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DISSERTATION

EFFECT OF VISITOR AND VISIT VARIABLES ON OVERALL SATISFACTION
IN THREE VISITOR INSTITUTIONS

Submitted by

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In partial fulfillment of the requirements

for the Degree of Doctor of Philosophy

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Spring 2001

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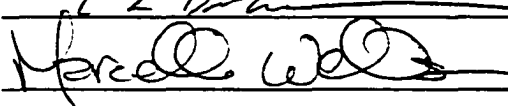
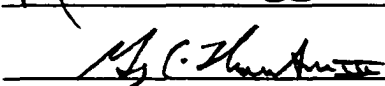
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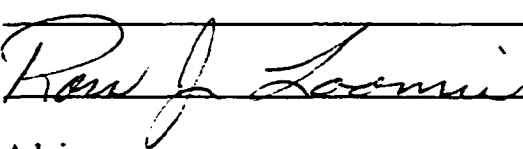
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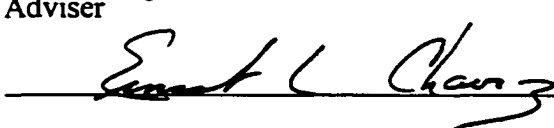
March 14, 2001

WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY STEVEN YALOWITZ ENTITLED EFFECT OF VISITOR AND VISIT VARIABLES ON OVERALL SATISFACTION IN THREE VISITOR INSTITUTIONS BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

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COLORADO STATE UNIVERSITY
EFFECT OF VISITOR AND VISIT VARIABLES ON OVERALL SATISFACTION
IN THREE VISITOR INSTITUTIONS

One of the most important outcome variables for visitor institutions is satisfaction (i.e., whether or not visitors are satisfied with their experiences). Consumer literature links satisfaction to repeated purchases. In museums, satisfaction leads to positive word-of-mouth, which, in turn leads to increased visitation (Adams, 1988). While satisfaction has been thoroughly researched in consumer science and in marketing, museum visitor studies specifically examining satisfaction and its antecedents are few and far between. The purpose of the present study was to determine whether visitor or visit variables are the best predictors of satisfaction, whether the predictive power of these variables would differ in different types of visitor institutions, and if higher ratings of satisfaction would result in specific visitor outcomes after the visit.

The present study examined and compared the major predictors of visitor satisfaction in an art museum, a nature and science museum, and an aquarium. The four main types of variables studied were visitor variables, visit variables, satisfaction for the visit, and visitor intentions and other outcomes. Visitor variables included as a person's Need For Sensory Experience (NSE; Eisenberger, Sucharski, Yalowitz, Rhoades, & Loomis, 2001), Need for Cognition (NFC; Cacioppo & Petty, 1982), and informational and sensory reasons for visiting. Informational Reasons for Visiting consisted of learning new things and expanding one's knowledge, while Sensory Reasons for Visiting were to

have vivid visual experiences and see visually interesting exhibits. The visit variables studied were the visitor ratings of perceived informational and sensory opportunities during the visit. Satisfaction (the dependent measure) was evaluated using an item asking about a visitor's overall satisfaction with their visit.

The current study revealed that a combination of both visit and visitor variables best predicted satisfaction, although satisfaction is regressed on only four of the six key variables: Sensory Opportunities, Informational Reasons for Visiting, Informational Opportunities, and Sensory Reasons for Visiting. In addition, some interaction terms of the key variables added additional variance: Informational Reasons for Visiting x Informational Opportunities, Informational Reasons for Visiting x Sensory Reasons for Visiting, and Need For Sensory Experience x Informational Reasons for Visiting. The first two interaction terms were negative interactions while the last was positive.

Satisfaction significantly increased visitor outcome variables such as likelihood of a return visit, likelihood of recommending friends and family visit, willingness to provide a quote to be used for endorsement, and perceiving that an institution cared about them. This type of research will allow researchers and museum professionals to understand and increase visitor satisfaction, as well as determining what role the visitor and the institution play in satisfaction. By understanding and improving satisfaction, visitors will be more loyal, recommend visits to others, and be more likely to return.

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Chapter I

The roles that museums and similar visitor institutions (e.g., aquariums, zoos, nature centers, living history sites, historic homes, etc.) play in society has changed drastically during the last century. This shift has occurred based on changes in three realms of the museum experience: the institutions and their collections, the attitudes of museum professionals, and those who visit. The first two are intertwined, so that it is difficult to determine whether people who have specific skills are hired to adjust to the changing museum environment, or whether employees' attitudes have changed and this in turn is applied to institutions and exhibits. The visitor profile at these institutions has also changed as the exhibits have changed to reach out to new audiences.

Visitor institutions have changed physically from halls filled with artifacts or animals to the much more versatile and eye-catching environments of today. As a result, a visitor institution such as the Rock and Roll Hall of Fame in Cleveland, Ohio would have been unrealistic one hundred years ago. A century ago the average mode of presentation was an object with a label attached to it. Today, there are countless ways museums can and do present objects to their audience. Museum personnel have responded by initiating radical changes, resulting in very different visiting experiences from those of yesteryear. Multimedia presentations allow for video, computer-generated images, and even immersive virtual reality experiences with a myriad of topics. Museums now have to utilize cutting-edge technology to compete for the attention of a new generation that expects eye-catching graphics and constantly changing environments. As

a result, the attitudes and techniques of those displaying and providing the visitor experience (museum workers or professionals) have also changed (Bedno & Bedno, 1999; Chambers, 1999). In fact, Falk and Dierking (2000) state “museums have clearly changed what and how they present objects, ideas, and information, as well as the types of exhibitions and programs they present” (p.2).

It is difficult to determine whether it is the institution or the audience driving these changes, but visitors certainly have different expectations today than 100 years ago. An increase in the entertainment factor combined with a shorter visitor attention span requires exhibits that are dynamic and draw a visitor’s attention. To hold a person’s attention, the topic should be interesting, alluring, and connect with a visitor in some way. Serrell (1997, 1999) points out that exhibits meaningful to visitors increase the number of stops and the time spent in exhibits. Other researchers have also stated the importance of attention in the museum visit (Chambers, 1990; Falk, 1983; Harvey, 1995; Koran & Koran, 1983; Koran, Lehman, Shafer, & Koran, 1983). Consequently, if a visitor’s attention and time are directed in a way that matches their expectations, they should leave feeling more satisfied.

With all of the past and present changes in museums, and the highly varied visitor environments, it is necessary to systematically examine the visitor experience. By examining what happens before, during, and after a visit, the dynamic interaction between visitor and institution can be better understood and improved. Of special interest are the differences and similarities between different types of institutions: which parts are typical of visitors in general, and which are particular to the institution. This will

hopefully encourage what most museums strive for – a satisfied visitor who will come back for more.

While the increase in visitor studies in the 1960's yielded dramatic change in how the visitor is understood (Hein, 1998), there is much more to learn. This particular study will draw on research from outside fields, particularly consumer psychology and marketing, to determine what constitutes a satisfying visitor experience.

There has also been an increase in the number of museums and similar institutions and visitors with a comparatively limited amount of leisure time are forced to pick and choose their leisure destinations carefully (Kotler & Kotler, 1998). Visitor institutions have also faced increasing competition from theme parks, shopping malls, and similar experience-based attractions (Pine & Gilmore, 1999). Understanding what visitors prefer or like in a visit will allow visitor institutions to more readily compete for visitors.

The purpose of the present study was to determine whether visitor or visit variables are the best predictors of satisfaction, whether the predictive power of these variables would differ in different types of visitor institutions, and if higher ratings of satisfaction would result in specific visitor outcomes after the visit. Two key variables visitor variables studied will be Informational and Sensory Reasons for Visiting. The additional visitor variables which are personality measures are Need For Cognition (Cacioppo & Petty, 1982), a person's tendency to engage in and enjoy thinking, as well as Need for Sensory Experiences (Eisenberger et al., 2001), a person's tendency towards sensory experiences. Visit variables such as the Informational and Sensory Opportunities will be examined, as well as an overall satisfaction measure. Finally, visitor intentional and outcome variables will be studied: likelihood of a return visit, likelihood of

recommending friends and family visit, willingness to provide a quote to be used for endorsement, willingness to become a member, and perceiving that an institution cares about them.

In following marketing literature based on consumer satisfaction, visitor satisfaction should result in increased visitation and return visits, making it a valuable measurement tool. Additionally, while much has been learned in the last decade about visitors and their preferences, there is a need for a greater understanding of the interaction between the visitor and the visit environment, and how it relates to satisfaction.

Chapter II

The field of visitor studies, which focuses on evaluating the visitor experience at places such as museums, aquariums, zoos, historic sites, and similar institutions, is rather new, but gaining in popularity. In fact, Hein (1998) discussed the impressive momentum of the field in relation to the number of visitor studies conducted dramatically increased in the latter half of the 20th century. Hein (1998) reported about a study by Screven and Shettel (1993) that cited the number of visitor studies doubling from the 1970's to 1980's, from 143 to 335. Bitgood and Loomis (1993) also reported a dramatic growth in the field in the 1980's. This increase in interest resulted in two publications in the late 1980's to early 1990's that specialized in visitor studies work: Current Trends in Audience Research and Visitor Studies: Theory, Research, and Practice (Loomis, 1993). In a four-year period, 110 total articles were published between these two sources. Even with an increase in the number of articles published in this area, when exploring specific topics related to visitors there are not very many articles directly related to a topic. As a result, any literature review for a project in visitor studies has somewhat limited sources to draw upon.

This literature review begins with a brief description of cognition and affect, although cognition and affect per se will not be studied. The related topics of informational aspects of the visitor and visit will be studied, slightly different applications of the general topic of cognition. Additionally, instead of affect as it has been used in previous research, sensory aspects of the visitor and visit will be studied.

Previous research on cognition and affect were major influences on the present study and the application of the variables mentioned. Of particular importance is the discussion of the interaction between cognition and affect, as it directly relates to hypotheses derived.

Past research dealing with visitor variables will be reviewed next, including the topics of sensory and cognitive preferences of visitors and motivations for visiting.

Visitor variables are defined as the aspects of the visit that affect the visitor experiences.

Additionally, visit variables are defined as the aspects during the visit that affect the visitor experience, and visitor research related to those variables are briefly discussed.

In the last part of the literature review section, satisfaction is discussed, starting with what other fields have discovered. Following that, a few studies that specifically measured satisfaction with museum visitors are covered. While those visitor studies that directly coincided with the hypotheses of the present study were important, there is much reference to literature from outside fields.

Cognition and Affect

The field of education has been particularly useful in contributing to an understanding of cognitive and affective experiences, as they relate to educational objectives. Cognition generally deals with more informational aspects of an experience, including analytical thinking skills such as problem solving and evaluation (Bloom, 1956; Krathwohl, Bloom, & Masia, 1964). In applying cognition to a museum visit, this would include situations that foster thinking and learning.

In contrast to cognition, affect involves a person's emotions, feelings, or attitudes. For the highest level of affective learning to take place, first a person must receive or attend to the message, at some point value it, then characterize the information or

experience as a part of one's identity (Kratwohl et al., 1964). In addition to cognition, people also learn by changing their feelings or attitudes towards material. This concept has gained much interest in recent years, especially in psychology.

Relationship between Cognition and Affect

In past discussions, researchers have talked about cognition and affect as relatively independent (Zajonc, 1980). However, this was not the intention of the authors of the aforementioned handbooks on cognition and affect (Kratwohl et al., 1964). In fact, they said that the two domains clearly overlap, and referred to specific levels of attending to and processing of information that deal with both affect and cognition. Through the years, however, cognition and affect have sometimes been discussed in terms of whether a person is processing the world cognitively or affectively. Almost any experience can be a mixture of both affect (i.e., emotions, feelings, attitudes) and cognition (i.e., beliefs, knowledge), with one perhaps overshadowing or influencing the other. Therefore, in any situation dealing with these topics, the relationship between cognition and affect, both correlational and causal, should be examined.

In the present study, while cognition and affect are not studied per se, the related topics of informational and sensory aspects of the visit are studied. As a result, the relationships between the informational and sensory aspects of the visit are looked at together, and not independently, to determine their effects on satisfaction.

Cognition and Affect in Museums

The topics of cognition and affect and their relationship have received much attention in the last decade or so in regard to the visitor experience (McManus, 1993; Roberts, 1993; Webb, 1996). The basic question asked is how people react during a

museum visit: either affectively, cognitively, or a combination of the two. There is evidence that the two work together to determine the quality and outcomes of a visit. This has been shown in various studies where information about exhibits given before or during a visit can lead to more affective responses such as enjoyment (Fischer, 1984; Rennie, 1994; Temme, Sas, & Derks, 1986). In these studies, a cognitive element of the visit (i.e., information given during the visit) influenced affective responses (i.e., enjoyment) during the visit.

The reverse can also be true, as Roberts (1992) suggested that affective experiences could influence a person's reception of information. This idea was seconded by Rennie (1994) who stated that "an important role of affect in the visit experience is to prime the learner for subsequent instruction" (p.263). Rennie (1994) found that to have a maximum cognitive learning experience it is important to be given information before the visit. This would be followed by positive affect during the visit, which is then followed with post-visit instruction. Therefore, in a cognitive learning experience there needs to be an affective element to create the best possible results. Based on these findings, Rennie also noted the importance of looking at both cognitive and affective factors in evaluating the success of a visit. As a result of previous museum research (Fischer, 1984; Rennie, 1994; Temme, Sas, & Derks, 1986), it is assumed that cognition and affect are more likely to occur together during a visit than one or the other occurring on its own. For example, when a visitor is viewing an exhibit, it is more likely that some combination of affect and cognition is occurring, rather than the visitor reacting in a cognitive or an affective manner.

Visitor Variables

Cognition as a Personality Variable

Up until now, cognition has been discussed as an outcome, in that during an educational or visitor experience different levels of cognition occur as a result of certain conditions. However, it is possible that cognition is not only an outcome variable, but also an input in a situation. In other words, cognition can be a personality variable that affects an outcome, rather than being the outcome. Whether someone is satisfied, the outcome, may depend on whether someone likes to think or reason cognitively, the input.

Cacioppo and Petty (1982) devised the Need for Cognition (NFC) scale (i.e., the input) to examine NFC's influence on persuasion (i.e., the output). They define NFC as "the tendency for an individual to engage in and enjoy thinking" (Cacioppo & Petty, 1982, p.116). This scale was based on Cohen's (1957) concept of NFC, which Cohen defined as a person's desire and ability to organize, understand, and make reasonable their experiences or a need to structure relevant situations in meaningful and integrated ways. Cacioppo and Petty (1982) believed that the desire to engage in effortful thinking, or a NFC, is a relatively stable characteristic or personality variable of an individual. Therefore, one person has an inherently higher or lower NFC than another.

Yalowitz and Loomis (1999) applied NFC to museum visitor satisfaction with cognitive and affective exhibit displays. As a personality variable, there was a distinction in the types of display visitors found satisfying. High NFC visitors were significantly more satisfied with the cognitive displays than the low NFC visitors. A personality variable had an effect on the kinds of experiences that visitors found satisfying. Miles (1986) has discussed a similar and seemingly parallel topic, as it relates to museum

visitors. In regards to willingness to be motivated to learn, he made the distinction between visitors who are highly motivated to learn and visitors who are not interested in the educational experience at all. Therefore, the distinction in personality variables has been shown to be a valuable comparison in evaluating the visitor experience.

Sensory Experiences in Visitor Institutions

In the present study, affect as a consequence of the visit will not be studied, but the related topic of sensory experiences will be examined. While there has been little research on cognition and how it relates to sensory experiences in museums, there is an obvious link between affect and sensory experiences. Sensory experiences can often be considered as precursors to affect; a person experiences the world through the senses, and affect is part of the reaction to these sensory experiences. For example, someone may see a beautiful waterfall, and the affective reaction of wonder or enjoyment follows. Webb (1993), while not specifically addressing this relationship, talks about experiencing our world and that a person would “tag each stimulus when we meet it with an affective tag for future encounters...” (p.10). The stimulus is often sensory in nature, and Webb mentions that in advertising it is common to accompany information with pictures and colors, strengthening the sensory experience in hopes of leading to positive affective reactions among customers. The affective primacy hypothesis (Zajonc, 1980) claims that a positive or affective experience can be initiated with minimal sensory stimulation, implying that sensory stimulation is needed in the first place.

Sensory experiences are those experiences that include not only visual processing of the environment, but those that utilize the other senses during a visit. Particularly hearing sounds and being able to touch parts of the exhibits, as well as other aspects that

involve sensory interaction with the environment will be studied. Included in this category are the concepts of “doing” things during a visit or “hands-on” sorts of activities. These are actions that often result in an affective response in the visitor. Diamond, Smith, and Bond (1988) concluded from their study that interactive exhibit areas should promote handling of objects, as they can promote interest, which can be considered a part of the affective domain.

In past research, sensory experiences have been found to affect visitor behavior. Bitgood, Patterson, and Benefield (1988) discovered that animals in a zoo being active increased viewing time and thus interest, and that visual competition between exhibits decreased visitor attraction. This showed the importance of the visual environment in a visiting experience for the typical visitor. Also, Harvey (1995) found that multisensory stimulation, as well as interactive displays and dynamic exhibits, affected attention among visitors. In a zoo study, Ogden, Linburg, and Maple (1993) varied whether or not there were sounds of birds, monkeys, and insects present in a gorilla habitat. They found that nearly twice as many visitors in the “sounds on” group reported learning something compared to the “sounds off” group. Also, those who visited the habitat with sounds reported a higher level of overall satisfaction with their experience.

An earlier study (Wright, 1980) looked at the benefits of multisensory, hands-on type exhibits in terms of learning, and found that these types of exhibits can increase the amount of content students learned. Therefore, not only does sensory experience affect the outward observable behaviors of museum visitors; it can also influence the internal processes of the visitors. This is explained in Falk and Dierking’s (2000) book as a physiological process, whereby sensory information is screened for relevance, and

information that is more relevant is more likely to be remembered. Before being remembered, however, something must be noticed, processed, and ultimately stored. A visit that contains vivid sensory experiences should at the very least result in greater attention, since more information will be noticed and subsequently processed. This relationship would be especially applicable for hands-on type experiences, where large amounts of time are sometimes devoted to one interactive, frequently lengthening the amount of time spent at an exhibit.

In the present study, sensory aspects of the visitor experience will be examined, examining how perceived sensory opportunities affect overall satisfaction. If the visitor perceives many sensory opportunities, this by itself may affect overall satisfaction, and whether the visitor finds this satisfying may depend on how much a person likes or needs sensory experiences in general.

Sensory Experience as a Personality Variable

Any experience is at least partly processed by the sensory system. However, whether and how much this sensory information is processed will be affected by the individual. There have been studies in psychology that examined differences in visual learning styles (Fahle & Daum, 1997; Kirby, Moore, & Schofield, 1988; Parmley, 1993). In this research, it was established that there were differences in peoples' abilities and tendencies to use visual information, with some people more likely to focus on the visual. Therefore, not only is a museum visit relative to the opportunities for sensory experiences, but whether the visitor values or needs these kinds of experiences.

Eisenberger, Sucharski, Yalowitz, Rhoades, and Loomis (2001) developed a scale similar in theory to Cacioppo and Petty's (1982) Need for Cognition. However,

Eisenberger et al. (2001) focused on a person's Need For Sensory Experience (NSE), creating a personality variable that measures a person's tendency to need and enjoy different sensory experiences. This scale was developed to be a separate construct from already-established scales that deal with similar topics, such as sensation seeking (Zuckerman, 1994) and Need for Cognition (Cacioppo & Petty, 1982). The present study will determine whether NSE affects a visitor's satisfaction with the sensory or informational aspects of the visit.

