedical emphasis at TAY was “biased” and was in need of more alternative medicine approaches. With characteristic directness, Kay stated:

What I noticed about the exhibition is that they jump from getting born to talking about all the diseases you can get. It just jumps over the whole question of emotional development. It just starts talking about brain synapses and it leaves out a whole bunch of things.

In this statement Kay expresses her opinion that TAY was overly focused on the treatment of disease, rather than healthy developmental processes. I’m not certain if Kay watched the “Deliberate Design” video where developmental psychologist Stanley Graven stressed the importance of touching and speaking to infants in order to foster healthy development. This video is an exception to Kay’s statement that TAY “just jumps over” the topic of emotional development. When I asked Kay if she could provide examples about other things that she felt TAY jumped over, the first example she mentioned was a lack of any exhibits that show the importance of breastfeeding. To Kay, breastfeeding was so important for infants, not only because of the nutrients that breast milk provides, but also the role it plays in a child’s emotional development.

Well, you have two different things there. You have the breast feeding for the emotional development of the baby. By breast feeding they are making an emotional connection with the mother, and that is so different from just popping bottle in their mouth and walking away. The second thing is the actual nutrients they are getting. You look at baby formula you see it is advertised “just like breast milk” and “we are the only formula that has these essential breast milk components.” Well, why not just give them breast milk?

Kay objected the most to the representations of childbirth found in TAY's Beginning of Life section. Her objections to the biomedical hegemony of these exhibits are best represented in the following quote, where Kay describes childbirth in a hospital environment:

If you go to the hospital, the first thing they do is hook you up to medical monitors, and they draw blood to test you for herpes and strep, and even before they get the results they start pumping you full of antibiotics. So even if you are negative on the tests, they are still giving you antibiotics. As soon as you walk in the door you are automatically put on a time limit, so if the labor isn't progressing according to their idea of the time limit they start with the medical interventions, which could be IV medication, intra-vaginally, or even caesarian. Most women end up on those medications, and then they tell the woman she needs to have an epidural...before you know it , you walk in the door and you are involved in all these medical interventions in processes that will occur naturally...

In this passage from our interview transcript, Kay is explaining that women are often given antibiotics and pain-killers when they go to deliver a baby in a hospital. Kay's statement alluded to temporality as being a construct, and the notion of "time frame" as being flexible and mutable.

I was curious to ask Kay about what her views were on vaccinations. She stated that vaccines were important for children, but she wanted to be cautious about allergic reactions that might occur when too many vaccinations happen all at one time:

We vaccinate, but we do delayed vaccination. I think that vaccines are important, and I think that doctors—because they get paid very little for their visits— they try to push too many vaccines at one time on children all at once, and it causes lots of complications, a lot of allergies, and a lot of problems. He has had issues, so has she [gesturing towards her kids]. They are very sensitive to them, and I mean, you can wait. They take babies

when they reach fifteen pounds when they start vaccinations. They are doing maybe three shots per visit, but in those three shots they're actually vaccinating for five different things. And the baby can potentially have a reaction to all of those. So we do one vaccination at a time. We refuse the regular vaccination schedule.

Kay explained that not all doctors agree to perform vaccinations in this way, but because her youngest has not started day care yet, her doctor agreed to not inject all the scheduled vaccines at one time.

In the course of our interview, Kay offered other examples of what she perceives to be over-medicalization, not at TAY necessarily, but for medicine in general. She argued that antibiotics were given out too frequently to children who only have viral (not bacterial) infections. The problem of antibiotic resistance is becoming widespread because doctors over-prescribe these medicines, according to Kay. She also related an experience where her doctor pressured her son to be circumcised, but this didn't happen because Kay and her husband were so opposed to the procedure. After all of the examples that Kay provided of over-medicalization, I realized that I needed to modify the facile distinction between *proactive* and *reactive* interventions. What Kay was describing were certain proactive and prophylactic measures that doctors use to prevent pain or illness. The pain meds and antibiotics provided to birthing women were given in order to prevent infection or pain symptoms. The process of testing a child's respiratory infection to see whether it was viral or bacterial is something that is expensive and time consuming, and Kay suggests that pediatricians over-prescribed antibiotics as a prophylactic measure against the possibility of bacterial infection. These preemptive measures could be described as proactive, except to Kay they were clearly not the right kind of proactive measures. Proactive health care needs to be distinguished as "non-pharmaceutical" forms of intervention

such as diet and exercise rather than prophylactic medicine. What Kay was opposed to is the chance that negative side effects could result from medical measures to prevent or treat. About the TAY exhibition, Kay stated:

There is a lot about healthy eating, and exercise, to reduce your chance of getting diabetes and other diseases. But there is nothing about all the stuff ...the *bad* sides of the medical interventions that we do all the time. There is nothing that discusses the negativity of the over-used medical procedures that doctors use.

Kay is here hinting at the problem of iatrogenic medicine, or medical treatments that only make people sicker. To provide some examples, there are estimates that between 44 to 98 thousand people die every year as a result of medical errors (Kohn, Corrigan, & Donaldson, 1999). In the case of infections that are acquired in health care environments, patients can become sick due to medical instruments, devices or medical staff carrying germs. One study estimated that Healthcare Associated Infections (HAI) happened to 1.7 million patients in one year (Klevens et al., 2007). This study concluded that “HAIs in hospitals are a significant cause of morbidity and mortality in the United States” (Klevens et al., 2007, p. 160).

The comments from Kay about TAY present an opportunity to reconsider simplistic notions of “non-compliance,” which suggest that, if only patients did what doctors told them to do, all would be well. This formulation of non-compliance does not take into account that people may be skeptical of medical advice for reasons that are grounded in empirical concerns about medical error or over-medicalization. The notion of “felicity conditions” for illocutionary acts (Austin, 1962; Searle, 1969) suggests that trust and credibility are a precondition for institutional authorities to issue directives, and there are some people who question the authority of medicine

as an institution. One survey (that was completed by a mother who was visiting from Greece) had this to say:

Yes- I would add more information on toxins and how they affect our health through our food system. Why?? One out of every 4 people will get cancer. You only have info on how to treat and NOT on its root cause. Look at our food and toxins and water. Thanks!

I tried to interest this woman (who was visiting MOSI with her husband and teenage son) in an interview, but she politely declined, leaving me with only this emphatic plea for an exhibition which focuses more on the root causes of diseases and less on reactive interventions.

This feedback about “reactive” vs. “proactive” approaches to health makes a statement about general ambivalence towards the medical profession which goes far beyond a commentary about the TAY exhibition. What these concerns are expressing are the “felicity conditions” (Austin, 1962) of injunctions issued by biomedicine. Theories of source credibility assert that a message is believable when the addressee perceives a source of information as originating from a trustworthy expert source (Hovland & Weiss, 1951). The opinions expressed by the informants in this section cast doubt on a strictly biomedical approach to health and wellness and question the trustworthiness of the information. A recent letter to the Journal of the American Medical Association (JAMA) which generated news headlines asserted that a large proportion of Americans surveyed are persuaded by “conspiracy theories” that doubt the credibility and trustworthiness of medical industries and governmental regulatory bodies (Oliver & Wood, 2014). The comments of Bruce, Alexis and Kay, above, while not asserting any scandalous conspiracies as such, nevertheless indicate some of the more grounded concerns that people may have about biomedical hegemony.

CHAPTER SIX:

CONCLUSION

Summary of Results and Findings

In this conclusion I will summarize this dissertation and return to some of the research questions I have posed in various chapters. To begin with, I will provide a succinct summary of the things I have learned through this research. It is my hope that these observations will be of interest to MOSI stakeholders, as well as a broad community of exhibit designers, visitor researchers, and health communication practitioners.

My analysis of this research shows a number of reoccurring themes that can be grouped together using the following subheadings:

- Representational strategies at TAY
- Considerations of gender, race/ethnicity, and socioeconomic status
- Agency, determinism and the mixed metaphor of games of chance
- Indirect directives as a rhetorical strategy
- The question of behavior change
- Individualistic genre elements of health promotion discourse?
- The human implications of interactivity

These headings have been formulated inductively as the themes have emerged from my analysis of the research findings. After introducing these sub-headings, I will then summarize the implications of this study for designers, visitor studies and communication theory researchers.

