An Assessment of the *Think Tank* Exhibition

at the National Zoological Park

INSTITUTIONAL STUDIES

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An Assessment of the "Think Tank" Exhibition at the National Zoological Park

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Report 97-1

Abstract

This report presents the results of a study of visitors to the *Think Tank* exhibition at the National Zoological Park (NZP) in Washington, DC. The study was based on personal interviews with 598 visitors entering and exiting the exhibition and observations of 155 visitors within the exhibition. The study was conducted during August 1996.

The 155 visitors we observed spent an average of 8.9 minutes and made 5.7 stops in the *Think Tank* exhibition rooms. On average, two-thirds of the time (5.8 minutes) was spent viewing the exhibition and the remaining time was spent between stops. Groups that included children tended to make more stops than those without children and individuals visiting alone.

The results of the study clearly indicate that the orang utans and macaques were the most engaging elements in the exhibition. Most visitors were also interested in the display on brains and took time to watch the demonstrations when they were performed.

Visitors came to *Think Tank* with a high interest in science and the opinion that some animals think. While viewing the exhibition did not alter visitor opinions on science or animal thinking, it did affect the way some visitors think about animals. Visitors without a college degree and adults visiting with children were most likely to say their perceptions of animals were influenced by the exhibition.

The study suggests that viewing the exhibition increased the type and quality of example visitors used to illustrate animal thinking behavior. Visitors with a college or advanced degree were most likely to gain information from the exhibition. For visitors without a college degree, one exhibition component, the demonstrations, was significantly associated with higher knowledge of animal thinking behavior. Nearly all visitors who considered the non-animal sections of the exhibition (Tools, Language, Society) the most interesting gained information about animal thinking behavior.

Finally, the study shows that adults with children were the most common social group visiting *Think Tank*.

Preface

The *Think Tank* exhibition study at the National Zoological Park (NZP) was undertaken by the Institutional Studies Office at the request of the exhibition team (Christine Broda-Bahm, Lisa Stevens, Benjamin Beck, Lynn Dolnick, Melissa Gaulding, Rob Shumaker and David Jenkins). This report summarizes the results. Its purpose is to share with the museum community what we learned about visitors to the exhibition. *Think Tank* staff are using the data and observations to improve the visitors' experience in the exhibition as well as to plan new exhibitions.

The study reflects the work, support and cooperation of numerous people in several organizations. At NZP, Christine Broda-Bahm was our primary liaison. She assisted with questionnaire development, data collection, data entry, and coding. Chris also provided the map used in the Tracking Study and succinct statements of the exhibition's aims and goals. The exhibition's curator, Lisa Stevens, supported every aspect of the work. Lisa and Chris gave us an appreciation of the educational aspects of the exhibition. David Jenkins, Associate Director for Interpretive Programs, encouraged the work and assisted in coding data.

The interviews and observations were conducted by both professional interviewers and volunteers recruited from the Friends of the National Zoo (FONZ) by JoAnn Grumm. We especially appreciate the efforts of all the volunteer interviewers. Professional interviewers -- Tricia Richardson and Henry Rich -- conducted interviews during an extremely busy zoo visitation period.

This report reflects the skills and expertise of the Institutional Studies Office staff. Stacey Bielick, assisted by Audrey E. Kindlon, skillfully trained interviewers, managed the interviewing schedules and monitored the data collection. Questionnaire development was a joint effort between ISO and our colleagues at NZP. Steven J Smith expertly oversaw all aspects of data processing and the creation of analysis files from the Tracking Study, as well as assisted in the interpretation of the tracking data. Andrew Pekarik reviewed the draft report and offered extensive suggestions. Karen Chiang, an ISO intern, provided valuable help in data preparation and coding.

We would especially like to acknowledge the 598 visitors, most accompanied by children, who took the time to respond to our questions and offer comments. Without their participation, the study could not have been conducted.

Errors in interpretation are the responsibility of the authors.

Table of Contents

Abstract i
Preface ii
Table of Contents iii
List of Figures iv
List of Tables v

Introduction 1
The *Think Tank* Exhibition 5

I. Summary and Discussion of Major Results 8

II. Entrance and Exit Survey Results 15

A. Visitor Responses to the Exhibition's Curatorial Objectives 15
Motivation/Behavior 15
What Visitors Want to Know More About 17
Affect: Attitude Toward Animals 17
A Closer Look at Visitors' Perceptions of Animals 18
Exhibition Components and Visitors' Perceptions (of Animals) 22
Cognition: Knowledge About Animal Thinking Behavior 22
A Closer Look at Who Gave Prime Examples 25
Exhibition Components and Visitor Cognition 26
Visitors' Descriptions of Apes and Monkeys 28

B. Visitor Responses to the Exhibition in General 29
Activities Visitors Engaged in During Their Visit 29
What Visitors Found Most Informative 31
Main Ideas Communicated by *Think Tank* 32
What Visitors Found Most Interesting 34
Emotional Impact of Exhibition 35
What Visitors Would Change in *Think Tank* 35

C. Who Visits *Think Tank*? 37
Demographic Characteristics 37
Comparisons to Other Visitor Profiles 40
Visit Characteristics 41

III. Tracking Study Results 43

Appendices

A. Data Collection Forms A-1
Entrance and Exit Survey Questionnaires A-2
Tracking Study Form and Map A-8

B. Supplementary Tables B-1
Entrance and Exit Survey Tables B-1
Introduction to Tracking Study Tables B-29
Tracking Study Tables B-31

C. Study Methodology C-1
Constraints and Limitations C-8

D. References D-1

List of Figures*

1. Self-Reported Interest in Science 16
2. Exhibition Influence on Visitors' Perceptions of Animals, by Selected Characteristics 19
3. Reasons for Changes in Perceptions of Animals, by Gender 21
4. Quality of Examples of Animal Thinking Behavior (Q7) Combined With Behaviors Scientists Would Study(Q8) 25
5. Visitors' Descriptions of Apes and Monkeys 29
6. Activities Visitors Engaged In at *Think Tank* (In percent of all responses) 30
7. What Visitors Found Most Informative 31
8. Main Ideas Communicated by *Think Tank* 32
9. Main Idea Communicated to Visitors in Exhibition Sections: Brains Based on 19& of All Visitors 33
10. Main Idea Communicated to Visitors in Exhibition Sections: Tools Based on 8% of All Visitors 34
11. Main Idea Communicated to Visitors in Exhibition Sections: Language Based on 8% of All Visitors 34
12. Visitor Recommendations for Change at *Think Tank* 36
13. Age of Visitors 37
14. Compositon of Visitor Groups 38
15. Educational Attainment, *Think Tank* Visitors, U.S. Zoos and Aquariums, and U.S. Population (Age 25 or Older) 39
16. Racial/Ethnic IdendificationVisitors, U.S. Residents Only 39
17. NZP Visitor Type 41

* Unless indicated otherwise, all figures and tables are for (i) visitors ages 12 and older; (ii) in percent; and (iii) based on the *Think Tank* Study.

List of Tables*

A. Examples of Animal Thinking Behavior (Q7) and Behaviors Scientists Would Study (Q8) 24
B. Aspects of *Think Tank* Identified by Visitors as Related to their Ideas about the Study of Animal Behavior 28

Appendix B: Supplementary Tables

1. Gender, Age, and Racial/Ethnic Identity, Entrance and Exit Surveys, RDC, NMNH, and SI B-1
2. Geographic Origins and Racial/Ethnic Identification, Entrance and Exit Surveys Combined B-2
3. Geographic Origins, Entrance and Exit Surveys, RDC, NMNH and SI Visitors ... B-3
4. Number In and Configuration of Group, Entrance and Exit Surveys B-4
5. Educational Attainment, Entrance and Exit Surveys, Visitors 12 Years of Age or Older and 25 Years of Age or Older B-5
6. Comparison of Educational Attainment, U.S. Census, 1994 Smithsonian Institution Marketing Study(SIMS) and *Think Tank* at the National Zoo, People 25 Years of Age or Older B-6
7. Number and Frequency of Visits to NZP and *Think Tank*, Entrance and Exit Surveys B-7
7a. NZP Visitor Type by Selected Characteristics *Think Tank*, Entrance and Exit Surveys Combined B-8
8. Prior Knowledge of the *Think Tank* Exhibition, by Zoo Visitor Type, Entrance and Exit Surveys B-9
9. Visitor Interest in Science, Entrance and Exit Surveys B-10
10. Visitor Belief in Animal Thinking, Entrance and Exit Surveys B-11
11. Exhibition Influence on Visitors' Perceptions of Animals, by Selected Characteristics, Exit Survey B-11
12. Influence of Exhibition on Perception of Animals, by Gender, Exit Survey B-13
13. Main Ideas Communicated by *Think Tank*, Exit Survey B-14
14. What Visitors Want to Know More About, by Selected Chars., Exit Only..... B-15
15. Respondents' Examples of Animal Thinking Behavior (Q7) and Behaviors Scientists Would Study (Q8), Entrance and Exit Surveys B-16
16. Words Used to Describe Apes and Monkeys, Entrance and Exit Surveys B-17
17. What Visitors Found Most Informative, Exit Only B-18
18. Activities Visitors Engaged In and Most Interesting Activities, Exit Only (In Percent of All Responses and in Percent of Visitors) B-19
19. What Section of *Think Tank* gave visitors their ideas about animal thinking?, Exit Only B-20
20. What Visitors Would Improve, Change or Add, by Selected Characteristics, Summer 1996 *Think Tank* Study, Exit Survey Only B-21
21. What Emotionally Moved Visitors, Exit Survey Only..... B-21

22. What Visitors Found Most Interesing, by Selected Characteristics, Exit Survey Only B-22
23. Exhibition Will Influence Perception of Animals, Exit Survey - All Visitors B-23
24. Exhibition Will Influence Perception of Animals, Exit Survey - Visitors without a College Degree B-24
25. Exhibition Will Influence Perception of Animals, Exit Survey - Visitors with a College or Advanced Degree B-25
26. Gave at Least One Prime Example of Animal Thinking Behavior for Q7 or Q8, Entrance and Exit Surveys Combined - All Visitors B-26
27. Gave at Least One Prime Example of Animal Thinking Behavior for Q7 or Q8, Entrance and Exit Surveys Combined - Visitors without a College B-27
28. Gave at Least One Prime Example of Animal Thinking Behavior for Q7 or Q8, Entrance and Exit Surveys Combined - Visitors with a College or Advanced Degree B-28
29. Stops in the Exhibition: Spatial Order B-31
30. Stops in the Exhibition: Rank Order B-33
31. Stops in the Exhibition: Element Order B-35
32. Unique Stops in the *Think Tank* Exhibition: Spatial Order B-37
33. Unique and "Return" Stop Data for Exhibition Elements at Which at Least 20.0% of All Visitors Stopped B-39
34. Percent of Visitors who Stopped in Each Exhibition Area B-39
35. Behavior in the *Think Tank* Exhibition: Subgroups B-40
36. Number of Stops Within Exhibition Areas B-42
37. Distribution of Unique Stops by Element Types, for Sub-groups B-43

Appendix C

C. Completion Rates, Summer 1996 Think Tank Study, Frequency and Percent) C-8

Introduction

In October 1995, *Think Tank*, a new permanent exhibition exploring the concept of thinking in animals, opened at the National Zoological Park (NZP). The exhibition has received considerable favorable publicity as well as laudatory comments from visitors and professionals alike. Nevertheless, the curatorial staff was not content to accept these assessments and assume that *Think Tank* was an unqualified "success." *Think Tank* staff felt that a scientific study was the most reliable way to understand the "fit" between curatorial goals and public response.

About nine months after the exhibition opening, the curatorial team asked us to conduct a study of the visiting public to *Think Tank*. Our previous experience in assessing major exhibitions and our organizational independence from NZP made us a logical choice. We have no vested interest in the outcome and our *Think Tank* colleagues understand the value of our independence.

This study does not include specific recommendations for ways in which the visitor experience can be improved, nor does it address issues for which data are not available. The former will be developed by *Think Tank* staff; the latter may require additional research. The specific objectives of the study, methods, and limitations are elaborated below. This Introduction concludes with a description of the exhibition and a summary of the contents of this report.

Curatorial Exhibition Objectives[1]

The most concise and non-technical exposition of the curatorial objectives for *Think Tank* is found in a manual used for training volunteers who work in the exhibition.[2] These objectives are:

-- *To educate visitors about a fascinating topic with current scientific vitality;*

-- *to stimulate an interest in science by exhibiting original scientific research on an interesting subject; and*

-- *to instill a new respect for animals by showing how they think and to thereby raise concern for conservation.*

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1 We are grateful to Christine Broda-Bahm for providing the material for this and the next subsection of this Introduction.

2 *Think Tank Volunteer Training Manual*, (1996, February). (Available from *Think Tank*, National Zoological Park, Smithsonian Institution, Washington, DC 20008).

Visitors will be encouraged to examine questions such as:

What is animal thinking?
Which animal behaviors involve thinking?
How do scientists evaluate thinking?
What are the advantages of thinking?
What is the future of the unparalleled thinking specialist, the human species?

Study Objectives

The study was designed to answer a set of specific questions posed by the NZP staff. In addition to an interest in a profile of visitors to *Think Tank*, the questions all address the extent to which the curators' key educational objectives are being met. The answers will inform changes and modifications to *Think Tank* as well as add to our growing awareness of the experience of visitors to the Smithsonian.

The three key educational objectives are listed here (in italics) under broad categories of visitor response. They are followed by more general questions which the study tried to address.

Cognition

Does the exhibition add to the visitors' scientific knowledge?
What ideas are visitors coming away with?

Motivation/Behavior

Does the experience increase the visitors' expressed interest in science?
What do visitors do during their visit?

Affect/Emotion

Does the experience increase visitors' respect for animals?
Are visitors' attitudes towards animals being influenced by the exhibition and, if so, in what ways?

General

To what degree are these responses significantly affected by the specific activities that people undertake in the exhibition or by the time that they spend with them?

Methodology

Data for this study were collected in personal interviews, with two systematic scientific samples: visitors entering the *Think Tank* building (Entrance Survey) and visitors exiting the exhibition (Exit Survey).[3] At the same time that the entrance interviews were being conducted, we observed (i.e., unobtrusively tracked) a sample of visitors through the entire exhibition, noting the overall time they spent in the exhibition as well as the time and location of each stop (Tracking Study).[4] Respondents were limited to visitors age 12 or older making a voluntary visit (i.e., school groups were excluded).[5] Interviewing was conducted between August 14 and August 26, 1996.

As noted above, we are primarily interested in uncovering any differences between visitors who have and visitors who have not experienced the exhibition with respect to the way in which they perceive, interpret, and synthesize their experiences. Our questionnaire for entering visitors (Entrance Survey) ascertained their interest in science, their understanding of the fundamental messages of the exhibition (e.g., their belief that animals show thinking behavior, their ability to provide examples of animal thinking behavior, their knowledge of animal behaviors scientists would study in order to examine thinking, etc.). The questionnaire also ascertained personal background characteristics.[6] The Entrance Survey establishes (prospectively) the framework that visitors brought to the exhibition.

Identical questions were asked of exiting visitors (Exit Survey) to see if there was a significant difference between the responses of those who entered and those who exited. In analyzing these data, we compared responses at the entrance and exit with statistical models which control for a set of background characteristics.[7] We also asked exiting visitors if they felt that the exhibition would influence the way they thought about animals, to see the degree to which visitors perceive any change, whether or not it can be measured with our instruments.

We wanted to know not only how visitors perceive the exhibition, but how it affects them personally. Other studies have shown that there can be a marked difference between recognizing a message and personal impact.[8] We asked exiting visitors what in the exhibition interested them the most, what they found most informative, and what

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3 See Appendix C for a complete description of the methodology, including sampling and the purpose of each question. The samples were independent; i.e., the schedule insured that the same individual would not be eligible for selection in both the Entrance and Exit Surveys.

4 See Appendix C for a detailed description of the Tracking Study.

5 See Appendix C for a discussion of this age restriction.

6 See questionnaire in Appendix A.

7 We have used such models in several of our other studies with good results. See, for example, Z. D. Doering, A. E. Kindlon and A. Bickford (1993), Z. D. Doering, S. J. Smith, A. Pekarik, A. Bickford, and R. D. Manning (1994), and Pekarik, A. J., Doering, Z. D., & Bickford, A. (1995).

8 Especially clear in Z. D. Doering, A. Pekarik and A. E. Kindlon (1995).

idea it gave them. We also asked visitors to report what activities they engaged in while in *Think Tank*, whether there was anything that they wanted to know more about, what things in the exhibition they would improve, change, or add if they were the director of the zoo, and whether they were moved emotionally by anything in the exhibit. These subjective questions told us what mattered most to visitors and what impression it left on them.

The interviews relied heavily on open-ended questions because we wished to capture as much of the nuance of people's experience as possible, without prejudging it. We coded these responses for content.

The Tracking Study captured the overall length of the visit, the number and order of stops, and the length of each stop.[9] From the Tracking data we were able to determine not only which parts of the exhibition were most engaging, but also how demographic features influenced the types of stops that visitors made, the length of the stop, and frequency of stops.

Constraints and Limitations of the Study

This assessment of visitors' responses to an informal educational experience has definite constraints and limitations. They are summarized briefly here and elaborated in the methodological appendix (see Appendix C). First, the results of this study may not be representative of an entire year's audience to *Think Tank*. The study reflects a particular seasonal visitor. Second, the study has no true control group. We cannot comment on self-selection of individuals into *Think Tank*. Third, the interviews capture only immediate ("top-of-the-mind") responses after individuals have viewed the exhibition. Fourth, there are limitations on the data collected. The context in which the study was conducted may have led some respondents to give "socially acceptable responses." In addition, we could not "test" visitors on the exhibition, since this would distort responses and antagonize some visitors. Finally, due to resource constraints, the quality of the data collection was somewhat uneven.

9 The Tracking Study Form is in Appendix A.

The *Think Tank* Exhibition[10]

The Context. *Think Tank* opened as an integral component of NZP's evolving BioPark concept. The BioPark philosophy, as described by NZP Director Michael Robinson, calls for "the creation of exhibits that explain, elucidate, and exemplify the interconnectedness of life. It means putting humans and our biology in the context of the rest of life" (Kleiman, et al (eds.) 1996). In practical terms, the philosophy calls for synthesizing botanical gardens, aquarium, zoological parks, and science and natural history museums.

Think Tank joins a number of other exhibitions including the *Invertebrate Exhibit, Reptile Discovery Center, Amazonia,* and the *Amazonia Science Gallery* as exhibitions which highlight the interdependence of all life forms on earth. *Think Tank* was designed to emphasize the complexities and links between elements of the natural world and expand the mission of the Zoo in both science and cultural education. Benjamin Beck, associate director for biological programs at NZP, articulates *Think Tank*'s BioPark connection in his conceptual plan for the exhibit by emphasizing the exhibit's focus on a multiplicity of relationships; "between humans and non-humans, between the living and extinct, between humans and their artifacts and inventions, between the whole animal and glimpses at exterior and interior parts, between individuals and groups..." (Beck, 1991, p. 1).

The BioPark concept with its multiple emphases on animal display, interpretation, and environmental education necessitates the creation and implementation of exhibit techniques not generally associated with zoological parks. *Think Tank* is a unique exhibition at NZP because it deals with the biological process of thinking rather than a specific animal species or habitat. Understanding how visitors respond to, interact with, and make sense of this new exhibition will have significant implications for further development of BioPark exhibits as well as informing decisions about the future plans and directions for *Think Tank.*

Description. *Think Tank* is a 15,000 square foot exhibition located in the former Monkey House, which at 91 years of age, is the oldest building in the park. The exhibition is the result of three years of planning and construction. A map of the exhibition is in Appendix A, page A-9.

Think Tank introduces visitors to the concept of animal thinking by presenting three factors necessary to establish the existence of thought: *image, intention,* and *flexibility.* By *image* NZP staff mean a mental representation of something that is not currently present in the immediate surroundings. *Intention* denotes having a specific purpose or goal. It involves having a plan for obtaining or doing something. Finally, *flexibility* is

10 This section was written by Christine Broda-Bahm.

the ability to devise more than one way to attain a goal.[11] In *Think Tank* , flexibility is considered the key to thinking as it can be both observed and tested.

Implementing this framework, the exhibition then moves to emphasize three areas of scientific inquiry on animal thinking: tools, language, and society. These areas can best be characterized by the questions which they address. Within the tool area, the primary question visitors confront is "What is a tool?" Whether and how an animal uses a tool provides insight into whether thinking is involved in the behavior. The second major area highlights language and communication. Visitors are asked to consider the questions "What is language" and "Are animals capable of language?" The third area in the exhibition focuses on society, exploring deception, cooperation, alliance-building, innovation and conflict among animals. The primary question posed is "Does social behavior require thinking?" For the purposes of this report we conceptualize the exhibition as containing six sections: exterior enclosure and Orang utan Transit System (O-Line), introductory area, tool area, language area, social area, and interior animal enclosure area.

The first area consists of the outdoor animal enclosures and the O-Line. Located at the front of *Think Tank* are two enclosures, one for a group of Sulawesi macaques (monkeys) and the second for orang utans. The orang utan outdoor enclosure contains a tower which is connected to the O-Line, a feature unique to NZP. The O-Line is comprised of eight 45-ft.-high towers strung with vinyl covered cables and connects *Think Tank* with the Great Ape House which is 400 ft. away. The orang utans may move between the two buildings at their leisure, weather permitting. While the outdoor enclosures and the O-Line are not the focus of our study, both have high visibility and orang utans traveling between the Great Ape House and *Think Tank* draw tremendous crowds.

The second area is the Introductory section. As visitors enter *Think Tank* they encounter a dozen video screens which depict images of animals engaged in natural behavior (i.e., a spider spinning a web, a beaver building a dam). Interspersed with these images are text asking the visitor to contemplate whether these animals are engaged in thinking behavior. To the left of the monitors is a text rail with a number of flip-panels running the length of the wall. On this rail visitors are introduced to the definition of thinking, a process defined by the exhibition as comprised of image, intention, and flexibility. This introductory interpretive material presents visitors with the framework that will be used within the exhibition to explore human and animal thinking; tool use, language, and society. The final components of the introductory area consist of several display cases of real and wax model brains, several bronzed brains and a computer interactive on brain size. These final brain displays act as a transition into the exhibition and are intended to dispel the commonly held belief that a bigger brain indicates better thinking. Additionally, they introduce visitors to the concept of relative brain size.

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11 For example, a reader of this report sitting in her office decides on a pizza for lunch. She has a clear *image* of it and plans to walk to a near by restaurant to get it. Walking to the restaurant is indicative of her *intention*. However, if the restaurant is too crowded she demonstrates *flexibility* by returning to the office and calling other places, driving elsewhere or settling on another food alternative.

The next area of the exhibit, *Tools*, investigates the definitions of tool use, and presents examples of animals that appear to be using tools. Visitors are encouraged to ponder tool use by hermit crabs when they are seeking their protective shells. Additionally, visitors have the opportunity to explore tool boxes containing fossil records of how human tool use has changed over the years and to compare pre-human tools with a collection of chimpanzee tools.

In the *Language* section of the exhibit, graphics and panels demonstrate the type of research currently being conducted both in the field and in the laboratory exploring animals' natural language and the acquisition of human-created symbolic language in animals. Interactive features include two wheels demonstrating how syntax functions and a phone attached to a monitor where visitors can listen and watch the images sent into space on two Voyager spacecraft. The section also includes a tangram (language) game which explores the difficulties in communicating even when the individuals interacting share a common linguistic system.

Society is focused on the social behaviors of deception, cooperation, alliance-building, innovation and conflict among animals fore grounding the question "Does social behavior require thinking?" This section also contains a computer interactive examining social behavior in gorillas and a colony of leaf cutter ants. The panels and graphics included in this section highlight research being conducted in the field and also address, through a series of displays, the difficulties involved in measuring and comparing intelligence within and across species.

The final section is comprised of two large animal enclosures, one housing orang utans and the other a group of Sulawesi macaques (monkeys). Both enclosures have fire hoses for climbing and a variety of other materials that promote activity and enrichment. Neither of the areas is designed to be a "naturalistic" enclosure, rather they are created for "functional naturalism." This design encourages the animals to interact with human-made items that stimulate the type of activity they would carry out in their natural habitats. However, it makes no attempt to "disguise" the human-made material (i.e. fire hose, shelving) as "natural."

Report Contents

Following this Introduction, we present a Summary and Discussion of Results. Here we integrate the empirical results from these studies and consider what they mean. This is followed by the major results sections: Section II is based on the Entrance and Exit Surveys and Section III is based on the Tracking Study. A set of Appendices provide ancillary information. Appendix A contains the questionnaires, the observation form, and a map of the exhibition. Appendix B contains supplementary tabulations. Appendix C includes the study methodology and details of the coding of responses.

We encourage readers interested in additional information or detail to contact the authors (contact information is on the cover of this report).

Section I: Summary and Discussion of Major Results

Behavior in the Exhibition: Tracking Study Results

Time and Stops. The 155 visitors we observed spent an average of 8.9 minutes in the *Think Tank* exhibition rooms. The median visit was 6.9 minutes; the middle 50 percent of visitors spent between 3.6 and 11.0 minutes. On average, two-thirds of the time (5.8 minutes) was spent viewing the exhibition and the remaining time was spent between stops. (Some of the time between stops was spent on benches available in the building.) Generally, men spent more time.

Visitors made an average of 5.7 stops during their visit. The median number of stops was 4; the middle 50 percent of visitors made between 3 and 7 stops. Groups that included children tended to make more stops than those without children and individuals visiting alone. Stop time averaged 1.3 minutes in length. The median was just slightly over half a minute (0.6 minutes).

Route. Upon entering, about three out of four visitors (72%) stopped at one or more of the components in the introductory area. Slightly less than half of all visitors (47%) made at least one stop in the tools section. Two-thirds of the visitors (66%) who stopped in Tools had also stopped in the introductory section, while others (21%) began their visit here. Most visitors moved rapidly through or by-passed the exhibition elements dealing with Language and Society.

Three out of four visitors (77%) stopped at the orang utan or macaque enclosures. For some visitors (15%) the animal enclosures area was their first stop; they did not stop before reaching the enclosures. Two-fifths of all visitors (41%) who stopped in this section arrived directly from the introductory area, an additional one-fourth (29%) came directly from Tools, while the rest (15%) came from the other two areas.

Major Stops. Four exhibition components particularly stood out: two elements of the introductory area (*Brains in glass cases* and *Bronzed brains*) and, understandably, the *Orang utan enclosure* and the *Macaque enclosure* . Three out of five visitors stopped at the *Orang utan enclosure* and about one-third at the other three. All four were also identified by visitors interviewed in the Exit Survey as the most interesting parts of the exhibition.

The animal enclosures held the attention of visitors about two to three times as long as the brain displays (approximately 2 minutes versus 0.7 minutes on average). The longest stops were made by the few visitors who had the opportunity to watch demonstrations (12 minutes on average). Although elements of the same type vary in size, complexity, design and function, sub-groups responded to different types of elements in different ways. Children (12 or older), for example, were reluctant or unable to read text panels in comparison with adult visitors. Children made about ten percent of their stops at panels, while adults made 20 to 30 percent of their stops at panels. At the same time,

adults with children were more likely to stop at panels than adults visiting with other adults. Presumably the adults were reading for the benefit of their children as well as for themselves.

In addition, groups with children were more inclined to use interactives than all-adult groups. Adult-child groups were more interested in the non-animal dimensions of the exhibition than all-adult groups.

Effect of the Exhibition on Visitors: Entrance and Exit Surveys

Attitude Changes. The exhibition did not modify the attitude of visitors towards science or alter their belief that animals think, probably because these attitudes were so strong among those who came to the exhibition. Eight out of ten visitors rated their interest in science as a five or above (on a scale of one to ten), with "8" being the most common answer; and almost all visitors (98%) felt that some animals display thinking behavior.

Just over half of visitors felt, upon leaving *Think Tank*, that the exhibition would influence the way they thought about animals (53%). An additional one quarter (25%) indicated that the exhibition affirmed what they already knew. Thus, for most visitors, the exhibition affected or affirmed their perception of animals in general (77%).

Those visitors (53%) who said the exhibition would influence the way they thought about animals indicated either that they learned something new (20%), that it increased their interest or made them think more about animals (17%), or that the exhibition changed the way they feel about animals (16%).

Visitors (47%) who said the exhibition would not influence the way they think about animals remarked either that the exhibition affirmed beliefs they already held (25% of all visitors), that they did not pay attention (10%) or that the exhibition did not provide new information (7%). Only two percent of all visitors said the exhibition contradicted beliefs they already held.

Two characteristics were most important in helping us to understand the differences between respondents who clearly indicated that the exhibition would influence their perception of animals and those that did not: visiting with children and college education.

All else being equal, adults visiting with children were 20 percent more likely to say the exhibition influenced their perceptions of animals, compared to adults visiting alone or with other adults. Not having a college degree increased the probability that a visitor's perception of animals would be influenced by *Think Tank* by 18 percent. Visitors with a college or advanced degree were less likely to say that they were influenced by the exhibition.

When we separately considered visitors without college degrees, we found that familiarity with NZP and interest in science were also significant factors.

All else being equal, among visitors who did not have a college degree, being a New or Returning NZP visitor increased the probability that their perception of animals would be influenced by the exhibition by 23 percent (compared to Frequent visitors). Among those without a college degree, an average or above average interest in science increased the probability that the exhibition would influence a visitor's perception of animals by 17 percent (compared to someone with a below average interest).