Reasons for Visiting

Besides the cognitive and affective personality measures, motivation for visiting an institution is a visitor variable that should be considered. Csikszentmihalyi and Hermanson (1995) discussed the differences between visitors who go to museums for more internal (intrinsic) reasons such as wanting to learn or enjoy things, and museum visitors who go for more external (extrinsic) reasons such as because other people want to go, or for some kind of reward. As they state, when something is done for its own sake it is intrinsically motivated by a person's interests or desires. However, if something is done because of an outside motivation or reward, it is extrinsically motivated. Addressing the variety of motivating factors of visitors, they state "no single recipe for motivating them could possibly apply across the board" (p.37). With such diverse backgrounds and interests in an audience, examining what kinds of motivation influence a visit becomes of paramount importance in unlocking what visitors are looking for in a visit. Also, these intrinsic reasons for visiting museums are powerful motivators, and the extent to which an experience lives up to expectations should relate to the overall reaction of the visitor to the visit.

A review of 60 years of literature by Hood (1983) revealed six major reasons why adults visit museums: being with people, or social interaction; doing something worthwhile; feeling comfortable and at ease in one's surroundings; having a challenge of new experiences; having an opportunity to learn; and participating actively. The last two relate to the cognitive and sensory experiences mentioned previously. Likewise, Wells and Loomis (1999) formulated ten types of experiences that museum visitors prefer. The ten types of experience preferences, in abbreviated form, are social, learning, risk, physical activity, reflection, comfort, solitude, fun, novelty, and exploration. Certainly, these preferences would drive decisions to visit institutions if they provide those kinds of experiences. Wells and Loomis's list of preferences was part of their Visitor Opportunity System (VOS) model, adapted from the Recreation Opportunity Spectrum (ROS) model used in natural resource management. In the VOS model, learning most closely relates to the cognitive classification used in the present research, while physical activity, exploration, and perhaps novelty are the most similar to sensory experiences.

Eisenberger (1999) postulated that motivation to return, favorable comments to others, donations, and volunteerism stem, at least in part, from their perception of whether a museum values them as individual visitors. Their motivation to do these things results from perceiving a museum as caring about their state of mind and comfort when visiting. This attitude is reflected by the survey instrument developed by Eisenberger (1999), in that it not only reflects a visitor's experience on multiple issues related to satisfaction, but also on how much control they perceive the institution as having in these issues.

In addition to motivation playing a role before the visit, there are also motivational factors during the visit. Lightner (1998) discussed an Attention Model for Museum Exhibits, which consisted of four types of motivation for attending to certain parts of an exhibit. They include enduring personal interest, curiosity, connections to personal history (i.e., things related personally to the individual), and group influence. In summary, this model provides for the self-regulated aspect of visitor motivation, that what a person carries with them to a visit often defines their behaviors while they are visiting.

In the present study, informational and sensory reasons for visiting the institution will be recorded for each visitor to examine whether the purpose for visiting influences visitors satisfaction. Why someone visits in the first place may interact with aspects of the visit itself. This can in turn affect satisfaction, depending on whether the expectations previous to the visit are met or not.

Visit Variables

Informational and Sensory Opportunities

While what a person brings with them to an institution (i.e., preferences, motivations, past experiences) has been shown to be a valuable determinant of the quality of a visit (Hood, 1983), perhaps even more important is what happens during the visit. This includes things like the physical environment and exhibit design, interactions with staff and volunteers, presentation of information, behaviors of the visitors, and even visitors' perceptions of the experience. By virtue of designing and presenting information to a visitor in a certain way, an institution influences visitor satisfaction and behavior to some degree. The effect of these visit variables and others have been shown in various

studies (Borun, Chambers, Dritsas, & Johnson, 1997; Falk, 1993; Litwak, 1996; Stronck, 1983; Yalowitz, & Koke, 2000; Yalowitz & Loomis, 1999). While it is true that not everyone will react identically to the same exhibits, there are exhibits that are generally better received than others are. This shows that satisfaction is partly a function of the environment someone is in, in addition to individual preferences.

While the studies mentioned examined the nature of visitor environment and its effect on visitor behavior, there have been no studies that specifically looked at informational and sensory aspects of the visit together. In the present study, asking visitors to rate their visit based on informational and sensory opportunities assessed the nature of the experience. Therefore, a visitor rated the perceived informational opportunities and the perceived sensory opportunities during the visit.

Measuring Satisfaction

For many years, measuring satisfaction has been an important factor in the consumer and marketing literature. Basically, the idea is that if a person has a satisfying consumer experience they will be more likely to purchase that product again, or tell friends or family about that product.

While studies typically focus on different aspects of consumer satisfaction, the topics of affect and cognition are often present in a discussion or study of what makes for a satisfying consumer experience. Madrigal (1995) discussed the relationship between the affective state of enjoyment and expectations to satisfaction. However, the distinction between affect and cognition is often somewhat tenuous, as Madrigal considered satisfaction to be a cognitive evaluation of affect, especially when satisfaction is measured using surveys. By having to read and think about affect and the affective

experience, and ultimately to write about it, a person does need to think about affect, further blurring the line between the two.

Another instance of applying cognition and affect to satisfaction was Oliver's (1993) research, in which satisfaction was an appraisal of the balance of positive and negative cognitive and affective experiences. According to Oliver, if the positive outweigh the negative, the visit experience was a positive one. What drives the subjective evaluation of whether an experience is positive or negative is preconsumption expectancies, or what a person expects to encounter before they actually experience the event. If the perceived experience was more positive than was expected, satisfaction resulted. However, Oliver noted that negative experiences can be more salient than positive experiences, so that the evaluation is not necessarily a sum total of positive versus a sum total of negative events. One bad experience can outweigh many positive experiences in terms of satisfaction.

In earlier research, Oliver (1980) described satisfaction as a cognitive comparison to a pre-conceived standard. In this model, Oliver listed expectations, attitudes, and intention as antecedents of satisfaction. After the satisfaction appraisal occurs in comparing the experience to the antecedents, this in turn leads to modified attitudes (or confirmed attitudes) and modified or confirmed intentions. Therefore, if one's attitudes and expectations influence the standard to which a comparison is made, this explains why two people visiting the same exhibit can have incredibly different experiences. One might have low expectations and then a generally mediocre event can result in high levels of satisfaction. On the other hand, someone with high expectations requires an amazing visit to meet the high pre-conceived standard. A museum can even influence the standards a

visitor sets, by promoting the exhibit as something special or worth seeing, an obvious conundrum for many museums. By raising the standards, an institution must produce something special in return.

Veenhoven (1996) talks about satisfaction as related to comparison theory, or that a person looks for a match between a standard and the reality of the situation, comparing the two then determining satisfaction accordingly. In their book, Pine and Gilmore (1999) also discussed consumer satisfaction as being a comparison of what they expect to get and what they perceive they get. The point of their comparison is that a person's perception rather than what they get is what is important. An institution may, in fact, be providing all of the appropriate qualities for a satisfying experience, but if the visitor perceives the situation differently, it may not be satisfying. Of course, determining what a customer's expectations are may seem as simple as asking a few questions, but as Pine and Gilmore point out, a much more sophisticated means of evaluating expectations is required. As a result, in the present study a visitor's preconceived notions or reasons for visiting will be recorded. The previous research described above indicated that expectations and motivation play a large role in satisfaction.

Measuring Satisfaction in Museums

According to the marketing and consumer literature, one of the most useful measures that could be researched in places like museums is satisfaction. As mentioned previously, consumer satisfaction may lead to repeated purchase of products and other positive behaviors. Surprisingly, there are only a few published examples of studies related to museums that actually measure satisfaction (Eisenberger, 1999; Pekarik, Doering, & Karns, 1999; Yalowitz & Loomis, 1999). Since there are many variables that

contribute to satisfaction, researchers have mistakenly interchanged these variables with satisfaction. A further literature review in the visitor studies field found additional articles that mentioned satisfaction, but as a consequence of longer stops at exhibit spaces, or as increased visitor attention. Instead of having items that specifically measured visitor satisfaction, it was assumed that these related variables indicated satisfaction. It is important to study specific relationship these variables to satisfaction rather than assuming a direct relationship.

While the term satisfaction covers many different areas and can be very general in nature, it will give a researcher or museum staff a good indicator of a visitor's overall interpretation of their experience. A common marketing practice at some institutions has been to use visitor satisfaction as a way of tracking how visitors evaluate the institution (e.g., Brown, 1999). This allows the institution to more systematically record and track the effects of changes in the institution on overall visitor satisfaction.

Eisenberger (1999) has recently produced the Visitor Social Satisfaction Survey, which examines how satisfied the visitor is with various aspects of their visitor experience. The survey asks the visitor to rate the museum on areas such as convenience of parking, ease of locating exhibits, level of crowding, friendliness of the people selling tickets, and many other areas, 26 items in all. Interestingly, for some of the items Eisenberger had visitors rate their perception of the level of control an institution has over the qualities they have just rated. Therefore, if the institution rates low on an item such as ease of locating the exhibits, it is useful to know if visitors see this as something that can potentially be corrected. The survey looks into which specific aspects of the museum environment their visitors find satisfying and which indicates room for improvement.

Also relevant to satisfaction in museums are the individual characteristics of visitors. Different visitors bring varied experiences, expectations, and personalities to the visit. In a study examining the role of cognitive characteristics of visitors for satisfaction of affective and cognitive exhibit displays, Yalowitz and Loomis (1999) found that how much someone likes to think affected their satisfaction ratings for more cognitive types of exhibit displays. The more someone liked to think, the more satisfied they were with the cognitive displays, while the less someone liked to think, the less satisfied they were with the cognitive displays. Meanwhile, the high and low NFC groups were equally satisfied with the affective displays. There were also differences in how often people visited museums and what they found satisfying. The more someone visited museums, the higher their Need for Cognition, and the higher their Need for Cognition the less likely they were to be satisfied the cognitive displays. Obviously, preferences and previous visitor experiences have a large impact on satisfaction.

The third study, which systematically examined visitor satisfaction as a construct, was by Pekarik, Doering, and Karns (1999). In the first stage, they simply asked an open-ended question about what kinds of experiences visitors found satisfying. This resulted in four general categories of satisfying visitor experiences: Object experiences, Cognitive experiences, Introspective experiences, and Social experiences. Pekarik et al. then used this list, which included subcategories for each type, to ask visitors about the kinds of things they anticipated or encountered during their visit. They found that the kinds of experiences visitors expected and found satisfying varied according to the person, institution, and exhibit.

Pekarik et al. (1999) found differences at the nine Smithsonian institutions they examined: visitors were most likely to cite object experiences at an American crafts museum, a zoo, and a natural history museum. Cognitive experiences were never the most frequent kind of experience mentioned at any of the museums. An American history museum was more likely to elicit introspective experiences as the most satisfying, compared to the other types of museums. There were also gender and age differences in terms of which types of experience were the most satisfying. The present study revealed that there are certain types of experiences that people find satisfying, and that these preferences depend on where they are visiting.

As museums start to become more sophisticated in measuring satisfaction and how it relates to visitor and visit variables, they will become more adept at providing increasingly satisfying experiences for their visitors.

Museum Visitors in Different Institutions

While some studies have talked about the differences between experiences at different kinds of institutions, there has been relatively little research done using the same data collection methods across different types of institutions. This is an acceptable approach for examining potential differences between institutions. The importance of holding the data collection procedure the same while varying the institution is that any differences will most likely be a function of the different institution and their visitors, rather than the procedures utilized to gather data. A previously mentioned example is the article by Pekarik et al. (1999) examining satisfying experiences.

One example of this method was an article comparing science center visitors to natural history museum visitors (Korn, 1995). In this article, Korn emphasized the

importance of the standardization of data collection procedures, and data were collected at two natural history museums and two science centers. Besides reporting general demographic characteristics (e.g., age and gender), visitors selected which types of interpretation they preferred at each type of institution. By holding the questionnaire, the results were more likely to be due to differences in the institutions or the visitors, and would not be influenced by the types of methods utilized to gather the data.

Another study by Borun, Chambers, Dritsas, and Johnson (1997) examined the effects of exhibits on family learning at a science museum, a science academy, a zoo, and an aquarium. This phase of the three-part project assessed whether modified exhibits increased active family learning. It was found that their strategy for increasing family learning occurred at all four sites. By demonstrating that the technique to encourage family learning worked at the different institutions, the method is seen as more reliable and applicable to other similar institutions. If the research had been conducted at only one institution, the results might be assumed to be a function of that particular environment.

Also, research done outside of museums has indicated that in different consumer environments, certain factors differentially predict satisfaction (Oliver, 1993). For example, different types of positive affect have been found to have varying effects on satisfaction, looking specifically at satisfaction for a marketing class versus an automobile as a product (Oliver, 1993). The present study found that the influence of positive affect on satisfaction was not consistent across the two products. Similar conditions might exist in museums and therefore warrant examination of satisfaction in different institutions.

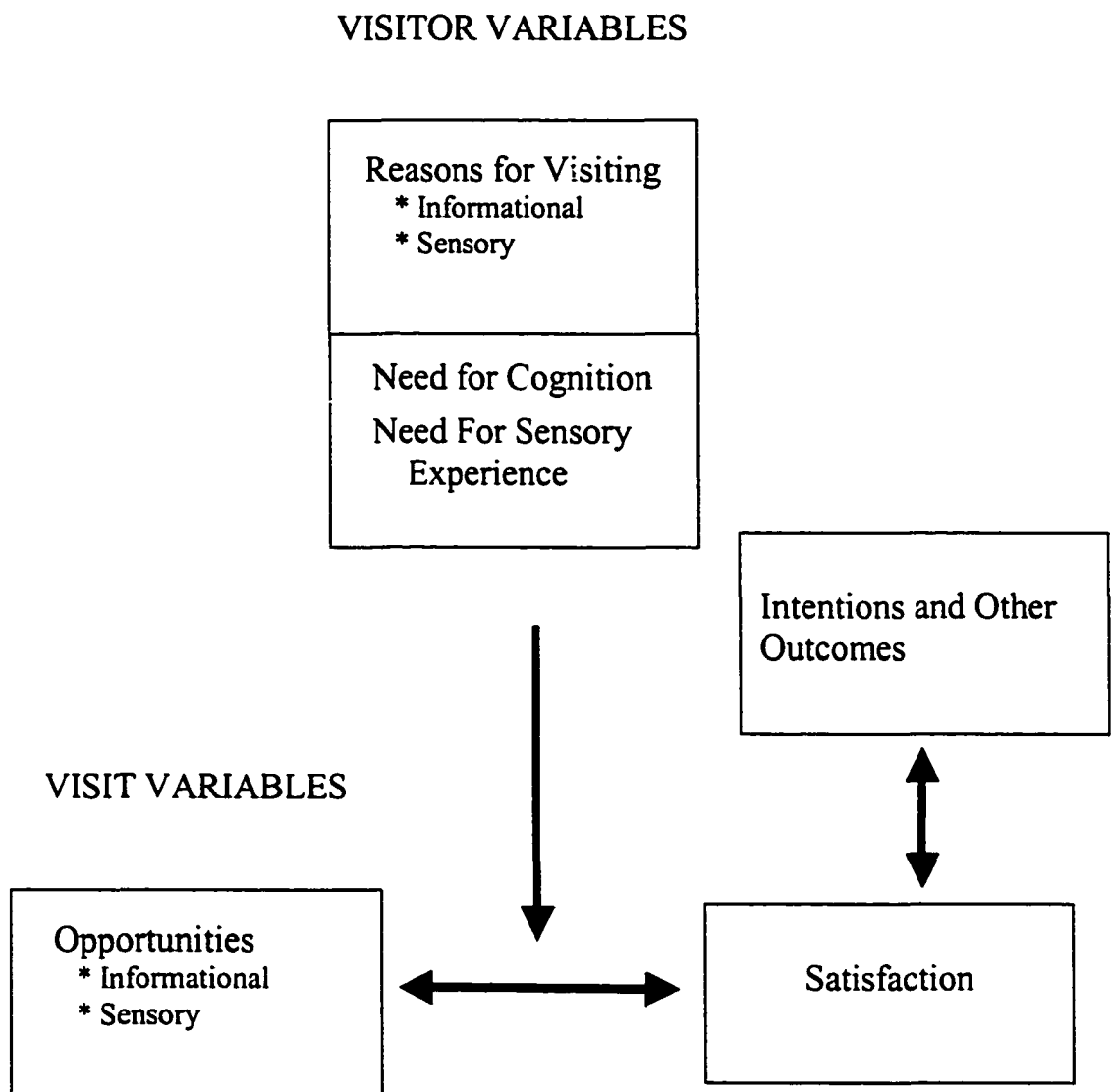
Model

The model (see Figure 1) utilized in the present study was comprised of three main types of variables: visitor variables, visit variables, the satisfaction measure, and intentions and outcomes. The visitor and visit variables were independent variables, while satisfaction was the dependent variable. More specifically, the relationship of the visitor and visit variables was studied in how they interacted with each other to produce satisfaction in the visitor experience. Additionally, the intentions and outcomes were independent variables as well.

Key Variables

In the model (see Figure 1), the visitor's perception of two kinds of opportunities during the visit was measured. These were the only visit variables examined. Specifically, the visitors reported the Informational Opportunities and the Sensory Opportunities. For the second part of the model, visitor variables were examined. The first category of visitor variables related to the reasons for visiting the institution. They specifically examined the informational and the sensory aspects of this variable: Informational Reasons for Visiting and Sensory Reasons for Visiting. Personality measures, also visitor variables, were recorded to determine how they interact with the other variables to produce a satisfying experience. The cognitive, or more informational, personality measure consisted of items from the Short Need for Cognition Scale (Cacioppo, Petty, & Kao, 1984) and determined whether someone was higher or lower on this characteristic. Also, a sensory personality measure, Need For Sensory Experience (NSE) was used to determine if visitors were more inclined to sensory experiences in

Figure 1: Model of visit and visitor variables and satisfaction



most situations. The relationship between these visit and visitor variables and how they relate to the dependent measure of overall satisfaction was examined.

Another set of analyses was performed to examine the intentions or outcomes as a result of satisfaction. These included variables such as likelihood of returning, telling friends and family to visit, willingness to provide a quote in support of the institution, and willingness to become a member. Theoretically, if a visitor were more satisfied then their positive intentions and behaviors related to the institution should increase as well.

In addition, ancillary analyses were performed. General demographic variables such as gender, level of education, and institutional membership were recorded. The relationship between these variables and the key variables was examined. Also, how key variables were affected by other variables such as familiarity with the topic, previous visitation, and how often people visit similar types of institutions were studied to determine any ancillary results to the hypothesized analyses. While not directly related to the hypotheses, these analyses should further the understanding of the antecedents and consequences of visitor satisfaction.

Research Objectives

For some of the variables to be examined (e.g., Informational Opportunities, Sensory Opportunities) there is little research specific to these topics. As a result, some of the research questions are more general in nature. While the variables included in the hypotheses were identified (see Figure 1), the relationships between all of the variables were not hypothesized because of this lack of background on the specific variables and how they relate to satisfaction. The problem being studied was whether visitor or visit variables, the type of institution someone was visiting, or some combination of these

variables best predicted visitor satisfaction. Also included in the problem is whether higher ratings of satisfaction would result in positive visitor intentions and behaviors after the visit.

The following research questions were examined in the present study:

1. Which variable set is the best predictor of satisfaction: visitor variables, visit variables, or a combination of the two?
2. Will NFC and Informational Opportunities together explain satisfaction better than each one alone? Likewise, will NSE and Sensory Opportunities interact to determine satisfaction?
3. Does the predictive power (related to satisfaction) of visitor and visit variables differ for an art museum, a nature and science museum, and an aquarium?
4. Does satisfaction lead to positive behavioral outcomes such as visiting again or telling other people that they should visit?

Hypotheses

Based on the research questions, the following hypotheses will be tested in the present study:

1. Visitor and visit variables would significantly predict satisfaction, and interaction effects would add a significant amount of variance explained.
2. The interaction of NFC and Informational Opportunities will be positive and significantly predict satisfaction. Likewise, the interaction between NSE and Sensory Opportunities would be positive and significantly predict satisfaction.
3. Informational variables will account for more variance in satisfaction at the Denver Museum of Nature and Science, and sensory variables would account for

more variance in satisfaction at the Denver Art Museum and the Ocean Journey Aquarium.

4. Satisfaction will affect outcome variables such as likelihood of returning, telling friends and family that they should visit, and intentional variables such as willingness to become a member, providing a quote for promotion of the institution, and feeling that the institution cares about them.