Representational strategies at TAY

Understanding Hymes' (1974) notion of "act sequence" involves understanding different kinds of constituent communicative acts. Speech acts are communicatives that serve to make a declaration of fact, ask a question, or issue a suggestion, command, promise or threat (Austin, 1962; Hymes, 1974; Searle, 1969). When speech acts appear in sequence, attention is paid to both form and content. Exhibits at TAY can be considered as communicative acts that are at once informative, entertaining, diagnostic or prescriptive. Each of these descriptors can be used to describe a kind of communicative act, but analysis of the exhibition shows that often these acts appear in sequence within the same exhibit. For example, "Unique, Just Like You" is an exhibit in the Adolescence area of TAY that combines the amusing repartee of puppets with both covert and overt commands to teenagers to be individuals and not cave to peer pressure. The entertaining premise precedes the issuing of a directive. Another example is the "Cardiology" exhibit where visitors first encounter cross-section models of a human heart (informative) which is followed by a blood pressure monitor (diagnostic) which is followed by clear directives about preventing cardiovascular disease (prescriptive). I would like to suggest that communicative acts appear in the exhibition in sequence—from descriptive to prescriptive, or from descriptive to diagnostic to prescriptive—or in other sequential combinations.

While exhibits can be described as descriptive or prescriptive, etc., according to the content of the messages, it has also been important to consider these descriptors as contextual

properties which depend on the visitor. An exhibit that urges me to protect the health of the growing embryo inside me does not “hail” or interpellate me as the addressee because I am not equipped with a uterus. To provide another hypothetical example, a visitor who has perfect blood pressure readings may be less inclined to identify with the profile of a heart attack candidate. These examples indicate that the meaning of a message is not inherent, but rather depends on personal factors.

Therefore, in addition to considering messages at TAY as a sequence of acts, it is also worthwhile to view them as instead differential purposes or “ends” that emerge during the relational encounter of a visitor and an exhibit. Regarding the goals or outcome of communication “the conventionally expected or ascribed must be distinguished from the purely situational or personal, and from the latent or unintended” (Hymes, 1974, p. 57). Exhibits at TAY may set out to influence visitor behaviors, but the intended outcome needs to be distinguished from the actual outcome in each case. In the terminology of speech act theory (Austin, 1962), this can be described as the difference between “illocutionary intent” (intended outcome) and “perlocutionary effect” (actual outcome, intended or otherwise).

So far, this discussion has considered communication at TAY as an arrangement of speech acts in sequence, or as a combination of purposes that can be interpreted differently according to the contextual factors that the visitor brings. I wish to make another inference about the representational strategies that TAY employs that is grounded in interactions with some of the exhibits. This inference also concerns the formal structure of the ways that messages appear in sequence in some exhibits. In short, I am interested in how TAY uses metaphor, euphemism, fantasy and mimicry to “climb a representational hierarchy” towards more realistic

representations of health and disease. To illustrate this point, I will use some examples from the exhibition.

In the Beginning of Life area of TAY we are first introduced to images of the zygote in the form of computer animations. In the “Welcome to Our World” video booth, the first couple of videos use a spare, clean form of computer graphics to represent a nondescript neonate emerging from the womb. I have used the term “euphemism” to describe these forms of parsimonious visual representations that (I have argued) may shield the visitor from any possibly unpleasant images of blood or bodily fluids. However, the videos that follow show graphic video images of a woman giving birth. This is one example of where TAY ups the realistic quotient of imagery towards greater realism. A little further on in this content area of the exhibition, visitors come upon a realistic model of a “premie” baby with uncanny resemblance to an actual baby born prematurely. The next exhibit is the collection of actual fetal remains in glass cylinders. This is another example of how TAY lays out sequences of representation that begin as pretend or fanciful and culminate in stark realism. Other examples of this explanatory sequence can be seen later in the Childhood content area, where after “operating” on a pretend body in “Surgery 101” visitors are given a chance to view an actual video record of a knee arthroscopy. Similarly, the “Eye Care” exhibits (later on in the exhibition) begin by using models and culminate in a video of actual surgery on an eye.

Hymes’ (1974) notion of “keying” is an appropriate analytic tool to understand these exhibits which progress from models and euphemistic representations towards greater realism. Keys are a way to describe switches in tone from mock to serious or from perfunctory to painstaking (Hymes, 1974, p. 57). This analysis of the exhibits above shows that switches in key appear as moments in the representational process. Having identified these switches in key, the

pedagogical or rhetorical function of these explanatory sequences has not been identified beyond informed speculation. I have argued that, when it comes to viewing potentially unpleasant imagery of blood and viscera, visitors may prefer to be ‘eased in’ instead of taken by surprise. Incidentally, training in medicine also follows this sequence of representational hierarchy. For example, medical students will begin their training using charts or models, and then proceed to the actual dissection of a corpse. This description of medical school is congruent with a description of keying where the perfunctory moves into the painstaking.

Other examples of representational strategies used at TAY include moving from the molar to the molecular. The “Exploring Our Molecular Selves” video goes from the everyday, ‘molar’ level of perception to fantastic, colorful representations of cell biology. Similarly, the “Stem Cell Story” exhibits also descend to the microscopic level, but this exhibit uses speech conventions from the everyday ‘molar’ level (personification and anthropomorphism) to describe stem cells as having decision-making capabilities that approximate human agency.

Considerations of gender, race/ethnicity and socioeconomic status

In his history of public museums, Tony Bennett (1995) writes that museums were formed according to a democratic policy impulse that he terms “representative generality” (p. 97). In this view, the museum is tasked with representing the human race inclusively, with a consideration of all the different cultures, ethnicities and social classes in the general population. Bennett explains that this core ideology of the public museum serves to provide marginalized or excluded groups with a rationale for reform:

...the space of representation associated with the museum rests on a principle of general human universality which renders it inherently volatile, opening it up to a constant

discourse of reform as hitherto excluded constituencies seek inclusion—and inclusion on equal terms—within that space (Bennett, 1995, p. 97).

TAY is an exhibition that hails different classes of visitors and addresses health issues that pertain to people from different races and ethnicities as well as socioeconomic backgrounds. In this dissertation I have had some occasion to address issues of gender, class and race which can be summarized here.

There are two problematic exhibits where the representation of race and ethnicity yielded some factual confusion or a hostile reaction from visitors. In the “Stroke” exhibit there is a confusing attribution of risk factors to race which tautologically point back to behavior. The “Stroke” exhibit lists risk factors as being either within or without of people’s control. Smoking, diet, overweight/obesity, and exercise were listed as factors within individual control, while genetics and “being African American” were listed as determining factors outside of individual control. Upon reading up on the risk factors for African Americans, it became apparent that blacks were at higher risk for stroke because, statistically, they were more prone to engage in risky behaviors such as poor diet, smoking, and being overweight. In this example, race has become reified to suggest a determining factor beyond the control of African Americans, when in fact the racial category was used to indicate a higher tendency towards volitional behaviors classified as risky. African Americans who view these risk factors phrased in this way may come to the conclusion that they are at higher risk for stroke due to their skin color, and therefore experience a sense of defeatism about modifying behaviors.

The other exhibit that was cited by two visitors as “offensive” was “Healthywood Squares.” In this exhibit, there were puppet characters that had hyperbolic ‘racial’ or ethnic signifiers such as the “Juanita” character who spoke in an exaggerated “Latina” accent. Cecilia

and Dominic, a Latino couple, were offended by this puppet character. They also said that another one of the puppets had an “exaggerated Asian accent.” While interacting with the “Healthywood Squares” exhibit, I also took note of the lone brown puppet named “RB” who (it was insinuated by the other puppets) appeared to have an STD. Among my other informants, some of whom were African American themselves, there was no mention of “Healthywood Squares” as being particularly offensive, but this in no way mandates a disqualification of Cecilia and Dominic’s views. The concept of “positionality” (Davies & Harré, 1990) is illustrated by the response of Cecilia and Dominic, because these visitors recognized their own ethnic identity as being singled out and caricatured by the “Juanita” character. In turn, this perception of having been caricatured allowed them to consider the representation of race and ethnicity at the exhibit more broadly.