Visiting with children remained a significant predictor of a visitor's perceptions being influenced, whether or not the visitor had a college degree. Visitors with a college degree who came to *Think Tank* with children were 18 percent more likely to say the exhibition influenced the way they think about animals. For those with less than a college education, the probability was somewhat lower (15%).

Acquisition of Information. In order to evaluate visitors' acquisition of factual information and awareness of connections we asked them to give us some examples of animal thinking behavior and examples of the types of behavior they thought scientists might study. In addition to categorization by content, answers were coded for the quality of the answer using a four-part classification: *Prime* examples are those which reflect key animal behaviors discussed in the exhibition; *Other* examples are examples which show some thought about animal thinking behavior, but which are not emphasized in the exhibition; *Unacceptable* examples are those which are not appropriate examples of animal thinking behavior; *Don't Know* answers mean the respondent was unable to provide any example.

The study suggests that the exhibition affected the type and quality of example visitors used to illustrate animal thinking behavior. The most common example given by respondents who had not viewed the exhibition was generally a vague response, while the most frequent response for those who had viewed the exhibition was something about tool use or social behavior.

If we look only at those visitors who had viewed the exhibition, 28 percent gave a Prime example for each of two different, but related, questions, 43 percent gave only one Prime example, and less than a third (30%) did not give a Prime example. In comparison, those visitors who had not seen the exhibition gave a Prime example for both questions only half as often (14%) as visitors who had seen the exhibition. Two out of five visitors (40%) who had not seen the exhibition did not give a Prime example for either question.

Only two characteristics significantly affect the probability of giving at least one Prime example: having a college degree and viewing the exhibition.

The statistical regression model shows that, all else being equal, having a college or advanced degree increases the probability of visitors giving a Prime example by 22 percent (compared to not having a college degree). Visitors who had viewed the exhibition were 10 percent more likely to provide prime examples than visitors who had not yet seen the exhibition. However, when we look at the two educational attainment groups separately (not having a college degree and having a degree), we find that viewing the exhibition only increases the probability of giving a Prime example for visitors who have a college or advanced degree.

The number and types of activities visitors said they engaged in during their visit to *Think Tank* had no relevance to visitors' knowledge about animal thinking behavior overall. However, when we split visitors into two groups based on their level of educational attainment, we find some differences. For visitors with a college degree, specific exhibition components had no relationship to their knowledge of animal thinking behavior. For visitors without a college degree, one exhibition component, the demonstration, was relevant to knowledge of animal thinking behavior. Eight out of ten visitors without a college degree who watched a demonstration (13% of the total) were able to provide a Prime example for at least one of the two substantive questions on animal thinking behavior.

Attraction to the non-animal sections of the exhibition clearly affected the acquisition of information. Almost all (99%) of the visitors who said that any one of the Tools, Language or Social sections were most interesting (7% of the total) were able to provide at least one Prime example. Approximately half of the visitors (47%) who did not find anything in particular interesting about *Think Tank* (11% of the total) did not provide a Prime example for either substantive question, compared to 31 percent overall.

Personal Responses. Not surprisingly, two out of five visitors found the orang utans and macaques the most interesting part of the exhibition. Another two out of three visitors mentioned the display of brains as most interesting. Visitors' interest in the animals and the display about brains was consistent for both genders and across all age groups and visit groups.

About one in five visitors (19%) thought the displays on brains were the single most informative aspect of the exhibition. The animals were found most informative by about one in eight visitors (13%). No other specific element was comparable to these.

About half of the exiting visitors said they wanted more information about something in the exhibition (48%). Overall, visitors most often inquired about language acquisition in animals (13%), followed by information about specific animals (7%), and animal social behavior (6%).

Demographic Characteristics

More women than men visited *Think Tank* (55% women, 45% men). Adult visitors were primarily between the ages of 25 and 44 (68%) and were most often visiting with children (65%) or with other adults (30%).[12] Very few adults visited *Think Tank* alone or as part of an organized group. The average age of adult visitors was 34. The average group size was 4.

Exactly half of all visitors were from out of town and most local visitors came into the city from the suburbs (43%). Like Smithsonian visitors on the Mall, visitors to *Think Tank* were highly educated.

Discussion

Attraction of Animals and Demonstration

Visitors to *Think Tank* were obviously highly motivated to see the animals, especially the orang utans, and their placement probably had an important influence on the way visitors moved through the exhibition. The drop-off in attention to Language and Society as visitors move through the exhibition, for example, may reflect the fact that visitors must literally turn their backs on the animals to investigate these sections.

Although the animals held the attention of visitors longer than the average display, the demonstration was especially compelling. On average, demonstrations held visitors six times longer than simply viewing the animals, and viewing demonstrations had a significant impact on what visitors learned from the exhibition. Unfortunately, the availability of demonstrations was unavoidably limited during the period of the study, thus accounting for the relatively small number of visitors who saw them.

Attraction of Brains Displays

The display of brains in the introductory section had a major impact on visitors probably for three reasons: position, subject, and element type. The brain display cases are situated so that they essentially interrupt the flow of movement towards the animals. They are impossible to miss. In addition, they introduce a subject of intrinsic human interest in an engaging way. By amusing and unlikely juxtapositions of large and small brains they create immediate interest and communicate a clear message. Finally, they are attractive displays of objects in a setting where such elements are relatively rare. The traditional glass cases that contain the brains signal visitors that something unusual and "museum-like" is being displayed here.

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[12] Children under age 12 were excluded from the study.

Influence of Higher Education

Visitors to all Smithsonian units are very well educated, even in comparison with visitors to similar institutions nationally. In other studies in Smithsonian museums, we have found that better educated visitors were more likely to recognize and come away with the messages of the exhibition.[13] We find a similar pattern at *Think Tank.* The higher-educated visitors (i.e., those with college degrees) were more likely to have learned specific information about thinking behaviors in animals, but, were less likely to say their perceptions of animals were influenced. This result both supports the pattern of educational affect in the acquisition of factual information and demonstrates how viewing an exhibition also affects the attitudes of visitors who are less likely to have experience with the concepts presented in the exhibition.

Influence of Visiting with Children

The profile of visitors from this study, as well as other studies at zoos, makes it fairly clear that children are a central motivating factor for a visit to the zoo. As a result, zoo-visiting follows the life-cycle of the individual. Excluding formal trips in groups, children are brought to zoos starting at a very young age.[14] Most of these children come with family groups including several adults. Zoo visiting slows sharply with the beginning of the teenage years. Children 11 or under outnumber teens (11.3% of this sample). Twenty-year-olds start to visit zoos again (11.9% of visitors are ages 20-24), but this time in pairs. Zoo visitation increases in the 25-34 age range (25.1% of visitors), as young parents together bring their first children and continues in the next decade (35-44, 33.1%). Zoo visiting begins to decline in the 45-54 group. Overall, two-thirds of the visitors were in groups of adults and children (64.5%).

Why is zoo-going so closely linked with the life-cycle and with children? One reason is probably the practical virtues of a zoo visit for parents and caretakers. There is lots to do, the environment is safe but exciting, there are facilities and amenities for children, and there is plenty of room to run around. A key element may be the fact that adults can feel comfortable in a zoo environment knowing that their children can be free-spirited in the open spaces of the zoo without endangering themselves, others, or property.[15]

A second factor is undoubtedly parents' intentions for the development of their children. In-depth studies of the zoo experience have shown that parents bring their

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13 See Z.D. Doering, A. Pekarik and A.E. Kindlon (1995).

14 In this study, children under 12 were excluded. However, other studies show that at least 20% of visitors are 11 or under. For example, 12.1 % of all visitors in the RDC study were age 5 or under, 22.7% were 11 or under (Z.D. Doering, S J. Smith, A.J Pekarik, A. Bickford and R. D. Manning (1994).

15 Private communication, David Karns, October, 1994.

children to zoos deliberately to expand their curiosity and their acuity in inquiry and visual observation.[16] They want to help their children develop an inquisitive, positive, thoughtful view of the world. Because children have a particular affinity for using animals as a way to think about themselves and their environment, and since this thinking with animals is often colored by positive emotional responses, the zoo is an ideal environment for developing young children intellectually, emotionally, socially, and even morally.

These motivational factors may explain why adults visiting *Think Tank* with children are more likely to report that their perceptions have been influenced than adults who visit alone or with other adults. The tracking data also suggests, however, that males and females visiting with children tended to play different roles within their visit group. Women visiting with children spent only 55 percent of their visit time engaged in the exhibition, compared to men visiting with children, who spent 72 percent of their visit time engaged. We speculate from this gender difference that women spent more time attending to children than did men. As a result, men who came to the exhibition with children, but, who may not have been attending to them during their visit, were more likely to read a panel than women with children, probably because of the difficulty of reading while attending to a child. On the other hand, women with children were more likely to view a display than men with children, probably because elements of this kind were better suited to parent-child interaction.

[16] Karns, 1992, p. 37.

Section II. Entrance and Exit Survey Results

A. Visitor Responses to the Exhibition's Curatorial Objectives

In the Introduction, the curators' key educational objectives were expressed in three questions which address the concepts of motivation/behavior, affect/emotion and cognition. This particular division arises from our belief that these three broad categories capture the responses of visitors to objects in cultural institutions. When these categories are elaborated, it becomes apparent that they overlap and interact with each other.[17]

It is also clear that the ordering of these categories is somewhat arbitrary. For example, we could posit that an individual should be informed about the study of animal behavior and acquire factual behavior (cognition), then be emotionally moved to consider animals differently (affect) and motivated to read or study biology or science (motivation/behavior). Alternatively, a visitor might be moved first, then informed, or moved and informed simultaneously, etc.

Here, we present results beginning with motivation/behavior, continuing with affect and ending with cognition.

Motivation/Behavior

As noted earlier, a basic question for the study was:

To what extent does the experience increase visitors' expressed interest in science?

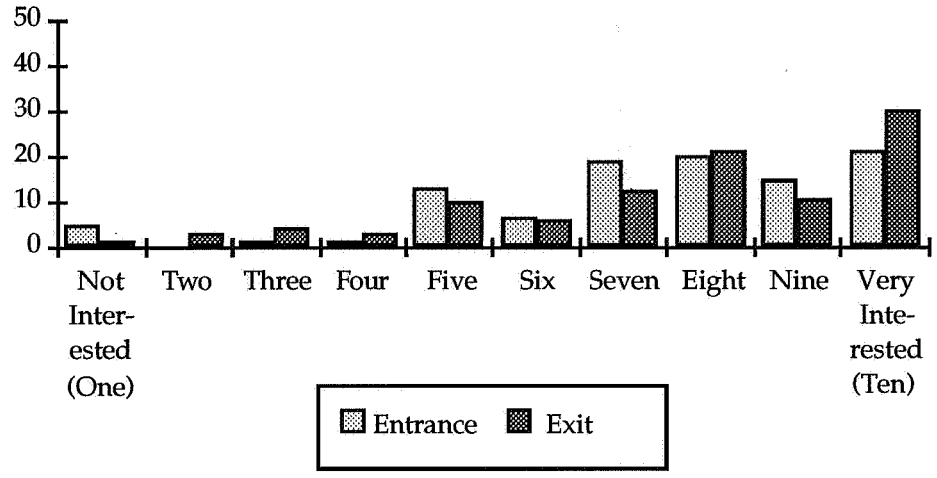
To provide some clues to possible changes in motivation and behavior, both entering and exiting *Think Tank* respondents were asked to rate their interest in science and to answer an initial question about animal thinking behavior. We recognize that our ability to measure the behavioral outcomes of the visit is weak. Ideally, we would want to know, at minimum, if the visitor actually took steps to tell others about the visit and to share the experience or feelings. At best, we would want to know if the visit motivated the individual to study more or to engage more deeply with the subject or related areas of science.

Attitude Toward Science. Visitors were asked to rate their interest in science by using a scale from one to ten where one was "not at all interested" and ten was "very interested". Visitors entered the *Think Tank* exhibition with high self-ratings of interest in science. Eight out of ten visitors rated their interest in science as a five or above, with "8" being the most common answer (M =7.5, SD =2.3). We cannot tell from this study to what extent these visitors' high interest in science reflects the U.S. population as a whole, zoo visitors in general, or visitors who visited this particular exhibition. In addition, many

17 See Z.D. Doering,, and A. Pekarik (1996).

of these visitors were certainly aware of the social acceptability of indicating high interest. Visitors' interest in science is highest among those ages 35 to 44, those with high educational attainment, and frequent NZP visitors.[18]

Figure 1
Self-Reported Interest in Science
Entrance and Exit Surveys
Visitors Ages 12 and Older
(in Percent)



Source: Appendix B, Table 9.

Variation in visitors' interest in science is low and there is no significant difference between the scores of entering and exiting visitors. As a result, visitors' interest in science can be used as a background characteristic in understanding visitors' attitudes and opinions toward the exhibition.[19]

Opinion on Animal Thinking. We also asked visitors in both the entrance and exit surveys if they believed that some animals show thinking behavior. Almost all visitors (98%) felt even before they saw the exhibition that some animals display thinking behavior. As a result, the exhibition had no affect on visitors' opinion that some animals think (see Table 10).

We believe that there are two reasons why the exhibition did not modify the attitude of visitors towards science and a belief in animal thinking. The first is that attitudes toward science are probably too fundamental to be seriously affected by a ten-minute

18 Data on file, ISO.

19 A comparison of the Entrance (M=7.52, SD=2.26) and Exit Survey (M=7.61, SD=2.28) scores distribution shows no statistical difference, t (564.3)=.5462 p<.5852). In some of the analysis, we use a three-category scale (1-7 = Below Average, 8 = Average and 9-10 = Above Average, $\chi 2(2, N=611) = 1.909$, p = .385.

exhibition visit. The second is that the scores on both entrance and exit are so high, that there is very little room for improvement.[20]

What Visitors Want to Know More About[21]

About half of the exiting visitors said they wanted more information about something in the exhibition (48%). Overall, visitors most often inquired about language acquisition in animals (13%), followed by information about specific animals (7%), and animal social behavior (6%). Twelve percent of visitors were not able to identify anything in particular but gave general answers to the question "What kinds of things would you like to know more about?" (e.g. "everything," "Yes, if I had more time," "I'm not sure").

Visitors ages 25 to 34 were more interested in obtaining more information (60%) than visitors of other ages. Women also wanted to know more about the material in the exhibition (50%) than men (40%), as did visitors with a Master's degree or higher (59%) and visitors with an above average interest in science (50%). Finally, as might be expected, Frequent zoo visitors were more inquisitive about the exhibition (60% wanted more information) than New and Returning visitors (39% and 30% respectively).[22]

Affect/Emotion: Changes in Perceptions of Animals

Ideally, we wanted to answer the following question:

Does the experience increase visitors' respect for animals ?

In the study, as we were limited to an immediate, short-term response, we asked visitors who had seen *Think Tank* if they thought the exhibition would influence the way they think about animals.[23] Just over half of visitors felt, upon leaving *Think Tank,* that the exhibition would influence the way they thought about animals (53%). An additional one quarter (25%) indicated that the exhibition affirmed what they already knew. Thus, for most visitors, the exhibition affected or affirmed their perception of animals in general (77%).

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20 In order to get a significant difference between entering and exiting visitors on the question of whether some animals think, all but one or two of the exiting respondents would have had to agree with the statement.

21 Data in Appendix B, Table 14.

22 We define New Visitors as those who are making their first visit to NZP; Returning Visitors as those who have been to NZP from one to three times in the past; and Frequent Visitors as those who have been to NZP four or more times before. In this study we found that 34% were New Visitors, 25% were Returning visitors and 40% were Frequent Visitors. See Section II.C., Who Visits *Think Tank*? for a discussion.

23 See Appendix B, Table 12.

Those who said the exhibition would influence the way they thought about animals (53%) said either that they learned something new (20%), that it increased their interest or made them think more about animals (17%), or that the exhibition positively changed the way they feel about animals (16%).

Among visitors who said the exhibition would not influence the way they think about animals (47%), 25 percent remarked was that the exhibition affirmed beliefs they already held and two similar-sized groups admitted either that they did not pay attention (10%) or that the exhibition did not provide new information (7%). Only two percent of all visitors (N =5) said the exhibition contradicted beliefs they already held.

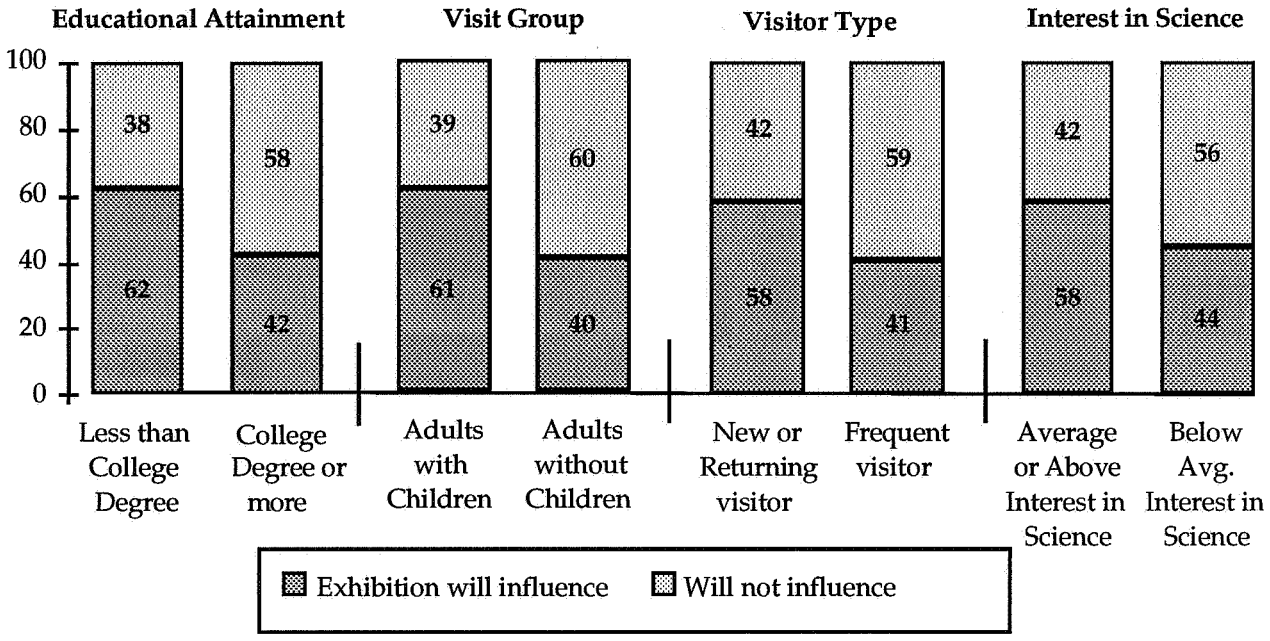
A Closer Look at Changes in Perceptions of Animals

In order to understand how a visit to *Think Tank* might influence visitors' perceptions of animals, we need to consider characteristics of visitors which may have affected their attitudes and opinions of animals independent of their visit to *Think Tank.* Since the data in this study was collected in an unbiased, systematic way, we can construct mathematical models to accurately describe the relationship among a variety of visitors' characteristics and the influence of the exhibition on visitors' perception of animals.

The analyses show that the social composition of the visitors' group at the zoo, visitors' level of educational attainment, familiarity with NZP, and visitors' level of interest in science were the most important factors in determining who indicated that their perceptions of animals were influenced by the exhibition.

Before we look at complex models, we can look at characteristics individually, as shown in Figure 2. Each bar in the figure identifies a subgroup of visitors and is divided into the percentage who indicated that the exhibition will influence their feelings toward animals and those who indicated that it will not. For example, among visitors with less than college education, about two-thirds (62%) indicated that the exhibition will influence their feelings and the remainder that it will not (38%). In comparison, when we look at visitors with at least a college education, we find the reverse (42% indicated that the visit will influence them and 58% indicated that it will not.)

Figure 2
Exhibition Influence on Visitors' Perceptions of Animals, by Selected Characteristics
Summer 1996, Exit Survey
Visitors Ages 12 and Older
(in Percent)



Source: Appendix B, Table 11.

We analyzed these relationships by constructing statistical models (logistic regression models) that identify which demographic factors had significant impacts on the probability that an individual would indicate that their perceptions of animals were influenced by the exhibition.[24]

We created several basic models. First, we looked at the total sample of exiting visitors, i.e., all those who were asked "Do you think that this exhibition will influence the way you think about animals?" Then, we created two additional models, one for individuals with at least a college degree and one for those with less than a college degree. By dividing respondents into these two educational attainment categories, we are making the implicit assumption that the effects of educational attainment are entwined with other variables in the model. Here we report on all three models jointly.[25]

The characteristics that were found significant in trying to understand the differences between respondents who clearly indicated that the exhibition will influence their perceptions and those that did not are:

24 The tables and logit models on which the discussion is based are in Appendix B.

25 The full and final models are in Appendix B, Tables 23-25.

Adults with Children. All else being equal, adults visiting with children were 20 percent more likely to say the exhibition influenced their perceptions of animals, compared to adults visiting alone or with other adults. The visit group was the only factor that remained a significant predictor of a visitor's perceptions being influenced whether or not the visitor has a college degree. Visitors with a college degree who came to *Think Tank* with children were 18 percent more likely to say the exhibition influenced the way they think about animals. For those with less than a college education, the probability was somewhat lower (15%).[26]

Less Than a College Degree. Not having a college degree increased the probability that a visitor's perception of animals would be influenced by *Think Tank* by 18 percent. Visitors who have a college or advanced degree are less likely to be influenced by the exhibition.

As already noted, for visitors with a college or advanced degree, only the visit group significantly affects whether or not visitors perceptions are influenced.

New and Returning Visitors. When we look just at those visitors who have less than a college education, familiarity with NZP becomes the most important factor in reporting influence. All else being equal, among visitors who did not have a college degree, being a New or Returning NZP visitor increased the probability that their perception of animals would be influenced by the exhibition by 23 percent (compared to Frequent visitors).

Average or Above Average Interest in Science. Although education was a strong factor in determining whose perceptions were influenced by *Think Tank*, visitors' interest in science was also important. We found that visitors without a college degree who said that their perceptions were influenced by the exhibition were likely to have a high interest in science. Among those without a college degree, an average or above average interest in science increased the probability that the exhibition would influence a visitor's perception of animals by 17 percent (compared to someone with a below average interest).

Since these influences were independent of one another, they can be combined by way of illustration. For example, imagine two visitors who did not graduate from college. One visitor came to *Think Tank* with children, was a New visitor to NZP, and had an average or above average interest in science. This first visitor was 55 percent more likely to say the exhibition influenced his/her perception of animals than the visitor who came to *Think Tank* alone or with other adults, was a Frequent NZP visitor and who was not interested in science.

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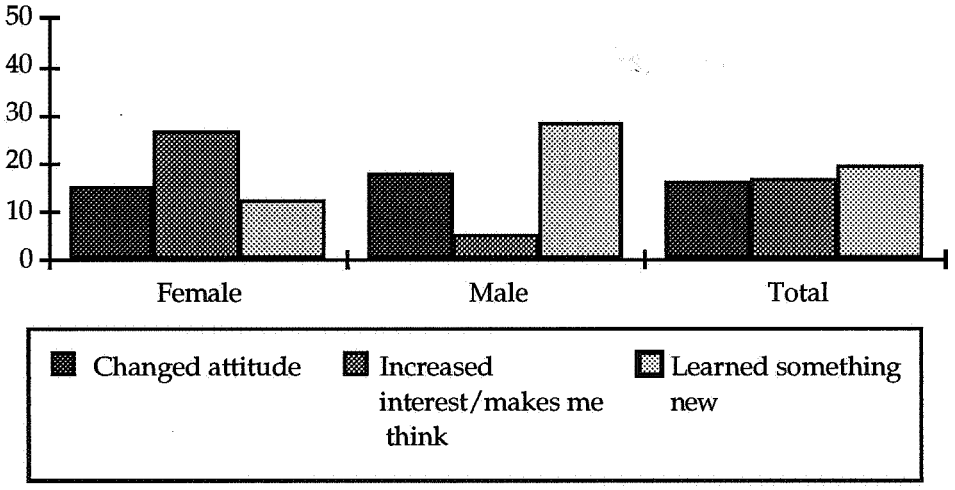
26 In the education subgroup models, visit group was marginally significant in the full model for respondents with less than a college education ($p = .0593$). Thus, this variable was included in the final model. See Appendix B, Table 24.

While equal proportions of women and men reported that the exhibition influenced their perceptions of animals,[27] there were gender differences in the response to a follow-up question, "In what way?" About one-fourth (27%) of women said *Think Tank* increased their interest in animal thinking compared to five percent of the men. More men than women said they learned something new from the exhibition (28% men, 12% women).[28]

Figure 3
Reasons for Changes in Perceptions of Animals, by Gender
Summer 1996, Exit Survey
Visitors Ages 12 and Older
(In Percent)



Most of the younger visitors, ages 12 to 24, who were influenced by the exhibition said the exhibition changed the way they feel about animals while older visitors, age 45 and older, said *Think Tank* increased their interest.[29]

27 See Appendix B, Table 12.

28 See Appendix B, Table 12. The variables examined here (i.e., age, and gender) were suggested in S.R. Kellert, 1980). There is a significant gender difference in the follow-up question "In what way?" among those who indicated that the exhibition influenced their perceptions c2(3, N=281) = 28.575, p = .001., but not among those who indicated that the exhibition did not c2(5, N=281) = 5.426, p = .366.

29 See Appendix B, Table 12a. $\chi 2(9, N=281) = 28.944$, p = .001.

Exhibition Components and Visitors' Perceptions of Animals

We have already discussed how visitors' pre-exhibition characteristics affect whether or not *Think Tank* influenced their perceptions of animals. Here we consider the degree to which visitors' perceptions are influenced by what they found most informative about *Think Tank*, what they found most interesting and the specific activities that they undertook in the exhibition. [Recall that, overall, fifty-three percent of visitors responded that the exhibition will change their perceptions of animals.]

Seven out of ten visitors who found the animals most informative (73% or 8% of all visitors) also said that their perceptions of animals were influenced by the exhibition. About two-thirds (65% or 14% of all visitors) who found one of the tools, language or social sections informative reported that their perceptions were influenced by the exhibition.[30]

We did not find any relationship between what visitors found most interesting and their reports that their perceptions of animals were influenced by the exhibition.

Similarly, the number of different activities visitors engaged in during their visit to *Think Tank* had no bearing on their self-report of changed perceptions. Only one activity, the computers, stands out -- 66 percent of the small number of visitors who used one of the computer interactives (12% of all visitors) said their perceptions of animals were influenced by the exhibition compared to the over half (53%) of visitors who were influenced overall.[31]

Visitors whose perception of animals was not influenced by the exhibition (47% of the total) disproportionately complained about the physical environment or crowd control in the exhibition (14%) compared to visitors who were influenced by the exhibition (4%).[32]

Later in the report, we will discuss in greater detail what visitors found most informative and interesting and what activities they engaged in.

Cognition: Knowledge About Animal Thinking Behavior

Cognitive responses to objects in an exhibition can be defined as acquisition of factual information, awareness of connections (pattern-finding), and curiosity about additional information or connections (Doering & Pekarik, 1996). A key objective of the *Think Tank*

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30 Very few visitors mentioned the Tools, Language and Social sections, separately, as most informative (7% Tools, 8% Language, 3% Social). When we look at these individual categories, the small number of responses negates statistical significance. Therefore, we combined these three exhibition sections. $\chi 2(5, N=257) = 22.745$, $p = .001$.

31 Data on file $\chi 2(1, N=281) = 4.675$, $p = .031$.

32 Data on file $\chi 2(9, N=259) = 15.761$, $p = .072$.

exhibition is to communicate to visitors a view of what is animal thinking behavior and why and how researchers study these behaviors. This goal was phrased as a question:

Does the exhibition add to the visitors' scientific knowledge?

In order to evaluate visitors' acquisition of factual information and awareness of connections we asked visitors to give us some examples of animal thinking behavior and examples of the types of behavior they thought scientists might study. The two questions, asked of both entering and exiting visitors, were as follows:

Q7. Can you give me an example of animal thinking behavior?

Q8. Scientists who study "thinking in animals" focus on their behavior. Can you think of a behavior or several behaviors that scientists would study?

Discussions with our NZP colleagues led us to evaluate visitors' examples in several ways. First we looked at the type of example given. Was it an example of tool use? Communication? Problem solving? Then, we looked at the type of animal in the examples. Did visitors use a wild or domestic animal, or make no reference to a specific kind of animal, to illustrate their examples? For visitors exiting the exhibition, we also determined if the example they provided is directly related to the exhibition.

To illustrate how we evaluated responses, consider one visitor's response to Q7: *"The language demo with the orang."* This example was first coded three ways: (1) Type of example -- this is an example of Language or communication behavior; (2) Type of animal used -- this visitor used a wild animal in the example; (3) Relationship to exhibition -- Yes, the example is related to the demonstrations given in *Think Tank.*

In addition to the content of the response, the quality of the answer was also assessed.[33] Examples were evaluated using a four-part classification: *Prime* examples are those which reflect key animal behaviors discussed in the exhibition; *Other* examples are examples which show some thought about animal thinking behavior, but which are not emphasized in the exhibition; *Unacceptable* examples are those which are not appropriate examples of animal thinking behavior; *Don't Know* answers mean the respondent was unable to provide any example. The example provided above was considered a Prime example because the visitor mentioned language , a key behavior emphasized in *Think Tank.* The table below shows the ratings of visitors' examples of animal thinking behavior.