Chapter III

This chapter discusses the methods used to collect and analyze the data. First, how participants and the institutions were selected is described, followed by the design of the survey and of the study. The data collection procedure for data is explained, and also how the data will be analyzed. Finally, limitations and assumptions of the study are addressed.

Participants

Participants were 450 museum or aquarium visitors. A between-subjects design by institution was employed. Therefore, a visitor filled out a survey at only one of the three sites. There were 150 visitors surveyed at each of three Denver cultural institutions: the Denver Art Museum (DAM), the Denver Museum of Nature and Science (DMNS), and the Ocean Journey Aquarium (OJA).

Visitors were randomly selected from those exiting the exhibit portion of the institution. To hopefully reduce the number of refusals, visitors were approached as they exited the exhibits and entered the public area that typically includes concessions, gift shop, restrooms, and ticketing services. Conducting surveys outside the physical building usually increases the likelihood of refusals, and since data were collected during some fall months, outside data collection was not desirable because of the weather.

Site Selection

The three sites were selected based on two factors: perceived differences in the visitor experience, and support for the project. Data were collected at the three

institutions a total of 35 days in fall of 2000, from September 23, to November 18, 2000. This constituted 10 days at the Denver Art Museum, 15 days at the Denver Museum of Nature and Science, and 10 days at the Ocean Journey Aquarium. Surveys were conducted on both weekend days (53.2% of surveys) as well as during weekdays (46.8% of surveys) for each institution. A non-stratified sampling technique was used, and there were some differences among the institutions on which days of the week data were collected.

After data collection had already begun, the DMNS started offering weekend activities about dinosaurs that varied greatly from previous days of data collection and from weekday activities. This included many more live shows, hands-on activities, and puppeteers in the lobby with large moving dinosaur skeletons. A decision was made to not collect data on weekends once this had started because of a loss of space to have visitors fill out surveys in the lobby. Also, it was likely that the different experiences for weekend visitors during these activities would confound the results of the study. As a result, visitors filled out more surveys during the week (69.3%) than on weekends (30.7%). This trend was reversed for the art museum (35.3% during the week and 64.7% on weekends) and for the aquarium (36.0% during the week and 64.0% on weekends).

Survey Design

The survey incorporated items taken from other scales, a scale that was devised for this particular study and for future research (Need for Sensory Experience, NSE), items typical of this type of visitor research (e.g., demographics), and items that were constructed that specifically related to the hypotheses.

Items from the Short Need for Cognition Scale (Cacioppo, Petty, & Kao, 1984) were included based on their ability to discriminate between high and low NFC individuals. In previous research done with the Short NFC Scale by Yalowitz and Loomis (1999), certain items were better at discriminating between the high and low NFC groups, and the 6 items with the highest item-total correlations were used in the present study.

The Need For Sensory Experience items were devised by Eisenberger, Sucharski, Yalowitz, Rhoades, and Loomis (2001) to accurately measure a visitor's tendency to enjoy sensory experiences. Scale development included a factor analysis from 71 original items that yielded 34 potential items. Next, another factor analysis determined whether NSE was a different construct from the related constructs of Need For Cognition, desire for exertion, and sensation seeking. Results did indicate a separate construct for NSE. However, to reduce the amount of time it took to fill out the survey, eight items with some of the highest factor loadings were included in the present study.

The items relating to Informational and Sensory Reasons for Visiting, and those for Informational and Sensory Opportunities were created for the present study based on tapping into different aspects of informational and sensory experiences. They were chosen based on their broad or specific representation of these categories, and no specific validation measures were utilized before data collection for the present study.

Demographic variables were chosen as the typical variables utilized in these types of studies, and the question about how often people visits museums was based on Hood's (1993) three categories of visitation. The items that referred to Institutional caring were taken from Eisenberger's (1999) Visitor Social Satisfaction Survey. Finally, the outcome variables (return visit, telling friends and family, willingness to become a member,

providing a quote, and institutional caring) utilized in the present study were not based on previous research. However, return visits and recommending a visit to a friend or family member are common measures of visitor outcome variables.

Oftentimes, multiple methods are used to make sure that the method being employed is not driving the results that are found (Yalowitz & Wells, 2000). If more than one method is used and the results are the same then there will be more confidence that the construct is being measured accurately. Convergent validity is an important tool in providing evidence that the correct construct is being measured. Therefore, not only was the overall satisfaction item employed to tap into satisfying visitor experiences, but there was also an open-ended item that asked visitors to tell what the most satisfying experience was during the visit, and why it was the most satisfying.

There were three differences between the slightly modified versions of the survey instrument used in each institution. The first was in the term used in questions about each institution in the survey itself. For the two museums, the phrase “the museum” was used while the phrase “Ocean Journey Aquarium” was used in the aquarium survey. Stating the name of the aquarium reflected the desires of the aquarium staff consulted during survey development. They preferred to use the name of the institution in the survey, rather than simply “the aquarium.”

The second modification related to the demographic question asking about annual visitation; for the art museum it asked about visitation to art museums, for the aquarium it inquired about visitation to zoos and aquariums, while the DMNS survey asked about visitation to museums about nature and science. Again, the phrasing of the second part of

this question reflected the wishes of each institution, as well as reflecting visitation to similar kinds of institutions.

Lastly, the first item in the section dealing with Need for Cognition and Need For Sensory Experience was tailored to each institution. This item reflected knowledge of the topics displayed in the particular institution. It asked whether visitors knew or had studied a lot about art at the art museum, fish at the aquarium, or science and nature at DMNS. This item was modified to provide a self-reported measure of knowledge or experience with the material presented at each institution.

Research Design

A mixed design was used in the present study, with one of the variables a between-subjects design, while the key variables were within-subjects. All of the key variables examined were continuous variables. A between-subjects design was used for the institution, so that a visitor could only fill out a survey at one institution. The rest of the variables were within-subjects, meaning that all visitors

The distinction between visitor variables and visit variables is very important. Visitor variables refer to those variables that are most influenced by the person visiting, while visit variables are determined mostly by the institution. The present study examined the person-situation interaction; therefore, who the person was (i.e., person) and how they interacted with the visitor environment (i.e., situation) was the main focus of this line of research.

Procedure for Data Collection

A survey administrator was stationed at the exhibits exit, then approached each third person to cross a pre-determined line. If the third person was obviously a staff

member, or was younger than 18 years old, the next eligible person to cross the line was approached. Visitors were handed an information sheet (see Appendix C) that addressed issues such as confidentiality, the purpose of the research, and what they would be doing if they participated. This sheet also stressed that participation was voluntary, and that even if visitors initially agreed they could end their participation at any point. As stated in the information sheet, only those who were 18 years or older were eligible for participation. If a visitor refused, information was recorded regarding which institution they were at, their estimated age, gender, and reason for refusal (if given).

An additional criterion to participate related to three items asked of visitors after they were intercepted and initially agreed to participate:

1. Have you been to this institution before?
2. Did you spend at least an hour here today?
3. Did you see more than one exhibit here today?

If the potential participant answered “yes” to at least 2 of the 3 questions, they were considered eligible to participate, and they received a clipboard, the survey, and a pencil to fill out the survey.

The participation criterion was set up in order to determine whether or not a person would be able to answer detailed questions about their visit, and to exclude people who visited very briefly. One purpose of this research was to evaluate the overall visit experience to an institution, and this criterion measure increased the likelihood that visitors had at least experienced a larger portion of the exhibits. Those who had only been to the gift shop or a temporary exhibit would not be representative of the typical visitor and thus not desirable for inclusion in the study. If a visitor answered “yes” to 2 or 3 of

the questions, they were considered to have had a more typical visitor experience at the institution. The administrator also explained the correct way to fill out the survey, specifically pointed out the back page of the survey, and answered any questions the visitor had about filling out the survey.

Data Analysis

Hypothesis 1, that visitor and visit variables would significantly predict satisfaction, and interaction effects would add a significant amount of variance explained, will be tested using a Stepwise Multiple Regression with the six key variables in the model. With six variables, a fully factorial model was not run because of the large number of possible interactions. Therefore, only the main effects for the six variables and all possible 14 two-way interactions will be examined to determine whether the interaction effects would add a significant amount of variance. First, the six main effects will be entered into the equation to determine what variance will be accounted for by the key variables. Then, the 14 possible two-way interactions will be added into the equation to determine what additional variance the interactions will account for.

To test the first part of Hypothesis 2, that the interaction of NFC and Informational Opportunities will be positive and significantly predict satisfaction, a Stepwise Multiple Regression will be used. First the two main effects of NFC and Informational Opportunities will be entered, then the interaction of NFC x Informational Opportunities will be entered. For the second part of the hypothesis, that the interaction between NSE and Sensory Opportunities would be positive and significantly predict satisfaction, again a Stepwise Multiple Regression will be employed. Again, first the two main effects and then the interaction will be entered into the equation.

Hypothesis 3, that informational variables will account for more variance in satisfaction at the Denver Museum of Nature and Science, and sensory variables would account for more variance in satisfaction at the Denver Art Museum and the Ocean Journey Aquarium, will be tested using a Stepwise Multiple Regression. The same technique used to test Hypothesis 1 will be used to test Hypothesis 3, but entering the six key variables and then all 14 possible two-way interactions will be done separately for visitors at each institution.

For part of Hypothesis 4, that satisfaction will affect outcome variables such as likelihood of returning, and telling friends and family that they should visit will be tested using bivariate correlations. To test the effect of satisfaction on the intentional variables of willingness to become a member and providing a quote for promotion of the institution, unpaired t-tests will be used. Finally, a bivariate correlation will be used to test the effect of satisfaction on visitors feeling that the institution cares about them.

Limitations of the Study

As with any non-experimental design, where participants are not randomly assigned to specific conditions, there is the likelihood that other variables not controlled for or studied had an influence on the results. In the present study, some differences were detected between visitors at the three institutions, so it is likely that there were other differences between visitors that affected the results. In using the general public, and specifically visitors, there was self-selection in the sample, including who filled out a survey. While there were not any apparent differences in those who agreed to participate versus those who did not, there might still be some differences in variables that were measured.

One cautionary note that should be included in discussing the data is that there could be some method bias in the results. The correlations between the main variables (see Table 1) were all positive and all but one was significant, even though theoretically some of the correlations should not be significantly related. As a result, the specific survey method used may have influenced how people answered the items. How a visitor answered one item was predictive of how they answered the other items, meaning that respondents may have tried to be consistent when answering the questions. As is always the case with survey data, it is possible that visitors also answered the questions to make themselves look better, or attempted to answer the questions to please the researcher or the institution.

Assumptions of the Study

Since the present study dealt mainly with informational and sensory experiences, the institutions were selected as a result of perceived differences in their visitor environments. In terms of the visitor experience, it was assumed that there were fundamental differences in what sort of experiences a visitor had at the different institutions. An aquarium was assumed by the researcher to rank highly in sensory experiences, while the art museum and nature and science museum a bit less so. In terms of informational experiences, the Denver Museum of Nature and Science was assumed by the researcher to have a more information-rich environment, while the art museum and aquarium were assumed to have less text and informational detail in their exhibits. However, there were not any value judgments made about which types of experiences were better.

Table 1: Correlational matrix of key variables

<u>Variable</u>	<u>Sat</u>	<u>NFC</u>	<u>NSE</u>	<u>Info Reas</u>	<u>Sen Reas</u>	<u>Info Opp</u>	<u>Sen Opp</u>
Sat	---						
NFC	.232*	[.7490]					
NSE	.304*	.428*	[.7162]				
Info Reas	.426*	.246*	.311	[.8486]			
Sen Reas	.391*	.254*	.375	.347	[.5090]		
Info Opp	.410*	.055	.163	.312	.182	[.7196]	
<u>Sen Opp</u>	<u>.539*</u>	<u>.203*</u>	<u>.289</u>	<u>.305</u>	<u>.350</u>	<u>.501</u>	<u>[.6841]</u>
Mean	6.08	5.79	6.34	5.82	6.06	5.51	5.91
SD	1.03	.93	.67	1.15	.96	1.10	.99
N	449	431	429	441	437	446	441

NOTE: Cronbach alpha values for each scale are reported in brackets. The satisfaction measure was a single item so there was no Cronbach alpha reported.

Chapter IV

This section is divided into four main categories. The first category describes the profile of the visitors included in the survey. Secondly, the results of the hypothesis testing are reported. See Appendix D for all reliability and validity information for the subscales used in the present study. Next, major differences across the three institutions are highlighted, and the results of ancillary analyses are also discussed. Since the ancillary analyses do not pertain to the hypotheses, but do relate to the overall visitor experience, the results are included in an appendix (see Appendix E). A correlational matrix (see Table 1) was included for the dependent variable of satisfaction as well as the six key variables. Means and standard deviations are reported.

Profile of Visitors

Of those sampled, roughly half of visitors were female (54.6%) and half were male (45.4%) this difference was not significant. No efforts were made to balance the gender distribution; random sampling methods were utilized. There was a slight difference in the gender distribution when comparing the three institutions, although this difference was not significant.

Besides gender, other visitor characteristics were recorded and provided a description of the visitors surveyed. Level of education of the sample consisted of almost two-thirds (61.7%) having a Bachelor's degree or higher, and more than one-quarter (25.6%) had a Master's degree or higher. A comparison of level of education was made

across the three institutions, but there was no significant difference; visitors at one institution did not vary in level of education from visitors at the other institutions.

Who accompanied the visitor was examined, and visitors could select more than one category for this item. People were most likely to be visiting with either one other adult (58.7%) or with two or more adults (22.0%). A little over one in ten people visited alone (13.8%) or with one or more children (12.9%). Very few of those surveyed (4.0%) were there with a tour group. Who someone was visiting with did not significantly differ between the three institutions.

At each institution the item that asked about visitation varied to reflect visitation to the respective type of institution (see Appendices A & B). At DAM it asked about art museum visitation, at the DMNS it asked about museums having to do with nature or science, and at OJA the item asked about zoo and aquarium visitation. Collapsing across the institutions, participants were most likely to visit 3 or more times per year (39.8%), followed by 1 to 2 times (34.7%), then less than once per year (25.5%). There was a significant difference between institutions regarding how often visitors attended similar institutions, $\chi^2(4, N = 447) = 20.075, p < .001$ (see Table 2). The art museum sample indicated visiting similar institutions much more frequently than the DMNS and aquarium visitors. Over 4 out of 5 (81.4%) of the art museum visitors frequented art museums one or more times per year, a higher percentage than the aquarium (73.3%) or DMNS (68.7%) groups visited similar institutions.

Another variable examined was how far away from the institution a person lived (see Table 3). Almost one in three (30.5%) lived more than 120 miles away, but over 2 out of 5 visitors (43.1%) lived within 25 miles of the institution. Most visitors lived

Table 2: Frequency of Visitation, by Institution

<u>Visits per Year</u>	<u>All Visitors</u>	<u>DAM</u>	<u>DMNS</u>	<u>OJA</u>
Less than once	114	28	46	40
1 to 2 times	155	43	47	65
<u>3 or more</u>	<u>178</u>	<u>79</u>	<u>54</u>	<u>45</u>
<u>N</u>	447	150	147	150

All Visitors: $\chi^2 (2, N = 447) = 14.107, p < .01$

Comparing 3 Institutions: $\chi^2 (4, N = 447) = 20.075, p < .001$

Table 3: Percentages of How Far Away Live from Institution, by Institution

<u>How Far Away</u>	<u>All Visitors</u>	<u>DAM</u>	<u>DMNS</u>	<u>OJA</u>
0-10 miles	93	42	23	28
11-25 miles	99	19	41	39
26-60 miles	69	27	19	23
61-120 miles	49	13	15	21
<u>120+ miles</u>	<u>136</u>	<u>47</u>	<u>50</u>	<u>39</u>
<u>N</u>	446	148	148	150

All Visitors: $\chi^2 (4, N = 446) = 48.484, p < .001$

Comparing 3 Institutions: $\chi^2 (8, N = 446) = 20.193, p < .05$

relatively close to or far from the institution they were visiting. There was a significant difference between the three institutions in how far away someone lived, $\chi^2 (8, N = 446) = 20.193, p < .05$ (see Table 3). The DAM had the highest percentage of visitors living within 10 miles of the institution.

Visitors were also asked whether or not they were members of the institution they were visiting. Overall, almost 1 in 4 (23.4%) were members of the institution they were visiting. Equal percentages (26.4%) of visitors were members of the Denver Art Museum and the Denver Museum of Nature and Science, while fewer than 1 in 5 (17.6%) were members of the Ocean Journey Aquarium. These differences between the institutions were not significant.

Overall, more than half (54.4%) of the visitors had been to the institution previously. When comparing by type of institution, there was a significant difference between whether someone had previously visited the institution, $\chi^2 (2, N = 450) = 50.120, p < .001$. People were much more likely to have previously visited the Denver Museum of Nature and Science (75.3%) than the Denver Art Museum (53.3%) or the Ocean Journey Aquarium (34.7%). Regarding length of stay, almost every visitor (97.1%) had been in the institution more than an hour, and there was no significant difference between the three institutions on this measure. Almost everyone (96.0%) had visited more than one exhibit. While these three questions were used in the screening process, the data were recorded for each individual visitor.

As in any study that involved collecting data from the general public, not every person who was approached was either willing to or able to participate. A total of 750 visitors were approached and categorized as one of the following: participant, refusal,

ineligible, or incomplete. Besides participants, there were the “refusals” or those who were approached and asked to participate but declined. Visitors who were willing to participate but did not meet predetermined requirements were referred to as “ineligibles.” There were a few visitors who started filling out the survey but did not complete it, referred to as “incompletes.”

Refusals

As was stressed to visitors in the Participant Information Sheet (see Appendix C), filling out a survey was voluntary. Not only was participation voluntary, but the researchers also made sure that the visitors did not feel badgered or pressured when asked to participate. This was done out of respect for both the visitors and the institutions that allowed data collection for this project. While detailed information could not be gathered on the refusal group, some data were recorded on those who refused to fill out a survey. This was done to see if the refusal group was any different from the group that did fill out surveys. For each refusal, the researcher recorded which institution they were visiting, their gender, estimated age, and reason for refusal, if given.

Almost 2 out of 3 (66.5%) of those approached did fill out a survey. Out of the 750 visitors approached to participate, 251 people refused to fill out a survey. This resulted in a refusal rate of 33.5%, relatively low considering that participation in the present study involved the visitor filling out a ten-minute survey. This refusal rate was comparable to the refusal rate of 32.6% for a previous study conducted at the Denver Museum of Nature and Science (Yalowitz & Loomis, 1999). A different study conducted at the Ocean Journey Aquarium yielded a refusal rate of 32.4% (Yalowitz & Loomis,

2000). Both of these previous studies involved visitors filling out a survey on their own, making refusal rates comparable to the current study.

The likelihood of receiving a refusal was not consistent across the three institutions. People were more likely to refuse at the Denver Museum of Nature and Science (42.7%) than at the Denver Art Museum (36.7%) or the Ocean Journey Aquarium (25.7%). This difference was significant, $\chi^2 (2, N = 251) = 21.713, p < .001$.

Ineligibles and Incompletes

Of those approached to participate, a total of 42 visitors were ineligible as a result of not meeting the participation criteria explained previously. This constituted 5.6% of the 750 visitors asked to participate.

In addition to people who were ineligible or refused to participate, there were a few visitors who initially agreed and started to fill in a survey but did not complete it. There were a total of seven people who started but did not finish a survey. Six of these people were at the art museum and one person was at the DMNS.

Hypothesis Testing

This section addresses the study's four hypotheses. As mentioned, the model as well as specific assumptions about the key variables drove the hypotheses. Examining how the variables interacted with each other was a valuable part of the analysis, since there was little previous research to specifically determine how the variables might interact.