In the exhibit called “Early Arrival” I argued that there was an undue focus on the ‘bad’ behavior of expectant mothers, and not enough focus on poverty as a determining factor of underweight birth. The way that the health problem was framed risked blaming the mother for a premature baby while socioeconomic factors beyond the mother’s control may play a larger etiological role than was emphasized. To back up my argument, I cited a World Health Organization (2013b) fact sheet that emphasized the determining role of poverty on premature birth and infant mortality. In my interview with Paula (the health educator who brought smoking cessation programs to expectant mothers) we talked about the meaning of the term “non-compliance.” Was non-compliance something that was entirely within the volition of the patient? Or, were there structural factors (such as being poor) that interfered with a patient’s ability to follow orders? Paula seemed to stress the role of individual volition, saying that some mothers smoked on purpose in order to have a baby that weighs less. Paula noted, however, that mothers

who would prefer low weight babies may be under physical limitations such as commuting, working at an unskilled job, or taking care of other kids or aging relatives. Considered in this way, the ratio of agency and determinism seems not entirely either/or. The analysis of this exhibit shows how TAY is arguably inattentive to issues of socioeconomic status. I would also mention that TAY represents a variety of expensive medical treatments for injury and disease that may be out of reach to over 40 million uninsured Americans, in addition to millions more who could be potentially made bankrupt or impoverished by the deductibles, copays, and uncovered treatments alone. The findings concerning the representation of gender, race and class at TAY indicates a need for extra sensitivity for exhibit designers to address a diverse audience of visitors.

Agency, determinism and the mixed metaphor of games of chance

Health risks can be ascribed to behavioral factors as well as factors that are beyond people's control, such as genetics. Additionally, bald contingency also plays a role in injury and disease outcomes. The question throughout this research has been: what is the ratio between these risk factors? The answer is complex, and outside of the purview of this study. There are sophisticated statistical algorithms that are used to make risk calculi on the basis of large population data. These demographic estimates of health risk are an astonishing advance in the prevention of disease, but even these estimates can miss individual patients who are prone to injury or disease based on their own peculiar combination of behaviors, genetics, chance and environment. There are exhibits at TAY which, while not offering comprehensive risk assessments, point to the ambiguous ratio of determinism, agency and chance involved in a lay calculus of risk. In particular, I want to focus here on four exhibits that use gambling to

symbolize risk: “Infant Roulette,” “Taking a Chance With Your Spine,” “The Spin Doctor” and “Stroke of Bad Luck.”

In “Infant Roulette” visitors spin a steering wheel which lands on a section representing a different kind of health problem for neonates. This interactive shows the birth defects a baby can be born with if the mother takes certain medications, has poor nutrition, smokes, drinks, does illegal drugs, is overweight, or has an untreated STD. The roulette wheel “keys” this exhibit as a game, but the subject matter is serious. While the affordances of the wheel emphasize chance, the exhibit is mostly focused on deliberate choices that a mother must make so that her baby is born healthy. There is a tacit implication of this game that suggests smoking, drugs and drinking during pregnancy *may* possibly harm the fetus, when actually the range of injuries a baby can sustain as a result of these behaviors are more probable than potential. As the health educator Paula explained to me “there is no safe amount of alcohol during pregnancy.” The game offers a tacit second-order message which may undermine the first-order message of this exhibit, namely, that a mother has to abstain entirely from certain behaviors in order to protect her fetus. The roulette wheel implies pure contingency, yet the kinds of birth defects resulting from unhealthy behaviors is something that requires deliberate, volitional behavior on the part of an expectant mother.

In “Taking a Chance with Your Spine” visitors interact with a kiosk that is patterned after a slot machine. When the reel stops spinning the window shows a kind of behavior that increases the chance of getting a back injury. Some of these behaviors include a horseback riding accident; a gunshot wound; a car crash and a diving accident. “Taking a Chance With Your Spine” is another exhibit where the “key” vacillates between an amusing game of chance, but one with mortal consequences. As in other exhibits where it is used, chance is an ambivalent metaphor,

because the content of the interactive is focused on behaviors that are governed, at least in good measure, by acts of will. Some high risk activities like horseback riding can be avoided, while occupational hazards and driving are hard to get around. Yet the gambling affordances of “Taking a Chance With Your Spine” may send a message that spinal injuries are purely a matter of chance rather than deliberate behaviors.

In “Spin Doctor” visitors interact with a computer-based kiosk to spin a wheel and flip over cards to reveal treatments posed by alternative medicine for various ailments. These affordances derived from games of chance could be interpreted as suggesting that alternative treatments are akin to ‘gambling with one’s health.’ The term “Spin Doctor” also a term used to describe punditry or sophistry in popular parlance. These features of the exhibit can be interpreted as a derision of alternative medicines. In “Stroke of Bad Luck” visitors spin a roulette wheel that appears on a video screen. This wheel lands on a tile which has either a risk factor for stroke (including, high cholesterol, poor diet, follow doctor’s orders, active lifestyle, smoking, obesity, diabetes, excessive alcohol) or a healthy behavior which prevents stroke (such as following doctor’s orders and an active lifestyle.) The tiles focus on both good and bad behaviors, yet where each spin will land is a matter of contingency. “Stroke of Bad Luck” suggests that luck is a determining factor, which contradicts the behavior change message. Lifestyle choices are here being framed as something we fall into accidentally instead of deliberately deciding upon.

Frame flexibility (Steier, 2005) is a concept of framing that allows for plasticity and mobility. If games of chance help to frame behavioral health, than perhaps any mixed metaphors connoted by the frame should be permitted to coexist with the substantive persuasive content of the message. Frame conflicts (Jorgenson, 2000; Reddy, 1979) need to be reconciled with a

notion of flexible and mutable frames. Suffice it to say that exhibits that use games of chance as a frame for behavioral health may send a mixed message.

Indirect directives as a rhetorical strategy

Earlier in this document I have posed the question: How can exhibits issue directives without coming across as overly heavy-handed or paternalistic? One of the findings of this research is that directives can be phrased indirectly in exhibits so that it is up to the visitor to elicit the plain “take-away” message. In this section I would like to reiterate this point using examples from the TAY exhibition.

“Body Armor” is an exhibit that informs visitors about vaccination and attempts to persuade them to vaccinate their kids. Using vintage photos of children who are stricken with infectious diseases is one way that this exhibit argues on behalf of the net benefits of vaccination. With only minimal explanation, pictures are shown of children with their bodies covered in small pox, their postures ruined by polio, and their bodies bruised by whooping cough. The upsetting photos of children are a reminder of how vaccination efforts have prevented the spread of these killer diseases. I have argued that these photos, when viewed as communicative acts, can be classified as “indirect directives” or illocutionary acts where a command is not stated explicitly (Searle, 1975). The concept of “indirect directives” can be applied to this “secondary orality” context, where images of diseased bodies force a reckoning with the undeniable benefits of vaccine efforts for addressees. As such, visual rhetoric can be characterized as a form of public health intervention.

There are other examples where, instead of being explicitly instructed to avoid risky behaviors, visitors are provided with photographic evidence of disease as a means of persuasion.

In the “Risky Relations” exhibit, visitors are shown photos of a yellowed jaundiced eye indicating Hepatitis and a cancerous cervix resulting from untreated HPV infection. The message of these photos, while not stated explicitly, is that visitors should avoid unprotected sex in order to not come down with the symptoms that are illustrated. These photos may also serve as “indirect directives” where the visitor needs to make a few inferences in order to reconstruct the consequences of unsafe sex.

Another example of the use of indirect directives appears in the “Smoking and Health” suite of exhibits. Nowhere in TAY is the recommendation for behavior change so pronounced (abstaining from smoking and tobacco) yet these exhibits build their case indirectly before delivering the plain and explicit injunction to not smoke. For example, first visitors compare a pink, healthy set of lungs in a jar with another blackened set of lungs that is swimming in cloudy, grey water. Visitors also read a massive list of 600 cigarette additives that are found in cigarettes, and told that combustion releases another 4000 toxic ingredients. These exhibits may be categorized as *descriptive* or informative insofar as they merely state scientific information, but I would argue that they also serve a *prescriptive* purpose. The lungs in jars as well as the list of toxic chemicals state their case indirectly without a need to pedantically assert the harms of smoking. Interestingly, after the life-long smoker Harry Nyce is shown removing the prosthetic parts of his face as a result of necrosis, teenagers are shown on the video saying “that’s not going to happen to me.” This is a portrayal of dis-identification, where those engaged in high risk behaviors stubbornly refuse to internalize the message that is addressed to them. While these imaginary addressees do not take heed, the intelligent visitor cannot help but be persuaded by the powerful message of the “Smoking and Health” exhibits.