33 The criteria for determining the quality of a response are detailed in Appendix C.

Table A
Examples of Animal Thinking Behavior (Q7)
and Behaviors Scientists Would Study (Q8)[34]
Summer 1996, Entrance and Exit Surveys
(In Percent)

	Q7			Q8		
	Entrance	Exit	Total	Entrance	Exit	Total
Type of Thinking behavior						
Prime	**25.5**	**35.7**	**31.4**	**49.6**	**59.4**	**55.3**
Tools	10.7	18.4	15.2	6.7	1.7	3.7
Social	6.0	9.8	8.2	26.8	32.4	30.1
Language	8.8	7.4	8.0	7.0	11.8	9.8
Two or more Prime examples	--	--	--	9.0	13.5	11.7
Other	**21.3**	**22.3**	**21.9**	**6.4**	**1.6**	**3.6**
Trainability/ability to learn	17.2	8.4	12.0	0.4	0.5	0.5
Human-like traits/qualities	4.1	11.1	8.2	6.0	0.1	2.5
Problem solving	0.0	2.9	1.7	0.0	1.0	0.6
Unacceptable	**42.5**	**30.4**	**35.4**	**27.6**	**23.1**	**25.0**
Vague/general unacceptable	30.4	17.3	22.7	11.6	17.7	15.3
Instinctive	9.3	8.6	8.9	15.2	5.2	9.3
Looking, attending responding	2.8	4.6	3.8	0.7	0.2	0.4
Don't know	**10.7**	**11.6**	**11.2**	**16.5**	**15.9**	**16.1**
Total	100.0	100.0	99.9	100.0	100.0	100.0

Source: Appendix B, Table 15.

The study suggests that the exhibition affected the type and quality of example visitors used to illustrate animal thinking behavior. The most common example given by respondents who had not viewed the exhibition was generally a vague response, while the most frequent response for those who had viewed the exhibition was something about tool use or social behavior.

More visitors (55% overall) provided a Prime example in answer to Q8 which emphasizes the scientific study of thinking behavior.[35] Visitors also gave an example of social behavior more often in Q8 than in Q7, where the most common answer was about tool use. The two questions elicited somewhat different responses in terms of content. We found that combining the two questions provides us with a more comprehensive analytical tool than looking at each question separately, because the combination allows us to analyze a wider range of examples of animal thinking behavior. Therefore, most

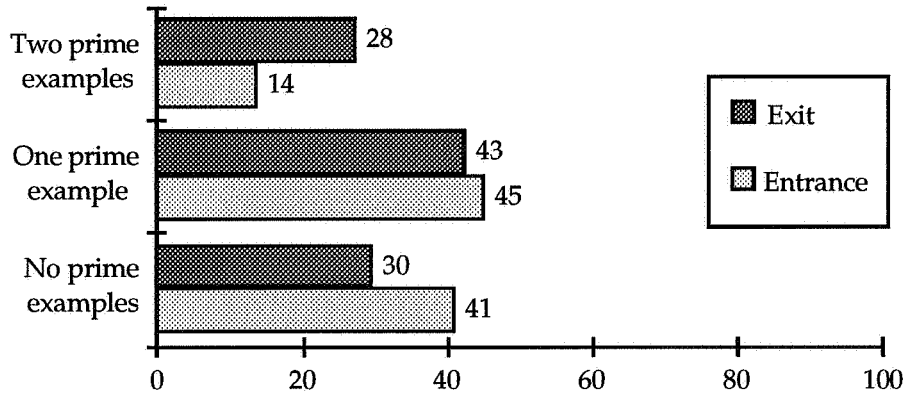
34 Visitors were able to provide more than one response for Q8. In order to compare Q7 and Q8, only multiple responses which were Prime examples were coded for Q8.

35 Q8. *Scientists who study "thinking in animals" focus on their behavior. Can you think of a behavior or several behaviors that scientists would study?*

of the discussion below is focused on a combination of the quality of response for both of the substantive questions on animal thinking behavior.

If we look only at those visitors who had viewed the exhibition, 28 percent gave a Prime example for both questions, 43 percent gave only one Prime example and less than a third (30%) did not give a Prime example for either question. In comparison, those visitors who had not seen the exhibition gave two Prime examples only half as often (14%) as visitors who had seen the exhibition. Two out of five visitors (40%) who had not seen the exhibition did not give a Prime example for either question.[36]

Figure 4
Quality of Examples of Animal Thinking Behavior (Q7) Combined With Behaviors Scientists Would Study(Q8)
Summer 1996, Entrance and Exit Surveys
Visitors Ages 12 and Older
(In Percent)



Source: Appendix B, Table 15

A Closer Look at Who Gave Prime Examples

In order to assess the extent to which a visit to *Think Tank* played a role in the type of examples visitors gave to the questions discussed above (Q7 and Q8), we developed several statistical models which allow us to examine several characteristics simultaneously. First we looked at the total sample of visitors, then we looked at visitors with college or advanced degrees separately from those without a college degree.[37] We find that educational attainment, viewing *Think Tank*, and visitors' interest in science are the three characteristics that most affect the quality of the example visitors provide.

When we look at all visitors and estimate the probability of giving at least one Prime example, the results show the following:

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36 $\chi 2(2, N=564) = 17.115$, $p = .001$.

37 The regression models are in Appendix B, Tables 26-28.

College or Advanced Degree. The statistical regression model shows that, all else being equal, having a college or advanced degree increases the probability of visitors giving a Prime example by 22 percent (compared to not having a college degree).

Viewing the exhibition. Visitors who had viewed the exhibition were 10 percent more likely to provide prime examples than visitors who had not yet seen the exhibition. However, when we look at the two educational attainment groups separately (not having a college degree and having at least a degree), we find that viewing the exhibition only increases the probability of giving a Prime example for visitors who have a college or advanced degree.

Other comparisons, separate from the statistical models discussed here, also show that visitors who had viewed *Think Tank* were more likely to use wild animals to illustrate their example of animal thinking behavior while visitors who had not seen the exhibition were more likely to use domestic animals in their examples (See Appendix B, Table 15).[38]

Interest in science. Among visitors who have less than a college degree, we find that having an average or above average interest in science increases the probability of giving a Prime example by 21 percent.

Exhibition Components and Visitor Cognition

In the preceding section we focused on how visitors' characteristics and their experience viewing *Think Tank* affected the likelihood of providing a Prime example of animal thinking behavior. The following discussion considers to what degree visitors' knowledge of animal thinking behavior was influenced by specific exhibition components. We look at what visitors found most informative about *Think Tank*, what visitors found most interesting, and what they said they did in the exhibition. As we found when we looked at visitors' perceptions of animals, there are a few exhibition components which are significantly related to visitors' knowledge of animal thinking behavior.

About three-fourths (73%) of visitors who had viewed *Think Tank* gave an example that was directly related to the exhibition for either Q7 or Q8. A third of visitors (33%) gave an example from the Tools section for Q7 and 38% gave and example from the social

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[38] Data here are reported for responses to Q7 only. $\chi 2(2, N=520) = 31.912, p = .001$. In Q8, 95% of visitors did not use an animal to illustrate their example. Interviewers could fill in pre-coded categories for Q8 and the wording of the question asks visitors to focus only on a type of behavior in their response.

section for Q8. Not surprisingly, visitors who found the Graphics, Text or Panels the most informative (92% or 13% of all visitors) were able to provide a Prime example for at least one of the substantive questions on animal thinking after viewing the exhibition.

Almost all (99%) of the visitors who said that any one of the Tools, Language or Social sections were most interesting (7% of the total) were able to provide at least one Prime example. Approximately half of the visitors (47%) who did not find anything in particular interesting about *Think Tank* (11% of the total) did not provide a Prime example for either substantive question, compared to 31 percent overall.

The number and types of activities visitors said they engaged in during their visit to *Think Tank* had no relevance to visitors' knowledge about animal thinking behavior overall. However, when we split visitors into two groups based on their level of educational attainment as we did above in the statistical models, we find some differences. For visitors with at least a college degree, specific exhibition components had no relationship to their knowledge of animal thinking behavior. For visitors without a college degree, one exhibition component did become relevant to knowledge of animal thinking behavior. Eight out of ten visitors without a college degree who watched a demonstration (13% of the total) were able to provide a Prime example for at least one of the two substantive questions on animal thinking behavior.

In order to further identify which sections or exhibits in the *Think Tank* exhibition were linked to visitors' understanding of animal thinking behavior, we asked visitors what in particular in the exhibition affected their thoughts on the types of behaviors scientists might study to learn about animal thinking (see Table B below).

Although visitors who had seen the exhibition were more likely to give prime examples of animal thinking behavior than those who had not seen the exhibition, about half could not pick out something in particular in the exhibition that enhanced their knowledge about animal thinking. One out of every five visitors indicated that they gained information by watching the animals, while about one in ten visitors said the tools, language or social sections influenced their answer.

The orang utans and macaques were, again, the favored answer, although naming the animals was also the most obvious answer to any difficult question.

Table B
Aspects of Think Tank Identified by Visitors
as Related to their Ideas about the Study of Animal Behavior
Visitors Ages 12 and Older
Summer 1996, Exit Survey Only
(In Percent)

Was there anything in particular in Think Tank that gave visitors their ideas about what behaviors scientists would study?	*Total*
Animals	**22.3**
Tools,Language, Social	**12.5**
Tools section	4.7
Language section	4.9
Social section	2.9
Other	**13.3**
Intro area	0.6
Demonstrations	0.6
Docents/staff	1.8
Panels/text/graphics	3.3
Videos	1.9
Computers	1.7
Interactives	0.2
Other	3.2
Nothing/Don't know	**51.9**
Total	100.0

Source: Appendix B, Table 19

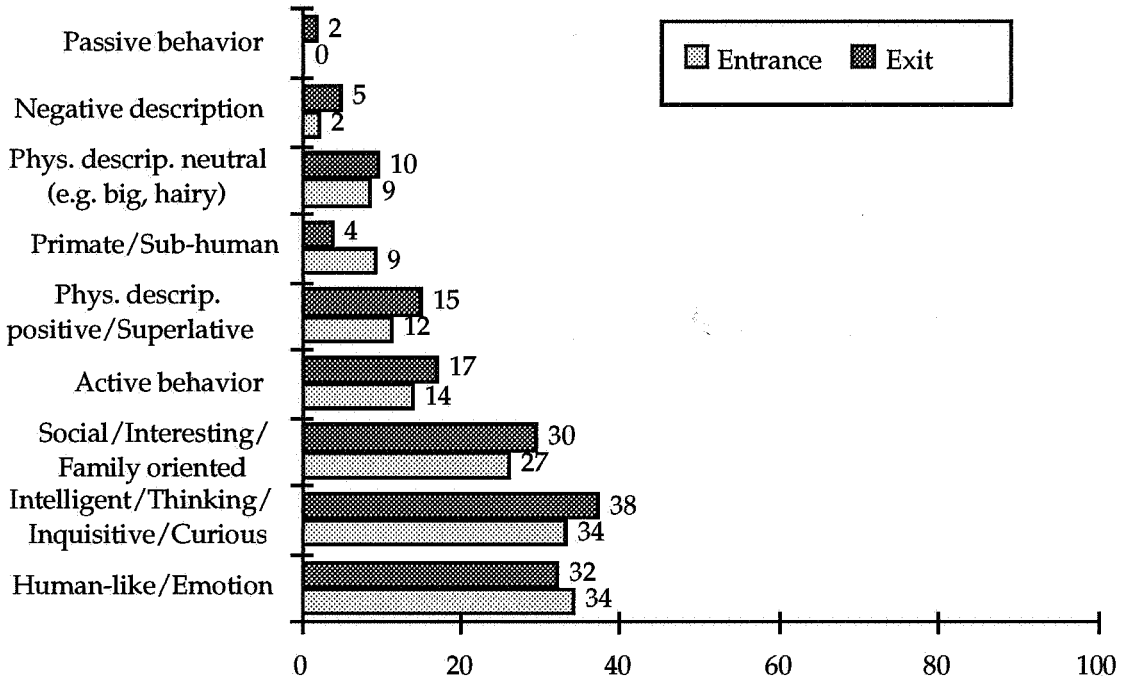
Visitors' Descriptions of Apes and Monkeys

Although there are distinct differences between Entrance and Exit responses to the substantive questions on animal thinking, as discussed above, we do not see significant differences in visitors' descriptions of apes and monkeys before or after they have viewed the exhibition (Figure 5).

The only significant difference between entrance and exit responses appears in the category Primate/sub-human. Fewer visitors described apes and monkeys simply as primates or as sub-human after they had viewed the exhibition (9% Entrance, 4% Exit).[39]

[39] $\chi 2(1, N=576) = 6.831, p = .009$.

Figure 5
Visitors' Descriptions of Apes and Monkeys
Summer 1996, Entrance and Exit Surveys
Visitors Age 12 or Older
(in Percent)



* Total percents equal more than 100%, as individuals could give more than one response.
Source: Appendix B, Table 16.

Thus far, in this discussion, we have not fully addressed another curatorial concern: what did visitors' do during their visit? And, to what degree are responses to the exhibition significantly affected by the specific activities that people undertook or by the time that they spend with them? These questions are addressed in the next section.

B. Visitor Responses to the Exhibition in General

Activities Visitors Engaged in During Their Visit

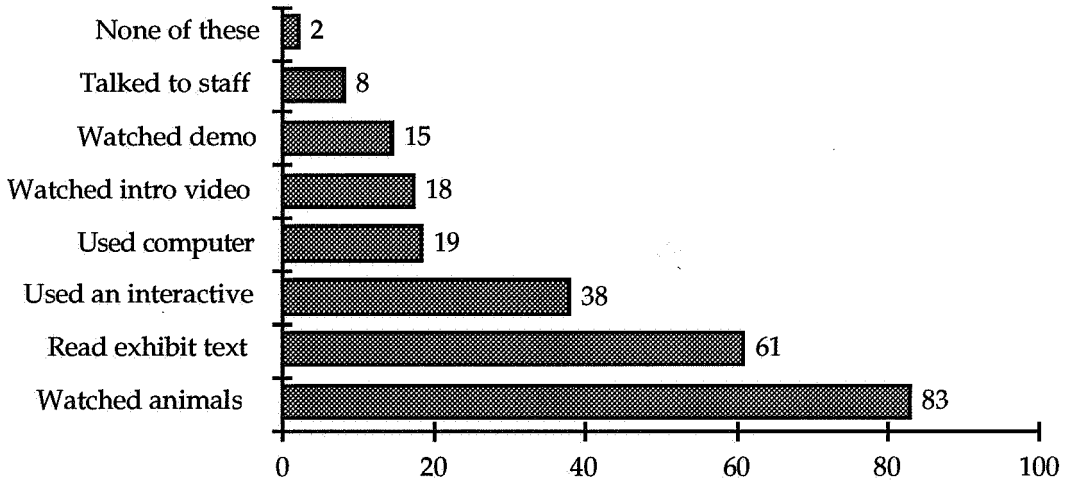
We asked visitors to report their activities in the exhibition (selected from a list of seven items shown by the interviewer (see Figure 3, below). These activities are not mutually exclusive; a visitor could report engaging in all seven activities or none at all.

Visitors engaged in an average of 2.4 (*SD*= 1.3) activities in the exhibition.[40] As illustrated in Figure 6, watching the animals was reported by eight out of ten

40 Data on file, ISO.

individuals, followed by reading the exhibit text (six out of ten), and using a non-computer interactive (four out of ten), and using the computers (two out of ten visitors).

Figure 6
Activities Visitors Engaged In at Think Tank*
Summer 1996, Exit Survey
(In percent of all responses)



* Total percent equals more than 100%, as individuals could give more than one response.
Source: Appendix B, Table 18.

There were some differences in visitors' reported activities based on their gender, the social composition of the visit group, familiarity with NZP, and educational attainment. Men reported watching the demonstrations and the introductory video more often than women. Adults without children reported reading the exhibit text more often than adults with children. Frequent NZP visitors reported watching the animals less frequently than New and Returning visitors and visitors who had earned a Master's degree or higher reported using an interactive more often than visitors with less educational attainment.[41]

We also asked visitors to tell us which of the activities they engaged in was most interesting to them. Interviewers recorded both a first and second choice (if indicated). The responses to this question parallel what visitors found most interesting in general (discussed below). As would be expected, visitors found the animals, by far, the most interesting part of *Think Tank* -- half of the visitors who said they engaged in one or more activities said the animals were most interesting (48%). Reading the exhibit text was reported as the next most interesting activity (37% named it as second choice, 17% as a first choice) followed by using a non-computer interactive (22% second choice, 19% first choice).[42]

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41 Data on file, ISO Gender difference demo, $\chi 2(1, N=368) = 6.088, p = .014$; Gender difference intro, $\chi 2(1, N=368) = 7.439, p = .006$; Visit group, $\chi 2(1, N=364) = 7.203, p = .007$; NZP visitor type $\chi 2(2, N=356) = 9.486, p = .009$; Education, $\chi 2(3, N=355) = 13.487, p = .004$.

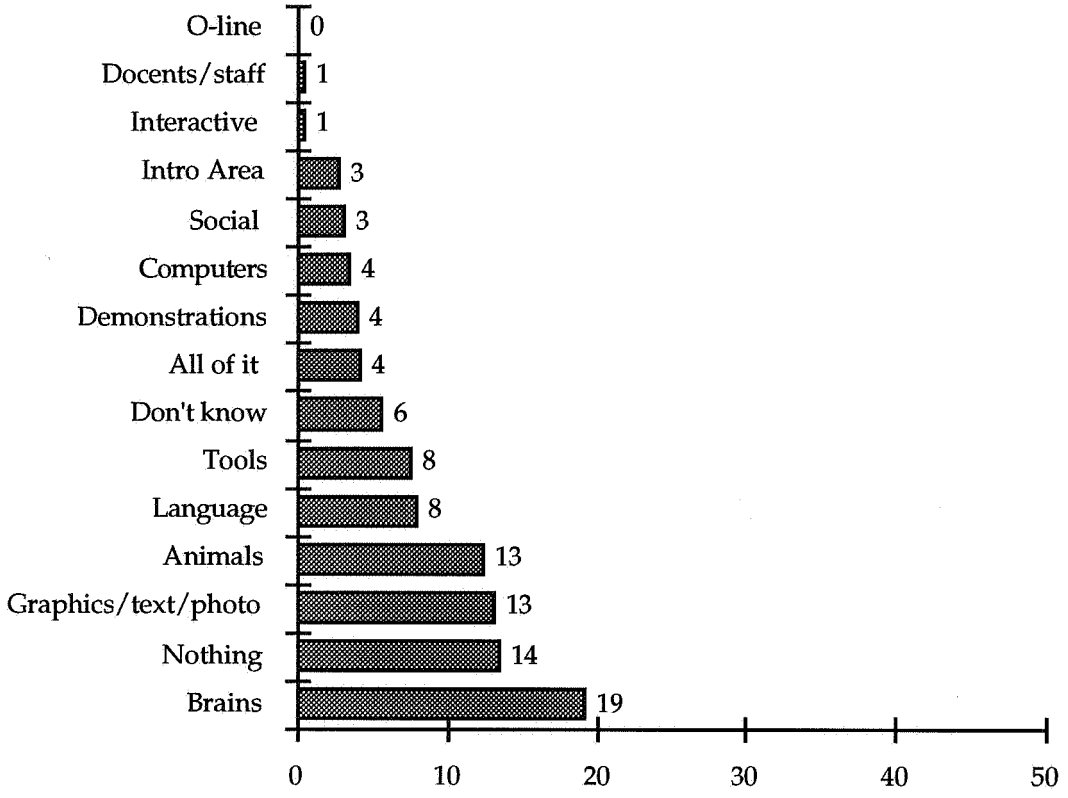
42 See Appendix B, Table 18.

These results differ in some cases from the results of the Tracking Study discussed in Section III of this report. In general, self-reports of activities are less reliable than observations due to the effect of memory, the possibility that some terms were understood differently by the visitor, and the level of experience of the interviewer in probing.

What Visitors Found Most Informative

As Figure 7 illustrates, about one in five visitors (19%) thought the displays on brains were the single most informative aspect of the exhibition. The animals were found most informative by about one in eight visitors (13%). No other specific element was comparable to these.

Figure 7
What Visitors Found Most Informative, Exit Only
Visitors Age 12 or Older
(in Percent)



Source: Appendix B, Table 17.

Men found the brain displays more informative than women did. Nearly one in three men (30%) found the brain displays to be most informative.[43]

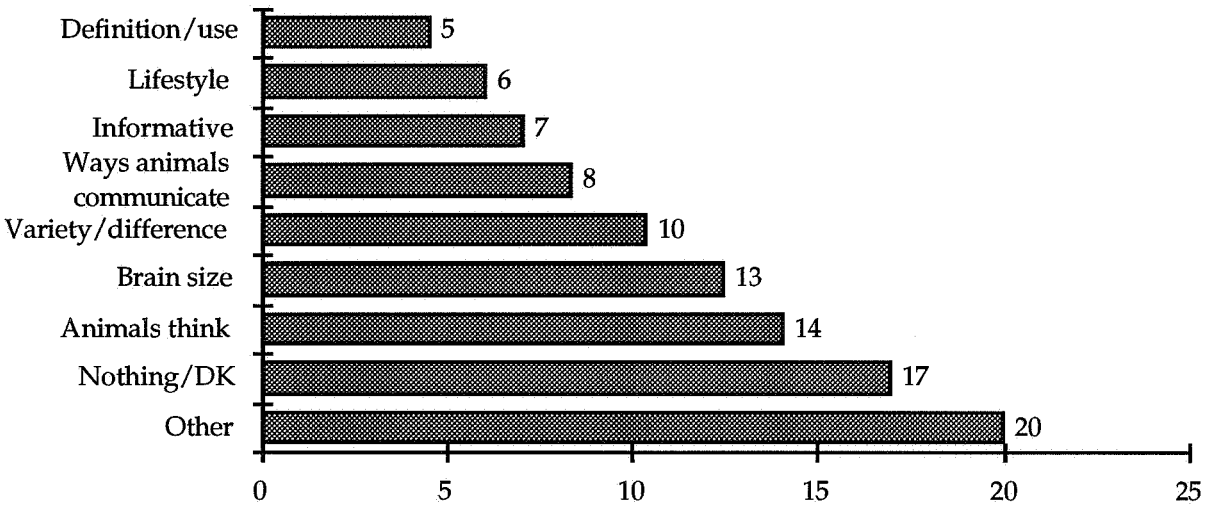
43 Data on file, ISO $\chi 2(5, N=330) = 24.079, p = .001$.

Main Ideas Communicated by *Think Tank*

After visitors told us what they thought was informative in the exhibition, we asked them to tell us what was the main idea it provided. Our ability to analyze these data is somewhat hampered by the fact that interviewers wrote down, rather than tape recorded, the responses. Thus, some of the texture, richness and detail is undoubtedly lost.

Figure 8 shows the categories of responses that were mentioned by at least 5 percent of visitors.

Figure 8
Main Ideas Communicated by *Think Tank*
Summer 1996, Exit Survey
(In Percent)



Source: Appendix B, Table 13.

The following shows each of the categories of "main ideas," illustrated in the graph above, with selected examples of the actual responses visitors' provided.

Definition/use
"How animals use inanimate objects for tools"
"Defining what is thinking"

Lifestyle
"I'm glad not to have to go through the mating cycle"
"To think about animals in their daily life"

Informative
"History of animals"
"Basic facts - I need more time"

Ways animals communicate)
"It is possible for humans to communicate with animals"
"Had not realized how symbols work - different symbols for parts of speech."

Variety and/or difference
"Tools can be put together in different ways"
"Different habitats for different things"

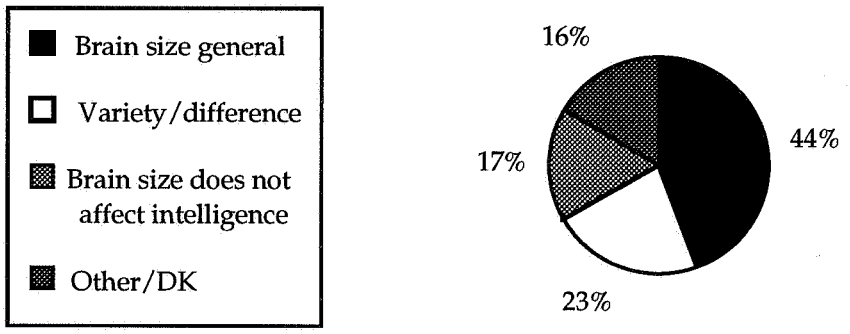
Brain sizes
"Seem small compared to size of animal"
"Learned more about brains and their size"

Animals think
"Orangs are smart"
"Animals are smarter than we give them credit for"

As noted above, one-fifth of visitors considered the display on Brains (in the introductory section) most informative. Tools and Language were each cited as the most informative aspects of the exhibition by eight percent of visitors. The following graphs illustrate the main ideas visitors saw communicated by these three exhibition sections.

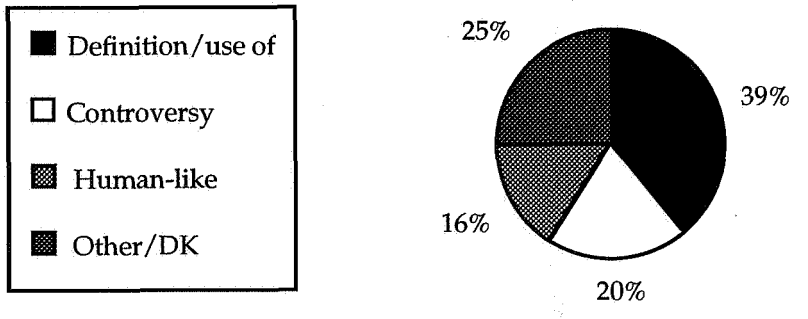
As Figure 9 shows, the main idea communicated by the Brains exhibit was something about their size. About one-fifth of visitors who thought the Brains were most informative said that brain size does not affect intelligence.

Figure 9
Main Idea Communicated to Visitors in Exhibition Sections: Brains
Based on 19% of All Visitors
(In Percent)



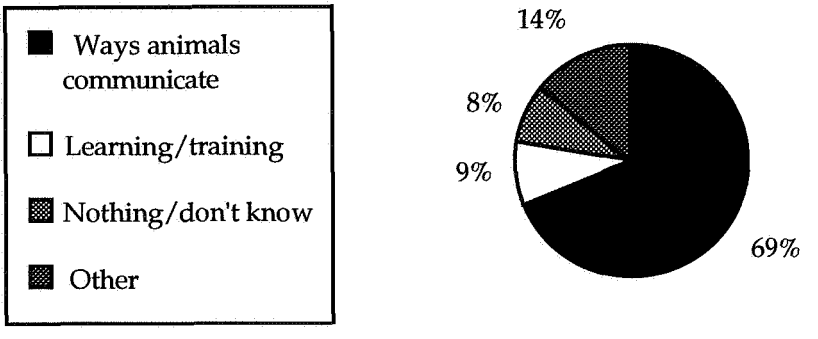
The next graph, Figure 10, illustrates the main ideas communicated by the section on tools. Most visitors (59%) who found Tools informative learned something about the definition and/or use of tools or about the controversy surrounding the definition of tools.

Figure 10
Main Idea Communicated to Visitors in Exhibition Sections: Tools
Based on 8% of All Visitors
(In Percent)



The section on language clearly informed visitors about the way animals can communicate. Seven out of ten visitors who thought the language section was most informative learned something about the process of animal communication.

Figure 11
Main Idea Communicated to Visitors in Exhibition Sections: Language
Based on 8% of All Visitors
(In Percent)



Source: Appendix B, Table 13.

What Visitors Found Most interesting

Not surprisingly, two out of five visitors found the orang utans and macaques the most interesting part of the exhibition. Another two out of three visitors mentioned the display of brains as most interesting.

Visitors' interest in the animals and the display about brains was consistent across all age groups, visit groups, gender and racial/ethnic groups. While all visitors were

interested in the animals and brains sections, we find that visitors with above average interest in science and high educational attainment, and Frequent NZP visitors were also interested in other exhibition components, as well as the animals and brains.

Visitors with a below average interest in science and lower educational attainment, as well as New visitors, were extremely interested in the orang utans and macaques without much consideration for other aspects of the exhibition.