Hypothesis 1

Hypothesis 1, that visitor and visit variables would significantly predict satisfaction, and interaction effects would add a significant amount of variance explained,

was tested using a Stepwise Multiple Regression with the six key variables in the model. For the first analysis, the six key variables were entered using a Multiple Stepwise Regression, and satisfaction regressed on only four of the variables: Sensory Opportunities, Informational Reasons for Visiting, Informational Opportunities, and Sensory Reasons for Visiting (see Table 4). These four variables accounted for only 38.7% of the variance in satisfaction, and did significantly predict satisfaction, $F(4, 391) = 61.662, p < .001$. In reporting variance accounted for, it is important to note that little or no previous research has been conducted that examined the effect of these variables on satisfaction. Therefore, variance accounted for of less than 50 percent is acceptable and can even be considered to be good. Further research and understanding of which variables statistically predict visitor satisfaction will yield higher accounted variances.

The second analysis performed to test Hypothesis 1 involved satisfaction regressed on the six key variables and the 14 two-way interactions. When all of the 14 possible two-way interactions were entered, this accounted for an additional 3.2% of the variance of satisfaction (for a total of 41.9%), supporting Hypothesis 1. However, only three of the interaction terms were added to the equation because they explained additional variance in satisfaction. These were Informational Reasons for Visiting x Informational Opportunities, Informational Reasons for Visiting x Sensory Reasons for Visiting, and Need For Sensory Experience x Informational Reasons for Visiting (see Table 4). Satisfaction is regressed on these seven terms (4 main effects & 3 interactions), $F(7, 388) = 39.899, p < .001$. See Table 4 for a report of significant main effects and two-way interaction terms for these analyses.

Table 4: Beta values and significance of key variables and two-way interactions entered into stepwise regression for Hypothesis 1

<u>Main Effects</u>	<u>R-Square</u>	<u>R-Square Change</u>	<u>Beta Value</u>
Sensory Opportunities	.290	.290	.355***
Informational Reasons for Visiting	.350	.060	.155***
Informational Opportunities	.368	.018	.160**
Sensory Reasons for Visiting	.381	.013	.089*
<u>Interactions</u>			
Info. Opp. x Info. Reas.	.396	.015	-.129**
Info. Reas. x Sens. Reas.	.401	.005	-.150**
NSE x Info. Reas.	.408	.007	.114*

* $p < .05$

** $p < .01$

*** $p < .01$

NOTE: $N = 395$

The negative Betas for two of the interactions warranted further investigation to understand the relationship between the variables in the interaction and satisfaction. For the interaction of Informational Reasons for Visiting x Informational Opportunities and satisfaction, the moderating variable of Informational Reasons for Visiting was divided by median split. Therefore, there was a High Informational Reasons for Visiting group and a Low Informational Reasons for Visiting group. Then, the correlation between Informational Opportunities and Satisfaction was computed for each of the groups. The correlation for the High Informational Reasons for Visiting group ($r = .262, p < .001$) was lower than for the Low Informational Reasons for Visiting group ($r = .535, p < .001$). In computing a Fisher's Z-score, there was a significant difference between the two correlations ($z = 2.48, p < .05$). People who were visiting for lower informational reasons were more satisfied with increased informational opportunities than the high informational reasons group.

The second negative interaction in Hypothesis 1 investigated was for Informational Reasons for Visiting x Sensory Reasons for Visiting. In this case, Informational Reasons for Visiting was again separated into high and low groups. Correlations for these two groups were computed between Sensory Reasons for Visiting and Satisfaction. The correlation for the High Informational Reasons for Visiting group ($r = .129, p < .05$) was lower than that for the Low Informational Reasons for Visiting group ($r = .539, p < .001$). Again, a Fisher's Z ($z = 3.73, p < .001$) revealed a significant difference between the correlations. People with lower Informational Reasons for Visiting were significantly more satisfied the higher their Sensory Reasons for Visiting.

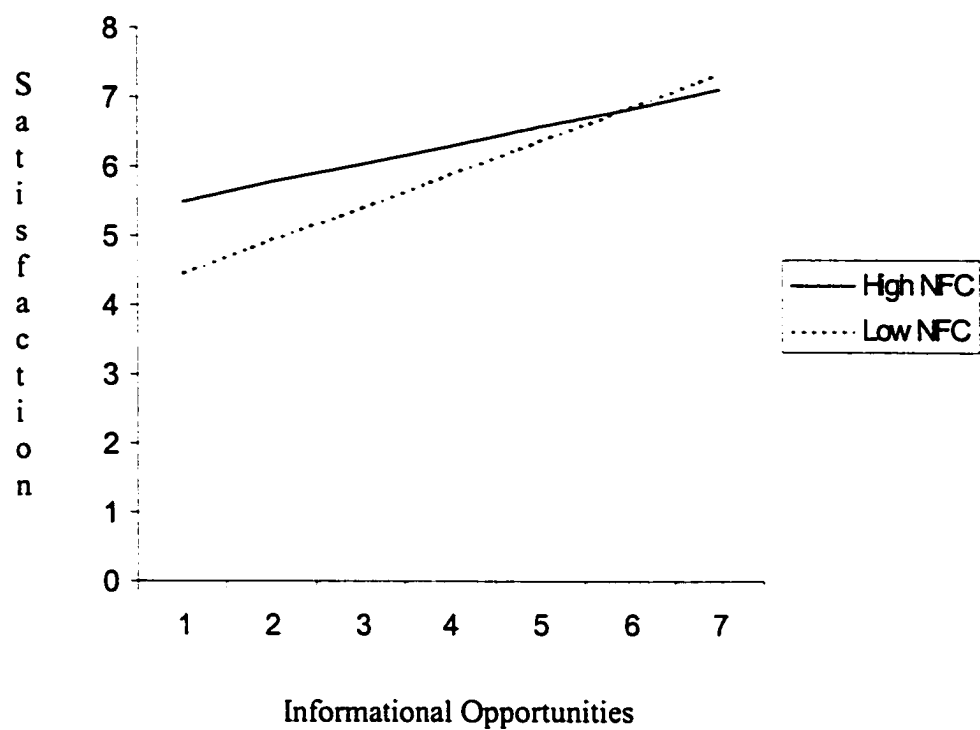
Hypothesis 2

To test the first part of Hypothesis 2, that the interaction of NFC and Informational Opportunities will be positive and significantly predict satisfaction, a Stepwise Multiple Regression was used. Satisfaction is regressed on the main effects for Informational Opportunities ($B = .416, p < .001$) and NFC ($B = .202, p < .001$), and the interaction term for NFC x Informational Opportunities ($B = -.133, p < .01$). The two main effects and the interaction term accounted for 23.9% of the variance, and significantly predicted satisfaction, $F(3, 422) = 45.607, p < .001$.

Since a negative Beta was not predicted based upon the hypothesis, more analyses were done to determine how NFC and Informational Opportunities were interacting to determine satisfaction. First, the interaction was plotted (see Figure 2), and this was done by dividing visitors into a high NFC and low NFC group. A median split was employed, where visitors with the top 50 percent of highest NFC scores were the high NFC group, and the lowest 50 percent of NFC scores were the low NFC group. This plot revealed that at the lower informational opportunities the high NFC group was more satisfied. However, at the highest levels of informational opportunities the low and high NFC groups were almost identical. Also, the plot showed that the interaction of the two variables was more consistent for the high NFC group, while the steeper slope of the low NFC group indicated a stronger interaction effect on satisfaction for the low NFC group.

Next, the correlation between Informational Opportunities and Satisfaction was examined for each NFC group. For the high NFC group, the correlation was significant ($r = .370, p < .001$). There was also a significant correlation for the low NFC group ($r = .492, p < .001$). This was conducted to see if the interaction of the two variables was

Figure 2: Plot of interaction of NFC x Informational Opportunities on Satisfaction



different based on NFC. However, the difference between the two correlations was not significant. Therefore, NFC did not have any effect on how Informational Opportunities influences Satisfaction.

The second part of Hypothesis 2 relating to sensory aspects of the visit tested the effects of NSE and Sensory Opportunities on satisfaction. Satisfaction is regressed on the main effects for both Sensory Opportunities ($B = .499, p < .001$) and NSE ($B = .168, p < .001$). However, the interaction term was not entered into the equation. Therefore, only the two main effects were entered into the equation, accounted for 32.2% of the variance in satisfaction, and significantly predicted satisfaction, $F(2, 417) = 100.709, p < .001$.

Hypothesis 3

For Hypothesis 3, that informational variables would account for more variance in satisfaction at the Denver Museum of Nature and Science, and sensory variables would account for more variance in satisfaction at the Denver Art Museum and the Ocean Journey Aquarium, was tested using a Stepwise Multiple Regression. Satisfaction is regressed on six key variables and the 14 two-way interaction effects. However, since this hypothesis was examining institutional differences, an analysis was performed for each institution by itself to determine whether the key variables and interactions differentially predicted satisfaction at different institutions.

There were differences in which variables best predicted satisfaction at the different institutions (see Tables 5, 6, & 7). The Denver Art Museum and the Ocean Journey Aquarium yielded more similar results to each other, while results were very different for the DMNS. For the DAM (see Table 5), satisfaction regressed on four key variables and accounted for 44.0% of the variance in satisfaction, and significantly

Table 5: Beta values and significance of key variables and two-way interactions entered into stepwise regression for Hypothesis 3, Denver Art Museum

<u>Main Effects</u>	<u>R-Square</u>	<u>R-Square Change</u>	<u>Beta Value</u>
Sensory Opportunities	.280	.280	.252**
Informational Reasons for Visiting	.400	.120	.246***
Sensory Reasons for Visiting	.420	.020	.080
Informational Opportunities	.440	.020	.171*
<u>Interactions</u>			
Info. Reas. x Sens. Reas.	.522	.082	-.422***
NFC x Info. Reas	.545	.023	.155
Info. Opp. x Info. Reas.	.561	.016	-.183**
NFC x Info. Opp.	.573	.012	.161*

* $p < .05$

** $p < .01$

*** $p < .01$

NOTE: $N = 131$

Table 6: Beta values and significance of key variables entered into stepwise regression for Hypothesis 3, Denver Museum of Nature and Science

<u>Main Effects</u>	<u>R-Square</u>	<u>R-Square Change</u>	<u>Beta Value</u>
Sensory Opportunities	.204	.204	.332***
Informational Opportunities	.243	.039	.247**

** $p < .01$

*** $p < .01$

NOTE: $N = 127$

Table 7: Beta values and significance of key variables and two-way interactions entered into stepwise regression for Hypothesis 3, Ocean Journey Aquarium

<u>Main Effect</u>	<u>R-Square</u>	<u>R-Square Change</u>	<u>Beta Value</u>
Sensory Opportunities	.383	.383	.459***
Informational Reasons for Visiting	.459	.076	.191**
Informational Opportunities	.479	.020	.159*
<u>Interactions</u>			
Info. Opp. x Info. Reas.	.497	.018	-.233**
NFC x NSE	.513	.016	.218*
NSE x Sens. Reas.	.538	.025	-.480***
NSE x Info. Reas.	.560	.022	.369**

* $p < .05$

** $p < .01$

*** $p < .01$

NOTE: $N = 135$

predicted satisfaction, $F(4, 131) = 26.764, p < .001$. When satisfaction is regressed on the four key variables and four interaction terms, the independent variables accounted for 57.3% of the variance in satisfaction, and yielded a significant difference, $F(8, 123) = 22.963, p < .001$. The interaction terms explained an additional 13.3%, much more than for the overall sample.

For OJA, satisfaction was first regressed on three key variables to test the first part of Hypothesis 3. These three variables accounted for 47.9% of the variance in satisfaction and yielded a significant difference, $F(3, 135) = 42.399, p < .001$. When satisfaction is regressed on the three key variables and four interaction terms, only one of the interaction terms was the same as in the DAM sample (see Table 7). They were entered into the equation and accounted for 56.0% of the variance in satisfaction, and also significantly predicted satisfaction, $F(7, 128) = 25.555, p < .001$. The interaction terms added an additional 8.1% of explained variance in satisfaction. While the key variables (with the exception of Sensory Reasons for Visiting) were the same and in the same order, the interaction effects were quite different between the two analyses, with more informational main effects and interaction terms at the Denver Art Museum.

Meanwhile, results for the DMNS were very different from the first two analyses. Satisfaction is regressed on by only two of the key variables (see Table 6). Sensory Opportunities ($B = .332, p < .001$) and Informational Opportunities ($B = .247, p < .01$) accounted for 25.5% of the variance in satisfaction, and yielded a significant difference in satisfaction, $F(2, 125) = 21.367, p < .001$.

Hypothesis 4

As stated previously, there were five output measures recorded: likelihood of recommending that friends and family visit, willingness to become a member, likelihood of a return visit, willingness to provide a quote for advertising, and institutional caring. These measures were some indication of actions either as a result of satisfaction or behaviors visitors said they would do, after the visit were recorded.

Recommending a visit. People who were more satisfied were significantly more likely to recommend to friends and family that they visit the institution ($r = .465, p < .001$). In examining this relationship for each institution, all of the correlations were significant. The correlation for the Denver Museum of Nature and Science ($r = .347, p < .001$) and the Denver Art Museum ($r = .424, p < .001$) were more similar, while the relationship was stronger for the Ocean Journey Aquarium ($r = .611, p < .001$).

Becoming a member. There was not a significant difference in comparing high (6 or 7 on overall satisfaction) to low (1 to 5 on overall satisfaction) ratings on satisfaction. In other words, of those who were not already members, whether someone was high or low in overall satisfaction did not significantly affect wanting to become a member. In looking at each institution by itself, there was no significant difference in satisfaction on who wanted to become a member.

Return visit. Likelihood of a return visit was significantly affected by how satisfied a visitor was, $F(3, 414) = 6.079, p < .001$ (see Table 8). The more satisfied a visitor was the earlier they said they intended to return. In fact, across the four categories, there was a drop in satisfaction for each of the categories, as the time within which a visitor said they would return increased. In looking at specific institutions, however, the

Table 8: Likelihood of a Return Visit, by Satisfaction Ratings, by Institution

<u>Satisfaction</u>	<u>Within 1 mo.</u>	<u>Within 6 mos.</u>	<u>Within 1 yr.</u>	<u>> 1 Year</u>
All Visitors	6.59	6.11	6.06	5.87
DAM	6.62	6.10	6.23	5.97
DMNS	6.70	6.13	6.02	5.77
OJA	6.25	6.12	5.97	5.89

ALL VISITORS: $F(3, 414) = 6.079, p < .001$

DAM: $F(3, 134) = 2.320, p = .078$

DMNS: $F(3, 137) = 3.415, p < .05$

OJA: $F(3, 135) = 0.563, p = .640$

only significance difference in this measure was the Denver Museum of Nature and Science, $F(3, 137) = 3.415, p < .05$ (see Table 8).

Providing a quote. The outcome measure of providing a quote was used as an indicator of satisfaction, since it was hypothesized that those who were more satisfied would be more likely to provide a quote than those who were not willing to provide a quote. This was partly because people who were more satisfied would have more positive things to say about their visit, and partly as a result of being more willing to take the time to write something down. When looking at high (6 or 7 overall satisfaction rating) versus low (1 to 5 overall satisfaction rating) satisfaction groups, there was a significant difference in satisfaction ratings between these two groups, $\chi^2(1, N = 449) = 6.250, p < .05$. Of those with a high rating of overall satisfaction, 24.0% provided a quote, while 11.6% of visitors with a low rating of overall satisfaction provided a quote. When comparing visitors specifically by institution, there were no significant differences between the two groups, although the comparison for each institution was approaching significance.

Institutional caring. Another visit variable that was included in the survey was a visitor's perception of whether or not the institution cared about them. There were five items taken from Eisenberger's (1999) Visitor Social Satisfaction Survey that had a visitor rate things such as whether the institution cared about their opinion or tried to make their experience as interesting as possible. For statistical analyses, an average score on these five items was computed for each visitor and this was the Institutional caring variable. There was a significant relationship between satisfaction and Institutional caring ($r = .512, p < .001$). The more satisfied a person was, the more they perceived the

institution as caring about them. This trend was consistent for each individual institution as well.

Institutional Differences for Visitors

While there were some differences in the three institutions in analyses, the majority of comparison between the institutions yielded no differences. There was not a significant difference in satisfaction, indicating that if there were differences in what constituted a satisfying experience at each institution this did not raise or lower the average level of satisfaction reported. Also, there were no significant differences in NFC or NSE across the different institutions. Therefore, the average visitor at one of the institutions seemed no more inclined to informational or sensory experiences than visitors at the other institutions.

Lastly, and of great importance to the institutions where data collection took place, there were no significant differences on any of the output measures based on which institution a person was visiting. Whether someone was willing to provide a quote, whether they were likely to recommend to friends and family that they visit, how soon someone was likely to return, and whether they were willing to become a member had little or nothing to do with where they were visiting. Therefore, any differences in these measures were due to other factors of either the individual or the visit itself, and not the institution.

In discussing differences, some of the results reported here are repeated in subsequent sections of the results section. This is done for consistency's sake, and to report the findings in a consistent manner in later sections.

Satisfaction and Previous Visitation

There was a significant difference in the overall satisfaction item based on whether or not someone had visited the institution before, $t(409) = 2.723, p < .01$. People who had visited previously were more satisfied ($M = 6.200, SD = 0.97$) than those who had not previously visited ($M = 5.93, SD = 1.09$). While visitors who had previously visited the institution were significantly more satisfied than those who were first time visitors, this was not the case at all three institutions. Return visitors ($M = 6.36, SD = .68$) were significantly more satisfied than first time visitors ($M = 5.93, SD = 1.17$) at the Denver Art Museum, $t(148) = 2.817, p < .01$. Similarly, at the Ocean Journey Aquarium return visitors ($M = 6.27, SD = .82$) were significantly more satisfied than first time visitors ($M = 5.80, SD = 1.13$), $t(147) = 2.614, p < .05$. For the DMNS sample the difference was not significant, and the return visitors were actually slightly less satisfied ($M = 6.05, SD = 1.16$) than first time visitors ($M = 6.27, SD = .73$).

Open-ended satisfaction item. There was a difference in the open-ended question about satisfaction. A structured coding method was used to analyze responses to this item, and all responses were coded as “Informational,” “Sensory,” or “Other answer.” This was done to examine the relationship of the responses to this question to the key variables in the study. Also, three raters independently coded these responses, then discussed any discrepancy in the coding of individual items. A very conservative coding method was employed, and assumptions were not made regarding the reasoning for any answer unless it specifically related to informational or sensory experiences. For example, one person in the nature and science museum had their answer coded as informational because they answered: “Recent discoveries in space – very informative, learned a lot.” An example of

a sensory coded response from the aquarium was “The Depths of the Pacific display. It was visually pleasing.”

Not everyone answered this question, but the large majority, or 367 of the 450 participants (81.6%), wrote down a response for this particular item. When examining the responses (see Table 9), the majority (59.9%) of the responses were not categorized as dealing with either the informational or sensory part of the visit, but as “Other answer,” meaning an answer that was neither informational nor sensory in nature. However, there were more than twice as many references to sensory (27.8%) than informational (12.3%) experiences.

There was a significant difference when looking at the type of answers given in comparing the three institutions, $\chi^2 (4, N = 367) = 39.177, p < .001$ (see Table 9). In fact, more than half of the respondents at the aquarium (55.9%) gave an informational or sensory answer, although this high percentage resulted from almost half (47.1%) of aquarium visitors mentioning sensory experiences. Very few mentioned informational experiences. At the art museum and the nature and science museum, respondents listed fewer informational or sensory reasons (39.0% and 28.0%, respectively).

When examining responses that were informational or sensory in nature (see Table 10), there was a significant difference among institutions, $\chi^2 (2, N = 147) = 22.637, p < .001$. Informational and sensory responses were not split evenly at the aquarium, as almost 9 out of 10 (89.1%) responses were for sensory reasons. The nature and science museum was the only institution where people mentioned more informational (54.5%) than sensory experiences (45.5%) when looking at just those two types of responses.