The question of behavior modification

One question that has been posed throughout this research is: Will TAY prompt visitors to adopt healthy behaviors? This is something of a million dollar question when it comes to evaluating public health interventions. The findings of this research do not go very far in proving the “illocutionary force” (Holtgraves & Ashley, 2001; Kissine, 2009; Wee, 2004) of TAY beyond the self-reported opinions of MOSI staff and visitors. 65% of visitors surveyed thought that TAY would definitely promote healthy behaviors, and 28% either didn’t know or didn’t answer the question. Only 7% thought that the exhibition would have no effect. These results are only speculations on the part of visitors.

In order to more fully address this issue of effects on behavior, follow up research would need to enlist visitors for a longer-term study. Ideally, a clinician could gather “before and after” readings of weight, blood pressure, a complete metabolic profile and other metrics. A “pre, then post” survey could be given before and in several month intervals after a visitor encounters TAY which would have them self-report on things such as food intake, exercise and “bad habit” diaries. In addition, visitors would be asked to estimate the influence of TAY over other forms of influence, such as doctor’s orders or family pressure. Comparing the before and after result could serve as a powerful argument for any effects the exhibition has. Even still, such a follow up study would have to control for variables (such as the influence of other people or other forms of media). In addition, the therapeutic effect of self-monitoring (such as keeping a diary) has been shown to be effective on its own (Burke, Wang, & Sevick, 2012), and the study would need to be designed to account for this. This suggests the need for a control group of people who had not been to TAY.

Individualistic genre elements of health promotion discourse?

In this dissertation I have tried to indicate the ways that a doctrine of individualism is invoked on behalf of adopting health behaviors. For example, puppets in the “Unique, Just Like You” exhibits strongly urge their adolescent audience to not follow the herd and stand their ground as an individualist. One puppet proclaims her individualism by asserting “It’s *my* life, and *I’m* the one in charge!” A similar expression is heard later on in the exhibition when, in the “Smoking and Health” video, a teenager says ““It’s *my* body. I’ll do what I want. It’s *my* choice!” These two examples stand in sharp contrast, because while the first instance of individualistic discourse is invoked to help provide teens with rationales for resisting peer pressure, the second example is uttered by a teen that is adamantly defending their right to smoke on individualistic grounds. These two examples show how a rhetoric of individual agency can serve at cross purposes when it is used as a rationale for justifying behaviors.

There are critics of health promotion that argue against individualistic methods (Bandura, 1998; Crawford, 1977; Goldberg, 2012; Lupton, 1995; Powers & Faden, 2006; Sheeran & Abraham, 1996; Tesh, 1988). As one critic phrases it, methodological individualism “produces a focus on the individual as the node of intervention” (Goldberg, 2012) instead of viewing health in social terms. Critics of methodological individualism suggest that instead of focusing so much on the individual and his or her thoughts, beliefs, attitudes and inclinations, the focus of public health should be to intervene on the structural limitations (such as home and job hazards, income inequality and toxic environments) that determine public health outcomes (Powers & Faden, 2006).

While this debate is outside of the scope of this research, it may be useful to use the notion of “genre” (Hymes, 1974; Bakhtin, 1986) to consider the individualistic components of health promotion literature. Namely, for a researcher who is looking at psychological theories of persuasion from a communication perspective, what are some common themes which would serve to constitute health promotion discourse as an individualistic genre of speech? The clinical encounter between doctor and patient arguably has generic elements, such as the medical history taken by the nurse, the typical recording of weight and blood pressure, and the indeterminate wait in the examining room, after which the doctor makes his or her appearance. The advice issued by a doctor to their patient about lifestyle also has some conventional features which are likely to be consistent across examination rooms. Prescriptions to get plenty of sleep, avoid over eating, and exercise at least three time a week are conventional forms of advice that are easily recognized because we have all heard them and may even try to abide by them as best as possible. The mantra to eat right, exercise, and avoid smoking is an arrangement of syllables that can be unpacked and recombined in numerous ways that all have some predictable elements. These same elements of discourse are reiterated in health promotion interventions which apply individual solutions to the population level. Health promotion and behavioral approaches to health emphasize the role of the patient in taking control of their own health and disciplining themselves. These public health approaches have been around long enough that some visitors may recognize them as common forms of a persuasive discourse that they are familiar with.

Health promotion has been located historically by Lupton (1995) as the “central plank” of a “new” public health that originated in the social movements of the 1970s (p. 50). Health promotion set itself apart from earlier models of health education because of its focus on the individual’s responsibility to stay healthy and adopt lifestyle changes which older models didn’t

stress. In a study about an exhibition that is focused on promoting health and wellness, it has been useful for me to consult the literature on persuasion and behavior modification. In what follows I will introduce a few of these models, and then reflect on what individualistic elements they all have in common.

The “Knowledge, Attitude and Behavior” model (KAB) suggests that people begin the process of behavior change by getting knowledge or information about what it takes to stay healthy. This information in turn helps to change their personal attitude, and this new attitude is used to modify their behavior (Bettinghaus, 1986). According to this description, this approach is individually focused. Another health promotion model called “The Health Belief Model” predicts that individuals are more likely to take action about their health if they perceive a threat of disease and perceive benefits from preventative measures (Janz & Becker, 1984). This approach, as described, is also focused on an individual process of perception and belief. The “Theory of Reasoned Action” (Ajzen, 1980; Fishbein & Ajzen, 1975) suggests that people behave according to their intentions, and these intentions are governed by their underlying attitude towards the behavior (another individualistic model focused on mental concepts.)

These models for behavior change all presuppose a subject who is logical and has a good storage of “uncommitted variation” available to enact second order changes. All of these models make use of psychological concepts such as intention, attitude, belief, and perception, which are terms describing individual mental processes. Each one of these models also suggests that behavior is governed by conscious intention, which when combined with the proper information can effect healthy choices. If we can permit, as a thought experiment, a description of health promotion literature as containing ‘genre elements’ it is noticeable that these approaches are focused on the individual mind. The notion of speech genres, when applied to theories of

persuasion, suggests that beliefs, attitude, intentions and other mentally individualistic terms are generic features.

As they have been described briefly above, the mission statements of these behavior change models do not reference the social, interactive and communicative processes through which the individual mind undergoes an alteration. By focusing on the mental processes of behavior change, such theories may de-emphasize the determining role of structural barriers to health such as poverty, racism, or sexism. An evaluation of psychological techniques which health promotion practitioners use to modify behavior is beyond the scope of this research. As theories of museum learning privilege face to face communication and social interaction (Falk & Dierking, 2000; Leinhardt & Knutson, 2004) there appears to be a need for a more social, relational and interactive conception of behavior change using health promotion strategies.

The human implications of interactivity

One of the main findings that emerged from chapter five is that visitors may be expressing a wish for a more truly interactive experience at TAY. While the exhibition contains numerous computer based interactive exhibits, these interactions arguably delimit the range of interaction within a narrowly circumscribed procedure of question and answer. As Heath and von Lehn (2008) have argued, computer based interactive exhibits are often only “pseudo-interactive” because the sequence of the activity is rigidly predetermined. Heath and von Lehn (2008) point out that interactivity should be more broadly defined to include person to person interactions where the sequence is not entirely determined by a computer program. Visitors to TAY cited “interactivity” the most as their favorite feature of the exhibition, however it was not clear in each instance what definition the respondent had in mind. In chapter five I argued that

complaints from visitors about functionality of exhibits, noise levels and age-appropriateness concerns could be interpreted as various iterations of a broader complaint about the need for more staff. Having paid staff or unpaid volunteers on the floor of TAY could address visitor frustrations as they occur and therefore provide for a more reflexive and fully interactive experience. Noise levels could be adjusted; non-functioning exhibits could be reset (or an “out-of-order” sign provided); and complex or controversial exhibits could be “framed” by a trained docent who could answer questions or concerns.

Unfortunately, budgetary limitations are an over-riding factor when it comes to the feasibility of these concerns. MOSI has done an amazing job with TAY in spite of huge unanticipated shortfalls in funding. Because of these financial constraints, the present appeal to have more staff needs to go up a level to the corporate and governmental underwriters who could make it happen. TAY is a tremendous repository of social capital that serves to emphasize choices for healthy living in a way that is entertaining, informative and instructive. The underwriting community of corporate, county, state and federal organizations should continue to support this exhibition.