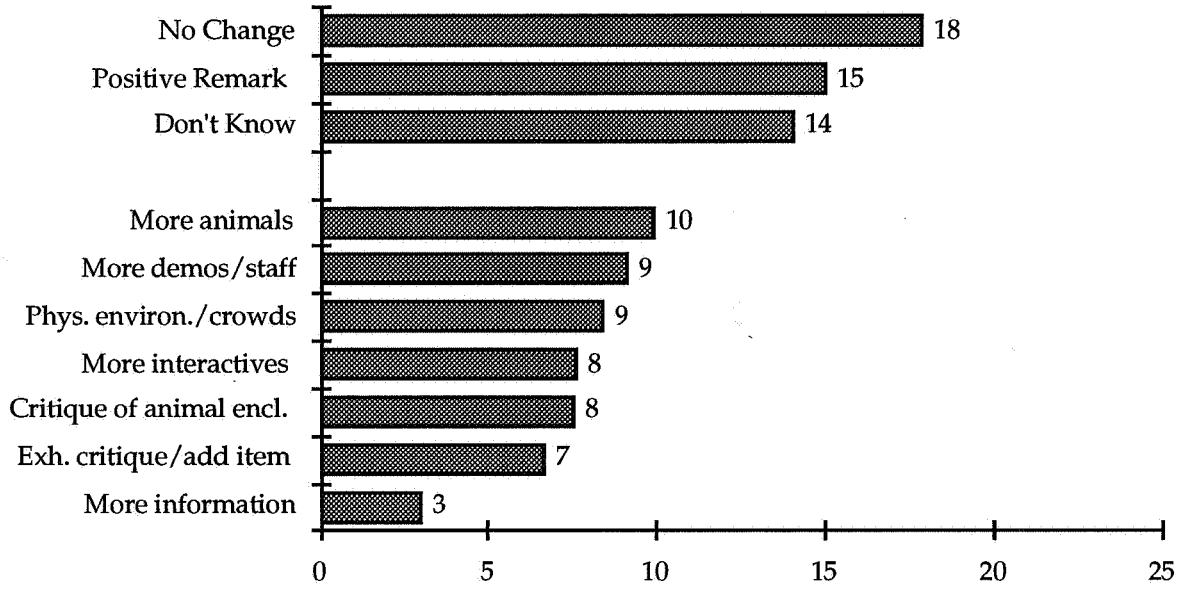
Was there anything that moved you emotionally?

Exhibitions sometimes have emotional effects on visitors. As we discussed above, half of the visitors to *Think Tank* said the exhibition influenced their perceptions about animals. However, most visitors to *Think Tank* said they were not affected emotionally by the exhibition (see Appendix B, Table 21). Eight out of ten visitors said nothing moved them emotionally (80%). For visitors who were moved by the exhibition, watching the animals stirred the most emotional response -- half of the visitors who said they were moved by the exhibition cited watching the animals as the reason (13% overall). Three percent of visitors had a negative emotional reaction to the animal enclosures. For example, one visitor responded, "seeing animals caged up-like a person in jail." The remaining 11 percent were positive responses to human-animal interaction (3%), using interactives (2%) and other exhibition components (3%), or a feeling that the exhibition was emotionally moving in general (3%).

Two-thirds (63%) of visitors who indicated that they were moved by the exhibition also said their perception of animals was influenced by the exhibition, compared to 53 percent overall.

What Visitors Would Change. Visitors were asked what they would improve, change, or add, if they were the director of NZP. Many visitors (47%) had no recommendations for change. For those who recommended changes, suggestions for improvement could be divided into seven categories, led by a request for more animals in the exhibition, as shown in Figure 12.

Figure 12
Visitor Recommendations for Change at Think Tank
Visitors Age 12 or Older
(In Percent)



Source: Appendix B, Table 20.

In general, Frequent NZP visitors are more critical than New visitors both because they have a greater identification with NZP, and because they have had the time and experience to note more things that they would like to see changed. Visitors with a Bachelor's or advanced degree were also more critical of the exhibition than visitors who did not have a college degree.

Older visitors disproportionately complained about the physical environment or the crowds (25%) while younger visitors disproportionately critiqued the animal enclosures (14%). Adults who came with children were, overall, more satisfied than adults visiting alone or with other adults -- 53 percent of adults with children made no recommendations for change compared to 37 percent of adults visiting without children.[44]

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44 Age $\chi 2(27, N=328) = 73.014$, $p = .001$; Visit group $\chi 2(9, N=325) = 17.041$, $p = .048$.

C. Who Visits *Think Tank*?

Demographic Profile

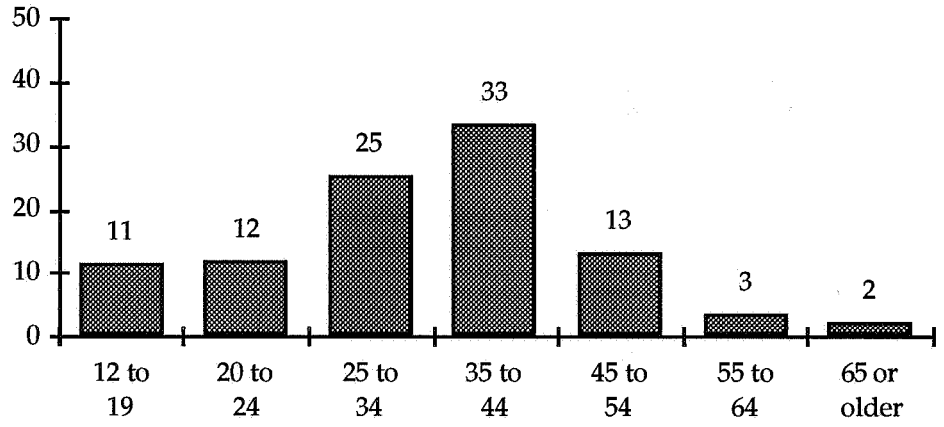
To aid in interpreting visitor responses to questions about *Think Tank*, we collected information about the demographic and social characteristics of respondents, prior experience with NZP, and their sources of information about the exhibition.

As shown above, our main analytic approach was the comparison of data from entering and exiting visitors. This approach assumed that we selected samples with similar characteristics. In fact, there were no significant differences between visitors interviewed in the Entrance Survey and those interviewed in the Exit Survey. The discussion below, therefore, is based on the total number of visitors interviewed.

The demographic characteristics of *Think Tank* visitors are based on interviews with visitors age 12 and older and, as already noted, reflect a particular seasonal visitor.

Gender, Age and Social Groups. More women than men visited *Think Tank* (55% women, 45% men).[45] Adult visitors to *Think Tank* were primarily between the ages of 25 and 44 (68%) and were most often visiting in a group composed of adults and children (65%) or with other adults (30%) (Figure 13). Very few adults visited *Think Tank* alone or as part of a tour/school group (Figure 14).[46] The average age of adult visitors was 34 (*SD= 12.8*). The average group size was 4 people (*SD= 4*).[47]

Figure 13
Age of Visitors
Visitors Ages 12 and Older
(in Percent)



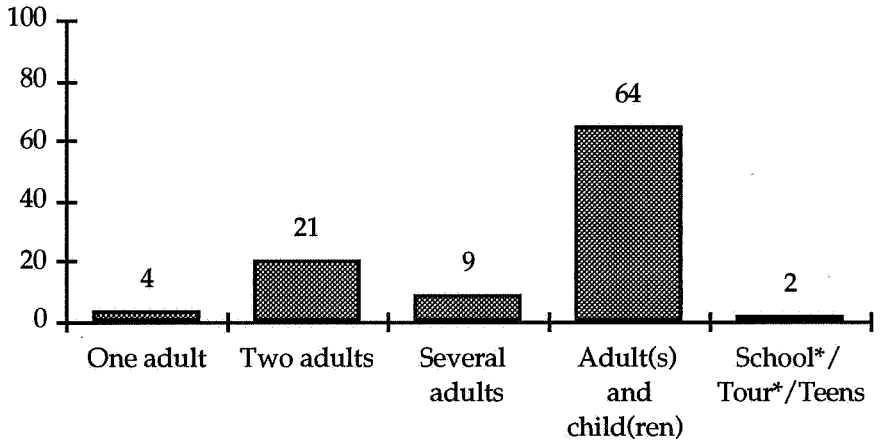
Source: Appendix B, Table 1.

45 See Appendix B, Table 1.

46 See Appendix B, Table 1 for Age and Table 4 for Visit Group.

47 Data on file, ISO. Men were slightly more likely to come alone, compared to women. This difference, while statistically significant, is based on very few cases.

Figure 14
Composition of Visitor Groups
Visitors Ages 12 and Older
(in Percent)



Source: Appendix B, Table 4.

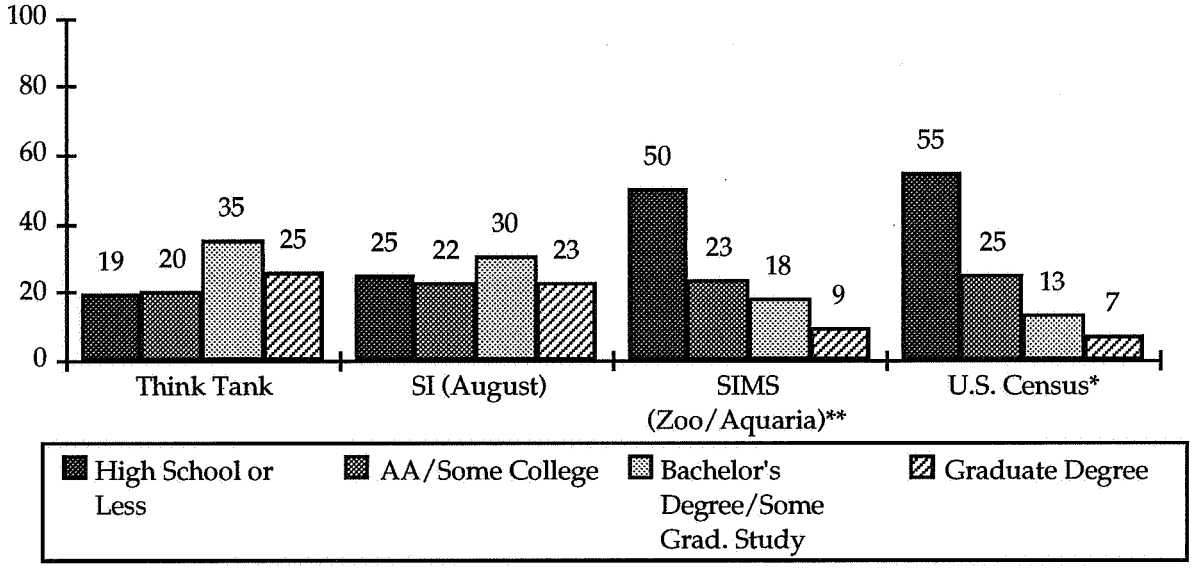
Residence. Exactly half of all visitors were from out of town. Most local visitors came into the city from the suburbs (43%). About 1 in 10 visitors were residents of Washington, DC (8%) and four percent were visiting from another country.[48]

Education. As Figure 15 illustrates, like Smithsonian visitors on the Mall, visitors to *Think Tank* are highly educated.

Six out of ten visitors age 25 or older have a college or advanced degree (35% Bachelor's, 25% Graduate Degree). Visitors to *Think Tank* were also highly educated in comparison to visitors to zoos and aquariums nation-wide.

48 See Appendix B, Table 3.

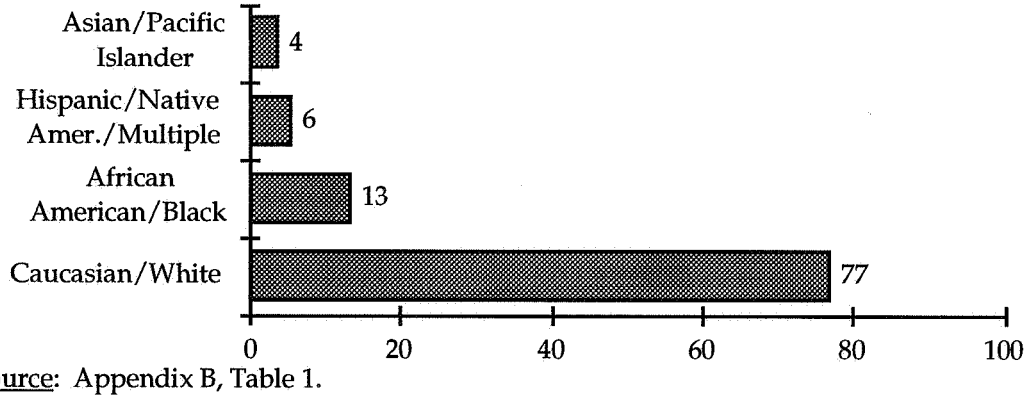
Figure 15
Educational Attainment
Think Tank Visitors, Smithsonian, U.S. Zoos and Aquariums, and U.S. Population
Age 25 or Older (in Percent)



Source: Appendix B, Table 6. *1990 U.S. Census of Population and Housing. Educational Attainment of All Persons 25 years and over. U.S. Census Bureau 1990. ** The Smithsonian Institution Marketing Study (SIMS) was completed in May 1994 for the Office of the Assistant Secretary for Institutional Advancement in preparation for the Smithsonian's 150th anniversary celebration.

Race/Ethnicity. Also like Smithsonian visitors to the Mall museums, visitors to *Think Tank* were mostly non-minorities. Approximately one-fourth of *Think Tank* visitors were from a minority group (23%) (See Figure 16). African Americans were over half of all minority visitors and comprised one-third of visitors from Washington, DC.[49]

Figure 16
Racial/Ethnic Identification
Visitors Age 12 or Older, U.S. Residents Only (in Percent)



Source: Appendix B, Table 1.

49 See Appendix B, Table 2.

Comparisons to Other Visitor Profiles

Unlike visitors to other major Smithsonian units visitors to NZP have not been comprehensively studied. This paucity of data about general NZP visitors makes it difficult to understand *Think Tank* visitors in a broader context. However, we have information about recent visitors to NZP's *Reptile Discovery Center* (RDC) and visitors to the museums on the National Mall. Those data can help us isolate any unique characteristics of *Think Tank* visitors. We use a set of demographic characteristics -- gender, age, racial/ethnic identity, residence, visit group and education -- to make comparisons.

Here, we compare visitors to *Think Tank* with visitors to NZP's *Reptile Discovery Center* (RDC) during the month of October, 1992 and the National Museum of Natural History (NMNH) during the month of August, 1994.[50] One major caveat in our comparison of visitors to *Think Tank* and RDC is the assumed difference among seasonal audiences. The *Think Tank* data was collected during the summer season and RDC data was collected during the Fall. Any differences may be a reflection of seasonal variation rather than a difference in audiences.

The demographic characteristics of visitors to *Think Tank* resemble visitors to RDC in all aspects except racial/ethnic identification. African Americans were a larger proportion of visitors to *Think Tank* (13%) than of visitors to RDC (8%).

The similarity of visitors to *Think Tank* and RDC suggests that there is little self-selection among visitors to major NZP exhibits. *Think Tank* and RDC are physically close to each other at NZP, but their subject matter is quite different. Based on this limited comparison we can speculate that *Think Tank* visitors are not distinct from other NZP visitors who are strolling along Olmsted Walk.

In contrast, we find that visitors to *Think Tank* are different from visitors to NMNH on the National Mall. We selected NMNH for comparison, rather than other Mall museums, hypothesizing possible similarities arising from a joint concern with nature.

Visitors to *Think Tank* differ from visitors to NMNH during the month of August in race, residence and visit group.[51] While the proportion of minorities and non-minorities was parallel between NMNH visitors and *Think Tank* visitors, the distribution among minority groups differed. African Americans formed a higher percentage of minority

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50 The Institutional Studies Office collected information about visitors to the Reptile Discovery Center at the National Zoo (RDC) as part of a longitudinal study of the Reptile Discovery Centers Project at the National Zoological Park, Zoo Atlanta and the Dallas Zoo. The data reported here is based on the 1992 study of visitors to RDC and considers visitors age 12 and older. The data reported in Doering, Z. D., S. J. Smith A. Pekarik, A. Bickford and R. D. Manning. (1994) is based on visitors of all ages.

51 Comparisons are based on data collected during the month of August, 1994 as reported in S. Bielick, A. Pekarik, and Z. D. Doering (1995).

visitors at *Think Tank* (13%) than at NMNH (6%) and Asians were less represented at *Think Tank.*

Think Tank had a much higher percentage of local visitors (50%) and adults visiting with children (65%) than NMNH had (18% local, 52% adults with children).

Visitors to *Think Tank* and NMNH were similar in gender -- more women than men visited; in their high level educational attainment; their age -- mostly between the ages of 25 and 44 and; the number of people in their visit group -- most visitors over the age of 12 came in a group consisting of two to four members.

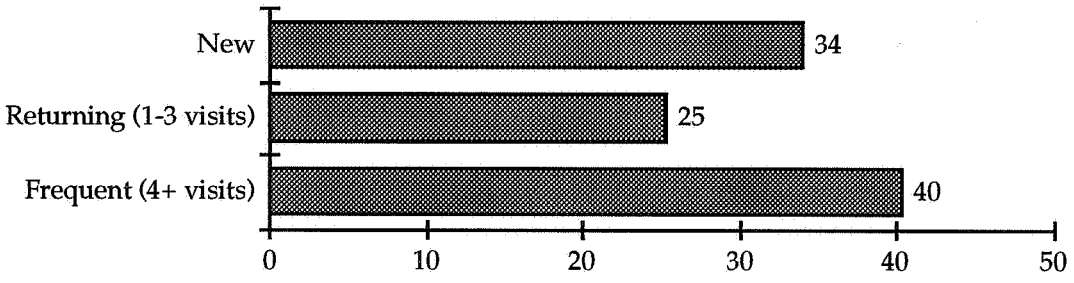
Appendix A, Tables 1-4, also contain data for all visitors to the National Mall during the month of August, based on year-round surveys. The Mall visitors overall differ from visitors to NMNH in only one notable respect. Whereas the *Think Tank* and RDC audiences show a clear majority of women (55% and 54%, respectively), and NMNH shows a slight majority of women (51%), Mall visitors show a slight majority of men (51%).

Previous Experience With NZP and *Think Tank*

Our previous research has shown that an individual's experience with a museum, defined by the number of previous visits, helps us understand some aspects of behavior and attitude. Applying these definitions to *Think Tank* visitors, we find the following distribution of visitor types: New Visitors -- 34% (who are making their first visit); Returning Visitors -- 25% (who have been to NZP from one to three times in the past); and Frequent Visitors -- 40% (who have been to NZP four or more times before).

As is shown in Figure 17, most *Think Tank* visitors were on a repeat visit to NZP (65%) and were often Frequent visitors -- four out of ten visitors to *Think Tank* were Frequent NZP visitors (40%).

Figure 17
NZP Visitor Type
Visitors Age 12 or Older
(in Percent)



Source: Appendix B, Table 7.

Very few individuals were making a repeat visit to the *Think Tank* exhibition (6% in the Exit Survey).[52] It is not surprising that since the exhibition is relatively new, most repeat visitors to NZP were making a first visit to *Think Tank* .[53]

The key characteristics that differentiate New, Returning and Frequent NZP visitors are age, race, residence, education and interest in science (see Appendix A, Table 7a). New visitors are younger, are more often members of racial/ethnic minority groups, are from out-of-town, and have less educational attainment and below average interest in science. Frequent visitors are older, more likely to be non-minorities, come from the Washington Metropolitan Area, and have high educational attainment and above average interest in science. The characteristics, attitudes and opinions of Returning visitors are hybrids of those belonging to New and Frequent visitors. In some respects, Returning visitors resemble New visitors and in other respects they resemble Frequent visitors.

Eight out of ten visitors to *Think Tank* had no prior knowledge of the *Think Tank* Exhibition. Those who had heard of *Think Tank* prior to their visit learned about it from a newspaper or magazine (5%), from a previous visit (4%), from family or friends (4%), from television (2%) or from sources they could not recall (5%).[54] Not surprisingly, more Frequent local NZP visitors had prior knowledge of the *Think Tank* exhibition (36%) than New or Returning visitors (13% and 17%, respectively). Most visitors who had heard of *Think Tank* were local residents (61%) (χ^2 (3, N=594) = 10.870, p<.012).

Visitor Expectations

We asked visitors who were entering *Think Tank* what they expected to see in the exhibition. Half of the visitors did not have any expectations (50%) and about a quarter expected to see animals (27%). The remaining 23 percent of visitors expected to see didactic components in the exhibition -- 16 percent thought they would see something on learning, four percent expected demonstrations or experiments and three percent expected basic displays.

52 The few visitors who were making a repeat visit to *Think Tank* were mostly women between the ages of 25 and 34, in a visit group made up of adults and children and who were residents of the Maryland and Virginia suburbs. Data on file, ISO.

53 See Appendix B, Table 7.

54 The few visitors (6%) who were making a repeat visit to the exhibition are excluded from this figure.

III. Tracking Study Results

Introduction

The *Think Tank* Entrance and Exit Surveys were complemented by unobtrusive observations of visitor behavior in the exhibit. These observations allow us to suggest possible connections between what visitors did in the exhibition and how they were affected by the experience. Visitors were selected for tracking as part of the Entrance Survey,[1] and their stops (location and duration) were recorded from their entrance into the first area of the exhibition until they left the building (see exhibition Map following this section). A "stop" was recorded if it was at least three seconds in duration. In addition, a few demographic characteristics were recorded from observations.

The 155 visitors we observed spent an average of 8.9 minutes (*SD*=8.8 minutes) in the exhibition rooms.[2] The median visit was 6.9 minutes; the middle 50 percent of visitors spent between 3.6 and 11.0 minutes. On average, 5.8 minutes (*SD* =2.2 minutes) were spent viewing the exhibition and the remaining time was spent between stops. (Some of the time between stops was spent on benches available in the building.) Not surprisingly, different social groupings spent varying periods of time in the exhibition. As shown in Table 35, men generally spent more time. While overall about two-thirds of the time was spent engaged with exhibition elements, women who were part of family groups spent the least amount of time engaged and men the most. [Note, however, that some of these groups are quite small, so differences should be viewed with caution.]

Visitors made an average of 5.7 stops (*SD* =4.9 stops) during their visit. The median number of stops was 4.0; the middle 50 percent of visitors made between 3 and 7 stops. Groups that included children tended to make more stops than those without children and individuals visiting alone.

Movement through the exhibit was not always linear. Approximately one-fourth (43 people or 27.7%) of visitors returned to see a particular exhibition element more than once. Without considering the 'return' stops, the 155 tracked visitors made a total of 763 unique stops. Return stops were most common in the animal enclosure area (see Table 34).

As is apparent from the data on the average number of stops and the total stopped time, the average stop time at a specific element was over one minute. On average, a stop was 1.3 minutes in length (*SD* =2.5). The median was just slightly over half a minute (0.6 minutes). (See Table 35).

---

1 See Appendix C for a discussion of the methodology.

2 Following American Psychological Association convention, *SD* = Standard Deviation, *M* = mean, *N*= number. Supplementary tables are in Appendix B.

Specific Elements

Four exhibition components stood out as particularly important: two elements of the introductory area (*Brains in glass cases* and *Bronzed brains*) and, understandably, the *Orang utan enclosure* and the *Macaque enclosure* (see Table 30). Three out of five visitors stopped at the *Orang utan enclosure* and about one-third at the other three. All four were identified by exiting visitors who were interviewed as the most interesting parts of the exhibition (See Appendix B, Table 22).

The *Orang utan enclosure* accounted for 11.9 percent of all stops, and was stopped at by 58.7 percent of all visitors, (see Tables 32 and 30).[3] This was followed by the *Brains in glass cases* and *Bronzed brains* (7.6% and 6.6% of all stops, and each was stopped at by 37.4% and 32.3% of all observed visitors, respectively). The Macaques accounted for 6.2 percent of all stops and drew 30.3 percent of visitors.

The animal enclosures held the attention of visitors about two to three times as long as the brain displays. On average, visitors spent 2.2 minutes (*SD*= 2.5) at the *Orang utan enclosure* and 1.6 minutes (*SD*= 2.0) watching the *Macaques*. (The median stop at the *Orang utans* was 1.3 minutes, the median stop at the *Macaques* was 0.8 minutes). They spent 0.7 minutes (±0.6) at *Brains in glass cases* and 0.7 minutes (*SD*= 1.3) at *Bronzed brains*. (Median stops at these brain displays were 0.6 and 0.5 minutes, respectively.)

The longest stops were made by visitors watching demonstrations. Eight stops (made by 5.2% of the observed visitors) were made here, and the median length of stop was 5.4 minutes. The next longest stops (3.7 minutes, *SD*=5.3) were made at *The Language Game.*[4] Less than ten percent (8.4%) stopped here, either to observe someone using the game or to play. During the tracking, we also observed two visitors talking to docents for about 3 minutes.

Types of Elements

Although elements of the same type vary in size, complexity, design and function, we can get a sense of how different sub-groups respond to different types of elements by looking at the distribution of their stops (Table 37). The table suggests, for example, that children were reluctant or unable to read text panels in comparison with adult visitors (except for adult males visiting with others). Children made about ten percent of their stops at panels, while adults made 20 to 30 percent of their stops at panels. (Males in adult groups made 16 percent of their stops at panels). At the same time, adults in groups with children were more likely to stop at panels than adults visiting with other

3 The 11.9% is based on the overall number of discrete stops. The 58.7% is based on the total number of observed visitors (155).

4 The median was 1.4; in other words, several visitors made very long stops.

adults. Presumably the adults were reading for the benefit of the children as well as for themselves.

The table also suggests that all groups with children were more inclined to use interactives than either all-adult groups or males visiting alone. Finally, we should note that adults visiting with other adults were more likely to stop in front of an animal than adults visiting with children. In other words, all-adult groups had less interest than adult-child groups in the non-animal dimensions of the exhibition.

Exhibition Sections

Upon entering, three of four (72.3%) observed visitors stopped at one or more of the components designed to orient them to the building (Table 34). Within this introduction section, half (45.5%) made only one stop, one-fourth (28.6) made two stops, and another fifth (19.6%) made three stops (see Table 36). Half (48.2%) of all visitors who stopped in the introductory area by-passed the rest of the exhibition and went directly to the animal enclosures area. Most of the others who stopped in the introductory area (42.9%) went on to the Tools section.

Less than half (47.1%) of all visitors made at least one stop in the Tools section and their stops were brief (0.8 minutes $\pm$1.0, median for a stop in Tools is 0.5 minutes). Two-thirds (65.8%) of the visitors who stopped in Tools had also stopped in the introductory section, while others (20.5%) began their visit here. One element in this section, *Is A Cow A Tool?*, was especially popular. About one-sixth (17.4%) of all tracked visitors stopped at *Is A Cow A Tool?* and, on average, spent 1.3 minutes (*SD*= 1.9, median is 0.7). Aside from this interactive, the tools section, like the introduction section, saw a rapid drop-off in visitor stops. Two out of five visitors (41.1%) who stopped in Tools made only one stop, one-third (35.6%) made two and the remaining fourth (23.3%) made three or more stops.

Visitors moved rapidly through or by-passed the exhibition elements dealing with Language and Society. About one-fourth of the tracked visitors made one or more stops in each of these exhibition sections (23.2% in the Language, 25.8% in Society). These visits tended to be brief[5] In each section, one element stood out, the *Syntax Wheel* in Language and the *Yani Art* in Society. About 14 percent of visitors stopped at each. Within these two sections most visitors made one stop (50.0% and 75.0%, respectively). In general, most visitors who stopped in these two section had already stopped in both the introductory area and Tools and were following the exhibition sequence section by section. They went on to the animal enclosure section.

---

5 For Language the average stop time is 1.4 minutes *SD*= 2.6. The median for a stop in Language is .66 minutes. In Society, the mean is 1 minute *SD*= 1.3 and the median for a stop is .4 (less than half a minute). Data on file, ISO.

Altogether 131 visitors made a stop in the animal enclosures section; 77.4 percent of all tracked visitors stopped at the orang or macaque enclosures. Twenty (15.3%) of the tracked visitors began their visit in the animal enclosures area, after by-passing everything else. Two-fifths (41.2%) of all visitors who stopped in this section arrived directly from the introductory area, an additional one-fourth (29.0%) came directly from Tools, while the rest (14.5%) came from the other two areas.

As in the other sections, most visitors stopped at only one or two elements. About two-fifths (44.3%) made only one stop and half made two or three (27.5% made two stops, 19.9% made three). Very few (8.3%) made four or more unique stops. Even so, visitors made more repeat stops in this section than they did anywhere else in the exhibition.

While the animal enclosures in the final section were the major draw, visitors did not disregard the accompanying didactic materials. As shown in Table 29, the various photos and panels attracted some interest and most (65.2%) of them glanced at the didactic materials.

Appendix A.

Data Collection Forms: *Think Tank* Study

This appendix contains copies of the questionnaires used in the Entrance Survey and the Exit Survey, the associated card shown to visitors, and the form used in the Tracking Study. A map of the exhibition, showing the codes used in the Tracking Study, is on page A-9.

Entrance and Exit Survey Materials

By Institutional Studies Office convention, questions read to respondents are shown in **bold**. Response categories are not read to visitors. In some instances, interviewers mark a pre-printed response category. In others, they record the visitors comments verbatim. Finally, some questions require both marking a pre-printed response and recording a response. For example, a response of "Texas" to Q.17. **Where do you live?** would require the interviewer to mark "Other U.S." as well as record "Texas" for subsequent coding in the office. From the perspective of the interviewee, all of the questions are open-ended. For additional information about the questionnaires, see Appendix D.

Tracking Study Materials

The exhibition space was divided into six discrete areas from the orientation/entry area to the animal enclosures. Within a given area, exhibition elements were given numeric codes.

When a visitor was selected for tracking, the observer recorded the demographic and administrative data on the bottom of the form. At each stop the visitor made, five items of data were recorded:

(a) the location of the stop;
(b) the time at the beginning of the stop;
(c) the visitor's activity during the stop - the "Social Interaction Code" ("Soc. Int." on the Tracking Form) gives an indication of visitor and group activity;
(d) the animals' activity during the stop at the animal enclosures - the "Animal Interaction Code" ("Ani. Int" on the Tracking Form) gives an indication of what the animals were doing while the visitor was watching them; and
(e) the time at the end of the stop.