Table 9: Open-Ended Satisfaction Response Percentages, by Type of Institution

<u>Type of Item</u>	<u>All Visitors</u>	<u>DAM</u>	<u>DMNS</u>	<u>OJA</u>
Informational	45	20	18	7
Sensory	102	30	15	57
<u>Answer</u>	<u>220</u>	<u>78</u>	<u>85</u>	<u>57</u>
<u>N</u>	367	128	118	121

All Visitors: $\chi^2 (2, N = 367) = 130.240, p < .001$

Comparing 3 Institutions: $\chi^2 (4, N = 367) = 39.177, p < .001$

Table 10: Open-ended satisfaction, informational and sensory response percentages, by institution

<u>Type of Item</u>	<u>All Visitors</u>	<u>DAM</u>	<u>DMNS</u>	<u>OJA</u>
Informational	45	20	18	7
<u>Sensory</u>	<u>102</u>	<u>30</u>	<u>15</u>	<u>57</u>
<u>N</u>	147	50	33	64

All Visitors: $\chi^2 (1, N = 147) = 22.102, p < .001$

Comparing 3 Institutions: $\chi^2 (2, N = 147) = 22.637, p < .001$

DAM: $\chi^2 (1, N = 50) = 2.000, p = .157$

DMNS: $\chi^2 (1, N = 33) = 0.273, p = .602$

OJA: $\chi^2 (1, N = 64) = 39.063, p < .001$

Informational and Sensory Reasons for Visiting

Participants were asked to rate their agreement with various statements that related to reasons for visiting. Two of the four statements related to sensory experiences (have vivid sensory experiences, see visually interesting exhibits), and the other two statements related to informational reasons (learn new things, expand my knowledge) for visiting. The average rating for the sensory items ($\underline{M} = 6.06$, $\underline{SD} = 0.96$) was higher than the informational items ($\underline{M} = 5.82$, $\underline{SD} = 1.15$), and there was a significant difference in comparing the two means for each person, $t(436) = -4.229$, $p < .001$. People consistently reported sensory experiences as a more likely reason for visiting that particular institution than informational.

There were significant differences in these two specific measures across institutions. When examining informational reasons, there was a significant difference for this measure in comparing the three institutions, $F(2, 438) = 10.209$, $p < .001$. People were most likely to be visiting for informational reasons at DMNS ($\underline{M} = 6.15$, $\underline{SD} = .95$), followed by DAM ($\underline{M} = 5.74$, $\underline{SD} = 1.15$), and finally at OJA ($\underline{M} = 5.57$, $\underline{SD} = 1.26$). Meanwhile, there was also a significant difference between the three institutions when looking at sensory reasons, $F(2, 434) = 3.590$, $p < .05$. This time, the highest rating for sensory reasons existed for the DAM ($\underline{M} = 6.20$, $\underline{SD} = 1.01$), followed by OJA ($\underline{M} = 6.08$, $\underline{SD} = .97$), then DMNS ($\underline{M} = 5.90$, $\underline{SD} = .89$).

An additional comparison can be made at the individual institutional level. When comparing sensory and informational reasons by institution, there were significant differences at all three institutions in whether a person was visiting for informational and sensory reasons. At DAM, a visitor was significantly more likely to be visiting for

sensory reasons, $t(144) = -4.613, p < .001$. Likewise, Ocean Journey Aquarium visitors favored visiting for sensory reasons, $t(147) = -4.913, p < .001$. However, just the opposite was true for the Denver Museum of Nature and Science. Their visitors were significantly more likely to be visiting for informational reasons, $t(143) = 2.683, p < .01$.

Informational Reasons for Visiting and Visiting Similar Institutions

When looking at how often someone visits similar institutions and its effect on informational reasons for visiting, there was not a significant difference (see Table 11). However, there were significant differences at specific institutions. At the Denver Art Museum, there was a significant difference, meaning that those who more often visited similar institutions were more likely to be visiting for informational reasons, $F(2, 143) = 4.335, p < .05$ (see Table 11). The same was also true at the Denver Museum of Nature and Science, $F(2, 141) = 3.761, p < .05$ (see Table 11). There was no significant difference at the Ocean Journey Aquarium, in that visiting aquariums or zoos more frequently did not affect whether or not someone was visiting to learn new things or expand their knowledge.

Sensory Reasons for Visiting and Visiting Similar Institutions

Looking at how often someone visits similar institutions and its effect on Sensory Reasons for Visiting did not yield an overall significant difference (see Table 12). However, there was a significant difference when looking just at Denver Art Museum visitors, $F(2, 142) = 3.352, p < .05$. The more often someone visited art museums, the more likely they were to visit for sensory reasons.

Table 11: Informational Reasons for Visiting by Visiting Similar Institutions, by Institution

<u>Visits per Year</u>	<u>All Visitors</u>	<u>DAM</u>	<u>DMNS</u>	<u>OJA</u>
Less than once	5.66	5.44	5.84	5.59
1 to 2 times	5.78	5.45	6.21	5.69
<u>3 or more</u>	<u>5.95</u>	<u>6.00</u>	<u>6.35</u>	<u>5.37</u>
Average	5.82	5.74	6.15	5.57

All Visitors: $F(2, 435) = 2.307, p = .101$

DAM: $F(2, 143) = 4.335, p < .05$

DMNS: $F(2, 141) = 3.761, p < .05$

OJA: $F(2, 145) = .836, p = .435$

Table 12: Sensory Reasons for Visiting by Frequency of Visitation

<u>Visits per Year</u>	<u>All Visitors</u>	<u>DAM</u>	<u>DMNS</u>	<u>OJA</u>
Less than once	5.88	5.77	5.93	5.90
1 to 2 times	6.11	6.20	5.90	6.20
<u>3 or more</u>	<u>6.14</u>	<u>6.35</u>	<u>5.90</u>	<u>6.06</u>
Average	6.06	6.20	5.91	6.08

All Visitors: $F(2, 432) = 2.736, p = .066$

DAM: $F(2, 142) = 3.352, p < .05$

DMNS: $F(2, 139) = .019, p = .981$

OJA: $F(2, 145) = 1.199, p = .304$

Informational and Sensory Opportunities

There was a significant difference between the informational opportunities reported by the visitors at the three different institutions, $F(2, 443) = 17.107, p < .001$. Visitors were more likely to say that there were more informational opportunities ($M = 5.93, SD = .85$) at the Denver Museum of Nature and Science, then about equally for the Denver Art Museum ($M = 5.32, SD = 1.12$) and Ocean Journey Aquarium ($M = 5.28, SD = 1.18$). When comparing informational and sensory opportunities by each institution, only two of the comparisons were significant. At the Denver Art Museum, visitors were significantly more likely to say there were more sensory opportunities ($M = 5.91, SD = 1.01$) than informational ($M = 5.32, SD = 1.12$) opportunities, $t(148) = -6.90, p < .001$. Visitors to the Ocean Journey Aquarium also reported significantly more sensory ($M = 5.83, SD = .96$) than informational opportunities ($M = 5.28, SD = 1.18$), $t(146) = -5.649, p < .001$. However, the difference between perceived informational opportunities ($M = 5.93, SD = .85$) and sensory opportunities ($M = 6.02, SD = .96$) at the Denver Museum of Nature and Science was not significant.

Chapter V

Following a brief summary of the study's most important findings, four main areas are covered. First, the hypotheses findings are discussed, followed by results from ancillary analyses that may be of interest to the reader. Then, implications for researchers in visitor institutions are reviewed. Finally, general conclusions from the present study are discussed.

Relevant to the discussion is the model for the present study (see Figure 1), which explains the relationship between the key variables and satisfaction. Visit variables (Informational and Sensory Opportunities) and visitor variables (NFC, NSE, Informational Reasons for Visiting, Sensory Reasons for Visiting) as they relate to satisfaction will be discussed. Additionally, the intention and other outcome variables will be addressed as consequences of visitor satisfaction.

Summary of Results

The purpose of the present study was to determine whether visitor or visit variables are the best predictors of satisfaction, whether the predictive power of these variables would differ in different types of visitor institutions, and if higher ratings of satisfaction would result in specific visitor outcomes after the visit.

Hypothesis testing revealed that while both visitor and visit variables were important in satisfaction, the visit variable of sensory opportunities accounted for the most variance in satisfaction. Also, the key variables were much more predictive of satisfaction than the two-way interactions, which accounted for very little additional

variance. When looking at the sensory and informational variables, both were important in predicting satisfaction, although which specific variables were important depended on the institution. At both the art museum and aquarium, multiple main effects as well as interactions predicted satisfaction, while at the nature and science museum only the informational and sensory opportunities variables accounted for original variance in satisfaction. Also, interactions effects accounted for more new variance at DAM than at OJA, while they accounted for no new variance at DMSN. Four of the five outcome or intention variables were significantly affected by satisfaction. Higher degrees of satisfaction resulted in increased likelihood of returning, telling friends and family to visit, providing a quote, and increased perception of institutional caring.

Hypothesis Testing Discussion

Hypothesis 1, that visitor and visit variables would significantly predict satisfaction, and interaction effects would add a significant amount of variance explained, was tested in two parts. First, the main effects of the six key variables were entered, then the interaction terms were examined for additional variance accounted for. In the first part, the two personality measures of NFC and NSE did not account for any independent variance. However, a personality variable like *wanting to get a lot of information* or *enjoying sensory experiences* may not necessarily affect satisfaction directly.

Theoretically, if satisfaction is thought of as a person-situation interaction, it is more likely that a personality variable interacts with a specific situational variable to determine satisfaction (see Hypothesis 2). Therefore, when examining the effects of personality on measures such as satisfaction, it is important to look at situational variables to explain the effect of personality.

The best predictor of overall satisfaction was the rating of the sensory opportunities available at the institution. This was a sensory rather than informational variable. The fact that a sensory variable was the most important is not surprising, considering that previous research has shown that experiencing objects has influenced satisfaction more than cognitive experiences (Pekarik et al., 1999). Objects are typically experienced with the senses. The present study supports previous research about what constitutes visitor satisfaction. The next variable entered was Informational Reasons for Visiting, which accounted for a smaller but significant amount of additional variance explained. The next two main effects added little, though significant, variance explained. The finding that sensory opportunities during a visit greatly affected satisfaction is important in understanding visitor satisfaction at museums and similar institutions. Further understanding which specific kinds of sensory opportunities in exhibits positively affect visitor satisfaction should lead to better visitor experiences.

The same trend towards sensory importance occurred with reasons for visiting, since sensory reasons for visiting ratings had higher ratings than informational reasons for visiting. Interestingly, though, Informational Reasons for Visiting accounted for more additional variance in satisfaction than did Sensory Reasons for Visiting. Therefore, informational variables are important in visitor satisfaction. This, however, is not a suggestion to substitute information in exhibits with sensory experiences. A better approach to further understanding these results would be to study how the informational and sensory aspects of the visit work together to increase satisfaction.

The second part of testing Hypothesis 1 yielded three interaction terms as adding a significant amount of additional variance in satisfaction explained. However, these

three interaction terms together accounted for only 2.7% of new variance. Therefore, any discussion of these interaction terms should be done with the understanding that the effect of these terms on satisfaction is minimal. Two of the three interaction terms accounted for less than one percent of additional variance. Also, two of the interaction terms were negative.

In testing the first part of Hypothesis 2, that the interaction of NFC and Informational Opportunities will be positive and significantly predict satisfaction, a negative Beta value was found for satisfaction regressed on the interaction term of NFC x Informational Opportunities. While significance was found for this negative Beta, upon testing the hypothesis using different methods there was not a significant difference. Upon examining the correlation between the high and low NFC groups on Informational Opportunities and satisfaction, there was not a significant difference. The negative Beta for the interaction was most likely caused by the steeper slope of the low NFC group. For the second part of Hypothesis 2, that the interaction of NSE and Sensory Opportunities will be positive and significantly predict satisfaction, there was no difference for the interaction term of NSE x Sensory Opportunities. Thus, the explanation for the first part of Hypothesis 2 seems viable, since the second part is parallel in theory to the first part, and no significant interaction was found for the NSE x Sensory Opportunities interaction term.

Hypothesis 3 states that informational variables will account for more variance in satisfaction at the Denver Museum of Nature and Science, and sensory variables would account for more variance in satisfaction at the Denver Art Museum and the Ocean Journey Aquarium. For Hypothesis 3, there were some differences in which variables and

interactions predicted satisfaction at the different institutions. For the Denver Art Museum and Ocean Journey Aquarium, satisfaction is regressed on roughly the same number of variables. For DAM, there were four key variables and four interaction terms, and for OJA there were three key variables and four interaction terms. The interaction terms accounted for a respectable amount of variance at DAM, and only a little less so for OJA. However, satisfaction is regressed on only two key variables and no interaction terms for the Denver Museum of Nature and Science. In fact, for DMNS the Sensory and Informational Opportunities main effects were entered.

It was puzzling as to why interaction terms revealed significant differences at the other two institutions but not at DMNS. The most obvious explanation for the institutional differences is that there was not as big of a difference in the sensory and informational variables at DMNS as there were at the other two institutions (see Appendix E). For example, there was not a significant difference for the open-ended satisfaction item at DMNS, and it was the only institution of the three that listed informational aspects as the more satisfying type of experience. The DMNS was also the only institution where visitors were more likely to visit for informational reasons. Meanwhile, OJA and DAM rated sensory reasons significantly higher. These differences at DMNS may have contributed to the observed differences for the interaction effects.

Additionally, while the DAM and the OJA were similar in terms of the number of variables entered, and for the key variables, the interaction terms were different. For DAM, there were more informational terms in the interactions, including NFC in two of them. However, for OJA, there was more of an equal split between sensory and informational terms, including NSE being present in three of the significant interaction

terms. Interestingly, for OJA the interaction terms that involved one informational and one sensory term were negative. The differences between the two institutions resulted in the cognitive factors being more influential in terms of interactions at DAM. Whether this was due to the kinds of experiences offered or self-selection in visiting particular institutions is important and might be interesting to study further. If the informational and sensory needs of visitors vary based on the institution, then providing those kinds of experiences would be important.

As indicated in previous research, satisfaction can modify attitudes and increase the intent to perform specific related behaviors (Oliver, 1980). Hypothesis 4 is that satisfaction will affect outcome variables such as likelihood of returning, and telling friends and family that they should visit. Specifically, outcomes on three intention variables (likeliness to return, likeliness to tell friends and family to visit, and willingness to become a member) as well as two behavioral outcomes (willingness to provide a quote and perception of institutional caring) were measured.

The more satisfied visitors were, the sooner they were likely to return. However, as would be expected, the distance someone lives from the institution related to how soon they would return. Also, the more satisfied a visitor was, the more likely they were to recommend to friends and family that they visit. Word-of-mouth has been shown to be an important factor in not only museums (Adams, 1988), but also for consumer marketing (Chakrapani, 1998). As a result, measuring overall satisfaction affects positive visitor behaviors and intentions. Not only does it shed light on a visitor's current attitude and analysis of a visitor experience, it suggests that future behaviors are more likely to occur with increased visitor satisfaction. While these were intentional and not behavioral

outcomes, the influence of satisfaction was significant and therefore warrants studying the actual behaviors. There was no effect of satisfaction on willingness to become a member. Perhaps this variable was too extreme for visitors even when they were satisfied. Likely, other variables affect willingness to become a member. It would be beneficial to understand exactly what contributes to wanting to join as a member of an institution. While measuring specific behaviors was not within the scope of the present study, future studies examining post-visit behaviors as they relate to satisfaction may be useful.

One outcome measure that looked at an actual behavior was whether or not the visitor was willing to provide a quote that could be used in promotion of the institution. Satisfied visitors were significantly more likely to provide a quote, which may be interpreted as being more likely to help out an institution if asked. Perhaps satisfaction relates to other helping behaviors such as volunteering or making financial contributions.

Another aspect of the visit in the present study that had a very strong relationship with satisfaction was the outcome variable of institutional caring. These items were developed by Eisenberger (1999) to measure a visitor's perception of how much they thought the institution cared about the well-being of visitors and their visit. The very strong relationship between satisfaction and Institutional caring can be thought of as a somewhat causal relationship. Since a person who is satisfied has typically had the kind of experience they expected or desired, it is reasonable to think that this person would see the institution as caring about their experience. If, however, the experience was not satisfying, a visitor might suggest that the institution did not care about them. Therefore, rather than thinking of Institutional caring as a good predictor of satisfaction, it is more

likely that satisfaction is a good predictor of perceived Institutional caring. This would be especially true of first-time visitors, since they would not necessarily have a good idea of whether the institution cared about them, previous to their visit. In showing the importance of this variable as it relates to satisfaction, Institutional caring was a better predictor, and accounted for more new variance than Informational Opportunities in the analysis of the three visit variables and their effect on satisfaction.

Relevant Results from Ancillary Analyses

In addition to a discussion of the results of hypothesis testing, there were also results from analyses ancillary to the hypotheses that will be of interest to the reader. The following section discusses differences between visitors at the three visitor institutions. Not included in the discussion is a summary of other analyses performed on the key variables that can be found in Appendix E.

Institutional Differences for Visitors

These three institutions' visitors were more similar than different, since the majority of the comparisons across the institutions did not yield significant differences. The demographic variables, outcome variables, and overall satisfaction were not significantly different. Therefore, in many regards, visitors to art museums, aquariums, and nature and science museums are very similar.

Satisfaction and previous visitation. The fact that return visitors were more satisfied than first time visitors at DAM and OJA was not surprising. However, return visitors to the DMNS were not significantly more satisfied than first time visitors. During data collection at DMNS, major renovations were underway and two favorite parts of the museum were closed: the planetarium, and the gem and mineral hall. Since these exhibits

were standards of the museum and frequently the favorite part of a person's visit, this adversely impacted those who had previously visited when they were open. Expectations, as discussed in the literature review (Oliver, 1980; Madrigal, 1995; Veenhoven, 1996), often strongly affect satisfaction. Visitor institutions that have a large proportion of repeat visitors should note that renovations that involve closing exhibits could adversely affect satisfaction.

Open-ended satisfaction question. Visitors gave both informational and sensory reasons as the most satisfying visitor experience. In the present study, visitors were generally much more likely to mention sensory than informational aspects of the visit in response to the open-ended satisfaction question. This supports findings of previous research that found cognitive aspects as the least likely mentioned type of satisfying visitor experiences (Pekarik et al., 1999). While the majority of responses did not deal with either of these topics, one in four visitors mentioned sensory aspects of the visit. Again, visitor institutions should note that satisfaction seemingly relies on sensory more than informational aspects of the visit.

Informational and sensory reasons for visiting. Many museum professionals may insist that people go to visitor institutions to learn, and in support of this notion visitors do state that they are there to learn. The fact that in general, visitors rated sensory reasons as more important than informational reasons for visiting, challenges the long-held assumptions that the average visitor goes to museums only to learn. Partly, this may result from the changing presentation styles that focus as much if not more on the presentation of information than on the information itself. More often, visitors learn through seeing, hearing, touching, in addition to reading information.

An intriguing, though not surprising, finding was that the reasons for visiting varied by institution. At the Denver Museum of Nature and Science, visitors were there for informational more than for sensory reasons. At both the Denver Art Museum and the Ocean Journey Aquarium visitors were more likely to visit for sensory reasons; this effect was greater at the aquarium, though. The most likely explanation is that historically, certain kinds of visitor institutions have focused on different methods of presenting experiences to the visiting population. Natural history museums and nature and science museums have developed from a long tradition of exhibiting objects along with a thorough interpretation or text.

However, art museums have historically focused more on the object or art. As a result, there has historically not been as much focus on interpretive material. Similarly, aquariums have typically focused on presenting the fish, animals, and plants to visitors in a way that allows for maximum visual enjoyment. The recent trend has been for all kinds of visitor institutions to present information in a more didactic manner, incorporating presentation styles from other types of institutions. It is typical now to have a mix of sensory and informational experiences at these institutions. However, there are still some fundamental differences that exist in the types of material covered in these different institutions, and in the overall presentation of the information.

Reasons for visiting and visiting similar institutions. A comparison was made between Informational and Sensory Reasons for Visiting and how often a visitor goes to similar institutions to the one they are visiting. People at the Denver Art Museum who often visit art museums were significantly more likely to be visiting for both informational and sensory reasons. Perhaps frequent and repeat visitors to art museums

are more aware of the sensory and informational experiences and therefore found those experiences gratifying. This may result in a self-selection process where people who were frequent visitors to art museums knew to expect both kinds of experiences.