Summarizing Implications for Designers, Visitor Studies and Communication Theory

Now that I have summed up some of the highlights of my research findings, I wish to make a stronger statement about the way that this research contributes to current research in museums and health communication. In the introduction I stated that this research makes original contributions to various fields of knowledge, with implications for exhibit designers, visitor researchers, and communication theorists. I also posed some questions (starting on page 33) that I have been addressing in this dissertation. I will return to address these questions at this juncture

in order to provide a stronger summation of the findings of this research project. To begin, I would like to address questions related to design.

How do exhibit designers bring together a chorus of medical expertise into a consistent message about prevention? The MOSI design staff consulted with medical practitioners from a variety of medical specialties. While each specialty deals with different body parts and disease processes, what forms of health advice appear to be consistent throughout the exhibition? What appears to be consistent advice, issued by a wide range of specialties, are messages about behaviors which are implicated in disease and injury. Searching for a common thread in TAY's narrative about life stages reveals a common denominator: A striking morality tale about the proper governance of one's own body. For example, smoking is an elective form of behavior which is linked to a variety of disease processes, including respiratory illness, heart disease, stroke, and various cancers. Although not stated explicitly, it can be inferred from the exhibits that a smoker who comes down with any of these diseases can be held responsible for their onset. Other implicit failures in self-government include overweight and obesity (leading to stress on bones, diabetes, heart disease as well as cancer).

This emphasis on individual behaviors in the etiology of disease goes a long way in instructing and persuading visitors about the role of personal responsibility. Yet there is also a danger that this message is akin to "victim-blaming" (Adler & Stewart, 2009; Crawford, 1977) because it discounts other structural factors involved in disease. Structural factors include disparities in access to health care (Baum, 2008; Powers & Faden, 2006; Taylor-Clark, Mebane, Steelfisher, & Blendon, 2007; Tulchinsky & Varavikova, 2009; Wilkinson, 1996), structural violence (Farmer, 1999, 2003; Farmer, Connors, & Simmons, 1996) and environmental harm from pollution and toxic environments (Blanc, 2007; Gurjar, Molina, & Ojha, 2010; Singer &

Baer, 2009). What are the implications of “social determinants of health” (Marmot & Wilkinson, 1999, 2006; Navarro, 2007; WHO, 2013b) for exhibit designers? Instead of primarily seeking experts from individual medical practices, an extensive exhibition such as TAY should also seek information from public health researchers who are familiar with the influence of structural factors on human health. While individual responsibility is no doubt an important nexus of intervention, exhibitions which overemphasize it risk victim-blaming.

This research shows how injunctions about behavior modification are sometimes framed tacitly or indirectly at TAY. Message designers at science centers may be used to presenting scientific information in the form of declarative statements rather than in the form of injunctions or suggestions. Because science center learning is often modeled using ideas from information transfer, there may be a lack of familiarity with persuasive techniques. Should exhibit designers at science centers become more fluent in the strategies and tactics of persuaders (including health promotion, but also commercial advertising)? I hesitate to recommend this, because of the manipulative strategies sometimes involved in persuasive techniques.

Instead, I have suggested in this analysis of messages at TAY that phrasing advice informatively may have a strategic purpose. Rather than adopting more manipulative techniques, it may be wise for designers to phrase injunctions informatively. When visitors are given advice tacitly they are left to make the correct inferences about behavior modification through their own enthymematic processes, either mentally or in conversation with other visitors they happen to be visiting MOSI with. An enthymeme is a kind of syllogism where the conclusion follows from the major and minor premise. “Smoking contains toxins. Smokers get sicker and die sooner than non-smokers.” This argument does not contain the explicit conclusion “therefore, do not smoke.” At TAY, it is often up to the visitor to make this last inference.

This point suggests the importance of a consideration of “indirect directives” for exhibit designers. Health promotion messages appear to be tacitly aware of not phrasing messages too paternalistically. A paradigm case of the indirect directive can be found on the warning label of cigarette packages. “Quitting smoking now greatly reduces serious risks to your health” is emblazoned on tobacco products by the Food and Drug Administration (FDA, 2013). Notice that this message does not contain an explicit command to quit smoking. Instead it suggests that those who do quit are less at risk for serious health problems.

This dissertation makes a contribution to the design world by alerting designers to categorical differences in messages. In the terminology of speech act theory (Austin, 1962; Searle, 1969, 1975), a message can be either “constative” (a declaration of fact) or “directive” (ordering, suggesting, ordering, or pleading). This taxonomy is useful for heuristic purposes, yet this research has shown how directives can be otherwise phrased. Persuasive messages which are formed as declarations can also be seen as an example of frame flexibility (Steier, 2005). The equivocal nature of indirect directives, located in between informing and persuading, represents a storage of uncommitted variation in messages, which can be interpreted as *either, or, and both*. An awareness of indirect directives and frame flexibility as tacit design principles for both health promoters as well as exhibit designers appears to open up new lines of inquiry that is not discussed in the literature.

The insights suggested here about indirect directives also make a contribution to studies of science center visitors. Visitors entering TAY are called upon to interpret a variety of message forms, and their interpretation may depend on contextual factors (Falk & Dierking, 2000) each visitor brings to the encounter. How do visitors experience a science center exhibition with a persuasive purpose such as TAY? Through interviews and surveys I have shown that this

depends on the frame the visitor brings. Some visitors come to MOSI to be entertained and amused, and if possible to become better informed. The majority of visitors I encountered seemed to accept the “felicity conditions” (Austin, 1962) of the exhibition. MOSI, as a trusted community resource and fount of scientific knowledge, is in a prime position to synthesize insights from various medical specialties into a narrative about health. This fact is indicated by the mostly positive response to the exhibition. The taxonomy of entertaining, informing, persuading and diagnosing is a way to describe the flexible frames of communication, both at the design level as well as the visitor level. The taxonomy describes the properties of a message but also a range of visitor responses. Because the persuasive messages are often tacit, visitors are allowed a range of possible interpretations.

There was a smaller portion of visitors in this study who clearly had problems with the polysemy of messages. A mix of serious and farcical elements (such as the computer generated characters at “You, M.D.” or “Cancer Answers”) left some visitors feeling unsure of the proper “footing” upon which they were being asked to participate. A lack of human presence on the floor that could provide direction and help frame the exhibits left some visitors wishing for more “scaffolding.” Although it was not a focal point of this dissertation, this research has implications for the study of visitor experiences with instructional technologies. Computer based interactives that were difficult to figure out suggest the need for more fully interactive technologies which are monitored and troubleshooted by IT personnel. In addition, more interactive technologies could be modeled after “social” medias (where a person interacts with other persons through a computer interface).

Select visitors to TAY profiled in this study also provided a sophisticated critique of biomedical hegemony and the emphasis on disease processes. These socially conscious visitors

were aware of the underlying persuasive impulse at TAY. They interpreted the exhibition as emphasizing medical approaches to health which framed the visitor as an entrepreneur who was praised for following the straight and narrow and scolding for straying from the moral duty to stay healthy. At least for this small sample of visitors, the persuasive messages at TAY had a less than operant effect, because rather than being persuaded, these visitors felt somewhat nudged towards adopting high tech and expensive medical interventions for disease instead of non-medical interventions like diet and exercise. A consideration of framing—on the part of designers as well as visitors—contributes to theories of overlapping contexts (Falk & Dierking, 2000) used in the study of meaning making at a science center.

Perhaps the strongest contribution this research makes is to communication theory. There is a lack of research into design, visitors, and health promotion from a communication perspective. A diverse collection of theoretical tools from the ethnography of communication, speech act theory and frame analysis have helped in my analysis of the communication environment surrounding TAY. Notions from both frame analysis and the ethnography of communication (such as frame, key, participants, sequence, norms and genre) have been applied to this multimedia, multivocal environment of secondary orality. The notion of keying describes exhibits that equivocate in tone, between playful and serious, and between stating information and finger-wagging admonishments. The idea of indirect directives points the way to forms of persuasion previously under-researched which is tacit. These tools of analysis have been useful in describing the formal properties of messages at the exhibition, as well as the varied responses from visitors.

I have also tried to surface some of the tacit assumptions involved in both exhibit design as well as health promotion messages. I have shown how a focus on the individual consumer as

the main arbiter of health and disease is too one-sided. In addition there are structural factors involved in staying healthy, such as access to health care, racism and poverty. Individual injunctions (don't smoke, lose weight, etc.) emerge as a common thread uniting various discursive communities of medicine, but this focus on individual choice is only part of a larger frame. The challenge remains for both health promoters and science centers to communicate a more complex concept of the etiology of disease.