ENTRANCE INTERVIEW ☐☐☐☐ ID ☐☐ Interviewer ☐☐☐ Count

Think Tank Summer 1996 Visitor Study

Hello. My name is _____. I am a volunteer for the Smithsonian and would like to talk to you about your visit here today.

***1. Is <u>today</u> your first visit to this zoo?**

○ Yes [GOTO Q3] ○ No ASK Q1a.

1a. How many times have you been here before today?

○ 1-3 ○ 4-9 ○ 10+ _____

1b. In the last year, how many times have you visited this zoo? _____

○ 1-3 ○ 4-9 ○ 10+

***2. Is this your first visit to <u>this</u> building?**

○ Yes ○ No [TERMINATE].

3. Had you heard about this exhibition, called *Think Tank*, before today? ○ Yes ASK Q3A. ○ No [GOTO Q4a]

3a. Where did you hear about it? [MARK ALL THAT APPLY]

○ Saw it on last visit ○ TV
○ Heard about it on last visit ○ Zoo staff/volunteer
○ Family/friend ○ Don't recall
○ Newspaper/magazine Other _____

○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10

4. What do you recall hearing about this exhibition? [MARK ALL THAT APPLY]

○ Animal thinking ○ 1 ○ 5 ○ 9
○ Animal learning ○ 2 ○ 6 ○ 10
○ O-line ○ 3 ○ 7 ○ 11
○ Orangs/apes/monkeys: general ○ 4 ○ 8 ○ 12
○ Don't recall
Other _____

4a. What do you expect to see in this building? [MARK ALL THAT APPLY]

○ Animals (specify) ○ Animals learning
○ Demonstrations ○ Don't know
Other _____ _____

○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10

5. People have different feelings about science. On a scale of 1 to 10, where 10 is "*very interested*" and 1 is "*not at all interested*" where would you place yourself?

Record number_____ ☐☐

6. As you will see, at this zoo, scientists study how animals behave. On the basis of what you know, do you believe that some animals show "thinking behavior"?

○ Yes [GOTO Q7.] ○ No ASK Q6a. and GOTO Q8.

6a. Can you tell me why not?

_____ ☐☐
_____
_____ ☐☐
_____

7. Can you give me an example of animal "thinking behavior"? [PROBE FOR EXAMPLES]

_____ ☐☐ ☐☐
_____
_____ ☐☐ ☐☐
_____

8. Scientists who study "thinking in animals" focus on their behavior. Can you think of a behavior or several behaviors that scientists would study? [MARK ALL THAT APPLY]

○ Language ○ Don't know
○ Tool Use Other _____
○ Social Behavior _____

○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10
○ 11 ○ 12 ○ 13 ○ 14 ○ 15 ○ 16 ○ 17 ○ 18 ○ 19 ○ 20

9. What are some words you would use to describe apes and monkeys?

_____ ☐☐ ☐☐
_____
_____ ☐☐ ☐☐
_____

Now a few questions about you...

***10. Where do you live?**

○ Washington, D.C.
○ MD/VA suburbs
○ Other U.S._____
○ Foreign _____

☐☐☐ state/ctry

64008

***11. Who are you here with today?**

- O School trip
- O Tour group
- O Adult w/child(ren)
- O Adults w/child(ren)
- O One other adult [GOTO Q13]
- O Group of teens
- O Several adults
- O Child(ren)
- O Alone [GOTO Q13]

***12. Including you, how many people are in your group?**

Record number: _____ ☐☐

13. What is the highest level of education you have completed?

- O Pre/grade school
- O Some HS
- O HS graduate
- O Assoc./Jr./Technical
- O Some college
- O Bachelor's degree
- O Some graduate study
- O MA/Ph.D./Professional

***14. What is your age?**

Record Age: _____ ☐☐

***15. What is your cultural/racial/ethnic identity?**

- O African American/Black
- O Asian/Pacific Islander
- O Caucasian
- O Hispanic/Latino
- O Native American/Alaska Native
- Other_____ O

***16. Gender (MARK DO NOT ASK)**

O Female O Male

Admin. Box

STATUS:

- O Interview
- O SI staff/contractor
- O Ineligible
- O Refusal: Language
- O Refusal: Other

Reason for refusal/inelig.

_____
_____
_____
_____
_____
_____

Segment	Shift	Type of Int.
O 1	O 10:30-12:00	O Entry
O 2	O 12:45-2:15	O Exit
O 3	O 2:30-4:00	
O 4	O 4:30-6:00	
O 5		
O 6		

Session ☐☐

Comments:

_____
_____
_____
_____
_____
_____
_____
_____

---

extra1 O 1 O 2 O 3 O 4 O 5

extra2 O 6 O 7 O 8 O 9 O 10

extra3 O 11 O 12 O 13 O 14 O 15

extra4 O 16 O 17 O 18 O 19 O 20

extra5 O 21 O 22 O 23 O 24 O 25

☐☐ extra6 ☐☐ extra7 ☐☐ extra8 ☐☐ extra9

☐☐ extra10 ☐☐ extra11 ☐☐ extra12 ☐☐ extra13

☐☐ extra14

64008

EXIT INTERVIEW ☐☐☐☐ ID ☐☐ Interviewer ☐☐☐ Count

Think Tank Summer 1996 Visitor Study

Hello. My name is _____. I am a volunteer for the Smithsonian and would like to talk to you about your visit here today.

***1. Is <u>today</u> your first visit to this zoo?**

○ Yes [GOTO Q3] ○ No ASK Q1a.

1a. How many times have you been here before today?

○ 1-3 ○ 4-9 ○ 10+ _____

1b. In the last year, how many times have you visited this zoo? _____

○ 1-3 ○ 4-9 ○ 10+

2. Is this your first visit to <u>this</u> building?

○ Yes [GOTO Q3] ○ No ASK Q2a and GOTO Q3a.

2a. When was the last time you were here?

○ In the last 3 months [GOTO Q3a.]
○ 3-6 months ago
○ 6-12 months ago

3. Had you heard about this exhibition, called *Think Tank*, before today? ○ Yes ASK Q3A. ○ No [GOTO Q5.]

3a. Where did you hear about this exhibition? [MARK ALL THAT APPLY]

○ Saw it on last visit ○ TV
○ Heard about it on last visit ○ Zoo staff/volunteer
○ Family/friend ○ Don't recall
○ Newspaper/magazine Other _____

○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10

4. What do you recall hearing about it? [MARK ALL THAT APPLY]

○ Animal thinking ○ 1 ○ 5 ○ 9
○ Animal learning ○ 2 ○ 6 ○ 10
○ O-line ○ 3 ○ 7 ○ 11
○ Orangs/apes/monkeys: general ○ 4 ○ 8 ○ 12
○ Don't recall
Other _____ _____

5. People have different feelings about science. On a scale of 1 to 10, where 10 is "*very interested*" and 1 is "*not at all interested*" where would you place yourself?

Record number_____ ☐☐

6. As you have seen, at this zoo, scientists study how animals behave. On the basis of what you have seen, do you believe that some animals show "thinking behavior"?

○ Yes [GOTO Q7.] ○ No ASK Q6a. and GOTO Q8.

6a. Can you tell me why not?

_____ ☐☐
_____
_____ ☐☐
_____

7. Can you give me an example of animal "thinking behavior"? [PROBE FOR EXAMPLES]

_____ ☐☐ ☐☐
_____
_____ ☐☐ ☐☐
_____

8. Scientists who study "thinking in animals" focus on their behavior. Can you think of a behavior or several behaviors that scientists would study? [MARK ALL THAT APPLY]

○ Language ○ Don't know
○ Tool Use Other _____
_____
○ Social Behavior

○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10
○ 11 ○ 12 ○ 13 ○ 14 ○ 15 ○ 16 ○ 17 ○ 18 ○ 19 ○ 20

8a. Was there anything in particular you saw in the exhibition that emphasized that?

_____ ☐☐ ☐☐
_____
_____ ☐☐ ☐☐
_____

9. What are some words you would use to describe apes and monkeys?

_____ ☐☐ ☐☐
_____
_____ ☐☐ ☐☐
_____

○ 1 ○ 2 ○ 3 ○ 4 ○ 5 extra1
○ 6 ○ 7 ○ 8 ○ 9 ○ 10 extra2
○ 11 ○ 12 ○ 13 ○ 14 ○ 15 extra3

52717

10. Do you think this exhibition will influence the way you think about animals?

○ Yes ASK: **In what way?**
○ No ASK: **Can you explain why not?**

11. Overall, what in this exhibition interested you the most? [Animal, activity, demo, computer, text, graphic, etc.]

12. What part of the exhibition did you find most informative? [Animal, activity, demo, computer, text, graphic, etc.]

12a. What is the main idea it gave you?

13. On this card are some activities in *Think Tank*. Which of these did you have time to do? [SHOW CARD]

○ 1 Watched demonstration(s) [MARK ALL THAT APPLY]
○ 2 Read exhibit text
○ 3 Watched introduction video
○ 4 Used or watched someone use a computer game
○ 5 Watched animals
○ 6 Used an exhibit interactive
○ 7 Talked to a Think Tank staff member
○ 8 None of these **[GOTO Q14]**

13a. Which of these did you find the most interesting?

First Choice _____
Second Choice _____

14. Is there anything in the exhibition that you would like to know more about?

○ Yes **ASK Q14a.** ○ No **[GOTO Q15]**

14a. What kinds of things would you like to know more about? [MARK ALL THAT APPLY]

○ Information about specific animals
○ Brains
○ Animal tool use
○ Animal social behavior
○ Language acquisition in animals
○ IQ testing in humans
○ Don't know
Other_____

○ 1 ○ 5 ○ 9
○ 2 ○ 6 ○ 10
○ 3 ○ 7 ○ 11
○ 4 ○ 8 ○ 12

15. If you were the Director of this zoo, what things in the *Think Tank* exhibition would you improve, change or add? [MARK ALL THAT APPLY]

○ Nothing ○ Nothing + positive remark
○ More for children ○ More animals
○ More demonstrations ○ More hands-on
○ Critique of animal enclosures ○ Don't know
Other/spec_____ _____

○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10

16. Was there anything about the exhibition that moved you? (emotionally)

○ Yes ASK: **What was that?** ○ No

Now a few questions about you...

***17. Where do you live?**

○ Washington, D.C.
○ MD/VA suburbs
○ Other U.S._____
○ Foreign _____

state/ctry

***18. Who are you here with today?**

○ School trip ○ Group of teens
○ Tour group ○ Several adults
○ Adult w/child(ren) ○ Child(ren)
○ Adults w/child(ren) ○ Alone **[GOTO Q20]**
○ One other adult **[GOTO Q20]**

***19. Including you, how many people are in your group?**

Record number: _____

52717

20. What is the highest level of education you have completed?

- O Pre/grade school
- O Some HS
- O HS graduate
- O Assoc./Jr./Technical
- O Some college
- O Bachelor's degree
- O Some graduate study
- O MA/Ph.D./Professional

***21. What is your age?**

Record Age: _____ ☐☐

***22. What is your cultural/racial/ethnic identity?**

- O African American/Black
- O Asian/Pacific Islander
- O Caucasian
- O Hispanic/Latino
- O Native American/Alaska Native
- Other_____ O

23. We might like to talk to you again about your visit. Can we have your first name and a phone number where we would best be able to contact you at another time?

NAME_____

☐☐☐☐☐☐☐☐☐☐

NUMBER/area ( ) _____

☐☐☐ - ☐☐☐ - ☐☐☐☐

Is that a day or evening number?

O Day O Evening

***24. Gender (MARK DO NOT ASK)**

O Female O Male

Admin. Box

STATUS:

Reason for refusal/inelig.

_____

_____

_____

_____

_____

_____

- O Interview
- O SI staff/contractor
- O Ineligible
- O Refusal: Language
- O Refusal: Other

Segment	Shift	Type of Int.
O 1	O 10:30-12:00	O Entry
O 2	O 12:45-2:15	O Exit
O 3	O 2:30-4:00	
O 4	O 4:30-6:00	
O 5		
O 6		

Session ☐☐

Comments:

_____

_____

_____

_____

_____

_____

_____

_____

☐☐ extra6 ☐☐ extra7 ☐☐ extra8 ☐☐ extra9

☐☐ extra10 ☐☐ extra11 ☐☐ extra12 ☐☐ extra13

☐☐ extra14

O 16 O 17 O 18 O 19 O 20 extra4

O 21 O 22 O 23 O 24 O 25 extra5

52717

Card For Question 13 (Exit Survey)

On this card are some activities in Think Tank.
Which of these did you have time to do?

1 Read text panels/labels

2 Watched demonstration(s) on _____

3 Used or watched someone use computer program on strategies.

4 Used or watched someone use computer program on brain size.

5 Listened on phone/watched "Murmurs of the Earth".

6 Played language game

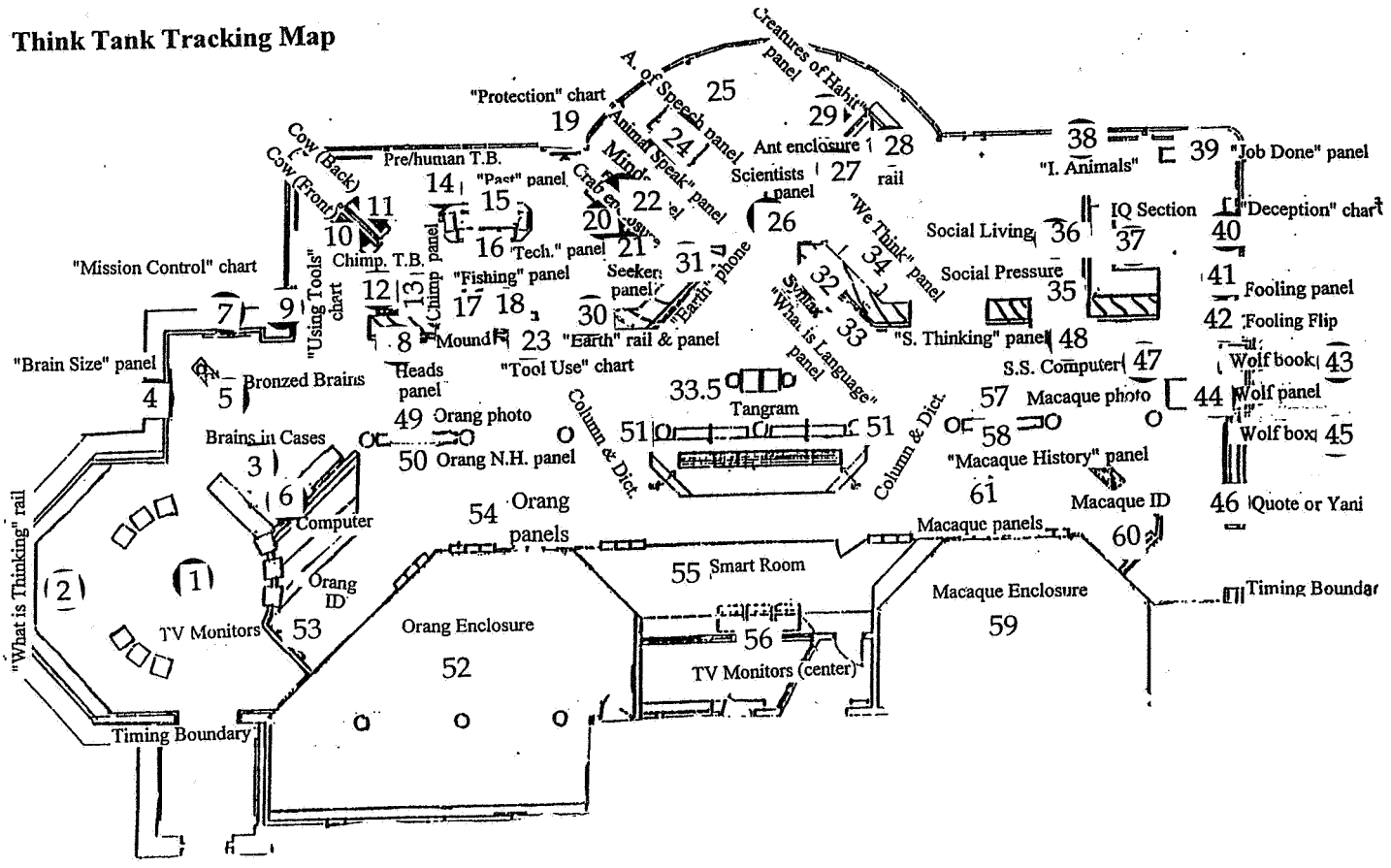
7 Talked to a *Think Tank* staff member

8 None of these

			TRACKING SURVEY FORM									Admin Box	
TRACKER ____												ID:	
BEGIN TIME:				Soc.	Ani.					Soc.	Ani.	Count:	_____
#	Start	Loc.	Stop	Int.	Int	#	Start	Loc.	Stop	Int.	Int.	Session:	_____
1						26						Segment:	1 2 3 4 5 6
2						27						Shift:	1 2 3 4
3						28							
4						29							
5						30						Visitor Social Interaction Key	
6						31						T	Together (doing/talking
7						32							with group member)
8						33						C	Calling something to
9						34							the attention of another
10						35							not at exhibit
11						36						D	Distracted or
12						37							interrupted by
13						38							a group member
14						39						P	Photographing
15						40						Q	Waiting to view/use
16						41						U	Using interactive
17						42						R	Reading
18						43						V	Viewing
19						44						S	Sitting/not attentive
20						45							
21						46						Animal Interaction:	
22						47						A	Active
23						48						C	Close to window
24						49						F	Facing visitor
25						50							

Gender:	**Animal Location**						**Demo (Loc. 99)**
Age:	**Orangs inside?**		**Y**	**N**			**Language**
Group size:	**Macaques inside?**		**Y**	**N**			**Tools**
Group Composition:							**Other**_____
Racial/Ethnic:							Talking to staff member= Loc. 98
END TIME:							

Think Tank Tracking Map



Introductory Area A

1. Any television monitor--**TV Monitors**
2. Any interpretive graphic *on rail* **"What is Thinking?"**
3. Any of the **brains in** glass **cases**
4. Relative **Brain size** bulletin *(on wall)* "What's Size Got to Do With It?"
5. **Bronzed brains**
6. **Computer**
7. **"Mission Control" chart** *(on wall)*

Tool Area B

8. "Using Their **Heads** &Their Tools" **panel** *(chalkboard mounted on wall before cow)*
9. "Using **Tool" chart** *(wall to left before cow)*
10. " Is A **Cow** A Tool?" **front** with painting of cow
11. "Is A **Cow** A Tool" **back** with flip panels
12. Chimpanzee Tool Box **(Chimp. T.B.)**
13. "The **Chimp**anzee Tool Kit" **panel** *(chalkboard mounted on wall)*
14. Any of the **(pre)human/human tool boxes**
15. "Researching **Past" panel** *(middle bulletin located in center of tool boxes facing out toward the main exhibit area--standing chalkboard)*
16. "Humans: The **Tech**nological Animal" **panel** *(middle bulletin located in center of tool boxes facing windows--standing chalkboard)*
17. Termite **Mound**
18. "Gone **Fishing" panel** *(chalkboard on wall)*
19. "Self **Protection" chart**
20. Hermit **Crab enclosure**
21. "The Shell **Seekers" panel** *(above case--standing chalkboard)*
22. "Simple **Minds" panel** *(behind crab enclosure--standing chalkboard)*
23. "Thinking **Tool Use" chart** *(on wall)*

Language Area C

24. Understanding **Animal Speak** *(standing chalkboard)*
25. Anatomy **of Speech Panel** *(standing chalkboard)*
26. **Scientists** at Work *(either side--standing chalkboard)*
27. Leaf Cutter **Ant** display
28. No Ant is An Island" panel & **rail** *(located above--chalkboard on wall)*
29. Creatures of Habit Panel *(behind ant tank, facing windows--chalkboard on wall)*
30. Murmurs of the **Earth** *(Panel & Rail)*
31. **Earth Phone**
32. **Syntax** Wheel *(either one)*
33. **What is Language panel** *(Above Wheel)*

33.5 The Language Game

Society Area D

34. **"We Think** Therefore..." rail and flip panels
35. **"Social Pressure"** *(panel with books)*
36. **"Social Living"** panel *(chalkboard on wall)*
37. **IQ Section** *(2 panels and an L-shaped case)*
38. **"**Innovative **Animals"** *(hanging over window)*
39. "Getting the **Job Done** Right *(standing chalkboard)*
40. **"Deception"** chart *(def. hanging)*
41. "Who's **fooling** whom" panel
42. **Fooling flip**
43. **Wolf** Dittus **Book**
44. **Wolf panel**
45. **Wolf box**
46. Any Quotation panel or Yani art *(5 works on the walls)*
    Quote or Yani Art
47. **S.S. Computer**
48. "Strategic **Thinking"** panel *(above the computer)*

E

Animal Enclosures, IDs, History Panels, and TV Monitors

49. **Orang** utan **photo** *(lights up)*
50. **Orang** utan **Natural History** *(reverse of above)*
51. OLP **column & dictionary** *(2)*
52. **Orang** utan **Enclosure**
53. **Orang** utan **ID**
54. **Orang. panels** *(4 in front of enclosure)*
55. **Smart Room**
56. **TV Monitors** (center)
57. **Macaque photo** *(lights up)*
58. **Macaque history** *(reverse side of above)*
59. **Macaque Enclosure**
60. **Macaque ID**
61. **Macaque panels** *(2 in front of enclosure)*

Appendix B.
Supplementary Tables

Table 1

Gender, Age, and Racial/Ethnic Identity,

Summer 1996, Entrance and Exit Surveys,

Reptile Discovery Center (RDC), National Museum of Natural History (NMNH), and Smithsonian (SI)

Visitors 12 Years of Age or Older

(In Percent)

	Survey Samples					
	Think Tank			*RDC*	*NMNH*	*SI*
	Entrance	*Exit*	*Total*	*1992 Total*	*Aug. Total*	*Aug. Total*
Gender						
Female	56.1	54.6	55.2	53.8	51.2	49.1
Male	43.9	45.4	44.8	46.2	48.8	50.9
Total	100.0	100.0	100.0	100.0	100.0	100.0
N	250	368	618			
Age						
12 to 19	12.0	10.9	11.3	10.7	10.8	14.8
20 to 24	12.9	11.3	11.9	11.5	9.9	8.7
25 to 34	23.3	26.3	25.1	31.1	21.5	20.0
35 to 44	32.7	33.3	33.1	25.7	30.2	27.0
45 to 54	11.6	14.3	13.2	13.1	17.6	18.8
55 to 64	5.1	2.3	3.4	5.6	5.1	6.3
65 or older	2.4	1.7	2.0	2.5	4.8	4.4
Total	100.0	100.0	100.0	100.2	99.9	100.0
N	248	367	615			
Racial/Ethnic Identity						
Minority	**20.7**	**25.2**	**23.4**	**18.5**	**26.4**	**22.4**
African American/Black	11.9	13.4	12.8	7.6	5.4	5.9
Asian/Pacific Islander	4.6	3.6	4.0	5.8	12.4	9.7
Hispanic/Nat. Amer./Mult.	4.2	8.1	6.5	5.1	8.6	6.8
White	**79.3**	**74.9**	**76.6**	**81.6**	**73.7**	**77.7**
Total	100.0	100.0	100.0	100.1	100.1	100.1
N	248	368	616			
Racial/Ethnic Identity--US Only						
Minority	**21.0**	**24.5**	**23.1**	**16.3**	**23.2**	**19.5**
African American/Black	12.8	13.6	13.3	7.9	5.8	5.5
Asian/Pacific Islander	4.5	3.7	4.0	4.7	10.2	8.5
Hispanic/Nat. Amer./Mult.	3.7	7.1	5.8	3.7	7.2	5.5
White	**79.0**	**75.5**	**76.9**	**83.8**	**76.9**	**80.5**
Total	100.0	100.0	100.0	100.1	100.1	100.0
N	240	344	585			

Table 2

Geographic Origins and Racial/Ethnic Identification

Summer 1996, Entrance and Exit Surveys Combined

Visitors 12 Years of Age or Older

(In Percent)

Racial/Ethnic Identity	*Washington, D.C.*	*MD/VA Suburbs*	*Other US*	*Foreign*	*Total*	*N*
	... Distribution by Racial/Ethnic Identity					
African American/Black	16.4	55.5	27.4	0.7	100.0	79
Asian/Pacific Islander	15.3	39.3	41.3	4.1	100.0	25
Hispanic/Nat. Amer./Multiple	9.5	50.9	25.3	14.3	100.0	40
White	5.9	40.0	50.3	3.8	100.0	470
	... Distribution by Geography					
African American/Black	27.6	17.4	8.1	2.4		
Asian/Pacific Islander	7.8	3.7	3.7	4.1		
Hispanic/Nat. Amer./Multiple	7.8	7.8	3.7	23.0		
White	56.7	71.0	84.5	70.5		
Total	100.0	100.0	100.0	100.0		
N	48	261	281	25		614

Table 3

Geographic Origins, Summer 1996, Entrance and Exit Surveys

Reptile Discovery Center (RDC), National Museum of Natural History (NMNH), and Smithsonian (SI)

Visitors 12 Years of Age or Older

(In Percent)

	Think Tank			*RDC*	*NMNH*	*SI*
	Entrance	*Exit*	*Total*	*1992 Total*	*Aug. Total*	*Aug. Total*
U.S. Distribution				*		
New England	2.9	2.7	2.8	---	3.3	4.5
Mid-Atlantic	14.3	11.8	12.8	---	14.4	16.1
South Atlantic	73.1	75.4	74.5	---	43.1	33.7
[Washington, D.C. Metro Area	54.9	47.4	50.4	---	18.0	19.1]
East South Central	1.1	0.4	0.7	---	2.4	1.0
West South Central	0.6	0.6	0.6	---	3.7	2.9
East North Central	1.2	4.3	3.0	---	8.7	10.1
West North Central	1.0	0.2	0.5	---	3.2	3.8
Mountain	0.0	0.2	0.1	---	1.2	1.9
Pacific	0.3	1.4	0.9	---	7.6	8.1
Foreign	5.5	3.0	4.0	---	12.4	17.9
Total	100.0	100.0	100.0	---	100.0	100.0
Local Distribution						
Washington, D.C.	7.5	8.2	7.9	8.2	3.9	4.1
MD/VA Suburbs	47.5	39.2	42.5	40.2	14.1	15.1
Other U.S.	39.6	49.6	45.6	44.3	69.6	68.8
Foreign	5.5	3.0	4.0	7.2	12.4	11.9
Total	100.0	100.0	100.0	99.9	100.0	99.9
N	248	368	616			

* Some data not available

Table 4

Number In and Configuration of Visit Group,

Summer 1996, Entrance and Exit Surveys

Reptile Discovery Center (RDC), National Museum of Natural History (NMNH), and Smithsonian (SI)

Visitors 12 Years of Age or Older

(In Percent)

	Type of Interview					
	Think Tank			*RDC*	*NMNH*	*SI*
	Entrance	*Exit*	*Total*	*1992 Total*	*Aug. Total*	*Aug. Total*
Number in Group				*		*
One	4.5	3.5	3.9	---	10.0	---
Two	19.2	25.2	22.8	---	27.0	---
Three	19.5	15.3	17.0	---	18.4	---
Four	30.4	27.8	28.8	---	19.3	---
Five	10.5	11.2	10.9	---	10.9	---
Six-Nine	12.6	14.6	13.8	---	10.9	---
Ten-24	1.6	2.1	1.9	---	2.2	---
25 or more	1.7	0.4	0.9	---	1.4	---
Total	100.0	100.0	100.0	---	100.1	---
Configuration of Group						
One adult	**4.5**	**3.5**	**3.9**	**3.1**	**10.0**	**14.2**
Two adults	**14.7**	**24.8**	**20.7**	**19.9**	**18.9**	**23.6**
Several adults	**7.4**	**10.2**	**9.1**	**10.7**	**16.9**	**14.7**
Adult(s) and child(ren)	**70.4**	**60.5**	**64.5**	**61.7**	**51.9**	**43.2**
Adult with child(ren)	23.0	26.4	25.0	---	14.4	---
Sev. adults with child(ren)	47.0	34.1	39.3	---	31.9	---
Children	0.4	0.0	0.2	10.0	5.6	---
School/Tour/Teens	**2.9**	**1.1**	**1.9**	**4.7**	**2.4**	**4.3**
School trip	2.2	0.6	1.2	4.1	0.1	---
Tour group	0.6	0.0	0.3	0.6	1.0	---
Group of teens	0.0	0.5	0.32	---	1.3	---
Total	100.0	100.0	100.0	100.1	100.1	100.0
N	251	368	619			

* Some data not available

Table 5

Educational Attainment

Summer 1996, Entrance and Exit Surveys,

Reptile Discovery Center (RDC), National Museum of Natural History (NMNH), and Smithsonian (SI)

Visitors 12 Years of Age or Older

(In Percent)

	Type of Interview					
	Think Tank			*RDC*	*NMNH*	*SI*
	Entrance	*Exit*	*Total*	*1992 Total*	*Aug. Total*	*Aug. Total*
Educational Attainment						
Age 12 or Older				*		*
Pre/Grade School	6.1	3.8	4.7	5.7	5.7	---
Some High School	7.5	6.0	6.6	5.4	9.1	---
High School Graduate	18.4	15.5	16.7	17.7	13.8	---
AA/Jr. College/Technical	2.5	4.7	3.8	---	3.6	---
Some College	13.7	21.1	18.1	25.6	20.2	---
Bachelor's Degree	29.1	23.8	26.0	24.8	22.2	---
Some Graduate School	3.5	5.1	4.4	3.4	3.7	---
MA/PhD/Professional	19.1	19.9	19.6	17.3	21.7	---
Total	100.0	100.0	100.0	99.9	100.0	---
N	244	355	599			
Ages 25 or Older						
High School or Less	21.2	18.2	19.4	19.0	20.1	17.9
AA/Jr. Coll./Tech/Some Coll.	15.3	23.6	20.3	24.3	21.9	19.8
Bachelor's/Some Graduate	37.9	33.1	35.0	33.9	29.6	35.4
MA/PhD/Professional	25.6	25.2	25.4	22.8	28.5	26.9
Total	100.0	100.0	100.0	100.0	100.1	100.0
N	182	276	458			

* Some data not available

Table 6

Comparison of Educational Attainment,

U.S. Census, 1994 Smithsonian Institution Marketing Study and Think Tank at the National Zoo

People 25 Years of Age or Older

(In Percent)

	U.S. Census*	SIMS**		*SI (August)*	*Think Tank*
	All Persons	*Visit Any Museum*	*Visit Zoo/Aquaria*	*Total*	*Total*
Educational Attainment					
High School or Less	54.8	47.6	49.9	24.7	19.4
AA/Some College	24.9	23.0	23.3	22.4	20.3
Bachelor's Degree/Some Grad. Study	13.1	19.5	17.9	30.3	35.0
Graduate Degree	7.2	9.9	8.9	22.6	25.4
Total	100.0	100.0	100.0	100.0	100.0

*1990 U.S. Census of Population and Housing.
Educational Attainment of All Persons 25 years and over. U.S. Census Bureau 1990.