The only other institution that yielded a significant difference for this comparison was the DMNS. These visitors who went to similar institutions more frequently were visiting for more informational reasons. The same reasoning could be applied to this situation, where visitors returning more often would have raised informational expectations, or those who had higher informational expectations had those needs met and returned more often.

Informational and sensory opportunities. In looking at the individual institutions, both art museum and aquarium visitors reported significantly more sensory opportunities. Since, as mentioned, the sensory aspects of viewing art or looking at animal species are a large part of visits to these institutions, this is not surprising. However, visitors rated the Denver Museum of Nature and Science as having more informational opportunities than the other two institutions. While there is a higher informational component to a visit at DMNS, this does not imply that there is a lack of sensory opportunities at this institution. In fact, the visitors did not report a significantly higher number of informational than sensory opportunities. The important piece of information is that DMNS differed from the other two institutions in that the sensory did not predominate.

Implications for Researchers in Visitor Institutions

From the results of this study several implications for researchers can be drawn. First methodology is discussed, then theoretical implications. Implications for research design and data analysis are covered next. Finally, implications related to the variables are discussed.

Methodology

Since the research conducted was non-experimental, one implication for research in this area is that some more experimental type of research in this area is needed. While studying these variables in the museum environment is of great importance, experimentally manipulating key variables may yield more specific answers to the research questions. Using actual visitors in these experimental studies would be very beneficial. However, care must be taken to ensure that the participants in the study were either visitors or as similar to the visiting population as possible.

An important consideration in any research is using multiple methods to ensure the method is not biases the results and conclusions (Yalowitz & Wells, 2000). By having a quantitative overall satisfaction item and a qualitative open-ended question, it was possible to test for convergent validity. Overall satisfaction was being compared to sensory and informational aspects of the visitor and visit. Therefore, visitors mentioning informational and sensory aspects of the visit for the open-ended question validated the focus on informational and sensory variables. Also, there were some aspects of the visit, such as social interaction, that showed up frequently as the most satisfying experience. This will hopefully provide some direction and lead to continuing this line of research about what makes for a satisfying visitor experience.

Applying the methods used in the present study to additional types of visitor institutions would be useful. Studying other types of institutions (e.g., zoos, living history museums, science centers, children museums, etc.) and how they relate to sensory and informational experiences and satisfaction would help understanding the effects of these variables in other visitor environments.

Theoretical Implications

The theoretical model for this study tested the interaction of visitor and visit variables on satisfaction. As a result, the theoretical separation of visitor and visit variables is valuable. It allows for a distinction to be made between the aspects of the visit that can and cannot be affected by the institution. While the visitor can be influenced, this influence would most likely occur in the form of the visitor environment. A theory that makes this distinction and is tested may then be more beneficial to those interested in understanding how to positively influence visitor satisfaction.

Previous studies had not examined the effects of visitor satisfaction on post-visit intentions and behaviors. The theoretical framework for visitor satisfaction may now include post-visit intentions and behaviors as a result of the present study. Some work still needs to be done to understand how satisfaction directly affects visitor behavior, but the present study provides some direction.

Additionally, some of the assumptions made about the hypotheses were not supported or only weakly supported. Therefore, testing of assumptions in the form of a theoretical model is necessary. If the theory is not supported, it must be decided or further tested whether the model or the methods used to test the model are affecting the results.

Research Design

In designing the study, the same subcategories (informational and sensory) were used for both reasons for visiting and opportunities at the institution. Providing the same conceptual subcategories allowed examination of these variables in a consistent manner. The relationship between these two variables was easier to interpret as a result. There are other likely reasons for visiting and other kinds of opportunities at a visitor institution, but focusing on the informational and sensory aspects alone permitted testing the relationship of these two types of variables on satisfaction. In designing a study, it is important to have specific objectives and variables to be tested, so that the interpretation of the results is more understandable.

Employing a moderation model in the present study followed the idea that satisfaction is a result of both what the visitor brings with them to the experience, and what happens during the visit itself. Designing a theoretical model should be based on either previous research or the assumptions of the researchers. It was assumed that if visitor variables were employed, then they likely interact with another variable to determine satisfaction. While there was some support for this hypothesis, the results were ambiguous. Therefore, further testing of the model is warranted.

Using three different visitor institutions was very valuable. If similarities are found between the three different institutions, generalizing the results of the present study is more valid. However, it also allows a comparison of different types of institutions so that differences between the different types of institutions can also be noted. Results for the aquarium and art museum seemed to cluster together, while the DMNS differed on

some of the analyses. This suggests that the art museum and aquarium, at least in terms of the variables studied, were more similar than previously thought.

While the survey was a bit lengthy and required 10 to 15 minutes from the respondents, having each visitor answer all of the questions was worthwhile. Splitting up the survey into different parts and administering the parts to different visitors might be considered. This might be done to decrease the amount of time volunteered by each visitor. However, using a within-subjects design for the key variables is important, since it allows for more power in detecting the influences of each variable on satisfaction. While it might be tempting in research with the public to do this, there will likely be a decrease in statistical power.

Data Analysis

When testing whether the interaction terms would explain any additional variance in satisfaction, first satisfaction is regressed on the main effects. Then, satisfaction is regressed on the main effects and the interaction effects. The purpose was to test the hypothesis that interaction effects would explain additional variance above and beyond the main effects. As a result, it was easy to determine how much additional variance was explained. Also, by using a stepwise model, the effects that accounted for the most variance would be entered first, indicating the importance of the effects in predicting satisfaction.

When running analyses, the hypotheses were also tested for visitors at each institution. In other words, for each analysis visitors at the aquarium were also analyzed as a group. This process was repeated for the art museum sample, then for the nature and science museum sample. In this manner, differences in which variables and/or

interactions significantly predicated satisfaction could be investigated. The variables and the order in which satisfaction regressed on them differed based on the institution, providing valuable information in predicting satisfaction. This process should be used whenever there is a variable that is suspected to influence the results of a study. Separating the groups out provided additional information about the effects of the key variables on satisfaction.

In analyzing Hypothesis 2, that the interaction of NFC and Informational Opportunities will be positive and significantly predict satisfaction, the interaction term of NFC x Informational Opportunities was negative and significant. This was not expected, so an alternate method was used to examine the relationship between NFC and Informational Opportunities with overall satisfaction. When a Fisher's Z was employed to test the relationship, no significant difference was found for high and low NFC groups. These two seemingly contradictory results for the same relationship highlights the importance of using multiple methods not only in data collection but data analysis.

Variables

There is also a need for some more development of some of the key variables. Since no survey development for the opportunities and reasons for visiting variables was done prior to data collection, reliability for some of these subscales was relatively low. Therefore, more scale development is necessary to more accurately determine the effects of these variables on satisfaction.

One of the most important implications from the present study was that studying overall visitor satisfaction was worthwhile. Since greater satisfaction led to intending to return sooner and increased the likelihood of recommending a visit to the institution,

there were positive consequences of having satisfied visitors. By understanding the factors that influence and especially increase visitor satisfaction, more satisfying experiences can be created for the visiting population. Additionally, it is important to increase the understanding of satisfaction and how it relates to measurable behavioral outcomes.

The present study focused mainly on the informational and sensory aspects of the visitor experience. It would benefit future research in satisfaction to study variables such as the social interaction during a visit. On the open-ended satisfaction question, quite a few people mentioned that the most satisfying thing during their visit was a social aspect, and this was one of the categories mentioned by Hood (1983) on motivations for participating in leisure activities such as museum visits. Typically, these social aspects fell into one of two categories: social interaction with staff, and observing or interacting with children. These two topics should be studied further in research on what makes for a satisfying visitor experience.

One topic addressed in the discussion of hypothesis testing was that some of the interaction terms were contrary to the hypotheses. The most likely possibility was that the Informational and Sensory Opportunities measures relied too much on a subjective interpretation of the visitor environments. Ideally, the opportunities variables could be manipulated so that there were measurable criteria (besides visitor opinion) that ranked the institutions on these items. Previous research utilizing this type of method (Yalowitz & Loomis, 1999) was successful in detecting differences in NFC. Also, a lab study (Eisenberger et al., 2001) dealing with some of the same variables used in the present

study found that varying the amount of information (similar to the Informational Opportunities distinction) did have some significant effects on satisfaction.

Implications for Exhibit Designers

An important finding for design and development of exhibits was that the sensory aspects of the visitor experience. For most analyses comparing the informational and the sensory, the sensory aspect was rated higher than the informational. Understanding which aspects of the sensory experience an institution can affect is important. Personality variables are theoretically not controllable by visitor institutions, and sensory reasons for visiting could possibly be influenced by previous visits or advertising. However, the most easily manipulated part of the process for the institution is the visitor environment. Understanding the positive connection between sensory experiences and satisfaction should result in providing desirable sensory opportunities for visitors. Giving varied sensory experiences, including visual and auditory stimuli, allowing visitors to touch objects, etc., should result in more satisfied visitors. However, while the sensory part of the visit should be better understood, this should not be done at the expense of the informational. The informational aspects of the visit were also highly positively correlated with satisfaction. How the two interact should be addressed in general and for specific exhibits.

There were some differences in the informational and sensory variables based on the institution someone was visiting. People were much more likely to visit based on sensory reasons at the aquarium or art museum. Informational aspects of the visit should not be ignored, but visitors' expectations for sensory experiences should be met. Understanding exactly which kinds of sensory experiences visitors are expecting would

be very beneficial. It is possible that in one type of institution, sounds are either expected or more highly correlated with visitor satisfaction. At another institution, a hands-on type of exhibit might be the most beneficial. Additionally, the sensory and informational seemed equally important at the nature and science museum. Therefore, exhibit designers should understand the preferences of visitors to that particular institution.

The main implication for exhibit designers and visitor institutions, however, was that there were trends in what predicted satisfaction, and that satisfaction resulted in intentions and specific behaviors by visitors. If the behaviors that resulted from satisfaction (e.g., return visits, word-of-mouth, etc.) are desired, then understanding, measuring, and increasing visitor satisfaction should result in the desired behaviors. Exhibit designers should be aware of the kinds of things visitors find satisfying, then provide these types of experiences whenever possible.

General Conclusions

There is a need to understand visitor satisfaction, as it can help visitor institutions improve the visitor experience. Building on previous research, the present study added a general understanding of how informational and sensory aspects of the visitor and visit affect satisfaction. Also, there is now more knowledge of how satisfaction differs at three different institutions: an aquarium, an art museum, and a nature and science museum. While much research has been conducted in other fields related to satisfaction, a clearer understanding of visitor satisfaction is needed. Especially important is understanding how satisfaction works at the different kinds of visitor institutions.

Visitor satisfaction seems to be a function of what the visitor brings with them to the site, as well as what happens during a visit. Additionally, both the sensory and

informational aspects are important, although not equally in all cases, at all times. The sensory variables played a larger role in predicting satisfaction. However, further research is needed to understand how these different variables interact to produce visitor satisfaction.

A main conclusion that can be drawn from the present study is that increasing satisfaction significantly affects positive visitor intentions and outcomes. While more long-term studies need to be conducted, the present study provided a framework and direction to future studies of visitor satisfaction.

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Appendix A: Exit Survey Instrument (see NOTE next page)

VISITOR SURVEY

Using the scale shown, please indicate how much you agree or disagree with each of the following statements:

	STRONGLY DISAGREE	NEUTRAL	STRONGLY AGREE
One of the reasons for my coming to the museum was to...			
1. learn new things			
2. have vivid sensory experiences			
3. expand my knowledge			
4. see visually interesting exhibits			

Using the scale shown, please indicate how much you agree or disagree with each of the following statements:

(These questions relate to all the exhibits you saw today at the museum)

	STRONGLY DISAGREE	NEUTRAL	STRONGLY AGREE
5. The exhibits provided a great deal of information			
6. The exhibits provided a lot of things to see, hear, or do			
7. Someone who wanted to learn information in the exhibit really couldn't			
8. There was a lot to see and look at in the exhibits			
9. There was a lot of informational detail in the exhibits			
10. There wasn't a lot to see and do in the museum, just things to read about			

Using the scale shown, please indicate how satisfied you were:

	EXTREMELY DISSATISFIED	NEUTRAL	EXTREMELY SATISFIED
11. Overall, how satisfied were you with your visit here today?			

What was the most satisfying thing you experienced during your visit today? Why?

Using the scale shown, please indicate how much you agree or disagree with each of the following statements:

	STRONGLY DISAGREE	NEUTRAL	STRONGLY AGREE
1. The museum really cares about my satisfaction while here			
2. The museum tries to make my experience as interesting as possible			
3. The museum does not care whether or not I visit here again			
4. The museum is willing to extend itself in order to help me get the most from my visit			
5. The museum cares about my opinions			

Please provide the following information to help interpret the findings. No individual responses will be reported.

1. Gender	2. Highest level of formal education obtained:	3. Who are you here with today?
Male	Some high school	(Mark all that apply)
Female	High School degree or GED	Alone
	Associate/Junior/Technical college degree	One adult
	Some college	2 or more adults
	Bachelor's	One child
	Some graduate school	2 or more children
	Master's, Ph.D., or higher degree	Tour group

Please turn this page over to continue the survey.

Appendix A (cont.)

Please provide the following information to help interpret the findings. No individual responses will be reported.

- | | |
|--|--|
| <p>4. How many times per year do you visit art museums?</p> <p>Less than once a year</p> <p>1 - 2 times</p> <p>3 or more times</p> | <p>5. How far away from the museum do you live?</p> <p>0 to 10 miles</p> <p>11 to 25 miles</p> <p>26 to 60 miles</p> <p>61 to 120 miles</p> <p>more than 120 miles</p> |
|--|--|

The following questions ask about some of your life experiences and preferences. Answering these will tell us more about you and the kinds of things you enjoy.

1. I know or have studied a lot about art
2. New sights and sounds are very enjoyable to me
3. I really enjoy a task that involves coming up with a new solution to problems
4. I like to have the responsibility of handling a situation that requires a lot of thinking
5. I enjoy the sound of the rain falling on the roof
6. Thinking is not my idea of fun
7. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities
8. Beautiful scenery has often been a great delight to me
9. I don't understand why people enjoy looking at the stars
10. The beauty of sunsets is greatly overrated
11. Learning new ways to think doesn't excite me very much
12. I enjoy long walks
13. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought
14. The smells of outdoors give me no pleasure
15. People always exaggerate the beauty and joys of nature

Using the scale shown, please indicate how much you agree or disagree with the following statement.

12. I would recommend friends and family to visit this museum

13. I would like to become a member of the museum Yes No Already a member

14. When do you think you will visit the museum again (please mark only ONE response)

Within 1 month

Within 1 year

Never

Within 6 months

Longer than 1 year from now

15. If you would like to provide a quote that could be used in promotion for the museum, please do so below:

Thank you for completing this survey!

NOTE: There were bubbles that visitors filled in for the items indicating agreement, ranging from 1 to 7. However, modern scanning equipment does not allow for these bubbles to appear on a scanned image, so they do not show up in the appendix.

Appendix B: Exit Survey Instrument Broken Down by Type of Question

Note: Each survey was slightly modified depending on the institution. For DAM and DMNS, the term “museum” was used. However, at OJA “Ocean Journey” was substituted for the term “museum.” This appendix, for consistency’s sake, uses the term “museum.”

Reasons for Visiting Questions (Strongly Disagree to Strongly Agree, 1 to 7):

1. Informational:
 1. One of the reasons for my coming to the museum was to learn new things.
 2. One of the reasons for my coming to the museum was to expand my knowledge.
2. Sensory:
 1. One of the reasons for my coming to the museum was to have vivid visual experiences.
 2. One of the reasons for my coming to the museum was to see visually interesting exhibits.

Opportunities During Visit Questions (Strongly Disagree to Strongly Agree, 1 to 7):

1. Informational:
 1. The exhibits provided a great deal of information.
 2. Someone who wanted to learn information in the exhibits really couldn’t.
(Reverse scored)
 3. There was a lot of informational detail in the exhibits.
2. Sensory:
 1. The exhibits provided a lot of things to see, hear, or do.
 2. There was a lot to see and look at in the exhibits.
 3. There wasn’t a lot to see and do in the museum, just things to read about.
(Reverse scored)

Satisfaction Items:

(Extremely Dissatisfied to Extremely Satisfied, 1 to 7):

1. Overall, how satisfied were you with your visit here today?

Open-ended question:

2. What was the most satisfying thing you experienced on your visit today? Why?

Perceived Visitor Support

(Strongly Disagree to Strongly Agree, 1 to 7):

1. The museum really cares about my satisfaction while here.
2. The museum tries to make my experience as interesting as possible.
3. The museum does not care whether or not I visit here again. (Reverse scored)
4. The museum is willing to extend itself in order to help me get the most from my visit.
5. The museum cares about my opinions.

Appendix B (cont.)

General Demographic Questions:

1. Gender: M F
2. Highest level of formal education obtained:
 - ☐ Some high school
 - ☐ High school degree or GED
 - ☐ Associate/Junior/Technical college degree

 - ☐ Some college
 - ☐ Bachelor's
 - ☐ Some graduate school
 - ☐ Master's, Ph.D., or higher degree
3. Who are you here with? (Mark all that apply)
 - ☐ Alone
 - ☐ One adult
 - ☐ 2 or more adults
 - ☐ One child
 - ☐ 2 or more children
 - ☐ Tour group
4. How many times per year do you visit art museums / museums about nature or science / zoos and aquariums?
 - ☐ Less than once a year
 - ☐ 1 - 2 times
 - ☐ 3 or more times
5. How far away from the museum do you live?
 - ☐ 0 to 10 miles
 - ☐ 11 to 25 miles
 - ☐ 26 to 60 miles
 - ☐ 61 to 120 miles
 - ☐ more than 120 miles

Familiarity With Institution's Topics (Strongly Disagree to Strongly Agree, 1 to 7):

1. I know or have studied a lot about art / nature and science / fish.
 - * Varies with each institution

Need for Cognition Items (Strongly Disagree to Strongly Agree, 1 to 7):

1. I really enjoy a task that involves coming up with a new solution to problems.
2. I like to have the responsibility of handling a situation that requires a lot of thinking.
3. Thinking is not my idea of fun. (Reverse scored)
4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities. (Reverse scored)
5. Learning new ways to think doesn't excite me very much. (Reverse scored)
6. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.

Appendix B (cont.)

Need For Sensory Experience Items (Strongly Disagree to Strongly Agree, 1 to 7):

1. New sights and sounds are very enjoyable to me.
2. I enjoy the sound of the rain falling on the roof.
3. Beautiful scenery has often been a great delight to me.
4. I don't understand why people enjoy looking at the stars. (Reverse scored)
5. The beauty of sunsets is greatly overrated. (Reverse scored)
6. I enjoy long walks.
7. The smells of outdoors give me no pleasure. (Reverse scored)
8. People always exaggerate the beauty and joys of nature. (Reverse scored)

Outcome Measures:

1. I would recommend friends and family to visit this museum. (Strongly Disagree to Strongly Agree, 1 to 7)
2. I would like to become a member of the museum. (Yes, No, Or "Already a member")
3. When do you think you will visit the museum again (please mark only ONE response) Within 1 month, Within 6 months, Within 1 year, Longer than 1 year from now, Never.
4. If you would like to provide a quote that could be used in promotion for the museum, please do so below: _____

Appendix C: Participant Information Sheet

**** NOTE: You must be 18 years of age or older to fill out this survey ****

PARTICIPATION IS COMPLETELY VOLUNTARY

PURPOSE OF THE RESEARCH: This research project involves your filling out a survey. One part relates to answering questions about your visit here today. The other relates to the kinds of things you enjoy doing. This information will help us understand what people like in an informal learning situation such as a museum, what compromises a good visit, and how to improve a visit at this institution.

CONFIDENTIALITY: Any information you give during the study is **STRICTLY** confidential and will not, under any condition, be released. Furthermore, at no time during the study or during data analysis will you be identified with your answers on the survey; no names or identifying information will be collected. All answers and survey instruments are completely anonymous.