Lastly, there is a sense in which this study opens up a conversation around the issue of organizational learning. In positing a wrap-around, circular model of science center communication I have tried to open up possibilities for MOSI to hear visitor feedback. While this research is not intended as a formal evaluation of the TAY exhibition, the findings from this study may be useful to MOSI as evidence of visitor response. The question is, how to set up conditions for MOSI stakeholders (and science centers more broadly) to hear this feedback? How can qualitative researchers in the ethnography of communication find a platform to engage with science centers about the process of exhibition design and revision? This is a question for further research beyond what is being presented in this study. Below, I will make some additional suggestions further research.

Terminologies for Further Research

Hymes (1974) notion of social norms involves a consideration of the historical context of a communication event. TAY is located in the Southeastern United States during a time period where pressures of a capitalist social order influence both health promotion messages as well as museum funding, design, and visitor relations. In what follows I will provide an extended footnote to Hymes' (1974) concept of social norms which need to be considered in the analysis

of a communicative situation. While the concepts I will introduce have not been prominently featured in this dissertation, they do present new and interesting ways in which framing can be studied within a persuasive context of health promotion. Several concepts from critical and cultural studies (neoliberal governmentality, healthism, and the post-museum) are useful for describing the intersections of health promotion and science centers which buttress at TAY. In the following brief explanation of these concepts, I will acknowledge the literature while also stating the ways in which these concepts are appropriate for further research.

Neoliberal governmentality and healthism

First of all, I will introduce the concept of neoliberal governmentality. This term relates to how individuals are expected to discipline themselves in a consumer society. The concept, in its pairing of terms, joins two different theoretical traditions, one macro-economic and the other Foucauldian. An explication of this concept needs to first unpack this unique pairing of traditions. To begin with the first half of the term (neoliberalism), we need to consider it as a term from macroeconomics which has broadened in definition to be considered the dominant ideology of market societies.

Neoliberalism is a perspective which holds that the state should not interfere with capitalist enterprises, except to facilitate the market's unrestricted reign (Harvey, 2005). The term neoliberalism can be confusing, because there is nothing necessarily liberal (politically) about the concept. Because neoliberal ideology prescribes a return to the unrestricted reign of the capitalist economy (unrestrained by government regulations) it is economically "liberal" in the mold of classical political economists such as Adam Smith (Smith, 1955). Starting in the 1970s, some economists sought to move away from Keynesian notions of government intervention and

return to the ideas of classical economics in order to boost growth. The adoption of neoliberal ideas by world leaders has led to soaring economic growth accompanied by an increase in poverty and income inequality along with a defunding of social safety nets, education and cultural institutions such as museums.

Significantly, David Harvey (2005) connects neoliberal economic policies to consumerism and libertarian ideas. In so doing, he makes it possible to speak of a neoliberalism as a dominant ideology in the late 20th and early 21st century— a definition which goes beyond a description of macro-economic policy. The term “neoliberalism” now has a broader semantic scope than it did when it only denoted the free-market ideology of Milton Freidman and the post-welfare state policies of Margaret Thatcher and Ronald Reagan. The term is now used to describe other institutional and policy developments wherever the “free” market—unencumbered by government regulations—is idolized. For example, in its turn towards commercialism, grant-writing and low-paid, itinerant adjunct faculty, contemporary universities have been described as having taken a neoliberal turn (Canaan & Shumar, 2008).

Although rarely characterized in the literature as having gone neoliberal, cultural institutions such as museums face funding shortfalls and other market pressures. When government is downsized at the federal, state and local levels, institutions that have previously relied on government subsidies find that they need to do “more with less.” This is the case for TAY, where MOSI’s proposed fundraising efforts fell far short. Alternative sources of funding from corporations have become a new revenue model to fund museum exhibitions, and TAY is no exception. In exchange for prominent branding of TAY, private health insurance corporations such as Florida Blue and Met Life have provided substantial funding to MOSI for the exhibition. In addition to relying on corporate sponsorship, MOSI has also explicitly reframed visitors as

“guests,” which is a nod towards customer-service approaches for museums modeled after retail. This indicates the influence of neoliberal ideas at the level of funding and visitors, but there is yet another sense in which neoliberalism has served to underwrite contemporary ideas about health promotion which show up in the TAY exhibition. Health promotion is a form of public health intervention that was ascendant along with neoliberal ideas (Navarro, 2009). With its focus on individual consumers, maximizing their own self-interest and avoiding risks in order to stay healthy, health promotion is related to neoliberal ideas, but on a micro rather than macro level. This brings us to the second half of the term *neoliberal governmentality*.

Roughly speaking, governmentality describes how people are expected to govern themselves in a civil society (Foucault, 2008, p. 295). Because the populace no longer takes orders from kings and queens or from stern authoritarian regimes, the onus of staying healthy is placed squarely on individuals. Governmentality can broadly refer to the art of government, not only via the state, but also those tactics and techniques which individuals adopt in order to discipline themselves. Exercise, weight-watching, diet and symptom awareness can be considered as “technologies of the self” (Foucault, et al., 1988) that individuals are persuaded to adopt according to a cost/ benefits calculus. The concept of “neoliberal governmentality” therefore relates to how people are encouraged to take charge of their own health and run their own bodies like a business (maximizing health and avoiding risk).

In this short exposition of the lineage of these concepts, I have tried to suggest how this pairing of terms joins ideas from macroeconomics with Foucauldian notions of self-governance. The idea that individuals should manage their own health according to a cost/benefits reckoning is a persistent theme of the TAY exhibition, even though it is usually not explicitly stated as such. Complicating the explication of Foucault’s governmentality concept are two related but

somehow distinct neologisms from his lexicon, *biopolitics* (Esposito, 2008; Foucault & Senellart, 2008; Wright & Harwood, 2009) and *biopower* (Nadesan, 2008). Broadly connoting a politics of life and the body, I have found these latter terms too unwieldy to incorporate into this study of the TAY exhibition. As a result of the widened semantic scope of what is designated by the term neoliberalism—combined with the theoretical complexities and commitments involved in adopting a Foucauldian analysis—I have used the notion of neoliberal governmentality only sparingly in this research project. It is, however, a theoretical tool I plan to elaborate on in future research.

I would also like to mention a term which originated outside of the Foucauldian corpus, but is thematically related. “Healthism” (Callahan, 2000; Crawford, 2006; Greco, 1993; Rose, 1999; Skrabanek, 1994) describes how health promotion ideology reframes individuals as patients in waiting. Healthism makes disease the result of a moral failure to properly govern oneself. It is a term that calls attention to the victim-blaming implications of those health promotion messages which imply (explicitly or tacitly) that individuals who succumb to disease are responsible for their own situation. The TAY exhibition is arguably “healthist” in its emphasis on personal responsibility and downplaying of structural factors which contribute to health problems. I have argued that one of the ways TAY 'promotes healthy behavior' is by trying to get pre-symptomatic visitors to identify themselves as disease candidates using behavioral risk profiles (If you smoke, drink, eat salty snacks, don't exercise, etc. you are headed for trouble and have no one else to blame but yourself). Visitors who encounter TAY and the health promotion messages there are being framed as “psychosomatic” (Greco, 1993) because their own imperfect coping mechanisms for stress are being singled out as being implicated in sickness—diseases for which they may only be a potential candidate for. Monica Greco writes,

In general, the psychosomatic explanation of a morbid phenomenon calls for an attention to the individual 'prior to' his or her symptom, and implies an evaluation in terms of disease potential of each situation of individual 'health' (Greco, 1993, p. 359).

Greco describes how the discourse of healthism addresses otherwise “healthy” individuals who are hailed as potential disease sufferers by virtue of a biomedical understanding of behavioral risk factors for disease. There is, of course, a great deal of truth to behavioral causes for disease, but it is a mistake to frame these behaviors as entirely volitional in each case. For example, research on “food deserts” shows that low income people don’t always have equal access to healthy foods (Roche & USDA, 2012; Shaw). Healthism is a philosophy that does not properly take into account structural factors for disease beyond individual volition.

The concepts of neoliberal governmentality and healthism present critical possibilities for future research into the intersection of multi-media health promotion messages at a science center. Running one’s own body as a health incurring, loss averse enterprise (as described in these concepts) are theoretical tools for understanding the strategies of health promotion. In addition, market-influenced attitudes can be witnessed in the business of museum and science centers, which brings us to the next theoretical term.