** The Smithsonian Institution Marketing Study (SIMS) was completed in May 1994 for the Office of the Assistant Secretary for Institutional Advancement in preparation for the Smithsonian's 150th anniversary celebration.

Table 7

Number and Frequency of Visits to NZP and Think Tank

Summer 1996, Entrance and Exit Surveys

Visitors Ages 12 and Older

(In Percent)

	Type of Interview		
	Entrance	*Exit*	*Total*
Number of Visits to the National Zoo			
First Visit	32.8	35.2	34.2
1 to 3	25.6	25.2	25.4
4 to 9	17.2	16.6	16.8
10+	24.4	23.1	23.6
Total	100.0	100.0	100.0
N	241	358	599
Number of Visits to the Zoo In the Last Year			
First Visit	32.8	35.2	34.2
None	36.4	26.6	30.5
1 to 3	26.5	31.4	29.4
4 to 9	3.6	5.7	4.8
10+	0.7	1.2	1.0
Total	100.0	100.0	100.0
N	241	358	599
Zoo Visitor Type			
New	32.8	35.2	34.2
Returning (1-3 visits)	25.6	25.2	25.4
Frequent (4+ visits)	41.6	39.6	40.4
Total	100.0	100.0	100.0
N	241	358	599
Frequency of Visits to Think Tank In the Last Year	*		
First Visit to Zoo	---	**35.2**	**35.2**
Repeat Visit to Zoo, First Visit to Think Tank	---	**59.0**	**59.0**
Repeat Visit to Think Tank	---	**5.8**	**5.8**
In the last 3 months	---	2.4	2.4
3 to 6 months ago	---	2.9	2.9
6 to 12 months ago	---	0.5	0.5
Total	---	100.0	100.0
N	---	358	358

* Visitors who were making a repeat visit to Think Tank were not eligible to participate in the Entrance Survey.

Table 7a

NZP Visitor Type, by Selected Characteristics

Summer 1996, Entrance and Exit Surveys

(In Percent)

	NZP Visitor Type			
	New	*Returning*	*Frequent*	*Total*
Local Distribution				
Washington, D.C.	3.2	7.2	12.3	7.9
MD/VA Suburbs	22.4	42.3	57.7	41.9
Other U.S.	65.9	47.8	28.7	46.0
Foreign	8.5	2.8	1.3	4.1
Total	100.0	100.0	100.0	100.0
N	205	147	249	601
Age				
12 to 24	31.6	21.9	18.5	23.7
25 to 34	22.2	23.9	26.1	24.2
35 to 44	26.5	32.6	38.7	33.1
45 and Older	19.7	21.5	16.7	18.9
Total	100.0	99.9	100.0	100.0
N	202	145	252	599
Racial/Ethnic Identity				
Minority	**21.5**	**33.4**	**19.6**	**23.6**
African American/Black	9.6	19.0	12.0	12.9
Asian/Pacific Islander	6.4	5.3	1.4	4.0
Hispanic/Nat. Amer./Mult.	5.6	9.1	6.2	6.7
White	**78.5**	**66.6**	**80.4**	**76.4**
Total	100.0	100.0	100.0	100.0
N	205	147	249	601
Educational Attainment				
High School or Less	34.8	35.4	19.2	28.4
AA/Jr. Coll./Tech/Some Coll.	17.5	22.5	24.2	21.5
Bachelor's/Some Graduate	30.3	23.5	34.4	30.3
MA/PhD/Professional	17.5	18.6	22.2	19.7
Total	100.0	100.0	100.0	100.0
N	200	144	245	588
Interest in Science				
Below Average	41.1	49.8	35.6	41.0
Average=8	25.5	15.6	20.5	21.0
Above Average	33.4	34.6	43.9	38.0
Total	100.0	100.0	100.0	100.0
N	205	146	246	597

Table 8

Prior Knowledge of the Think Tank Exhbition, by Zoo Visitor Type

Summer 1996, Entrance and Exit Surveys Combined

(In Percent)

	Zoo Visitor Type			
	New	*Returning*	*Frequent*	*Total*
Where did you hear about Think Tank?				
Had not head about Think Tank	86.8	82.9	63.8	76.1
Heard about Think Tank	13.2	17.1	36.2	23.9
Repeat Visit to Think Tank	0.0	2.0	9.1	4.2
Saw/heard about on last visit	0.0	2.7	7.8	4.1
Family/Friend	6.3	1.8	3.9	4.2
Newspaper or Magazine	3.4	7.1	4.2	4.5
TV	0.9	0.9	3.2	2.0
Don't recall	2.7	2.5	8.0	4.9
Total	100.0	100.0	100.0	100.0
N	192	144	247	583
What did you hear about Think Tank?				
Had not head about Think Tank				76.1
Animal Thinking				3.5
Animal Learning				2.6
O-line				4.5
Orangs/apes/etc.				2.4
Don't recall				10.9
Total				100.0
N				583

Table 9
Visitor Interest in Science
Summer 1996, Entrance and Exit Surveys
(In Percent)

	Type of Interview		
	Entrance	*Exit*	*Total*
Visitor Interest in Science: 1=Not interested 10=Very interested			
One	4.5	0.9	2.3
Two	0.0	2.8	1.7
Three	1.0	4.3	3.0
Four	1.3	2.5	2.0
Five	12.6	9.9	11.0
Six	6.6	6.0	6.2
Seven	18.4	12.5	14.9
Eight	19.7	21.2	20.6
Nine	14.7	10.4	12.1
Ten	21.2	29.6	26.2
Total	100.0	100.0	100.0
Condensed Categories			
1 to 4	6.8	10.5	9.0
5 to 7	37.6	28.3	32.1
8 to 10	55.6	61.2	58.9
Total	100.0	100.0	100.0
Distribution based on Average=8			
Below Average	**44.4**	**38.8**	**41.1**
Average and Above	**55.6**	**61.2**	**58.9**
Average=8	19.7	21.2	20.6
Above Average	35.9	40.0	38.4
Total	100.0	100.0	100.0
N	245	366	611

Table 10
Visitor Belief in Animal Thinking
Summer 1996, Entrance and Exit Surveys
(In Percent)

	Type of Interview		
	Entrance	*Exit*	*Total*
Do You Believe Animals Think?			
Animals Think	97.6	97.5	97.5
Animals Do Not Think	2.5	2.5	2.5
Total	100.0	100.0	100.0
N	237	358	595

Table 11

Exhibition Influence on Visitors' Perceptions of Animals, by Selected Characteristics

Summer 1996, Exit Survey

(In Percent)

	Perceptions of Animals: Exhibition ...			
	Will influence	*Will not influence*	*Total*	*N*
Visit Group				
Adults with Children	61.1	38.9	100.0	163
Adults	40.2	59.9	100.1	115
Familiarity with the National Zoo				
New visitor	58.3	41.7	100.0	100
Returning visitor	58.4	41.6	100.0	63
Frequent visitor	40.7	59.4	100.0	109
Educational Attainment (All ages)				
High School or Less	72.4	27.6	100.0	62
AA/Jr. Coll./Tech/Some Coll.	54.1	45.9	100.0	46
Bachelor's/Some Graduate	36.1	63.9	100.0	77
MA/PhD/Professional	49.5	50.5	100.0	60
Educational Attainment (All Ages) Dichotomous				
Less Than College	62.3	37.7	100.0	138
College or Advanced Degree	41.9	58.1	100.0	136
Level of Interest in Science (All Ages)				
Above average	56.0	44.0	100.0	110
Average	61.3	38.8	100.1	59
Below average	44.4	55.6	100.0	111
Level of Interest in Science (All Ages) Dichotomous				
Above average or average	57.9	42.1	100.0	169
Below average	44.4	55.6	100.0	111
Total	52.6	47.4	100.0	280

Table 12

Influence of Exhibition on Perception of Animals, by Gender and Age

Summer 1996, Exit Survey

(In Percent)

	Gender		
	Female	*Male*	*Total*
Influenced Perception of Animals			
Changed attitude	14.9	17.8	16.3
Increased interest/makes me think	26.7	5.2	16.6
Learned something new	12.4	28.0	19.7
Total influenced	53.9	51.0	52.6
Did Not Influence Perception of Animals			
Affirmed beliefs already held	20.5	29.1	24.5
Contradicted beliefs already held	1.4	2.2	1.8
No change in attitude (general)	4.8	3.2	4.0
Provided no new information	6.9	7.8	7.3
Did not pay attention	12.5	6.7	9.8
Total No Influenced	46.1	49.0	47.4
Total	100.0	100.0	100.0
N	149	132	281

	Age				
	12 to 24	*25 to 34*	*35 to 44*	*45 and older*	*Total*
Influenced Perception of Animals					
Changed attitude	32.5	13.6	9.4	12.14	16.3
Increased interest/makes me think	4.0	13.4	23.2	25.06	16.6
Learned something new	23.7	21.5	20.9	10.85	19.7
Total Influenced	60.2	48.5	53.5	48.1	52.6
Did Not Influence Perception of Animals					
Affirmed beliefs already held	18.3	30.9	17.4	33.9	24.5
Contradicted beliefs already held	3.5	0.4	2.1	1.4	1.8
No change in attitude (general)	0.0	3.9	4.1	8.7	4.0
Provided no new information	5.5	3.7	14.2	3.7	7.3
Did not pay attention	12.6	12.7	8.8	4.2	9.8
Total No Influence	39.8	51.5	46.5	51.9	47.4
Total	100.0	100.0	100.0	100.0	100.0
N	63	76	86	56	281

Table 13
Main Ideas Communicated by Think Tank
Summer 1996, Exit Survey
(In Percent)

Main Idea Communicated	*Most Informative (Q12)*							
	Animals	Brains	Tools	Social	Language	Graphics/ Text/Panel	Other	Total
Animals think	9.0	2.0	0.0	**39.3**	5.4	**35.1**	**20.2**	**14.1**
Brain size, general	0.0	**44.2**	0.0	0.0	0.0	5.4	0.0	**12.5**
Variety/difference	2.5	22.7	5.6	0.0	3.6	**20.3**	7.2	**10.4**
Ways animals communicate	0.0	0.0	0.0	17.6	**68.8**	2.5	10.7	**8.4**
Informative, general	16.2	3.7	14.4	0.0	1.4	7.6	4.0	7.1
Lifestyle	**23.6**	1.1	0.0	**28.5**	0.0	2.8	11.2	6.1
Definition/use	0.0	0.0	**39.4**	8.8	3.3	2.6	1.8	4.6
Brain size does not affect intelligence	0.0	16.9	0.0	0.0	0.0	0.0	1.5	4.1
Learning/training	13.1	0.6	0.0	5.9	9.4	0.0	0.0	3.1
Human-like	1.8	2.2	16.1	0.0	0.0	4.9	1.4	3.0
Science/research	3.9	0.3	0.0	0.0	0.0	2.6	7.4	2.8
Other	3.0	2.1	1.8	0.0	0.0	5.0	2.9	2.8
Survival/adaptation/evolution	2.7	0.9	0.0	0.0	0.0	0.0	12.9	2.3
Controversy	0.0	0.0	19.7	0.0	0.0	0.0	0.6	1.8
Nothing/don't know	24.3	3.2	3.0	0.0	8.1	11.4	**18.1**	16.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total (Most Informative)	42.5	22.3	2.2	0.9	5.6	16.3	10.2	
N	34	61	23	9	24	41	37	260

Table 14
What Visitors Want to Know More About, by Age
Summer 1996, Exit Survey
(In Percent)

What Visitors Want to Know More About	*Age*				*Total*
	12 to 24	*25 to 34*	*35 to 44*	*45 and Older*	
Want no more information	56.5	38.0	52.7	59.6	51.6
Don't know/everything	5.5	14.8	13.5	15.8	12.3
Language aquisition	9.6	22.5	11.8	6.8	12.8
Information about specific animals	12.0	5.6	8.4	0.9	7.2
Social behavior	3.9	6.4	9.9	2.4	6.2
Other	2.1	7.7	0.0	12.7	4.7
Tool use	6.1	0.0	2.8	0.0	2.4
Brains	4.4	4.2	0.0	0.0	2.0
IQ testing in humans	0.0	0.7	0.9	1.8	0.8
Total	100.0	100.0	100.0	100.0	100.0
N	79	78	111	62	330

Table 15

Respondents' Examples of Animal Thinking Behavior (Q7) and Behaviors Scientists Would Stud (Q8)

Summer 1996, Entrance and Exit Surveys

(In Percent)

	Q7			*Q8*		
	Entrance	Exit	Total	Entrance	Exit	Total
Relationship to Think Tank (Exit Survey Only)						
Exhibit related	---	61.5	61.5	---	84.5	84.5
Not exhibit related/Unable to determine	---	38.5	38.5	---	15.5	15.5
Total	---	100.0	100.0	---	100.0	100.0
Type of animal used in example						
Domestic	18.3	8.2	12.5	0.0	0.9	0.5
Wild	34.9	59.1	48.9	1.3	6.1	4.2
No reference to a specific animal	46.8	32.7	38.6	98.7	93.0	95.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
Type of thinking behavior described						
Prime	**25.5**	**35.7**	**31.4**	**49.6**	**59.4**	**55.3**
Tools	10.7	18.4	15.2	6.7	1.7	3.7
Social	6.0	9.8	8.2	26.8	32.4	30.1
Language	8.8	7.4	8.0	7.0	11.8	9.8
Two or more Prime examples	---	---	---	9.0	13.5	11.7
Other	**21.3**	**22.3**	**21.9**	**6.4**	**1.6**	**3.6**
Trainability/ability to learn	17.2	8.4	12.0	0.4	0.5	0.5
Human-like traits/qualities	4.1	11.1	8.2	6.0	0.1	2.5
Problem solving	0.0	2.9	1.7	0.0	1.0	0.6
Unacceptable	**42.5**	**30.4**	**35.4**	**27.6**	**23.1**	**25.0**
Vague/general unacceptable	30.4	17.3	22.7	11.6	17.7	15.3
Instinctive	9.3	8.6	8.9	15.2	5.2	9.3
Looking, attending responding	2.8	4.6	3.8	0.7	0.2	0.4
Don't know	10.7	11.6	11.2	16.5	15.9	16.1
Total	100.0	100.0	99.9	100.0	100.0	100.0
N	240	346	585	238	350	588

	Q7 & Q8 Combined Total		
(Combining Responses to Q7 and Q8)	Entrance	Exit	Total
Number of Prime Examples			
Two prime examples	13.8	27.6	21.9
One prime example	45.2	42.6	43.7
No prime examples	41.0	29.8	34.4
Total	100.0	100.0	100.0
N	230	334	564

Table 16
Words Used to Describe Apes and Monkeys
Summer 1966, Entrance and Exit Surveys
(In Percent)*

	Entrance	Exit	Total
Q9 Words to describe apes and monkeys.			
Passive behavior	0.4	2.3	1.6
Negative description	2.4	5.4	4.2
Primate/sub-human	9.4	4.1	6.2
Physical description neutral	9.0	10.0	9.6
Physical description positive/Superlative	11.6	15.3	13.8
Active behavior	14.3	17.3	16.1
Social/Interesting/Family oriented	26.6	29.8	28.5
Human-like/Emotion	34.4	32.5	33.2
Intelligent/smart/clever/thinking/Inquisitive/curious	33.5	37.5	35.9
Total	141.6	154.2	149.0

* Total percent equals more than 100%, as individuals could give more than one response.

Table 17
What Visitors Found Most Informative
Summer 1996, Exit Survey Only
(In Percent)

What Visitors Found Most Informative	Exit Total
Brains	19.3
Tools/Language/Social	19.1
Language	8.1
Tools	7.8
Social	3.2
Animals/O-line	12.8
Animals	12.5
O-line	0.3
Graphics/text/photo	13.3
Other	11.8
Demonstrations	4.1
Computers	3.6
Intro Area	2.9
Interactive	0.6
Docents/staff	0.6
Don't know/Nothing/All of it	23.7
Nothing	13.6
Don't know	5.7
All of it	4.4
Total	100.0
N	330

Table 18
Activities Visitors Engaged In and Most Intersting Activities
Summer 1996, Exit Survey Only
(In Percent)

Activities in Think Tank	Activities Engaged In*	Most Interesting Activity First Choice	Most Interesting Activity Second Choice
Watched Animals	83.1	47.9	16.5
Read exhibit text	61.3	16.7	36.9
Used an exhibit interactive	38.0	18.6	21.6
Used Computer	18.8	1.6	9.6
Watched introductory video	17.5	3.5	9.1
Watched demonstration	14.8	9.2	3.6
Talked to a staff member	8.3	2.5	2.7
None of these	2.3	---	---
Total	244.1	100.0	100.0
N	898	302	101
Average number of activities engaged in	2.4		

* Total percent equals more than 100%, as individuals could give more than one response.

Table 19

Aspects of Think Tank Identified by Visitors as Related to their Ideas about the Study of Animal Behavior

Summer 1996, Exit Survey Only

(In Percent)

Was there anything in particular in Think Tank that gave visitors their ideas about what behaviors scientists would study?	*Total*
Animals	**22.3**
Tools,Language, Social	**12.5**
Tools section	4.7
Language section	4.9
Social section	2.9
Other	**13.3**
Intro area	0.6
Demonstrations	0.6
Docents/staff	1.8
Panels/text/graphics	3.3
Videos	1.9
Computers	1.7
Interactives	0.2
Other	3.2
Nothing/Don't know	**51.9**
Total	100.0
N	169

Table 20
What Visitors Would Improve, Change or Add in Think Tank, by Age
Summer 1996, Exit Survey Only.
Visitors Ages 12 and Older
(In Percent)

	Age				
	12 to 24	*25 to 34*	*35 to 44*	*45 and Older*	*Total*
What Visitors Would Improve, Change or Add					
Nothing	23.0	10.0	23.6	12.1	17.9
Nothing + positive remark	16.3	13.2	11.2	23.8	15.1
Don't Know	13.4	9.5	15.5	19.0	14.1
More animals	16.7	12.6	5.7	4.2	10.0
More demos/staff	3.6	15.5	11.4	3.8	9.2
Physical environment/crowd control	5.1	5.9	3.7	25.8	8.5
More interactives	8.0	6.5	10.5	4.2	7.7
Critique of animal enclosures	8.0	13.7	5.8	1.8	7.6
Exhibition critique/add item	3.3	6.9	10.4	4.0	6.7
More information	2.7	6.3	2.2	1.2	3.1
Total	100.0	100.0	100.0	100.0	99.9
N	76	82	111	59	328

Table 21
What Emotionally Moved Visitors
Summer 1996, Exit Survey
(In Percent)

What Emotionally Moved Visitors	*Exit Total*
Not Emotionally Moved	**73.4**
Emotionally Moved	**26.6**
Watching animals	12.8
Human-animal interaction	2.5
Interactives	1.6
Negative toward animal enclosures	3.1
Other	2.8
Don't know	3.8
Total	100.0
N	348

Table 22

What Visitors Found Most Interesing by Selected Characteristics

Summer 1996, Entrance and Exit Surveys

Visitors Ages 12 and Older

(In Percent)

	Most Interesting								
	Animals	*Brains*	*Tools*	*Social*	*Language*	*Other*	*Don't know*	*Total*	*N*
Educational Attainment									
High School or Less	51.1	25.4	0.0	0.0	4.8	13.0	5.7	100.0	
AA/Jr. Coll./Tech/Some Coll.	48.5	27.6	0.7	2.9	1.3	12.3	6.7	100.0	
Bachelor's/Some Graduate	35.2	19.4	6.3	0.0	3.2	25.5	10.4	100.0	
MA/PhD/Professional	29.5	14.1	1.3	1.1	17.4	14.1	22.5	100.0	
									329
Interest in Science									
Below Average	57.9	15.6	4.9	0.0	0.9	12.4	8.3	100.0	
Average=8	42.2	25.3	0.0	2.5	9.1	14.0	7.0	100.0	
Above Average	27.2	27.3	0.8	1.0	8.5	21.4	13.8	100.0	
									338
NZP Visitor Type									
New	37.9	25.5	1.1	1.3	3.7	15.5	15.0	100.0	
Returning (1 to 3 visits)	52.7	14.3	2.0	2.1	5.3	22.3	1.5	100.0	
Frequent (4 or more visits)	40.5	23.2	3.6	0.0	7.9	14.5	10.4	100.0	
									328
Totals for Most Interesting	42.5	22.3	2.2	0.9	5.6	16.3	10.2	100.0	338

Table 23

Results of Regression Models: Exhibition Will Influence Perception of Animals

Exit Survey

All Visitors

	Full Model			Final Model		
VARIABLE	Coeff	P-Value	% Change	Coeff	P-Value	% Change
Intercept	-1.1651	0.0012	51.46	-1.5366	0.0001	51.46
LESS THAN COLLEGE EDUCATION (College or advanced education)*	0.6355	0.0273	15.22	0.7556	0.0042	17.84
ADULTS & KIDS (Adults only)*	0.8705	0.0013	20.23	0.8334	0.0017	19.47
NEW & RETURNING VISITORS (Frequent visitors)*	0.6946	0.0112	16.52	0.6843	0.0115	16.30
AVERAGE & ABOVE INT. IN SCIENCE (Below average interest in science)*	0.5335	0.0491	12.92	0.5431	0.0434	13.14
AGES 12 TO 24 (Age 25 and older)*	0.3814	0.2721	9.36			
FEMALE (male)*	0.2020	0.4464	5.01			
MINORITY (non-minority)*	0.0206	0.9450	0.51			
GAMMA	0.3170	0.0001	Df=7	0.3200	0.0001	Df=4
N Cases	268			268		

*Omitted categories

Table 24

Results of Regression Models: Exhibition Will Influence Perception of Animals

Exit Survey, Educational Attainment

Visitors Without a College Degree

	Visitors Without a College Degree					
	Full Model			Final Model		
VARIABLE	Coeff	P-Value	% Change	Coeff	P-Value	% Change
Intercept	-0.6978	0.2070	61.27	-1.1916	0.0108	61.27
ADULTS & KIDS (Adults only)*	0.7359	0.0593	15.49	0.7339	0.0551	15.45
NEW & RETURNING VISITORS (Frequent visitors)*	1.2121	0.0031	22.90	1.1802	0.0035	22.47
AVERAGE & ABOVE INT. IN SCIENCE (Below average interest in science)*	0.7720	0.0485	16.12	0.8002	0.0368	16.61
AGES 12 TO 24 (Age 25 and older)*	0.4100	0.3014	9.18			
FEMALE (male)*	0.2345	0.5516	5.40			
MINORITY (non-minority)*	-0.0357	0.9288	-0.84			
GAMMA	0.3340	0.0056	Df=6	0.3450	0.0007	Df=3
N Cases	134			134		

*Omitted categories

Table 25

Results of Regression Models: Exhibition Will Influence Perception of Animals

Exit Survey, Educational Attainment

Visitors With a College or Advanced Degree

	Visitors With a College or Advanced Degree					
	Full Model			Final Model		
VARIABLE	Coeff	P-Value	% Change	Coeff	P-Value	% Change
Intercept	-1.0242	0.0462	41.58	-0.7416	0.0069	41.94
ADULTS & KIDS (Adults only)*	0.9266	0.0214	22.68	0.7319	0.0412	18.09
NEW & RETURNING VISITORS (Frequent visitors)*	0.2951	0.4433	7.30			
AVERAGE & ABOVE INT. IN SCIENCE (Below average interest in science)*	0.3731	0.3424	9.25			
AGES 12 TO 24 (Age 25 and older)*	0.4691	0.5548	11.64			
FEMALE (male)*	0.1474	0.6925	3.62			
MINORITY (non-minority)*	0.0798	0.8635	1.95			
GAMMA	0.1560	0.3093	Df=6	0.1430	0.0389	Df=1
N Cases	133			136		

*Omitted categories

Table 26

Results of Regression Models: Gave at Least One Prime Example of Animal Thinking Behavior for Q7 or Q8

Entrance and Exit Surveys Combined

All Visitors

	Full Model			Final Model		
VARIABLE	Coeff	P-Value	% Change	Coeff	P-Value	% Change
Intercept	-0.0733	0.8238	65.46	-0.2451	0.1414	65.41
EXIT INTERVIEW (Entrance Interview)*	0.4667	0.0206	9.68	0.5049	0.0083	10.40
COLLEGE OR MORE EDUCATION (Less Than College Education)*	1.3293	0.0001	22.29	1.3187	0.0001	22.20
ADULTS & KIDS (Adults only)*	0.0740	0.7354	1.65			
NEW & RETURNING VISITORS (Frequent visitors)*	0.0637	0.7560	1.43			
BELOW AV. INTEREST IN SCIENCE	-0.4543	0.0778	-9.45			
ABOVE AV. INTEREST IN SCIENCE (Average interest in science)*	0.2242	0.4156	4.88			
AGES 25-34	-0.3852	0.1795	-8.13			
AGES 35-44	-0.2134	0.4693	-4.65			
AGES 45+ (Ages 12-24)*	0.0200	0.9472	0.45			
FEMALE (male)*	0.1870	0.3447	4.10			
MINORITY (non-minority)*	-0.0709	0.7555	-1.59			
GAMMA	0.3380	0.0001	df=11	0.4130	0.0001	df=2
N Cases	532			549		

*Omitted categories

Table 27

Results of Regression Models: Gave at Least One Prime Example of Animal Thinking Behavior for Q7 or Q8

Entrance and Exit Surveys Combined

Visitors Without a College Degree

	Visitors Without a College Degree					
	Full Model			Final Model		
VARIABLE	Coeff	P-Value	% Change	Coeff	P-Value	% Change
EXIT INTERVIEW (Entrance Interview)*	0.3564	0.1863	8.77			
ADULTS & KIDS (Adults only)*	-0.3120	0.2760	-7.70			
NEW & RETURNING VISITORS (Frequent visitors)*	0.0428	0.8754	1.07			
BELOW AV. INTEREST IN SCIENCE**	-0.7440	0.0267	-17.60	-0.8901	0.0003	-20.66
ABOVE AV. INTEREST IN SCIENCE (Average interest in science)*	0.3338	0.3764	8.22			
AGES 25-34	-0.3501	0.3159	-8.61			
AGES 35-44	-0.4549	0.2171	-11.10			
AGES 45+ (Ages 12-24)*	0.2018	0.5803	5.01			
FEMALE (male)*	0.4788	0.0742	11.66			
MINORITY (non-minority)*	-0.2325	0.4272	-5.76			
GAMMA	0.2610	0.0037	Df=10	0.3400	0.0003	Df=1
N Cases	268			272		

*Omitted categories

** Note that in the final regression model, we can interpret the significance of this variable also as the inverse where an average or above average interest in science has a +20.66 %change.

Table 28

Results of Regression Models: Gave at Least One Prime Example of Animal Thinking Behavior for Q7 or Q8

Entrance and Exit Surveys Combined

Visitors With a College or Advanced Degree

	Visitors With a College or Advanced Degree					
	Full Model			Second Model		
VARIABLE	Coeff	P-Value	% Change	Coeff	P-Value	% Change
Intercept	0.8850	0.2966	79.66	0.7755	0.0004	79.43
EXIT INTERVIEW (Entrance Interview)*	0.7088	0.0307	9.18	0.7972	0.0097	10.12
ADULTS & KIDS (Adults only)*	0.8469	0.0430	10.47	0.5090	0.1410	7.10
NEW & RETURNING VISITORS (Frequent visitors)*	0.1056	0.7511	1.66			
BELOW AV. INTEREST IN SCIENCE	-0.1467	0.7394	-2.27			
ABOVE AV. INTEREST IN SCIENCE (Average interest in science)*	-0.0788	0.8562	-1.25			
AGES 25-34	-0.1750	0.8178	-2.69			
AGES 35-44	0.4390	0.5769	6.21			
AGES 45+ (Ages 12-24)*	-0.1193	0.8786	-1.87			
FEMALE (male)*	-0.4429	0.1830	-6.25			
MINORITY (non-minority)*	0.1204	0.7787	1.88			
GAMMA	0.2780	0.1158	Df=10	0.3290	0.0050	Df=2
N Cases	265			275		

*Omitted categories

	Visitors With a College or Advanced Degree		
	Final Model		
VARIABLE	Coeff	P-Value	% Change
Intercept	0.8963	0.0001	79.43
EXIT INTERVIEW (Entrance Interview)*	0.8693	0.0043	10.78
GAMMA	0.4200	0.0039	Df=1
N Cases	275		

*Omitted categories

Tracking Study Tables

Introductory Note

Tables 29 to 37 in Appendix B are based on the *Think Tank Tracking Study*. This introductory note provides a guide to the tables and instructions for their interpretation.