WHAT YOU WILL DO: If you are eligible, you will fill out the survey described above, then receive a debriefing statement that explains in more detail what the purpose of handing out the surveys is. It is estimated that filling out the surveys will take a total of 5 to 10 minutes. Also, there will be the name and number of a person you may contact with any further or later questions, concerns, or comments about your participation.

Thank you very much for your time.

If you have any questions contact Steven Yalowitz at (970) 491-1320, at Colorado State University.

Appendix C (cont.)

Instructions for Survey

Your opinion is very important to us. By filling out this survey, you will allow us to understand our visitors better and be able to build better exhibits. In addition, your answers will help us understand what other visitors might like to see.

Please consider the following questions (you don't have to write anything down for this part):

1. Have you been to the Denver Museum of Nature and Science before?
2. Did you spend at least an hour here today?
3. Did you see more than one exhibit here today?

Please note how many of these questions you answered "yes" to.

If you will answer the survey, please keep the following things in mind:

1. Please answer all of the questions.
2. If you have any questions about filling out the survey, please ask.
3. Mark your answers as indicated below.

- Use a No. 2 pencil only.
- Do not use ink, ballpoint, or felt tip pens.
- Make solid marks that fill the response completely.
- Erase cleanly any marks you wish to change.
- Make no stray marks on this form.

CORRECT: ● INCORRECT: ☑ ✗ ○ ◎

THANK YOU FOR YOUR PARTICIPATION. IT IS MUCH APPRECIATED!

Appendix D: Reliability and Validity of Scales

Short Need for Cognition Scale Items

Reliability

There is evidence using other samples that the Short NFC Scale is reliable (Cacioppo, Petty, & Kao, 1984; Sadowski, 1992, 1993; Perri & Wolfgang, 1988). However, only some of the items from the Short NFC Scale were utilized. Unless there were major differences in the items selected for the present study compared to the whole scale, there should be good reliability for the selected items as a whole. Fatigue was not a concern for the NFC items in the present study, however, since only six of the items were used.

Item Analysis. When the means and standard deviations of the items from the Short NFC Scale were examined (Table D1), some minor differences were found. The means ranged from 5.58 to 6.15, and the standard deviations ranged from 1.12 to 1.65.

Homogeneity of the Scale. Using Cronbach's alpha, the homogeneity of the Short NFC Scale items was assessed (Table D1). There was an alpha of 0.7490. The reported alpha levels were lower than those reported for the original 18-item Short NFC Scale, but that is to be expected since only a few items were used. Typically, the more items one uses the higher the alpha level, so having fewer items would lower the alpha level.

Validity

Content Validity. The Short NFC Scale, like the original NFC Scale, was supposed to measure the tendency for an individual to engage in and enjoy thinking (Cacioppo & Petty, 1982). The scale was devised by Cacioppo and Petty, to differentiate between people who are inclined to think and those who are less inclined to think. Originally, the scale's items were included based on whether they differentiated between a sample of assembly line workers and members of a university faculty; the authors assumed the assembly line workers to be on average low in NFC, while faculty members were high in NFC. They used the criteria of ambiguity, irrelevance, and internal consistency to include items in further studies. Out of 45 original items, 34 were kept for the NFC Scale, and then 18 were eventually kept for the Short NFC Scale (Cacioppo, Petty, & Kao, 1984). Based on their various studies (Cacioppo & Petty, 1982), they devised a scale that measured an individual's tendency to engage in and enjoy thinking.

Construct Validity. The original study measuring NFC was made up a series of validation studies in devising the scale (Cacioppo & Petty, 1982), so the construct of NFC should be well-understood and well-measured. Need For Cognition was found to be positively correlated with intelligence and preferring simple to complex problems, and weakly related to cognitive style and dogmatism. Later studies using different samples

Table D1: Statistical Information for Need for Cognition Scale

<u>Item</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Corrected Item-Total Correlations</u>	<u>Alpha If Deleted</u>
NFC1	5.81	1.12	.4964	.7147
NFC2	5.87	1.17	.6633	.6744
NFC3	6.05	1.37	.6030	.6810
NFC4	5.58	1.65	.4699	.7218
NFC5	6.15	1.45	.4568	.7217
<u>NFC6</u>	<u>5.29</u>	<u>1.58</u>	<u>.3292</u>	<u>.7618</u>
Average	5.79	.93	.5031	.7126

NOTE: N = 431

have found evidence of construct validity of the NFC Scale with measures of self-esteem (Osberg, 1987).

Need For Cognition is positively correlated with Overall Satisfaction, Need for Sensory Experiences, Informational Reasons for Visiting, Sensory Reasons for Visiting, and Sensory Opportunities.

Criterion Validity. Since the present study did not predict a direct link between NFC and any specific criterion, no identifiable criterion was selected for the present study.

Need For Sensory Experience Scale

Reliability

Since the NSE scale is relatively new, there was not a lot of available data to assess the reliability of the instrument. However, practice was not assumed to affect the ratings, because it is a new scale and the person most likely had not filled it out before. Also, filling out the NSE items had less to do with a demonstration or performance of a particular skill than simply assessing one's own tendency towards sensory experiences. Fatigue was not a concern for the NSE items in the present study, however, since only six of the items were used. There is a chance that fatigue played a role in the survey, though, since the NSE items were always some of the last items to be filled out.

Item Analysis. When the means and standard deviations of the items from the NSE Scale were examined (Table D2), there was some variation. The means ranged from 5.97 to 6.57, and the standard deviations ranged from .87 to 1.41.

Homogeneity of the Scale. Using Cronbach's alpha, the homogeneity of the NSE Scale items was assessed (Table D2). There was an alpha of 0.7162. Only eight of the 34 items from the original NSE scale were used, and more validation needs to be conducted on the scale to determine which items are more reliable, particularly with populations such as museum visitors.

Validity

Content Validity. The Need for Sensory Experience scale is supposed to measure a person's tendency to engage in and desire sensory experiences (Eisenberger, Sucharski, Yalowitz, Rhoades, & Loomis, 2001). The scale was devised to differentiate between people who are attracted to sensory experiences and those not inclined towards sensory experiences. Out of 71 items tested, 34 were kept for the NSE Scale, and 8 were used in the present study because of high factor loadings.

Construct Validity. The original study measuring NSE used validation studies to determine which items to keep (Eisenberger, Sucharski, Yalowitz, Rhoades, & Loomis, 2001), and it did end up being a different factor from other related concepts, including NFC, desire for exertion, and sensation-seeking. NSE is positively correlated with

Table D2: Statistical Information for Need For Sensory Experience Scale

<u>Item</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Corrected Item-Total Correlations</u>	<u>Alpha If Deleted</u>
NSE1	6.28	.92	.4119	.6896
NSE2	6.36	1.04	.3787	.6940
NSE3	6.57	.87	.4575	.6836
NSE4	6.36	1.31	.4731	.6730
NSE5	6.50	1.13	.4462	.6800
NSE6	5.97	1.41	.3669	.7011
NSE7	6.31	1.33	.4061	.6896
<u>NSE8</u>	<u>6.39</u>	<u>1.15</u>	<u>.3758</u>	<u>.6946</u>
Average	6.34	.67	.4145	.6882

NOTE: N = 429

Overall Satisfaction, Need for Cognition, Informational Reasons for Visiting, Sensory Reasons for Visiting, Informational Opportunities, and Sensory Opportunities.

Criterion Validity. Since the present study did not predict a direct link between NSE and any specific criterion, no identifiable criterion was selected for the present study.

Reasons for Visiting Scale

Reliability

In terms of the reliability of the Reasons for Visiting Scale, both temporary and lasting as well as general and specific were taken into account. It is possible that lasting characteristics of participants could affect someone's reasons for visiting, because particular skills and/or interests could affect someone's motivation for visiting. It was less a learned task than it was a judgment of one's own motivations. However, this precludes evaluating the stability of the measure over time since data were collected only at one time.

Fatigue of the survey instruments was assumed to not be a factor for the study, although several people indicated that ten minutes was a long time to take out of a museum visit to fill out surveys. Depending on how long filling out the survey took, fatigue could possibly have affected other items, but since the Reasons for Visiting questions were in the first part, it is assumed that these items were not affected by fatigue. Also, visitors may have been prone to fatigue effects depending on how long they had been in the museum.

Item Analysis. In examining the particular items for this scale (Table D3), the means of the four items ranged from 5.71 to 6.49, and the standard deviations ranged from 0.89 to 1.40. The scale consisted of two categories of reasons: informational (Learn new and Knowledge) and sensory (Vivid sensory and Visually). The average mean for the sensory items (Table D4) was higher than the average mean for the informational items (Table D5), although sensory had both the highest and the lowest item means. The item with the highest mean was a specifically visual item, and that rated much higher than an overall sensory item. As a result of the low standard deviation for the "Visually" item and the high mean, people consistently rated that item as a reason for visiting.

Homogeneity of the Scale. For the overall homogeneity of the Reasons for Visiting Scale, the alpha of 0.6926 was rather low. However, when looking at the two scales, the informational items alpha of 0.8486 was much higher than the sensory items' alpha of 0.5090. With only two items for each subscale, one would expect lower alphas. The much lower alpha of the sensory items was likely explained by the differences between answering the two previously mentioned questions. With different means and different standard deviations, the homogeneity ratings would likely decrease.

Table D3: Statistical Information for Reasons for Visiting Scale

<u>Item</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Corrected Item- Total Correlations</u>	<u>Alpha If Deleted</u>	<u>Corr. with Satisfaction</u>
Learn new	5.71	1.28	.5778	.5578	.376**
Vivid sensory	5.63	1.40	.3426	.7304	.274**
Knowledge	5.93	1.20	.6071	.5422	.406**
Visually	6.49	.89	.4366	.6609	.418**
Average	5.94	1.19	.4910	.6228	

** $p < .01$

NOTE: $N = 437$

Table D4: Statistical Information for Informational Reasons for Visiting Scale

<u>Item</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Corrected Item-Total Correlations</u>	<u>Alpha If Deleted</u>
Learn new	5.71	1.28	.7388	----
Knowledge	5.93	1.20	.7388	----
Average	5.82	1.24		

NOTE: $N = 441$

Table D5: Statistical Information for Sensory Reasons for Visiting Scale

<u>Item</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Corrected Item-Total Correlations</u>	<u>Alpha If Deleted</u>
Vivid sensory	5.63	1.40	.3771	----
Visually	6.49	.89	.3771	----
Average	6.06	1.15		

NOTE: $N = 437$

Validity

Content Validity. These items were based on their dealing with either sensory or informational reasons why one might visit a museum. No pre-testing of the items occurred, and decisions to include them were based on preconceived notions of what might differentiate between the NFC and NSE dimensions for visitors. There were not many items included as a result of concern for space for the survey and amount of time visitors would spend answering questions.

Criterion Validity. It was predicted that motivations for visiting would be correlated with satisfaction, and all four of the items were significantly correlated with satisfaction (Table D3). The rating for visual reasons had the highest correlation, followed by the informational item of expanding one's knowledge. The least predictive item was the item that asked for a rating of vivid sensory experiences. Perhaps this item was too ambiguous, although it did significantly correlate with satisfaction. The average correlation for the sensory items and satisfaction ($r = .346$) was lower than the correlation for the informational items and satisfaction ($r = .391$).

Construct Validity. With two main types of questions and two questions for each type, it was assumed that there would be higher inter-item correlations among the groups of items than to unrelated items. However, all of the items were significantly correlated to each other. The two informational items were much more significantly correlated ($r = .739, p < .01$) than the two sensory items ($r = .377, p < .01$). This likely resulted in the low homogeneity for the sensory items.

Opportunities Scale

Reliability

In terms of the reliability of the Opportunities Scale, both temporary and lasting as well as general and specific were taken into account. No lasting characteristics of participants were assumed to affect judging of opportunities at the institutions, because the task does not involve demonstration or performance of a particular skill. It was less a learned task than it was a value judgment or opinion of the institution, although frequency of museum visitation may have affected the ability to evaluate available opportunities. Practice was not assumed to have an effect, either, since it was a between-subjects design and there were not multiple ratings of the same or different exhibit displays included. However, this precludes evaluating the stability of the measure over time.

Similar to the Reasons for Visiting scale, fatigue of the survey instruments was assumed to not be a factor for the study. Since this part of the survey was at the beginning, fatigue for the survey was not considered to be a factor.

Item Analysis. In examining the particular items for this scale (Table D6), the means of the six items ranged from 5.22 to 6.12, and the standard deviations ranged from 1.08 to 1.47. The scale consisted of two categories of opportunities: informational and sensory. The average mean for the sensory items (Table D7) was higher than the average

Table D6: Statistical Information for Opportunities Scale

<u>Item</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Corrected Item- Total Correlations</u>	<u>Alpha If Deleted</u>	<u>Corr. with Satisfaction</u>
Lots of info	5.56	1.30	.6392	.7108	.406**
See, hear, do	5.80	1.16	.6065	.7231	.461**
Couldn't learn	5.49	1.44	.4127	.7712	.218**
See and look at	6.12	1.08	.5213	.7439	.514**
No info detail	5.22	1.39	.5758	.7266	.369**
<u>No see and do</u>	<u>5.83</u>	<u>1.47</u>	<u>.4218</u>	<u>.7698</u>	<u>.335**</u>
Average	5.67	1.31	.5296	.7409	

** $p < .01$

NOTE: $N = 439$

Table D7: Statistical Information for Informational Opportunities Scale

<u>Item</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Corrected Item-Total Correlations</u>	<u>Alpha If Deleted</u>
Lots of info	5.55	1.30	.6457	.5075
Couldn't learn	5.46	1.43	.3860	.8454
<u>No info detail</u>	<u>5.21</u>	<u>1.40</u>	<u>.6117</u>	<u>.5392</u>
Average	5.41	1.38	.5508	.6307

NOTE: $N = 446$

mean for the informational items (Table D8), and every sensory item was higher than every informational item. Visitors were very consistent in rating the institutions as having more sensory than informational opportunities.

Homogeneity of the Scale. For the overall homogeneity of the Opportunities Scale, the alpha of 0.7748 was relatively high for the small number of items. In examining the two types of items, both had lower alphas than when they were combined, although the informational items' alpha of 0.7196 was higher than the sensory items' alpha of 0.6841. Again, with only three items for each subscale, a relatively low alpha value would be expected.

Validity

Content Validity. These items were based on their dealing with either sensory or informational opportunities in a museum. No pre-testing of the items occurred, and decisions to include them were based on preconceived notions of what might differentiate between the NFC and NSE dimensions for visitors. There were not many items included as a result of concern for space for the survey and amount of time visitors would spend answering questions.

Criterion Validity. It was predicted that opportunities during a visit would be correlated with satisfaction, and all six of the items were significantly correlated with satisfaction (Table D6). The rating for visual reasons had the highest correlation, followed by the informational item of expanding one's knowledge. The least predictive item was the informational reverse-scored item that said someone couldn't learn a lot of information if they wanted to. Again, the highest-correlated item to satisfaction was a visual rating, of how much there was to see and look at. The average correlation for the sensory items ($r = .437$) was much higher than the correlation for the informational items and satisfaction ($r = .331$).

Construct Validity. With two main types of questions and two questions for each type, it was assumed that there would be higher inter-item correlations among the groups of items than to unrelated items. However, again all of the items were significantly correlated to each other. Of the three inter-item comparison for the informational items there was a correlation of 0.467. For the sensory items the correlation was 0.436. For a second time, people were more consistent in rating the sensory items than the informational items.

Table D8: Statistical Information for Sensory Opportunities Scale

<u>Item</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Corrected Item-Total Correlations</u>	<u>Alpha If Deleted</u>
See, hear, do	5.80	1.17	.5408	.5418
See and look at	6.11	1.10	.5334	.5615
<u>No see and do</u>	<u>5.82</u>	<u>1.47</u>	<u>.4519</u>	<u>.6855</u>
Average	5.91	1.25	.5087	.5963

NOTE: N = 441

Appendix E: Results and Discussion of Ancillary Analyses

Results

The purpose of this section is to include the results of analyses that were conducted as part of the present study, but did not relate directly to the hypotheses. For results that were particularly important and/or interesting, a short discussion of these findings is included in the Discussion section. At the end of Appendix E are ancillary analyses about the key variables of Satisfaction, NFC and NSE, Informational and Sensory Reasons for Visiting, and Informational and Sensory Opportunities. This section was included to give the reader information about the visitor experience.

Satisfaction

On the overall satisfaction item ranging from 1 to 7, people had a relatively high degree of satisfaction with their visits ($M = 6.08$, $SD = 1.03$). When comparing satisfaction levels across the three types of institutions, there was not a significant difference.

Interestingly, being familiar with the topic(s) presented did not ensure that a person would be more satisfied with their visit. However, the more a visitor perceived the institution as caring about them and their visit, the more satisfied they were with their visit ($r = .512$, $p < .001$).

Satisfaction and demographics. Demographic variables consisted of level of education, gender, how often they visit similar institutions, and institutional membership. The only demographic variable that yielded a significant difference in satisfaction was gender, with females ($M = 6.18$, $SD = 0.94$) more satisfied than males ($M = 5.98$, $SD = 1.10$), $t(442) = -2.080$, $p < .05$.

Satisfaction and informational variables. The main informational variables consisted of Need for Cognition, Informational Opportunities, and Informational Reasons for Visiting. Each of these variables was calculated as an average item score for the related number of items. To calculate NFC, the six NFC items were added together for each person and divided by six. The same technique was utilized for the three Informational Reasons for Visiting items, and for the two Informational Opportunities questions. All subsequent analyses were performed using these average-item measures for each person in the study.

When examining the correlations between these individual items and satisfaction, all of the correlations were significant (see Table E1). The highest correlation of these

Table E1: Correlations of Informational Measures and Overall Satisfaction

<u>Measure</u>	<u>Satisfaction</u>	<u>Info Reason</u>	<u>Info Opp</u>	<u>NFC</u>
Satisfaction	--			
Info Reason	.419***	--		
Info Opp	.429***	.314***	--	
NFC	.230***	.249***	.043	--
<u>N</u>	449	441	446	431

*** $p < .001$

was between satisfaction and Informational Opportunities ($r = .429, p < .001$), closely followed by satisfaction and Informational Reasons for Visiting ($r = .419, p < .001$), and then satisfaction and Need for Cognition ($r = .230, p < .001$). These three informational variables are also correlated with each other (see Table E1). While the correlation between Need for Cognition and Informational Reasons for Visiting was significant ($r = .249, p < .001$), the correlation between Need for Cognition and Informational Opportunities was not significant ($r = .187, p = .187$). The other comparison, between Informational Reasons for Visiting and Informational Opportunities was significant ($r = .314, p < .001$).

When these three variables were entered into a stepwise regression (see Table E2) they yielded a significant difference in a visitor's satisfaction rating of their visit, $F(3, 415) = 57.698, p < .001$. In this regression model, each of these variables yielded significant differences in the satisfaction measures: Informational Opportunities, Informational Reasons for Visiting, and Need for Cognition. These three variables alone accounted for 28.9% of the adjusted variance for the dependent measure of satisfaction. The variable of Informational Opportunities by itself accounted for 18.2% of the adjusted variance in satisfaction.

Satisfaction and sensory variables. The main sensory experience variables consisted of Need For Sensory Experience, Sensory Opportunities, and Sensory Reasons for Visiting. As with the informational variables, all sensory variables used an average item score. An average score was calculated for the eight NSE items, the three Sensory Reasons for Visiting items, and for the two Sensory Opportunities items.

When examining the correlations between these individual variables and the overall measure of satisfaction, all of the correlations were significant (see Table E3). The highest was the correlation between satisfaction and Sensory Opportunities ($r = .543, p < .001$), followed by satisfaction and Sensory Reasons for Visiting ($r = .363, p < .001$), and then satisfaction and Need For Sensory Experience ($r = .301, p < .001$). These three informational variables were also correlated with each other (see Table E3). The correlation between Need For Sensory Experience and Sensory Reasons for Visiting was significant ($r = .383, p < .001$), and the correlation between Need For Sensory Experience and Sensory Opportunities was also significant ($r = .268, p < .001$). The other comparison, between Sensory Reasons for Visiting and Sensory Opportunities was also significant ($r = .339, p < .001$).