The post-museum

In the previous section I alluded to market pressures which cultural institutions such as MOSI face in an era of dominant market sentiments. To explore this historical context further, it is useful to reference Eilean Hooper-Greenhill’s (2000) concept of the “post-museum.” According to Hooper-Greenhill (2000) contemporary museums (faced with deficits in funding and a decline in visitors) have been increasingly modeling themselves after businesses. In the

first sense, the “post-museum” concept applies to the way that museum visitors have been increasingly cast as a customer/ consumer of knowledge and amusement (Hooper-Greenhill, 2000; D. Johnson, 2008). The patronage of the public can no longer be assumed as given. Instead contemporary museums rely on market-research, advertising campaigns, and a self-conscious customer service approach in order to attract ticket-buyers. The focus on customer service involves flattering the museum visitor as the addressee of messages. The motto of the Houston Health Museum is “We’re all about *you*” (D. Johnson, 2008, p. 351). Similarly, TAY’s use of the second person pronoun *you* can be seen as an attempt to foreground the visitor as the addressee. Interactive features at TAY, such as multiple choice quizzes, can also be interpreted as ways to “interpellate visitors as consumer agents who are responsible for choosing access to the knowledge embedded in the exhibit” (D. Johnson, 2008, p. 351).

While framing the visitor as a customer or “guest” can be considered as a hallmark of the “post-museum,” another aspect is corporate sponsorship. The branding of TAY by corporate funders shows how TAY can be considered as a marketing campaign, even though a specific product is never marketed as such. TAY encourages people to avoid risk factors for disease, which is congruent with a private insurer’s desire to enlist healthier customers. As described, the TAY exhibition represents an example of the post-museum in action, where knowledge is not being presented for its own sake. Instead, visitors are being framed as consumers who ‘choose their own adventure’ in life, either making responsible choices or engaging in risky behavior. The “post-museum” is therefore also the neoliberal museum, because market-based concepts of self-governance are the order of the day, stated either explicitly or tacitly.

There is a sense that the term “post-museum” uses hyperbole in an effort to make a critical statement about how museums have ‘sold-out’ to corporate sponsors. Science and

technology centers such as MOSI in fact have a longer history of being intertwined with corporations. Corporate branding of exhibitions, as seen at TAY, goes back at least as far as the dawn of interactive science centers such as MOSI. Corporate benefactors Lockheed and Bell were allowed to donate exhibits to the San Francisco Exploratorium as long as they didn't market any specific product (Heim, 1990, p. 30). Science and technology centers such as MOSI have more of an affinity with corporate industries than would an art museum. Hence, the rupture implied by the post-museum concept (between pre and post) may inadequately describe science centers where the link with capitalist enterprise is more organic. Nevertheless, the term is a rhetorically powerful descriptor of market pressures on museums, and hence it is worthy of further study as a description of science centers.

Closing remarks

The Amazing You is an ambitious exhibition about human health that was mostly well received by my 72 respondents. The exhibits are entertaining, diagnostic, informative as well as persuasive. Part of the success of this exhibition is related to its persuasive purpose. For the creators of the TAY exhibition, health education, by itself, is not enough. Health communication needs to address its audience personally to convey that health problems are not something that happens to other people. People can acquire good information about staying healthy from any number of sources, but unless they internalize the message their education is only an accumulation of facts. This has been a study of positionality and intersectionality where visitors from all walks of life are being interpellated by health messages and invited to identify with risk calculuses. To the extent that TAY suggests healthy lifestyles, visitors may be steered towards behavioral changes based on state of the art advice about staying healthy. The purpose of science

centers is usually to inform and entertain, but TAY is an exhibition that tries to do more, persuading visitors to alter their behaviors. It is an exhibition with a rhetorical mission: to get visitors to be involved in their own health and take initiatives to change their lives—things that the average human anatomy exhibition may not stress so emphatically.

TAY presents health and wellness as matter of free will and choice, however constrained within various ratios of determinism (hereditary and contingency). But with free will comes consequences. TAY highlights the volition of each visitor, who can elect to either engage in behaviors that help them live a long and healthy life, or choose behaviors which make them sick. At the same time that free will is being emphasized, TAY also issues normative admonishments about the right kinds of choices. In textual portions of the exhibition, ‘should statements’ are plentiful, which tell visitors what it is they should be doing to avoid disease and injury. Sometimes, these ‘should-statements’ are more or less tacit, such as the list of toxic ingredients in cigarette smoke. It is up to the visitor to interpret the implications of inhaling all these toxic ingredients. Exhibits with covert injunctions rely on the visitor’s ability to make inferences (construct mental syllogisms) in order to reconstruct the plain and explicit lesson, and they may be preferable to exhibits where the ‘should’ statement is overly didactic or strongly worded. At other times, the TAY exhibition phrases health advice in the form of an explicit directive or decree. While TAY is an exhibition that emphasizes human agency and free will, there are times when health advice is phrased, almost paternalistically, as an order (For example, “Stay active,” “You be the doctor,” “Live forever,” “Do this, not that” and “Use it or lose it.”).

Of course, not all health outcomes are within people’s control. People born into poverty don’t have the same kind of control over health outcomes that affluent people do. Stress, pollution and occupational risk pose health risks that are not purely a matter of choice. Many

diseases are determined (or partially determined) by genetics, and people can't choose who their parents are. But exactly where does determinism take over from free will? In every instance of disease and injury there is always a combination of factors that are both within and beyond the control of the individual. Risk calculus is a statistical form of reasoning which describes health risks in terms of probability. What I realized in the course of this research is that everyone uses probabilistic concepts in their assessment of health risk. Even non-scientists with no specialized training in statistics use concepts of probability to assign importance to health risks. Lay risk assessments are used by visitors to either identify or dis-identify themselves as disease candidates.

In most cases, the best doctors and medical researchers are bound by the scientific method to communicate health risks in terms of a range of possible outcomes. The representation of probability is found throughout the TAY exhibition, and in each instance the ratio of free will vs. determinism is differentially framed. Exhibits such as "Stroke of Bad Luck" or "Taking a Chance with Your Spine" use gambling as a metaphor for risk that may send a mixed message about the deliberate choices people can make to avoid disease or injury.

Notions of frame flexibility and mutability (Steier, 2005; Steier & Jorgenson, 2003; Steier & Ostrenko, 2000) describe a wealth of uncommitted representational storage which the exhibition draws upon, allowing the order of explanation to roam between molar and molecular, figurative and literal, serious and playful. In my analysis I have suggested how the exhibition draws on metaphorical resources from speech communication and telecommunication to describe cell division or the spinal cord. This indicates the importance of communication as an explanatory strategy in medicine. I have also argued that the use of figures of speech such as idioms, euphemism and anthropomorphism serves to help the visitor climb a representational

staircase towards greater realism which culminates in an unsentimental broaching of human mortality.

In my interviews with visitors, I tried to characterize a number of different complaints as instances of how a need for more human interaction at the exhibition. While communication is a root metaphor for the TAY experience, complaints about noise, age appropriateness, functionality and lack of staff suggest the need for more people on the exhibition floor who can ‘cut through the noise’ and have communicative exchanges face to face with visitors. Human interaction would move communication beyond the figurative into the literal.

TAY uses the eponymic “you” as an organizing pronoun to hail different visitors as the proper recipient of an intervention strategy. The subject position “you” is mobile and constantly switching according to the personal and sociocultural contexts where each visitor stands. In “Beginning of Life,” the “you” pronoun addresses a maternal subject and urges them to take steps behaviorally to protect the health of their unborn baby. Each stage of life in the exhibition addresses a different “you” who may be an adolescent, younger adult, elderly or other. In “You, M.D.” “you” become the doctor instead of the patient. Exhibits such as “Cybernetic Human” push the definition of “you” beyond flesh and bone to include prosthetic parts. When Harry Nyce removes his facial prostheses, it further emphasizes the boundary areas of what can be considered as “you.” In the “3D Body Exploration” exhibit, “you” become a collection of horizontal slices showing a cross-section of your insides. “MetiMan” is a simulation of an unconscious patient who “communicates” only through the readings (respiration, heart rate) he emits. In the “Alzheimer’s” exhibit, “you” become someone who is no longer self-identical, because your deteriorating mind can no longer remember who you are and the people in your life that you have a relationship with. At points, “you” as a subject capable of making choices

becomes framed as an object. The fetal remains present themselves to the visitor as dead specimens of ambiguous origin used to illustrate fetal development. In “Stages of Dying” “you” hover somewhere between near death and decay. In order to illustrate decomposition, a time-lapse video of a decaying swine seems to melt before your eyes. This video is a sobering reminder of the fate of bodies, and at this stage in the exhibition, “you” are urged to identify with the survivors instead of the deceased.