Table 29 lists all of the 61 exhibition elements included in the tracking protocol and information about them. In Table 29 and most of the subsequent tables, Column 1 is a location identifier (see map), Column 2 lists a Descriptive Label associated with each element, and Column 3 identifies the type of element. The identifiers in Column 1 were assigned beginning with the Introductory area. A map of the exhibition is in Appendix A, page A-9.

In Tables 29 and 30, Column 4 shows the percent of visitors who stopped at each element, followed by summary statistics for the amount of time visitors spent viewing the element.* (A "stop" was defined as a pause of at least 0.05 minutes, i.e., three seconds.) Column 5 gives the average length of those stops, Column 6 the standard deviation and Column 7 the median time (i.e., half of visitors made shorter stops and half longer). All times are in minutes. The information in Tables 29 and 30 is identical; however, the former is in spatial order of the exhibition, while Table 30 is in rank order based on the percent of visitors who stopped at that location. Similarly, Table 31 is sorted by type of element in the exhibition. Within each element, the data are sorted by the percent of visitors who stopped and by the average stop time.

In Table 32, the first three columns are the same as in the previous tables. Column 4 shows what percentage of the total number of stops was made at that location, in the spatial order of the exhibition. This is quite different from the percent of all visitors who stopped at each element, shown in Tables 29-31. It includes return stops, i.e., repeat stops made by an individual who leaves an element and then comes back to it later. For example, while in Table 29 we see that 9.7 percent of all tracked visitors stopped at A06, *Computer Brains*, in Table 32 we see that those stops were 2.0 percent of all stops and 7.1 percent of the stops in the introductory section. Column 5 shows what percentage of the total number of stops in the section was made at each element. The table is sorted by Column 5. We can see for example, that half (50.2%) of the stops in the Introduction are made at the *Brains in glass cases* and *Bronzed brains* displays.

In Table 33, the first four columns are the same as in the two previous tables. Column 5 shows the number of stops made by different visitors, while Column 6 is the number of return stops by visitors who stopped previously. The last column is the total of unique and return stops, i.e., the sum of Columns 5 and 6.

Table 34 is a summary of the percent of visitors who stopped in each of the major areas of the exhibition. For example, we see that 112 visitors (Col. 2) or 72.3 percent (Col. 3)

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* "Return stops" have been excluded from this table. The exclusion allows us to accurately discuss the number of different visitors who made each stop.

stopped in the introductory area. The table also shows the number of visitors (Col. 4) who made repeat stops in each area and their percentage (Col. 5) among all those who stopped in the section. For example, 61 visitors returned to a previous stop in the introductory area or about half (54.5%) of those stopping in the area.

Table 35 primarily provides information about the time that different visitor sub-groups, (defined on the basis of the social composition of the group), spent in the exhibition. The table contains six panels. In the first panel, *A. Total Time in the Exhibition (Visit Times): Statistics*, we see overall visit time (in minutes). For example, the third line (Male in Adult Group) shows that these 22 individuals spent an average of 6.7 (± 5.2) minutes in the exhibition.

In the next panel, *B. Percent of Visit Time Spent at Stops: Statistics*, we are looking at the percentage of time that each sub-group spent viewing exhibition elements. For example, the 11 males visiting alone (on average) spent two-thirds of the time in the exhibition viewing and the rest of the time in other activities.

Panel C. Total Time Observing (Sum of Time at Stops): Statistics is the average time spent observing exhibition elements in minutes. For example, line 2 shows that the five women who visited alone spent, on average, 5.0 (±4.9) minutes engaged in the exhibition.

The first three panels emphasized visitors. The next three panels of Table 35 provide information on the stops made by sub-groups. *D. Number of Stops: Statistics* shows the average number of stops for each subgroup, and *E. Stop Time: Statistics* focuses on time. For example, in panel D. we see that males visiting alone (on average) made 5.4 stops. This is based on 47 unique stops (i.e. returning stops to an exhibition element are not included). In E. we see that (on average) these stops were 1.6 minutes in duration. In E. we have also aggregated the sub-groups (i.e. a total is shown for Alone which combines Male Alone and Female Alone).

In the last panel, called *E. Stop Time: Statistics* , sub-groups are defined on the basis of age and the type of elements at which visitors made stops. Average stop time, standard deviation, and median are shown for each age group or type of element.

Table 36, like Table 34, deals with visitors' behavior in specific areas (listed in Col. 1). The table shows the number (and percent) of visitors making 1, 2, 3, etc. stops. For example, of those who stopped in the Introductory area, 51 visitors made 1 stop (or 45.5% of the 112 who stopped in the area), 32 made 2 stops (or 28.6%), etc.

Table 37 shows how stops made by specific sub-groups were distributed across element types. Eight element types were identified, as shown on the table. Each row of the table indicates how a specific sub-group distributed its stops across elements. For example, men visiting alone made 45 stops, 22.2 percent viewing an animal, 2.2% looking at a chart, etc.

Table 29

Stops in the Exhibition: Spatial Order

(% of Visitors)

1	2	3	4	5	6	7
				Unique Stops: Statistics		
Location	Type	Description	Percent of Visitors Who Stopped	Average Stop Time (Minutes)	Standard Deviation	Median
		Exhibition=155 Visitors				
A		**Introduction**	**72.3**	**0.85**	**1.01**	**0.53**
01	Video	TV Monitors	20.6	0.73	0.86	0.41
02	Graphic	"What is Thinking?"	23.9	1.53	1.21	1.37
03	Display	Brains in glass cases	37.4	0.71	0.61	0.56
04	Display	Brain size	11.0	0.75	0.65	0.53
05	Display	Bronzed brains	32.3	0.69	1.31	0.45
06	Interactive	Computer (Brains)	9.7	0.70	0.74	0.37
07	Chart	"Mission Control"	1.3	0.58	0.32	0.58
B		**Tools**	**47.1**	**0.78**	**1.02**	**0.51**
08	Panel	"Using Heads & Tools"	3.2	0.63	0.41	0.87
09	Chart	"Using Tool"	3.9	0.37	0.31	0.25
10	Graphic	"Is A Cow A Tool?"-Graphic	4.5	0.35	0.21	0.28
11	Interactive	"Is A Cow A Tool?"-Inter.	17.4	1.28	1.87	0.65
12	Interactive	Chimpanzee Tool Box	8.4	0.81	0.60	0.58
13	Panel	"Chimp Tool Kit"	4.5	0.76	0.63	0.65
14	Interactive	Human Tool Boxes	11.6	0.86	0.82	0.58
15	Panel	"Tech"	4.5	0.88	0.77	0.78
16	Bulletin	"Past"	5.8	1.48	1.45	1.13
17	Display	Termite Mound	10.3	0.45	0.40	0.39
18	Panel	"Gone Fishing"	5.2	0.59	0.37	0.44
19	Chart	"Self Protection"	1.3	0.15	0.11	0.15
20	Animal Encl.	Hermit Crab	7.7	0.45	0.24	0.48
21	Panel	"Shell Seekers"	7.1	0.58	0.48	0.52
22	Panel	"Simple Minds"	1.3	0.23	0.06	0.23
23	Chart	"Thinking Tool Use"	1.3	0.45	0.11	0.45
C		**Language**	**23.2**	**1.36**	**2.60**	**0.66**
24	Panel	Animal Speak	0.0	0.00	0.00	0.00
25	Panel	Anatomy of Speech	1.9	0.30	0.20	0.23
26	Panel	Scientists	2.6	0.44	0.25	0.42
27	Display	Leaf Cutter Ant	4.5	0.58	0.53	0.43
28	Panel	"No Ant is an Island"	0.6	0.37	.	0.37
29	Panel	Creatures of Habit	0.0	0.00	0.00	0.00
30	Panel	Craving?	4.5	1.56	0.82	1.80
31	Video	Earth Phone	5.2	0.83	0.45	0.89
32	Interactive	Syntax Wheel	13.5	0.83	0.83	0.46
33	Panel	What is Language	2.6	0.65	0.12	0.70
33.5	Interactive	The Language Game	8.4	3.69	5.29	1.42

(cont.)

Table 29 (cont.)

Stops in the Exhibition:Spatial Order

1		2	3	4	5	6
				Unique Stops: Statistics		
Location	Type	Description	Percent of Visitors Who Stopped	Average Stop Time (Minutes)	Standard Deviation	Median
D		**Society**	**25.8**	**0.97**	**1.34**	**0.40**
34	Interactive	"We Think Therefore..."	5.2	1.07	1.00	0.68
35	Panel	"Social Pressure"	0.0	0.00	.	0.00
36	Panel	"Social Living"	0.6	0.15	.	0.15
37	Panels	IQ Section	1.9	2.84	3.64	1.30
38	Panel	"Innovative Animals"	0.0	0.00	.	0.00
39	Panel	"Getting the Job Done"	0.6	0.15	.	0.15
40	Panel	"Deception"	1.3	0.68	0.78	0.68
41	Panel	"Who's Fooling Whom?"	1.3	2.12	2.38	2.12
42	Interactive	Fooling	0.6	0.95	.	0.95
43	Interactive	Wolf-Book	0.6	0.17	.	0.17
44	Panel	Wolf-Panel	3.2	0.27	0.11	0.23
45	Interactive?	Wolf-Box	0.6	1.02	.	1.02
46	Panel	Quote or Yani Art	13.5	0.54	0.52	0.37
47	Interactive	Computer (Strategy)	5.2	1.76	1.88	0.96
48	Panel	"Strategic Thinking"	0.6	1.72	.	1.72
E		**Animal Enclosures**	**84.5**	**1.73**	**2.54**	**0.85**
49	Photo	Orang utan photos	2.6	0.18	0.07	0.16
50	Panel	People panel	1.9	0.61	0.81	0.17
51	Panel	OLP column & dictionary	12.9	1.09	0.93	0.78
52	Animal Encl.	Orang utan enclosure	58.7	2.24	2.46	1.27
53	Display	Orang ID	1.3	0.17	0.16	0.17
54	Panel	Orang panels	11.0	0.84	1.03	0.67
55	Display	Smart Room	22.6	2.41	4.46	0.95
56	Video	TV Monitors	7.7	2.22	3.36	0.73
57	Photo	Macaque photo	0.0	0.00	.	0.00
58	Panel	Adaptable Panel	1.9	0.82	0.60	1.08
59	Animal Encl.	Macaque Enclosure	30.3	1.63	2.00	0.83
60	Display	Macaque ID	5.8	0.58	0.42	0.52
61	Panels	Macaque panels	11.6	0.77	0.54	0.80
F		**Demo/Docent**				
98	Docent	Docent	1.3	3.13	3.89	3.13
99	Demo	Demo	5.2	11.81	13.39	5.43
		Total Stops, without "Returns"	763			
		Total Visitors Tracked	155			

Table 30

Stops in the Exhibition: Rank Order

(% of Visitors)

1	2	3	4	5	6	7
				Unique Stops: Statistics		
Location	Type	Description	Percent of Visitors Who Stopped	Average Stop Time (Minutes)	Standard Deviation	Median
		Exhibition=155 Visitors				
52	Animal Encl.	Orang utan enclosure	58.7	2.24	2.46	1.27
03	Display	Brains in glass cases	37.4	0.71	0.61	0.56
05	Display	Bronzed brains	32.3	0.69	1.31	0.45
59	Animal Encl.	Macaque Enclosure	30.3	1.63	2.00	0.83
02	Graphic	"What is Thinking?"	23.9	1.53	1.21	1.37
55	Display	Smart Room	22.6	2.41	4.46	0.95
01	Video	TV Monitors - Introductory	20.6	0.73	0.86	0.41
11	Interactive	"Is A Cow A Tool?"-Inter.	17.4	1.28	1.87	0.65
32	Interactive	Syntax Wheel	13.5	0.83	0.83	0.46
46	Panel	Quote or Yani Art	13.5	0.54	0.52	0.37
51	Panel	OLP column & dictionary	12.9	1.09	0.93	0.78
14	Interactive	Human Tool Boxes	11.6	0.86	0.82	0.58
61	Panels	Macaque panels	11.6	0.77	0.54	0.80
04	Display	Brain size	11.0	0.75	0.65	0.53
54	Panel	Orang panels	11.0	0.84	1.03	0.67
17	Display	Termite Mound	10.3	0.45	0.40	0.39
06	Interactive	Computer (Brains)	9.7	0.70	0.74	0.37
12	Interactive	Chimpanzee Tool Box	8.4	0.81	0.60	0.58
33.5	Interactive	The Language Game	8.4	3.69	5.29	1.42
20	Animal Encl.	Hermit Crab	7.7	0.45	0.24	0.48
56	Video	TV Monitors	7.7	2.22	3.36	0.73
21	Panel	"Shell Seekers"	7.1	0.58	0.48	0.52
16	Bulletin	"Past"	5.8	1.48	1.45	1.13
60	Display	Macaque ID	5.8	0.58	0.42	0.52
18	Panel	"Gone Fishing"	5.2	0.59	0.37	0.44
31	Video	Earth Phone	5.2	0.83	0.45	0.89
34	Interactive	"We Think Therefore..."	5.2	1.07	1.00	0.68
47	Interactive	Computer (Strategy)	5.2	1.76	1.88	0.96
99	Demo	Demo	5.2	11.81	13.39	5.43
10	Graphic	"Is A Cow A Tool?"-Graphic	4.5	0.35	0.21	0.28
13	Panel	"Chimp Tool Kit"	4.5	0.76	0.63	0.65
15	Panel	"Tech"	4.5	0.88	0.77	0.78
27	Display	Leaf Cutter Ant	4.5	0.58	0.53	0.43
30	Panel	Craving?	4.5	1.56	0.82	1.80
09	Chart	"Using Tool"	3.9	0.37	0.31	0.25
08	Panel	"Using Heads & Tools"	3.2	0.63	0.41	0.87

(cont.)

Table 30 (cont.)

Stops in the Exhibition: Rank Order

(% of Visitors)

1		2	3	4	5	6
				Unique Stops:Statistics		
Location		Description	Percent of Visitors Who Stopped	Average Stop Time (Minutes)	Standard Deviation	Median
44	Panel	Wolf-Panel	3.2	0.27	0.11	0.23
26	Panel	Scientists	2.6	0.44	0.25	0.42
33	Panel	What is Language	2.6	0.65	0.12	0.70
49	Photo	Orang utan photos	2.6	0.18	0.07	0.16
25	Panel	Anatomy of Speech	1.9	0.30	0.20	0.23
37	Panels	IQ Section	1.9	2.84	3.64	1.30
50	Panel	People panel	1.9	0.61	0.81	0.17
58	Panel	Adaptable Panel	1.9	0.82	0.60	1.08
07	Chart	"Mission Control"	1.3	0.58	0.32	0.58
19	Chart	"Self Protection"	1.3	0.15	0.11	0.15
22	Panel	"Simple Minds"	1.3	0.23	0.06	0.23
23	Chart	"Thinking Tool Use"	1.3	0.45	0.11	0.45
40	Panel	"Deception"	1.3	0.68	0.78	0.68
41	Panel	"Who's Fooling Whom?"	1.3	2.12	2.38	2.12
53	Display	Orang ID	1.3	0.17	0.16	0.17
98	Docent	Docent	1.3	3.13	3.89	3.13
28	Panel	"No Ant is an Island"	0.6	0.37	.	0.37
36	Panel	"Social Living"	0.6	0.15	.	0.15
39	Panel	"Getting the Job Done"	0.6	0.15	.	0.15
42	Interactive	Fooling	0.6	0.95	.	0.95
43	Interactive	Wolf-Book	0.6	0.17	.	0.17
45	Interactive?	Wolf-Box	0.6	1.02	.	1.02
48	Panel	"Strategic Thinking"	0.6	1.72	.	1.72

Table 31

Stops in the Exhibition: Element Order

1	2	3	4	5	6	7
				Unique Stops: Statistics		
Location	Type	Description	Percent of Visitors Who Stopped	Average Stop Time (Minutes)	Standard Deviation	Median
52	Animal Encl.	Orang utan enclosure	58.7	2.24	2.46	1.27
59	Animal Encl.	Macaque Enclosure	30.3	1.63	2.00	0.83
20	Animal Encl.	Hermit Crab	7.7	0.45	0.24	0.48
16	Bulletin	"Past"	5.8	1.48	1.45	1.13
09	Chart	"Using Tool"	3.9	0.37	0.31	0.25
23	Chart	"Thinking Tool Use"	1.3	0.45	0.11	0.45
19	Chart	"Self Protection"	1.3	0.15	0.11	0.15
07	Chart	"Mission Control"	1.3	0.58	0.32	0.58
99	Demo	Demo	5.2	11.81	13.39	5.43
03	Display	Brains in glass cases	37.4	0.71	0.61	0.56
05	Display	Bronzed brains	32.3	0.69	1.31	0.45
55	Display	Smart Room	22.6	2.41	4.46	0.95
04	Display	Brain size	11.0	0.75	0.65	0.53
17	Display	Termite Mound	10.3	0.45	0.40	0.39
60	Display	Macaque ID	5.8	0.58	0.42	0.52
27	Display	Leaf Cutter Ant	4.5	0.58	0.53	0.43
53	Display	Orang ID	1.3	0.17	0.16	0.17
98	Docent	Docent	1.3	3.13	3.89	3.13
02	Graphic	"What is Thinking?"	23.9	1.53	1.21	1.37
10	Graphic	"Is A Cow A Tool?"-Graphic	4.5	0.35	0.21	0.28
11	Interactive	"Is A Cow A Tool?"-Inter.	17.4	1.28	1.87	0.65
32	Interactive	Syntax Wheel	13.5	0.83	0.83	0.46
14	Interactive	Human Tool Boxes	11.6	0.86	0.82	0.58
06	Interactive	Computer (Brains)	9.7	0.70	0.74	0.37
33.5	Interactive	The Language Game	8.4	3.69	5.29	1.42
12	Interactive	Chimpanzee Tool Box	8.4	0.81	0.60	0.58
47	Interactive	Computer (Strategy)	5.2	1.76	1.88	0.96
34	Interactive	"We Think Therefore..."	5.2	1.07	1.00	0.68
45	Interactive?	Wolf-Box	0.6	1.02	.	1.02
42	Interactive	Fooling	0.6	0.95	.	0.95
43	Interactive	Wolf-Book	0.6	0.17	.	0.17

(cont.)

Table 31 (cont.)
Stops in the Exhibition: Element Order

1	2	3	4	5	6	7
				Unique Stops: Statistics		
Location	Type	Description	Percent of Visitors Who Stopped	Average Stop Time (Minutes)	Standard Deviation	Median
46	Panel	Quote or Yani Art	13.5	0.54	0.52	0.37
51	Panel	OLP column & dictionary	12.9	1.09	0.93	0.78
61	Panels	Macaque panels	11.6	0.77	0.54	0.80
54	Panel	Orang panels	11.0	0.84	1.03	0.67
21	Panel	"Shell Seekers"	7.1	0.58	0.48	0.52
18	Panel	"Gone Fishing"	5.2	0.59	0.37	0.44
30	Panel	Craving?	4.5	1.56	0.82	1.80
15	Panel	"Tech"	4.5	0.88	0.77	0.78
13	Panel	"Chimp Tool Kit"	4.5	0.76	0.63	0.65
08	Panel	"Using Heads & Tools"	3.2	0.63	0.41	0.87
44	Panel	Wolf-Panel	3.2	0.27	0.11	0.23
33	Panel	What is Language	2.6	0.65	0.12	0.70
26	Panel	Scientists	2.6	0.44	0.25	0.42
37	Panels	IQ Section	1.9	2.84	3.64	1.30
58	Panel	Adaptable Panel	1.9	0.82	0.60	1.08
50	Panel	People panel	1.9	0.61	0.81	0.17
25	Panel	Anatomy of Speech	1.9	0.30	0.20	0.23
41	Panel	"Who's Fooling Whom?"	1.3	2.12	2.38	2.12
40	Panel	"Deception"	1.3	0.68	0.78	0.68
22	Panel	"Simple Minds"	1.3	0.23	0.06	0.23
48	Panel	"Strategic Thinking"	0.6	1.72	.	1.72
28	Panel	"No Ant is an Island"	0.6	0.37	.	0.37
36	Panel	"Social Living"	0.6	0.15	.	0.15
39	Panel	"Getting the Job Done"	0.6	0.15	.	0.15
24	Panel	Animal Speak	0.0	0.00	0.00	0.00
29	Panel	Creatures of Habit	0.0	0.00	0.00	0.00
35	Panel	"Social Pressure"	0.0	0.00	.	0.00
38	Panel	"Innovative Animals"	0.0	0.00	.	0.00
49	Photo	Orang utan photos	2.6	0.18	0.07	0.16
57	Photo	Macaque photo	0.0	0.00	.	0.00
01	Video	TV Monitors - Introductory	20.6	0.73	0.86	0.41
56	Video	TV Monitors - Demo	7.7	2.22	3.36	0.73
31	Video	Earth Phone	5.2	0.83	0.45	0.89
		Total Stops, without "Returns"	763			
		Total Visitors Tracked	155			

Table 32

Unique Stops in the Think Tank Exhibition: Spatial Order

1	2	3	4	5
Location	Type	Description	Percent of All Stops	Percent of Stops in Section
A		**Introduction**	**27.7**	**100.0**
03	Display	Brains in glass cases	7.6	27.5
05	Display	Bronzed brains	6.6	23.7
02	Graphic	"What is Thinking?"	4.8	17.5
01	Video	TV Monitors	4.2	15.2
04	Display	Brain size	2.2	8.1
06	Interactive	Computer (Brains)	2.0	7.1
07	Chart	"Mission Control"	0.3	0.9
B		**Tools**	**19.9**	**100.0**
11	Interactive	"Is A Cow A Tool?"-Inter.	3.5	17.8
14	Interactive	Human Tool Boxes	2.4	11.8
17	Display	Termite Mound	2.1	10.5
12	Interactive	Chimpanzee Tool Box	1.7	8.6
20	Animal Encl.	Hermit Crab	1.6	7.9
21	Panel	"Shell Seekers"	1.4	7.2
16	Bulletin	"Past"	1.2	5.9
18	Panel	"Gone Fishing"	1.0	5.3
10	Graphic	"Is A Cow A Tool?"-Graphic	0.9	4.6
13	Panel	"Chimp Tool Kit"	0.9	4.6
15	Panel	"Tech"	0.9	4.6
09	Chart	"Using Tool"	0.8	3.9
08	Panel	"Using Heads & Tools"	0.7	3.3
19	Chart	"Self Protection"	0.3	1.3
22	Panel	"Simple Minds"	0.3	1.3
23	Chart	"Thinking Tool Use"	0.3	1.3
C		**Language**	**8.9**	**100.00**
32	Interactive	Syntax Wheel	2.8	30.9
33.5	Interactive	The Language Game	1.7	19.1
31	Video	Earth Phone	1.0	11.8
27	Display	Leaf Cutter Ant	0.9	10.3
30	Panel	Craving?	0.9	10.3
26	Panel	Scientists	0.5	5.9
33	Panel	What is Language	0.5	5.9
25	Panel	Anatomy of Speech	0.4	4.4
28	Panel	"No Ant is an Island"	0.1	1.5
24	Panel	Animal Speak	0.0	0.0
29	Panel	Creatures of Habit	0.0	0.0

Table 32 (cont.)

Unique Stops in the Think Tank Exhibition: Spatial Order

1	2	3	4	5
Location	Type	Description	Percent of All Stops	Percent of Stops in Section
D		**Society**	**7.2**	**100.0**
46	Panel	Quote or Yani Art	2.8	38.2
34	Interactive	"We Think Therefore..."	1.0	14.5
47	Interactive	Computer (Strategy)	1.0	14.5
44	Panel	Wolf-Panel	0.7	9.1
37	Panels	IQ Section	0.4	5.5
40	Panel	"Deception"	0.3	3.6
41	Panel	"Who's Fooling Whom?"	0.3	3.6
36	Panel	"Social Living"	0.1	1.8
39	Panel	"Getting the Job Done"	0.1	1.8
42	Interactive	Fooling	0.1	1.8
43	Interactive	Wolf-Book	0.1	1.8
45	Interactive?	Wolf-Box	0.1	1.8
48	Panel	"Strategic Thinking"	0.1	1.8
35	Panel	"Social Pressure"	0.0	0.0
38	Panel	"Innovative Animals"	0.0	0.0
E		**Animal Enclosures**	**34.2**	**99.9**
52	Animal Encl.	Orang utan enclosure	11.9	34.9
59	Animal Encl.	Macaque Enclosure	6.2	18.0
55	Display	Smart Room	4.6	13.4
51	Panel	OLP column & dictionary	2.6	7.7
61	Panels	Macaque panels	2.4	6.9
54	Panel	Orang panels	2.2	6.5
56	Video	TV Monitors	1.6	4.6
60	Display	Macaque ID	1.2	3.4
49	Photo	Orang utan photos	0.5	1.5
50	Panel	People panel	0.4	1.1
58	Panel	Adaptable Panel	0.4	1.1
53	Display	Orang ID	0.3	0.8
57	Photo	Macaque photo	0.0	0.0
F		**Demo/Docent**	**1.3**	**100.0**
99	Demo	Demo	1.0	80.0
98	Docent	Docent	0.3	20.0
		Total Stops, without "Returns"	763.0	
		Total Visitors Tracked	155	

Table 33

Unique and "Return" Stop Data for Exhibition Elements at Which at Least 20.0% of All Visitors Stopped

1	2	3	4	5	6	7
Location	Type	Description	Percent of Visitors Who Stopped	Unique Stops*	Return Stops**	All Stops
			Exhibition = 155 Visitors			
52	Animal Encl.	Orang utan enclosure	58.7	91	27	118
03	Display	Brains in glass cases	37.4	58	5	63
05	Display	Bronzed brains	32.3	50	0	50
59	Animal Encl.	Macaque Enclosure	30.3	47	12	59
02	Graphic	"What is Thinking?"	23.9	37	1	38
55	Display	Smart Room	22.6	35	10	45
01	Video	TV Monitors	20.6	32	0	32
	Total for table		45.9	350	55	405
	All Stops			763	90	853

*Stops made by different visitors.