When these three variables were entered into a stepwise regression (see Table E4), these three variables together yielded a significant difference in a visitor's amount of satisfaction, $F(3, 406) = 70.305, p < .001$. In this regression model, each of these variables yielded significant differences in the satisfaction measures: Sensory Opportunities, Sensory Reasons for Visiting, and Need for Cognition. These three variables alone accounted for 33.7% of the adjusted variance for the dependent measure of satisfaction. The variable of Sensory Opportunities alone accounted for 29.3% of the variance of satisfaction.

Satisfaction and Visitor Variables

Visitor variables were described in this experiment as variables that were more a function of the visitor than of the visiting environment. These variables included NFC

Table E2: Linear Regression of Overall Satisfaction on Informational Measures

<u>Variable</u>	<u>R-Square</u>	<u>R-Square change</u>	<u>Beta</u>	<u>Significance</u>
Info Opp	.182	.182	.336	.000***
Plus Info Reason	.271	.089	.277	.000***
Plus NFC	.289	.018	.147	.001**

** $p < .01$

*** $p < .001$

NOTE: $N = 441$

Table E3: Correlations of Sensory Measures for Overall Satisfaction

<u>Measure</u>	<u>Satisfaction</u>	<u>Sensory Reason</u>	<u>Sensory Opp</u>	<u>NSE</u>
Satisfaction	--			
Sensory Reason	.363***	--		
Sensory Opp	.543***	.339***	--	
NSE	.301***	.268***	.268***	--
<u>N</u>	449	437	441	429

*** $p < .001$

Table E4: Linear Regression of Overall Satisfaction on Sensory Measures

<u>Variable</u>	<u>R-Square</u>	<u>R-Square change</u>	<u>Beta</u>	<u>Significance</u>
Sens Opp	.293	.293	.456	.000***
Plus Sens Reason	.327	.034	.164	.000***
Plus NSE	.337	.010	.116	.009***

** $p < .01$

*** $p < .001$

NOTE: $N = 410$

and NSE, which are considered to be personality variables, as well as reasons for visiting, both sensory and informational. Besides these four variables, which are variables included in the hypotheses, there were additional variables that were investigated which might relate to satisfaction. These include variables like institutional membership, whether an individual had previously visited the institution, and familiarity with the topic. While these are classified as visitor variables, this does not mean that they are unaffected by the visit variables. A person's reasons for visiting would definitely be affected by how much someone enjoyed a previous visit, and this would be affected by the visitor environment as well. However, for the present study the visitor variables are classified as such because of the strong influence of the individual on these variables.

Informational and sensory reasons for visiting. Additionally, the two visitor variables of Informational and Sensory Reasons for Visiting were computed to see whether they were good predictors of satisfaction (see Table E5). These two variables accounted for 25.0% of the variance of satisfaction, and did have a statistically significant influence on satisfaction, $F(2, 433) = 73.369, p < .001$.

All four visitor variables. When all four visitor variables were entered into a stepwise regression, only 3 of them were utilized: Informational Reasons for Visiting, Sensory Reasons for Visiting, and Need For Sensory Experience (see Table E6). Need for Cognition was not added into the equation because it did not account for any variance above and beyond the three variables in the equation. These three variables did yield a significant difference in satisfaction, $F(2, 404) = 38.280, p < .001$. Alone, the three variables entered into the equation accounted for 21.7% of the variance in satisfaction (see Table E6).

Institutional membership. Interestingly, in comparing all the visitors in the sample there was not a significant difference in satisfaction between members ($M = 6.15, SD = 0.92$) and non-members ($M = 6.04, SD = 1.08$). One might expect that members were those who had valued the experiences in the past enough to join, and therefore might have a significantly higher level of satisfaction.

Familiarity with the topic. In comparing the effect of being familiar with the topic on satisfaction, the correlation was not significant. Being familiar with the topic did not significantly affect satisfaction with the visit.

Satisfaction and Visit Variables

Visit variables were described as those variables that were more related to the visit or the visit environment than to the individual person. These include the variables of Informational Opportunities and Sensory Opportunities, both of which are included in hypotheses. An additional visit variable that is of interest but not specifically included in the hypotheses are whether or not a visitor perceives the institution as caring about them (i.e., Institutional caring)

Informational and sensory opportunities. The two visit variables of Sensory and Informational Opportunities during the visit were analyzed as well (see Table E7). The

Table E5: Linear Regression of Overall Satisfaction on Informational and Sensory Reasons for Visiting

<u>Variable</u>	<u>R-Square</u>	<u>R-Square change</u>	<u>Beta</u>	<u>Significance</u>
Sensory Reason	.186	.186	.338	.000***
Plus Info Reason	.250	.064	.273	.000***

*** $p < .001$

NOTE: $N = 435$

Table E6: Linear Regression of Overall Satisfaction on Informational and Sensory Reasons for Visiting, Need for Cognition, and Need For Sensory Experience

<u>Variable</u>	<u>R-Square</u>	<u>R-Square change</u>	<u>Beta</u>	<u>Significance</u>
Info Reason	.155	.155	.295	.000***
Plus Sens Reason	.208	.053	.210	.000***
Plus NSE	.217	.009	.117	.017*

* $p < .05$

*** $p < .001$

NOTE: $N = 403$

Table E7: Linear Regression of Overall Satisfaction on Informational and Sensory Opportunities for Visiting

<u>Variable</u>	<u>R-Square</u>	<u>R-Square change</u>	<u>Beta</u>	<u>Significance</u>
Sensory Opp	.294	.294	.451	.000***
Plus Info Opp	.321	.027	.184	.000***

*** $p < .001$

NOTE: $N = 437$

visit variables significantly predicted satisfaction, $F(2, 435) = 102.958, p < .001$. These variables accounted for 31.8% of the variance in satisfaction.

Institutional caring. When Institutional caring was added to the stepwise regression for Informational and Sensory Opportunities, it was the second variable entered, behind Sensory Opportunities but ahead of Informational Opportunities (see Table E8). The three variables together significantly predicted satisfaction, $F(3, 425) = 92.629, p < .001$. Meanwhile, these 3 visit variables accounted for 39.1% of the variance in satisfaction.

Satisfaction and Visitor and Visit Variables

In addition to examining the visitor and visit variables separately in terms of how they related to satisfaction, it was important to see which combination of visitor and visit variables tells us the most about satisfaction.

Six key variables and institutional caring. When the additional visit variable of Institutional caring was added to enter 7 variables (4 visitor & 3 visit) into the equation, the total variance accounted for by the 4 variables included in the analysis was 42.2% (see Table E9). The four variables, listed in order of independent variance accounted for in satisfaction, were Sensory Opportunities, Institutional Caring, Informational Reasons for Visiting, and Sensory Reasons for Visiting. These variables did significantly predict satisfaction, $F(4, 385) = 71.870, p < .001$. The four variables excluded from the equation because they did not account for additional independent variance are Informational Opportunities, Need for Cognition, and Need For Sensory Experience. Therefore, two visit and two visitor variables accounted for the most variance in satisfaction. However, it should be noted that two visit variables were entered first into the equation, and that they accounted for the most variance in satisfaction.

Visitor Variables

Need for Cognition. Need for Cognition (NFC) was based upon an average-item score for the 6 NFC items in the survey. On a scale from 1 to 7, the average score for NFC was 5.79 (SD = 0.93). There was not a significant difference in comparing visitors across the three different institutions. There was a significant relationship between NFC and peoples' ratings for informational reasons for visiting ($r = .246, p < .001$). The higher a person's NFC the more likely they were to visit because they wanted to learn new things or to expand their knowledge.

Table E8: Linear Regression of Overall Satisfaction on Informational and Sensory Opportunities for Visiting and Institutional Caring

<u>Variable</u>	<u>R-Square</u>	<u>R-Square change</u>	<u>Beta</u>	<u>Significance</u>
Sensory Opp	.314	.314	.368	.000***
Plus Inst Caring	.386	.072	.285	.000***
Plus Info Opp	.391	.006	.095	.041*

* $p < .05$

*** $p < .001$

NOTE: $N = 428$

Table E9: Linear Regression of Overall Satisfaction on Visitor and Visit Variables and Institutional Caring

<u>Variable</u>	<u>R-Square</u>	<u>R-Square change</u>	<u>Beta</u>	<u>Significance</u>
Sensory Opp	.298	.298	.317	.000***
Plus Inst Caring	.385	.087	.292	.000***
Plus Info Reason	.417	.032	.174	.000***
Plus Sens Reason	.422	.005	.088	.039*

* $p < .05$

*** $p < .001$

NOTE: $N = 390$

Need For Sensory Experience. Need For Sensory Experience (NSE) was computed by averaging the eight NSE items present in the survey. The average NSE score for visitors was 6.34 ($SD = 0.67$), on a scale from 1 to 7. Additionally, there was not a significant difference in comparing visitors across the three institutions. There was a significant relationship between NSE and visitors' ratings for sensory reasons for visiting ($r = .375$, $p < .001$). The higher a person's Need For Sensory Experience the more likely they were to be visiting to either have vivid sensory experiences or to see visually interesting exhibits.

Need for Cognition and Need For Sensory Experience. NFC and NSE were significantly correlated ($r = .428$, $p < .001$). This fits with the researcher's point of view that the two constructs are independent but somewhat related. As a result, these constructs are treated as two variables, with the possibility that a person can be high or low on both NFC and NSE. With a positive correlation between the two, the higher someone is on NFC the higher they are on NSE, and vice versa.

Interestingly, the variable of familiarity with the topic(s) at the institution was significantly correlated with both NFC ($r = .099$, $p < .05$) and NSE ($r = .169$, $p < .001$). Possibly, a person who generally likes to get information and has a need for sensory experience can get both at a place like a museum or aquarium. These two visitor variables being related to familiarity with the topics could result from self-selection to visiting places that can satisfy these needs. However, the low correlations for these relationships should be kept in mind when considering these results.

There was a significant positive correlation between level of education and NFC ($r = .143$, $p < .01$), as well as between level of education and NSE ($r = .100$, $p < .05$). How much formal education someone had completed was related to both how much information they liked to get, and to how much they valued sensory experiences.

Reasons for visiting and previous visits. An additional comparison on reasons for visiting is whether or not previously visiting an institution would have any effect on their reasons for visiting. It might be that having been to an institution before would change a person's expectations or reasons for visiting the next time. Those who had visited that particular institution before ($M = 5.99$, $SD = 1.06$) were significantly more likely to visit for informational reasons than those who had not previously visited ($M = 5.62$, $SD = 1.23$), $t(401) = 3.34$, $p < .01$. However, there was not a significant difference in comparing people who had previously visited the institution ($M = 6.12$, $SD = .85$) to those who had not ($M = 6.00$, $SD = 1.08$) in terms of sensory reasons for visiting.

Informational and Sensory Opportunities

Included in the survey were questions that related to visitors' perceptions of the kinds of opportunities that existed at the institution they were visiting. Questions specifically addressed whether or not there were informational and/or sensory opportunities present at the institutions. There were 3 questions related to each category of opportunity. There was a significant difference in comparing the two means for each person, $t(438) = -8.143$, $p < .001$. People were much more likely to say that there were more sensory opportunities ($M = 5.91$, $SD = 0.97$) than informational opportunities ($M = 5.51$, $SD = 1.10$).

Apparently, whom someone was visiting with had an effect on the kind of opportunities they perceived at the institution they were visiting. Those visiting without other adults ($M = 5.75$, $SD = .87$) said there were more informational opportunities than those visiting with other adults ($M = 5.45$, $SD = 1.15$), $t(444) = -6.90$, $p < .05$.

Institutional Caring

A five-item composite score looked at whether or not a visitor perceived the institution as caring about their satisfaction, experiences, opinions, and whether they visit again. The composite score consisted of the average of the items on a scale of 1 to 7, 7 being the highest score. The average score across the three institutions was 5.62 ($SD = 0.94$). There was no significant difference in comparing each institution.

One variable that clearly influenced a visitor's perception of whether the institution cared about them was the kind of opportunities there were during the visit. In examining both informational and sensory opportunities, each was significantly related to Institutional caring. The more informational opportunities existed, the more a visitor saw the institution as caring about them ($r = .502$, $p < .001$). This relationship also existed for sensory opportunities and Institutional caring ($r = .499$, $p < .001$). The more of both kinds of opportunities that existed, the more a person saw the institution as caring about their experiences there.

Output Measures

When asked how likely the visitor would be to recommend to friends and family that they visit the institution, people responded very positively to this item ($M = 6.39$, $SD = 0.95$). In comparing across the three institutions, there was not a significant difference on whether they would recommend a visit to others.

Visitors were also asked whether or not they would like to become a member of the institution they were visiting. Those who were already members were not included in the calculations since they were already members. However, those who weren't already members could say they would like to become a member or not. When just considering those that were not already members, people were much more likely to say they did not want to become a member, $\chi^2(1, N = 331) = 110.215$, $p < .001$. Of this group, over 1 out of 5 (21.2%) said they would like to become a member. There was not a significant difference between the three institutions.

Another output measure visitors reported was when they were likely to visit the institution again. They were able to choose within 1 month, within 6 months, within 1 year, longer than 1 year from now, and never. More than 2 out of 3 (67.5%) planned on returning within one year and only a handful (5.9%) did not plan on ever returning. In comparing across the three institutions, there was not a significant difference (see Table E10). However, the Denver Art Museum had the highest percentage (50.4%) who were planning on returning within the next 6 months or earlier.

Whether someone would visit again was significantly correlated with how far away they lived ($r = .239$, $p < .001$). The farther away they lived, the longer they were planning on waiting until they visited again (see Table E11). Additionally, the group that lived more than 120 miles away from the institution they were visiting was much less likely to say they would be visiting again.

Table E10: When Will Visit Again, by Institution

<u>When Visit Again</u>	<u>All Visitors</u>	<u>DAM</u>	<u>DMNS</u>	<u>OJA</u>
Within 1 month	49	21	20	8
Within 6 months	131	52	38	41
Within 1 year	120	30	44	46
Longer 1 year	118	35	39	44
<u>Never</u>	<u>26</u>	<u>7</u>	<u>9</u>	<u>10</u>
Total	444	145	150	149

All Visitors: $\chi^2 (4, N = 444) = 102.869, p < .001$

Comparing 3 Institutions: $\chi^2 (8, N = 444) = 14.235, p = .076$

Table E11: When Will Visit Again, by How Far Away Live

<u>When Visit Again</u>	<u>0-10</u>	<u>11-25</u>	<u>26-60</u>	<u>61-120</u>	<u>120+</u>
Within 1 month	24	8	12	2	2
Within 6 months	32	38	24	19	16
Within 1 year	23	31	22	17	26
Longer 1 year	9	21	10	8	70
<u>Never</u>	<u>4</u>	<u>1</u>	<u>1</u>	<u>3</u>	<u>17</u>
Total	92	99	69	49	131

$\chi^2 (16, N = 440) = 128.878, p < .001$

Lastly, visitors were able to provide a quote for promotion of the institution if they wanted to. Visitors were significantly less likely to provide a quote than provide one, with roughly 1 in 5 (21.8%) visitors providing a quote, $\chi^2 (1, N = 450) = 143.369, p < .001$. Providing a quote, however, was not dependent upon which institution they were visiting, as there was no significant difference when comparing across the institutions. Interestingly, a previous visit to the institution did not affect whether someone would provide a quote, but how often they visited similar institutions per year did yield a significant difference, $\chi^2 (2, N = 447) = 8.149, p < .05$. More than half (52.0%) of those providing a quote visited 3 or more similar institutions per year, much more than those who visited one to two times a year (29.6%), or less than once a year (18.4%). There was also a significant difference in providing a quote based on how much the visitor thought the institution cared about them. Those who provided a quote ($M = 5.87, SD = 0.78$) thought the institution cared about them more than those who didn't provide a quote ($M = 5.55, SD = 0.97$), $t (436) = 2.916, p < .01$.

Discussion

Satisfaction

One very serendipitous finding in the present study was that satisfaction levels did not significantly vary across the three institutions examined. As a result, differences in satisfaction were due more to the variables being examined than the institution someone was visiting. If there had been significant differences at the institutional level, then it would be difficult to determine whether the differences in satisfaction were a result of the variables examined or the institution itself. All three institutions, perhaps in their own distinct way, offered up an equally satisfying experience to visitors. This might have resulted from visitors going to institutions that matched their preferences and reasons for visiting.

The sensory variables accounted for more variance in satisfaction than the informational variables. In fact, one sensory variable, Sensory Opportunities, accounted for more variance by itself than the 3 informational variables did together. One explanation may be based on the average score for NSE being much higher than NFC. Perhaps this is an indication of a general preference for sensory experiences. However, more research needs to be conducted on the relationship of NSE and NFC. If this preference is accepted, it would not be surprising that sensory variables were better predictors of satisfaction than informational variables. In fact, when looking at Sensory versus Informational Reasons for Visiting, people were significantly more likely to be coming for Sensory Reasons. All of these factors point towards the importance of the sensory experiences for the average visitor, regardless of which institution they are visiting. While museum professionals often think people visit to learn, and visitors even report this as an important part of a visit, the sensory experiences seem to be slightly more important, at least in explaining satisfaction.

While visitors on average were more likely to visit for sensory reasons, there were two exceptions in the present study. At the Denver Museum of Nature and Science, visitors actually had a higher average score on Informational than Sensory Reasons for Visiting. While this difference was not significant, it was the only institution where this was the case; at the aquarium and art museum, visitors were significantly more likely to

go for sensory reasons. Additionally, those visitors who had visited that specific institution previously were more likely to visit for informational reasons. Therefore, there were factors that affected sensory or informational reasons for visiting, and consequently affected satisfaction.

NFC and NSE

There was a significant positive correlation between NFC and NSE ($r = .428$, $p < .001$). This follows the attitude of the researcher that the two are separate but related constructs. For some people, there will be a difference in how much the person likes to think and how much sensory information this person prefers. For others, there might not be as much of a difference. There might be a general need for stimulation (both cognitive and sensory) that could explain this relationship. Similar to the relationship between cognition and affect mentioned related to the taxonomies (Bloom, 1956; Krathwohl et al., 1964), NFC and NSE should be considered as related, but separate, variables. In fact, the relationship between sensory and informational aspects of museum visitation should be an indication that the sensory and informational work in tandem as one experiences the world. In fact, NSE was a significant predictor of Informational Reasons for Visiting. However, in the parallel comparison, NFC was not a significant predictor of Sensory Reasons for Visiting. The relationship between visitors and their informational and sensory needs should be studied further. Perhaps variables more specific to museum visitation, with items that ask about the amount of information in an exhibit, or the importance of sensory experiences for various components of a visit should be studied.

Reasons for Visiting

The personality measures of Need for Cognition (NFC) and Need For Sensory Experience (NSE) also influenced reasons for visiting. The positive correlation between NFC and Informational Reasons for Visiting and the positive correlation between NSE and Sensory Reasons for Visiting make sense. If the personality measures are valid, then they should drive peoples' motivations for visiting. People who were visiting alone were more likely to be visiting for informational reasons. When visiting in a group, often the amount of reading one is able to do is dependent upon the group dynamic, and the rate at which a group moves through exhibits.

One very telling relationship was the significant difference in reasons for visiting by previous visitation. If someone had been to the institution before, they were significantly more likely to be visiting for informational reasons. This relationship was most likely driven by the fact that returning visitors found something satisfying in a previous visit. Perhaps interest in the material being presented drove people to return, and part of that interest was informational in nature. Therefore, the sample that was visiting again found the informational experiences worthwhile and was returning. Another explanation relates to the relationship between informational and sensory experiences. There was some evidence (Webb, 1996) that affect can lead to cognition. Webb discussed this possibility for individual experiences, where something with a strong affective quality can trigger the cognitive into action, analyzing and thinking about this experience. In this case, perhaps the same process was at work over a longer time period, with the more affective, sensory experiences during a previous visit driving interest and therefore informational reasons for visiting in future visits.