The life-stages approach at TAY foregrounds human mortality, and the inevitable onset of disease processes arguably makes it into a tragic tale. The “you” that is portrayed in this exhibition seems to be constantly trying to walk the right path, exerting his or her will power to avoid bad habits and sometimes even getting on the straight and narrow. At one point, the chance to “Live Forever” is dangled before the visitor, but the exhibition soon reverts back to its focus on degenerative diseases. The perception from some visitors of a focus on reactive rather than proactive health indicates that health promotion messages need to have the capacity to be reflexive about the reasons for skepticism about medical interventions, as well as have more considerations of the social determinants of health. Individualistic prescriptions derived from population data may miss the unique profiles of individuals. In addition, methodological individualism may neglect the social and relational factors that are involved in the adoption of healthy behaviors. More attention to determining factors of health and wellness (such as toxic environments, racism, income inequality and prohibitive costs of medical procedures) may help to shore up uncertainty about the ratio of agency, determinism and contingency.

Most of all TAY should be viewed as a well received and novel form of a public health intervention that is worthy of more funding and more study. TAY sees the invisible and the inevitable, mentions the unmentionable, and presents a unique occasion to talk about health

outside of the home or the hospital. I will restate my hope that this research may help ‘complete the circle’ of science center communication by serving as feedback to MOSI as well as a broader community of science center stakeholders—as well as visitor and health communication researchers.

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APPENDIX I:
MOSI Letter of Support



March 13, 2012

To: USF Division of Research Integrity and Compliance, Human Research Protection Program (HRPP)

RE: Letter of Support for doctoral research at MOSI by David Lee entitled "Informing, entertaining and persuading at *The Amazing You*"

This is a letter in support of David Lee, a PhD candidate at the USF Department of Communication. MOSI would like to grant permission to Mr. Lee to conduct his doctoral research (entitled "Informing, entertaining and persuading at *The Amazing You*") at MOSI.

I have met with David and his doctoral supervisor, Dr. Frederick Steier, and I have also seen David's dissertation proposal. I am pleased that he will be doing his research at MOSI. We hope to learn quite a bit from his project.

David has explained he is interested in how guests have fun at *The Amazing You*, while at the same time learning about making healthier lifestyle choices. This is consistent with the MOSI slogan "we've got FUN down to a SCIENCE." The observations and interviews that Mr. Lee will be conducting at MOSI will benefit communication and museum scholars.

In conclusion, we support the research project that Mr. Lee will be conducting here at MOSI, entitled "Informing, entertaining and persuading at *The Amazing You*."

Sincerely,

A handwritten signature in black ink, appearing to read "Wit Ostrenko", with a long horizontal flourish extending to the right.

Wit Ostrenko
President, Museum of Science and Industry



MOSI (Museum of Science & Industry) is the proud winner of the 2009 National Medal for Museums by the Institute of Museum and Library Services, the nation's highest honor for museums.

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APPENDIX II:
Informed Consent Form



Informed Consent to Participate in Research Information to Consider Before Taking Part in this Research Study

IRB Study # Pro00008038

You are being asked to take part in a research study. Research studies include only people who choose to take part. This document is called an informed consent form. Please read this information carefully and take your time making your decision. Ask the researcher or study staff to discuss this consent form with you, please ask him/her to explain any words or information you do not clearly understand. We encourage you to talk with your family and friends before you decide to take part in this research study. The nature of the study, risks, inconveniences, discomforts, and other important information about the study are listed below.

The person who is in charge of this research study is David Lee, M.A. This person is called the Principal Investigator. However, other research staff may be involved and can act on behalf of the person in charge. Mr. Lee is being guided in this research by Dr. Fred Steier.

The research will be conducted at Tampa Museum of Science and Industry (MOSI)

Purpose of the study

The purpose of this study is to learn more about health communication at science centers

Study Procedures

If you take part in this study, you will be asked to participate in a one hour interview. The interview will be recorded on a digital tape recorder and transcribed. After transcription, I will erase the recording.

Total Number of Participants

About 20 individuals will take part in this study.

You do not have to participate in this research study.

Benefits

IRB Number: _____
IC Adult Minimal Risk - SB Rev:9-3-2010



IRB Consent Rev. Date: _____
Page 1 of 3

By participating in this study you will be helping a graduate student complete his dissertation, and also help communicators better impart information about staying healthy.

Risks or Discomfort

This research is considered to be minimal risk. That means that the risks associated with this study are the same as what you face every day. There are no known additional risks to those who take part in this study.

Compensation

You will receive no payment or other compensation for taking part in this study.

Cost

There will be no additional costs to you as a result of being in this study. The researchers are not interested in any private information.

Privacy and Confidentiality

We are not interested in any private or confidential information such as health records. We will keep the interviews private and confidential. We may publish what we learn from this study. If we do, we will not include your name. We will not publish anything that would let people know who you are.

Voluntary Participation / Withdrawal

You should only take part in this study if you want to volunteer. You should not feel that there is any pressure to take part in the study. You are free to participate in this research or withdraw at any time. There will be no penalty or loss of benefits you are entitled to receive if you stop taking part in this study. If you are a student, a volunteer or an employee, your decision to participate or not to participate will not affect your status.

New information about the study

During the course of this study, we may find more information that could be important to you. This includes information that, once learned, might cause you to change your mind about being in the study. We will notify you as soon as possible if such information becomes available.

You can get the answers to your questions, concerns, or complaints

If you have any questions, concerns or complaints about this study contact David Lee (813)313-6888

If you have questions about your rights as a participant in this study, general questions, or have complaints, concerns or issues you want to discuss with someone outside the research, call the USF IRB at (813) 974-5638.

Consent to Take Part in this Research Study

It is up to you to decide whether you want to take part in this study. If you want to take part, please sign the form:

Signature of Person Taking Part in Study

Date

Printed Name of Person Taking Part in Study

Statement of Person Obtaining Informed Consent

I have carefully explained to the person taking part in the study what he or she can expect from their participation. I hereby certify that when this person signs this form, to the best of my knowledge, he/she understands:

- What the study is about;
- What procedures/interventions/investigational drugs or devices will be used;
- What the potential benefits might be; and
- What the known risks might be.

I can confirm that this research subject speaks the language that was used to explain this research and is receiving an informed consent form in the appropriate language. Additionally, this subject reads well enough to understand this document or, if not, this person is able to hear and understand when the form is read to him or her. This subject does not have a medical/psychological problem that would compromise comprehension and therefore makes it hard to understand what is being explained and can, therefore, give legally effective informed consent. This subject is not under any type of anesthesia or analgesic that may cloud their judgment or make it hard to understand what is being explained and, therefore, can be considered competent to give informed consent.

Signature of Person Obtaining Informed Consent / Research Authorization

Date

Printed Name of Person Obtaining Informed Consent / Research Authorization

IRB Number: _____
IC Adult Minimal Risk - SB Rev:9-3-2010



IRB Consent Rev. Date: _____
Page 3 of 3

APPENDIX III:
IRB Approval Letter



UNIVERSITY OF
SOUTH FLORIDA

DIVISION OF RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX (813) 974-5618

August 17, 2012

David Lee
USF- Communication Dept.
Tampa, FL 33612

RE: **Expedited Approval** for Initial Review
IRB#: Pro00008038
Title: "Informing, entertaining and persuading at The Amazing You"

Dear Mr. Lee:

On 8/16/2012 the Institutional Review Board (IRB) reviewed and **APPROVED** the above referenced protocol. Please note that your approval for this study will expire on 8/16/2013.

Approved Items

Protocol Document(s):

[Entertaining, informing, and persuading at The Amazing You](#)

Consent/Assent Documents:

[dlee_informed_consent2012.docx.pdf](#)

Please note, the informed consent/assent documents are valid during the period indicated by the official, IRB-Approval stamp located on the form - which can be found under the Attachment Tab. Valid consent must be documented on a copy of the most recently IRB-approved consent form.

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review categories:

(6) Collection of data from voice, video, digital, or image recordings made for research purposes.

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history,

focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval by an amendment.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,



John Schinka, PhD, Chairperson
USF Institutional Review Board