**Return stops by visitors who stopped previously.

Table 34

Percent of Visitors who Stopped in Each Exhibition Area

1	2	3	4	5
Exhibition Area	Number of Visitors	Percent of Visitors Who Stopped	Number of Visitors Making Repeat Stops in Area	Percent of Repeats in Area
Introduction	112	72.3	61	54.5
Tools	73	47.1	43	58.9
Language	36	23.2	18	50.0
Society	40	25.8	10	25.0
Animal Enclosures	131	84.5	73	55.7

Table 35
Behavior in the Think Tank Exhibition: Subgroups

Sub-groups	No. of Visitors	Avg. Visit Time (Minutes)	Standard Deviation	Median	Maximum
	A. Total Time in the Exhibition (Visit Times): Statistics				
Male Alone	**11**	8.8	8.6	6.7	25.0
Female Alone	**5**	6.4	5.3	5.6	12.3
Male in Adult Group	**22**	6.7	5.2	5.7	24.2
Female in Adult Group	**43**	8.3	9.6	5.6	61.5
Adult(s) & Child(ren)/Adult Male*	**13**	16.5	15.0	9.7	54.4
Adult(s) & Child(ren)/Adult Female*	**39**	8.8	7.1	6.8	32.6
Adult(s) & Child(ren)/Male Child*	**6**	9.0	6.2	8.5	19.7
Adult(s) & Child(ren)/Female Child*	**5**	6.5	4.1	8.5	10.5
Child/Teen Group	**8**	5.9	3.0	4.9	11.1
Total	152	**8.7**	**8.6**	**6.7**	**61.5**
	B. Percent of Visit Time Spent at Stops: Statistics				
Sub-groups	No. of Visitors	Avg. % Stopped Time (0.0 - 100.0)	Standard Deviation	Median	Maximum
Male Alone	**11**	65.7	36.0	81.0	100.0
Female Alone	**5**	56.8	39.0	75.0	91.0
Male in Adult Group	**22**	71.7	17.4	72.5	98.0
Female in Adult Group	**43**	66.4	23.3	67.0	99.0
Adult(s) & Child(ren)/Adult Male*	**13**	72.4	19.0	81.0	94.0
Adult(s) & Child(ren)/Adult Female*	**39**	54.7	24.3	62.0	94.0
Adult(s) & Child(ren)/Male Child*	**6**	61.8	23.0	73.0	82.0
Adult(s) & Child(ren)/Female Child*	**5**	83.8	16.6	70.0	99.0
Child/Teen Group	**8**	56.5	26.7	51.0	89.0
Total	152	**64.8**	**24.5**	**69.0**	**100.0**
	C. Total Time Observing (Sum of Time at Stops): Statistics				
Sub-groups	No. of Visitors	Avg. Stopped Time (Minutes)	Standard Deviation	Median	Maximum
Male Alone	**11**	7.0	8.1	5.2	23.4
Female Alone	**5**	5.0	4.9	4.7	11.1
Male in Adult Group	**22**	5.2	4.9	4.2	22.2
Female in Adult Group	**43**	6.3	9.3	3.8	57.6
Adult(s) & Child(ren)/Adult Male*	**13**	13.0	14.5	8.0	51.2
Adult(s) & Child(ren)/Adult Female*	**39**	6.0	6.7	3.7	30.3
Adult(s) & Child(ren)/Male Child*	**6**	6.5	5.4	6.2	15.4
Adult(s) & Child(ren)/Female Child*	**5**	5.6	4.0	6.0	9.8
Child/Teen Group	**8**	3.4	2.4	3.1	7.6
Total	152	**6.5**	**8.1**	**4.5**	**57.6**

Table 35 (cont.)
Behavior in the Think Tank Exhibition: Subgroups

	D. Number of Stops: Statistics				
Sub-groups	Unique Stops	Avg. Number of Stops	Standard Deviation	Median	Maximum
Male Alone	47	5.4	5.3	5.0	16.0
Female Alone	28	6.2	5.6	5.0	13.0
Male in Adult Group	91	4.4	2.4	4.0	9.0
Female in Adult Group	187	4.9	4.5	4.0	27.0
Adult(s) & Child(ren)/Adult Male*	101	9.0	8.3	6.0	32.0
Adult(s) & Child(ren)/Adult Female*	214	6.1	4.5	4.0	18.0
Adult(s) & Child(ren)/Male Child*	44	8.0	5.4	6.5	17.0
Adult(s) & Child(ren)/Female Child*	16	3.8	3.0	3.0	7.0
Child/Teen Group	33	4.1	1.9	3.5	8.0
Total	761	**5.6**	**4.8**	**4.0**	**32.0**

	E. Stop Time: Statistics				
Sub-groups	Unique Stops	Avg. Stop Time (Minutes)	Standard Deviation	Median	Maximum
Alone (Total)	**75**	**1.4**	**2.3**	**0.6**	**15.2**
Male Alone	47	1.6	2.7	0.7	15.2
Female Alone	28	0.9	1.1	0.5	4.8
Adult Group (Total)	**278**	**1.4**	**2.7**	**0.8**	**31.9**
Male in Adult Group	91	1.3	2.4	0.8	21.8
Female in Adult Group	187	1.5	2.9	0.8	31.9
Adults & Children (Total)	**375**	**1.3**	**2.5**	**0.6**	**33.4**
Adult(s) & Child(ren)/Adult Male*	101	1.7	3.8	0.6	33.4
Adult(s) & Child(ren)/Adult Female*	214	1.1	2.0	0.5	18.6
Adult(s) & Child(ren)/Male Child*	44	0.9	1.0	0.6	4.2
Adult(s) & Child(ren)/Female Child*	16	1.7	2.2	0.9	9.0
Child/Teen Group	33	0.8	1.2	0.4	7.1
Total	761	**1.3**	**2.5**	**0.6**	**33.4**

	F. Stop Time: Statistics				
Characteristics	Unique Stops	Avg. Stop Time (Minutes)	Standard Deviation	Median	Maximum
Age					
19 and Younger	98	1.0	1.4	0.6	9.0
20-29	204	1.4	2.7	0.6	31.9
30-39	243	1.3	2.1	0.8	18.6
40-49	121	1.6	3.4	0.7	33.4
50 and Older	95	1.2	2.8	0.4	21.8
Type of Element					
Demo/Docent	10	10.1	12.4	5.2	33.4
Animal	150	1.9	2.3	1.0	15.2
Graphic	44	1.3	1.2	1.1	5.2
Interactive	113	1.0	1.2	0.6	9.0
Display	194	1.0	2.1	0.5	21.8
Video	52	1.1	1.8	0.5	12.1
Panels	169	1.0	0.8	0.6	18.6
Chart	12	0.4	0.3	0.3	1.0
All Stops	763	1.3	2.5	0.6	33.4

*Observed individual in a group of Adult(s) & Child(ren).

Table 36

Number of Stops Within Exhibition Areas

1	2	3	4
Exhibition Area	Number of Stops	Number of Visitors Making a Specific Number of Stops	% of Stops within Area
A-Introduction	1	51	45.5
	2	32	28.6
	3	22	19.6
	4	4	3.6
	6	2	1.8
	9	1	0.9
		112	100.0
B-Tools	1	30	41.1
	2	26	35.6
	3	7	9.6
	4	5	6.8
	5	4	5.5
	9	1	1.4
		73	100.0
C-Language	1	18	50.0
	2	10	27.8
	3	4	11.1
	4	2	5.6
	5	2	5.6
		36	100.0
D-Society	1	30	75.0
	2	6	15.0
	3	3	7.5
	4	1	2.5
		40	100.0
E-Animal Enc.	1	58	44.3
	2	36	27.5
	3	26	19.8
	4	5	3.8
	5	5	3.8
	8	1	0.8
		131	100.0

Table 37

Distribution of Unique Stops by Element Types, for Sub-groups

Subgroup	Unique Stops	Row Percentages for Element Type: Animal	Chart	Dem/Doc	Display	Graphic	Inter.	Panels	Video	
Male Alone	47	22.2	2.2	0.0	24.4	2.2	13.3	31.1	4.4	99.9
Female Alone	28	14.3	7.1	0.0	10.7	7.1	25.0	25.0	10.7	100.0
Male in Adult Group	91	25.0	1.1	0.0	30.7	5.7	12.5	15.9	9.1	100.0
Female in Adult Group	187	23.5	1.6	1.1	25.7	6.0	13.1	20.8	8.2	100.0
Adult(s) & Child(ren)/Adult Male*	101	16.3	3.1	3.1	20.4	4.1	19.4	29.6	4.1	100.0
Adult(s) & Child(ren)/Adult Female*	214	17.8	0.5	1.9	29.3	5.8	17.8	20.7	6.3	100.0
Adult(s) & Child(ren)/Male Child*	44	22.7	2.3	2.3	25.0	4.6	27.3	11.4	4.6	100.1
Adult(s) & Child(ren)/Female Child*	16	31.3	0.0	0.0	25.0	6.3	18.8	12.5	6.3	100.1
Child/Teen Group	33	9.1	0.0	0.0	27.3	18.2	21.2	12.1	12.1	100.0
Number of elements:	761	3	4	2	8	2	11	29	3	62
		20.2	1.6	1.3	26.1	5.9	16.9	21.0	7.0	100.0
		150	12	10	194	44	126	156	52	744

*Observed individual in a group of Adult(s) & Child(ren).

Appendix C.

Study Methodology: *Think Tank*

This study was conducted by the Institutional Studies Office as part of its activities to profile visitors to the Smithsonian, to increase our understanding of the visit experience and to provide information for future exhibition modification and planning. This appendix contains a discussion of the overall design and implementation.[1]

Objectives

As discussed in the Introduction, the study was designed to answer a set of questions about visitors to *Think Tank*. The key educational objectives, organized under broad categories reflecting visitor responses, are repeated here (in italics). They are followed by more general questions which the study tried to address.

Cognition

Does the exhibit add to the visitors' scientific knowledge?
What overall ideas are visitors coming away with?

Motivation/Behavior

Does the experience increase the visitors' expressed interest in science?
What do visitors' do during their visit?

Affect/Emotion

Does the experience increase visitors' respect for animals and for conservation?
Are visitors' attitudes towards animals and interest in science being influenced by the exhibition and, if so, in what ways?

General

To what degree are these responses significantly affected by the specific activities that people undertake in the exhibition or by the time that they spend with them?

Overall Design

Data for this study were collected in personal interviews with two systematic scientific samples: visitors entering the *Think Tank* building (Entrance Survey) and visitors exiting the exhibition (Exit Survey).[2] At the same time that the entrance interviews were being conducted, we observed (unobtrusively tracked) a sample of visitors through the entire exhibition, noting the overall time they spent in the exhibition as well

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1 For additional background, see the Introduction to this report.

2 The samples were independent.

as the time and location of each stop (Tracking Study). Respondents were limited to visitors age 12 or older.[3] It is important to keep in mind that only voluntary visits are addressed in this report. Interviewing was conducted between August 14 and August 26, 1996.

For this project we used a "continuous sampling" technique, a special procedure developed for sampling a mobile population.[4] This allowed us to maximize resources by selecting individuals whenever interviewers were available and then adjusting the sampling weights for every fifteen-minute period, according to the number of people who passed the interviewing location during that period.

We used teams of three (one counter plus two interviewers) at the exit, and four or five (one counter plus two interviewers and one or two observers (trackers)) at the entrance. Individuals were selected for the Tracking Study in the same way that respondents were selected for interviews, although they were not interviewed.

There were four interviewing sessions within each day (10:30 AM -12:00 Noon, 12:30-2:00 PM, 2:30-4:00 PM, and 4:30-6:00 PM). Interviews were conducted on each day of the week. Exit and Entrance Surveys were coordinated so that the same people could not be selected for both, and so that Exit and Entrance Surveys were conducted during all periods of the day.

Visitor cooperation with the study was average, 86.0 percent of eligible respondents completed interviews in the Entrance Survey and 75.1 percent in the Exit Survey, for an overall response rate of 79.2%.[5] A total of 246 interviews were completed in the Entrance Survey, 352 interviews in the Exit Survey, and 155 individuals were observed in the Tracking Study. The intercepted individuals represent a population of over 22,100 visitors to the exhibition during the survey period. In appreciation for their cooperation, respondents were given a postcard from NZP.

Questionnaires: Entrance and Exit Surveys

As noted above, we were primarily interested in uncovering changes resulting from a visit to *Think Tank*. A secondary objective was to relate the visitors' experience to specific objects and display strategies. The questionnaires for the study, then, had to collect information with which to assess the extent to which the exhibition successfully communicated its messages, what changes resulted in visitor perspectives as a result of a visit, as well as to assess exhibition components and provide an audience profile. This

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3 This restriction is discussed below.

4 The procedure and its rationale are described in Z. D. Doering, A. E. Kindlon and A. Bickford, *The Power of Maps: A Study of an Exhibition at the Cooper-Hewitt National Museum of Design.* Report 93-5. (Washington, D. C.: Smithsonian Institution, 1993).

5 See below for a discussion of these response rates and the response bias in the study.

profile was needed both for the analysis of changes and to increase general understanding about the audience to the National Zoological Park (NZP).

The initial portion of both the Entrance and Exit Survey questionnaire collected general information about the visit. Aside from asking for prior visits to the Zoo (Q1) and the exhibition (Q2), we asked for the visitors' sources of information, if any, about the exhibition and what they had heard (Q3 and Q4). Entering visitors were also asked about their expectations for the visit (Q4a). After establishing some rapport with visitors, we asked about their interest in science (Q5).

Several other questions were also asked of both entering and exiting visitors with minor tense modifications. These questions established their degree of understanding some of the fundamental messages of the exhibition (e.g., their belief that animals show thinking behavior (Q6), abilities to provide examples of thinking behavior (Q7), ability to cite behaviors scientists would study in order to examine thinking behavior (Q8)). As an additional potential change measure, all visitors were asked to describe apes and monkeys (Q9). Tense changes include, for example phrasing the question to entering visitors "As you will see, ..." and for exiting visitors "As you have seen, ..." (Q6).

The remaining substantive questions, asked of exiting visitors only, focused on the exhibition. Finding a way to assess the respondents' understanding of the curators' point of view was especially challenging. The approach we used relied primarily on open-ended items. Of exiting visitors, we followed the question asking for examples of behaviors scientists would study to explore animal thinking with a request to name specific things in the exhibition (Q8a). We asked exiting visitors if they felt that the exhibition would influence the way they thought about animals, to see the degree to which visitors perceive any change, whether or not it can be measured with our instruments (Q10). We also asked what in the exhibition they found most interesting (Q11) and most informative (Q12) and the main idea it gave them (Q12a).

We also asked visitors to identify (from a card) what activities they engaged in while in *Think Tank* (Q13) and which they found most interesting (Q13a), if there was anything in the exhibition that they wanted to know more about (Q14), and what things in the exhibition they would improve, change, or add if they were the director of the Zoo Q15).

To see if anything had a personal meaning for exiting visitors, we inquired if they were moved emotionally by anything in the exhibit and, if so, what that element was (Q16).

An identical set of personal background characteristics was collected from all visitors: residence, who accompanied the respondent to the Zoo, age, educational attainment, racial/ethnic identification and gender. The final question on the Exit Survey asked for a telephone number, should a follow-up study become feasible.

The questionnaire also included a section for recording administrative information that is necessary for empirical analysis. This included the time, date and location of the

interview, and the reason, if applicable, that an interview was not completed (e.g., Smithsonian employee). Interviewers were trained to administer the survey with the aid of a manual developed for the study.[6]

Questionnaire development included experimentation with the order of the exhibition items. That is, we tried not only different items but also different orders.[7] The final order of the items in the questionnaire aims to maximize the internal consistency of responses while minimizing respondent fatigue and the respondents' feeling that they were being tested.

Tracking Study Form

Our Tracking Study captured the overall length of the visit, the number and order of stops, and the length of each stop. We were able to determine not only which parts of the exhibition were most engaging, but also how demographic features influenced the types of stops that visitors made, the length of the stop, and the frequency of stops.

The form used in the study is in Appendix A, together with an explanation of its contents.

Sample Design and Selection

Survey Schedule. Resource and schedule constraints restricted the data collection to nine days during late August. Within each day, the schedule covered 6 hours instead of the 8 hours during which *Think Tank* was open. (Summer hours were from 10:00 AM to 6:00 PM). The schedule takes into account resource limitations as well as hypothesized variations in visitor types during different days of the week and times of the day.[8]

Sample Selection.[9] Within each time interval selected for the survey, a team of three or four interviewers were assigned to the exhibition exit (or entrance). A team leader, or "counter," used a mechanical counter and a stop watch to keep track of the number of persons exiting (or entering) the exhibition and maintained a record of the number of people exiting within 15 minute intervals. The counter also identified the visitors to be intercepted, whenever an interviewer had completed one interview and was ready to begin the next. (This method of selecting a sample keeps the interviewers fully

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6 General interviewing instructions were based on Institutional Studies, *A Manual for Interviewers.* Prepared for the 1988 National Air and Space Survey. Report 88-3. (Washington, D. C. : Smithsonian Institution, 1988). The general instructions and question-by-question specifications for this study are available from the Institutional Studies office.

7 Approximately 50 preliminary questionnaires were administered by Institutional Studies and Zoo staff as part of questionnaire development.

8 Schedule is on file at ISO.

9 The discussion is restricted to the mechanics of sample selection, rather than the rationale. See Z. D. Doering, A. E. Kindlon and A. Bickford, *The Power of Maps: A Study of an Exhibition at the Cooper-Hewitt National Museum of Design.* Report 93-5. (Washington, D. C.: Smithsonian Institution, 1993).

occupied, compared to an equal interval selection method; the counter is essentially incorporating a self-adjusting selection interval.)

Everyone, except those in escorted groups, was counted and the information recorded on a Sample Selection Form. In addition, when intercepts were made, the number on the mechanical counter ("count number") was recorded on both the Sample Selection Form and by the interviewer on the questionnaire.

For logistical and technical reasons, interviews were not conducted with two segments of the visiting public: (a) members of school groups clearly accompanied by adults and (b) children under age 12. In the case of school groups, our experience indicates that most teachers prefer not to have their entrance to or departure from a building, or an exhibition area, delayed for any reason. Thus, it seemed inappropriate to try to intercept any member of such a group. When school groups are encountered, its members are excluded from sample frames, i.e., they were not counted nor included in our statistical estimates. *Thus, our data pertain to "voluntary visitors."*

Using a similar logic of "voluntary visits," in this study we decided not to include interviews with children under age 12. In some studies, when children under 12 are intercepted, we ask the accompanying adult for permission to interview. If the child is too young to be interviewed, i.e., infants and children under age 6, the accompanying adult is asked to respond for the child and provide demographic information. Given the nature of the questions, and the fact that we were not collecting data for an overall profile of zoo visitors, children under 12 were excluded.

Data Preparation and Coding. The questionnaires were reviewed in the office and prepared for data entry. The main purpose of this review was to ensure that the data file included the appropriate information for weighting the data and the codes assigned to the open-ended questions.

The weight for each questionnaire was defined as the number of visitors counted in a specific 15 minute interviewing segment divided by the number of intercepts in the segment. For example, each of 4 questionnaires filled out in a given 15 minutes during which 40 visitors exited would be assigned a weight of 10, irrespective of when it was conducted during the 15 minutes (e.g., if the "count numbers" were 5, 12, 28 and 40). In the analysis, these weights were assigned to individual records, since respondents were not selected with equal probability throughout the survey.

Coding for most of the open-ended questions was straight-forward. Answers were sorted and grouped according to content. However, three questions required specific knowledge of the exhibition components in *Think Tank* and of the scientific concepts discussed in the exhibition. Therefore, we relied on our colleagues at NZP to code responses to Q7 "Can you give me an example of animal thinking behavior?" Q8

"Scientists who study thinking in animals focus on their behavior. Can you name a behavior or several behaviors scientists would study?" and Q12 and Q12a "What part of the exhibition did you find most informative?" and "What is the main idea it gave you?"

Discussions with NZP colleagues led us to evaluate visitors' examples in several ways. First we looked at the type of example given. Was it an example of tool use? Communication? Problem solving? Then, we looked at the type of animal in the examples. Did visitors use a wild or domestic animal, or make no reference to a specific kind of animal, to illustrate their examples? For visitors exiting the exhibition, we also determined if the example they provided is directly related to the exhibition.

To illustrate how we evaluated responses, consider one visitor's response to Q7: "The language demo with the orang." This example was first coded three ways: (1) Type of example (e.g., this is an example of Language or communication behavior); (2) Type of animal used (e.g., this visitor used a wild animal in their example); (3) Relationship to exhibition (Yes, the example is related to the demonstrations given in *Think Tank*).

Coding for type of response was based on sections of the exhibition (Tools, Language, Society) as well as reviewing responses to identify additional categories of examples (looking, attending, responding, human-like traits, trainability/ability to learn, problem-solving and instinctive). These additional categories are defined as the following:

> Looking, attending, responding refers to responses that indicate the way an animal looks physically or her/his ability to notice , listen or respond to either people or objects in its view.
>
> Human-like traits indicates that the animals resemble, mimic, or possess human characteristics. Additionally, responses that described the animals in anthropomorphic terms were included under this heading.
>
> Trainability/Ability to learn includes responses that refer to an animal's ability to follow commands, learn or do tricks.
>
> Problem solving suggests the presence of image, intention and flexibility. Usually the words "problem solving" were included in the response.
>
> Instinctive refers to responses that do not demonstrate thinking behavior as defined in the exhibition as including image, intention or flexibility. For example, "cats attack if cornered," "eating," "finding food," "stay together for warmth," were coded as instinctive behavior.

In several cases, the responses were too vague or general to be coded into separate categories. These responses were coded as general unknown or general unacceptable if the response was clearly not an appropriate example of animal thinking behavior.

Later, these two general categories were collapsed into one category of vague/general unacceptable responses.

In addition to the content of the response, the quality of the answer was assessed. Examples were evaluated using a four part classification: *Prime* examples are those which reflect key animal behaviors discussed in the exhibition (Tools, Language, Social); *Other* examples are examples which show some thought about animal thinking behavior, but which are not emphasized in the exhibition (Problem-solving, human-like traits, trainability/ability to learn); *Unacceptable* examples are those which are not appropriate examples of animal thinking behavior (Vague/general unacceptable, instinctive, looking, attending, responding); *Don't Know* answers mean the respondent was unable to provide any example. The example provided above was considered a Prime example because the visitor mentioned Language, a key behavior emphasized in *Think Tank.*

Completion Rates and Response Bias

Table C, on the next page, summarizes the results of the field work. As shown, 13.99 percent of all persons intercepted in the Entrance Survey and 24.95 percent in the Exit Survey refused to participate in the survey. The overall refusal rate was 20.79 percent. While a few refusals were due to language difficulties, the majority of refusals were for "other" reasons (e.g., visitors in a hurry, not wanting to detain companions, etc.).

To check for possible bias, we compared separate demographic characteristics available for both visitors who completed interviews and visitors who refused for any reason (from observations). These include type of interview (Entrance vs. Exit), residence, age, gender, and racial/ethnic identification. There were statistically significant differences between those who completed and those who refused in two categories: type of interview and residence.

When we look at all of the characteristics together in a multivariate statistical model, we find that individuals exiting the exhibition were more likely to refuse when compared to those entering, all else being equal. In addition, foreign residents were more likely to refuse in comparison to visitors who live in the U.S.[10]

[10] Data on file, ISO.

Table C
Completion Rates: *Think Tank* Data Collection
(Frequency and Percent)*

Type	Entrance		Exit		Total	
	N	%	N	%	N	%
A. Disposition, All Eligible Visitors						
Interviews	**246**	**86.01**	**352**	**75.05**	**598**	**79.21**
Non-Interviews	**40**	**13.99**	**117**	**24.95**	**157**	**20.79**
Refusal, Language Difficulty	10	3.50	8	1.71	18	2.38
Refusal, Other Reason	30	10.49	109	23.24	139	18.41
Total	286	100.00	469	100.00	755	100.00
B. Response Rates						
All Eligible Visitors		86.01		75.05		79.21

* Frequencies and percents are based on unweighted data.

We also used a multivariate model to determine if there was any difference between the demographic characteristics of visitors interviewed in the Entrance and Exit Surveys, since our analysis approach assumed comparing data from both surveys. Respondents in both samples were found to be identical on all characteristics, except that adults with children were less likely to be interviewed in the Exit survey. However, since adults visiting with children were the majority of visitors in both the Entrance and Exit surveys, we decided not to adjust the weight for this possible bias (61% Exit, 70% Entrance).[11]

Constraints and Limitations

The results of this study may not be representative of an entire year's audience to *Think Tank*. The study reflects a particular seasonal visitor. Our experience has shown clear seasonal differences among types of visitors. Results from full-year studies from major Mall museums, for example, indicate that summer audiences are dominated by first-time visitors (New Visitors), while winter audiences are dominated by repeat visitors (Frequent Visitors).[12] On the Mall, attendance is highest and reflects Washington, DC tourism during the summer months. Since zoos are mostly an out of doors excursion, the seasonal variations in attendance we find on the Mall are most likely exaggerated at NZP simply because of the climate.

This study also has no true control. We were not able to conduct interviews at another location in the zoo that would have helped us to understand possible self-selection of

11 Data on file, ISO. See also Appendix B, Table 4.

12 By our definitions, New Visitors are visiting for the first time. Returning Visitors have been to an institution between one and three times in the past. Frequent Visitors have visited four or more times in the past.

individuals into *Think Tank*. We do not know how visitors to NZP who did not visit *Think Tank* would have answered some of the key questions asked in both the Entrance and Exit Surveys. As discussed above, we can compare the demographic characteristics of those who decided to visit *Think Tank* with a profile of visitors to another exhibition at the NZP and to audiences to the National Mall during the summer. However, we do not know how these visitors compare to the general audience to NZP during the summer. We can only speculate about the unique demographic characteristics, or lack thereof, of *Think Tank* visitors.

The interviews capture only immediate ("top-of-the-mind") responses after individuals have viewed the exhibition. Some people need more time to reflect about what they have seen and experienced before they can reach conclusions about it. Visitors who take more time to process the exhibition are not fully represented in the study.

We recognize the complexities of museum-based informal learning. The study of long-term implications of museum experiences is still in its infancy. Some important effects invisible in the short-term might reveal themselves much later. Behavioral changes, for example, are far beyond the scope of this study. As a start for understanding some long-term implications, at the conclusion of the Exit Survey, we asked visitors to give us their first name and telephone number. This will allow us to follow-up the personal interview with a more in-depth look at some visitors' impressions of *Think Tank* after they have had time to reflect on their experience.

Our experience has shown that interviews cannot be any longer than 7-10 minutes. For many, even that is too long. Time constraints limited the number of questions we asked.

The *Think Tank* exhibition deals with subject matter that is debated within the scientific community as well as in mainstream society. Asking visitors to make quick decisions about disputable issues often leads to some respondents trying to please the interviewer by giving what they think is a "socially acceptable response" rather than what they actually might think or feel. We could not ask visitors about very specific issues presented in the exhibition, e.g., cultural bias in intelligence testing, for several reasons. First, such questions assume that visitors saw and considered elements related to a specific issue. The number of people who could respond to a specific question would be too small for analysis. We also cannot give visitors the feeling that they are being "tested" on the exhibition, since this, too, would distort their responses and potentially antagonize visitors. As a result, we questioned them indirectly. There is always a danger, however, that respondents may not understand all the questions in the same way that we intended them to be understood.[13] Therefore, since our measurement of exhibition influence and effect is indirect, our conclusions are only an indication or suggestion of the impact of the exhibition.

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13 We tried to correct many of these weaknesses through extensive pre-testing; however, some questions might have failed us in unknown ways.

It is always possible for an exhibition to have a major impact on visitors that is not captured by our questionnaires. We tried to account for the unexpected by conducting informal discussions with visitors during the pre-test period, and by including open-ended questions in the interview. Yet, we may have missed something that none of us was anticipating. It is also likely that important questions which can explain some of the results were not asked. For example, while we asked visitors about their prior experience at NZP, we neglected to ask them questions about their zoo visiting experiences more generally.

In addition, despite the thoroughness of our Tracking Study, the results were somewhat constrained by the relatively small sample and by the impossibility of interviewing the people we observed.

Finally, resource constraints necessitated using volunteers to supplement professional interviewers. While we are grateful for their assistance, time and resources did not permit the lengthy training that would improve response rates, recording of details, and other technical details.

Appendix D.

References

Beck, B. B. (1991) "Conceptual Plan for the Hall of Humankind - National Zoological Park" Internal Document. Washington, DC: Smithsonian Institution.

Bielick, S., Pekarik, A. J., & Doering, Z. D. (1995). *Beyond the Elephant: A report based on the 1994-1995 National Museum of Natural History Visitor Survey* (Report No. 95-6B). Washington, DC: Smithsonian Institution.

Bielick, S., Pekarik, A. J., & Doering, Z. D. (1996). *America Meets Asia: A report based on the 1994-1994 Freer Gallery of Art and Arthur M. Sackler Gallery Visitor Study* (Report No. 96-2B). Washington, DC: Smithsonian Institution.

Doering, Z. D., Kindlon, A. E., & Bickford, A. (1993). *The Power of Maps: A study of an exhibition at the Cooper-Hewitt National Museum of Design* (Report No. 93-4). Washington, DC: Smithsonian Institution.

Doering, Z. D., & Pekarik, A. J. (1997, in press). Questioning the entrance narrative. *Journal of Museum Education.*

Doering, Z. D., & A. Pekarik (1996).*Assessment of Informal Education in Holocaust Museums* (Report No. RN 96-2). Washington, DC: Smithsonian Institution.

Doering, Z. D., Pekarik, A. J., & Kindlon, A. E. (1995). *Different Sites, Different Views: A study of the Degenerate Art : The Fate of the Avant Garde in Nazi Germany exhibition* (Report No. 95-2). Washington, DC: Smithsonian Institution.

Doering, Z. D., Pekarik, A. J., & Kindlon, A. E. (1995). *Mechanical Brides: Women and Machines from Home to Office: A study of an exhibition at the Cooper-Hewitt, National Design Museum* (Report No. 95-3). Washington, DC: Smithsonian Institution.

Doering, Z. D., Smith, S. J., Pekarik, A. J., Bickford, A., & Manning, R. D. (1994). *From reptile houses to reptile discovery centers. A study of the Reptile Discovery Centers Project at the National Zoological Park, Zoo Atlanta and the Dallas Zoo* (Report No. 94-4). Washington, DC: Smithsonian Institution.

Karns, David (1992). (Audience Concepts), *Lincoln Park Zoo & Brookfield Zoo Educators Study: A Survey of Teachers, Parents and Community Organizations and Their Use of Zoos as an Educational Resource*,(Report II). Chicago: The Lincoln Park Zoological Society and the Chicago Zoological Society.

Kellert, S. R. (1980). *Phase II: Activities of the American Public Relating to Animals.* (U. S. Fish & Wildlife Grant Study #14-16-0009-77-056). New Haven, CT: Yale University, School of Forestry and Environmental Studies.

Kindlon, A. E., Pekarik, A. J., & Doering, Z. D. (1996). *Visitors to History: A report based on the 1994-95 National Museum of American History Visitor Study* (Report No. 96-3B). Washington, DC: Smithsonian Institution.

Robinson, M. H. (1966). "The BioPark Concept and the Exhibition of Mammals" in *Wild Mammals in Captivity: Principles and Techniques.* Kleiman, D., Allen, M. E., Thompson, K. V. et al. (Eds.). Chicago: University of Chicago Press.

Ziebarth, E. K., Smith, S. J., Doering, Z. D., & Pekarik, A. J. (1995). *Air and Space Encounters: A report based on the 1994 National Air and Space Museum Visitor Survey* (Report No. 95-4B). Washington, DC: Smithsonian Institution.