Effects of Design Features on Visitors' Behavior in a Museum Setting

By

C2008
Ting-Jui Chang

Submitted to the graduate program in Design,
and to the Graduate Faculty of the University of Kansas
in partial fulfillment of the requirements for the degree of
Master of Arts.

Committee:

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Chairperson

Committee Members: _____

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Date defended: _____

The Thesis Committee for Ting-Jui Chang certifies that this is
the approved Version of the following thesis:

Effects of Design Features on Visitors' Behavior in a Museum Setting

Committee:

_____
Chairperson

Committee Members: _____

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Date approved: _____

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Acknowledgement

Special thanks to my mentors, *Richard Branham* and *Mahbub Rashid*, who taught me many things, supported me every way a mentor could to make this study happen; to *Spencer Museum of Art* for being extremely helpful through the study and offered many opportunities and friendships; to the *National Association of Museum Exhibition* for offering a fellowship so that this study would to be shared with more museum professionals in the MuseumExpo2008 in Denver; to my boss and my editor, *David Perlmutter* who is always smart and helping, always being understanding and tolerating me and my multi-tasking; to the *KU Office of Research and Graduate Studies* and *Graduate & Professional Association* for awarded this study the 3rd place in the 2008 Graduate Research Competition; to *Dr. Chen* of National Taiwan University of Science and Technology and KU's *Office of Study Abroad* who introduced me to study in the USA; to professors in KU who built my research skills and knowledge for this study; to the Chadwick family the Wood family who are my families in USA, especially *Heather Wood*, who has been my friend, prove-reader, driver, roommate, therapist, cheerleader, travel partner and introduced me to the "real" American culture; to *Gina*, who makes sure that I can graduate; and most importantly, to my family in Taiwan for supporting me whole-heartily and holding the string of the flying kite.

Abstract

The study aims to define and measure aspects of possible interplay between design features of display and visitors' behavior in a museum setting. It asks, "What environmental features related to design decisions have an impact on visitors' behavior?"

The research was done by observing single adult visitors in the 20/21 gallery of the Spencer Museum of Art in the University of Kansas. Research methods included: 1) mapping and measuring the physical setting of the display and art pieces; 2) ranking art pieces by the curator on three scales: canonical value, popularity, and exhibit goals for the Museum; and 3) tracking visitors' paths, stops and time-spent at each stop/art piece by observing and note-taking over two weeks of time. Correlation analysis was used to discover the relationships between design features of display measured (eye-level, lighting, locations and clusters) and visitors' behavior (the stops, viewed-frequency and time). Graphs were studied as visual representations of the setting/display, viewing paths and stop locations to identify the patterns of behavior. Findings include: 1) 1) how display designs reflected the importance of the art pieces in the mind of the curator; and 2) patterns of visitors' behavior related to both display of art and arranged space.

Introduction

This research mainly focuses on the design features related to the built environment, specifically the display of art, and its interactions with visitors. The impacts of environmental design features on visitors' behavior in the museum settings have been studied in many different fields, including Art History, Museology, Education, Psychology, Environmental Behavior/Behavioral Science, Design and, of course, Architecture. In particular, psychology researchers have proposed guidelines based on how humans function. Examples include studies on selective attention by Bitgood (2002). Human-factors researchers have studied the effects of eye-level and viewing angle (e.g. Burgess-Limerick 2000). The quality of interaction between art and its audiences has also started to receive more attention from the arts and the museology professionals. Statements such as "the art-works as interfaces", "the displays could be effective in real/virtual environments" (Samis 1999, Dziekan 2003) and "a museum's check-list for designs from way finding systems to labels of arts" are mainly promoting a visitor-centered design principle to build/design experiences/services.

The importance of this study is based on the knowledge of Tversky's comprehension of how people "understand/think" the spaces (1991, 1993, 1995,

2000a, 2000b, 2003) and Arnheim's visual-thinking studies related to how humans view/understand art/image as a holistic picture (1969, 1980, 2001).

If it is needed the case that visitors to a built space try to understand a space/display as a whole rather than individual elements, the researcher is highly interested in the reasoning/logic in their mind of "what are together" (cluster) and "how it connects" (relations). The goal of this study, then, is to understand the physical setting of display and how it influences/interacts with the actors/visitors.

The museums' roles currently are more than collection protectors and accumulators of educational materials but also, increasingly, providers of leisure experience services. In order to offer the friendliest service possible, thoughtful decisions need to be made with consideration as to how the art and its environmental setting interact with patrons. Those decisions, the above cited work suggests go beyond selecting what art-works go on exhibit at what time. Interaction designers and researchers will need to identify the "big picture" of design related issues/problems in where to place objects within the built space.

The concept map in Diagram 1 represents the interplays of disciplines related to this study. The complexity of the map varies depending on a researcher's viewpoint.

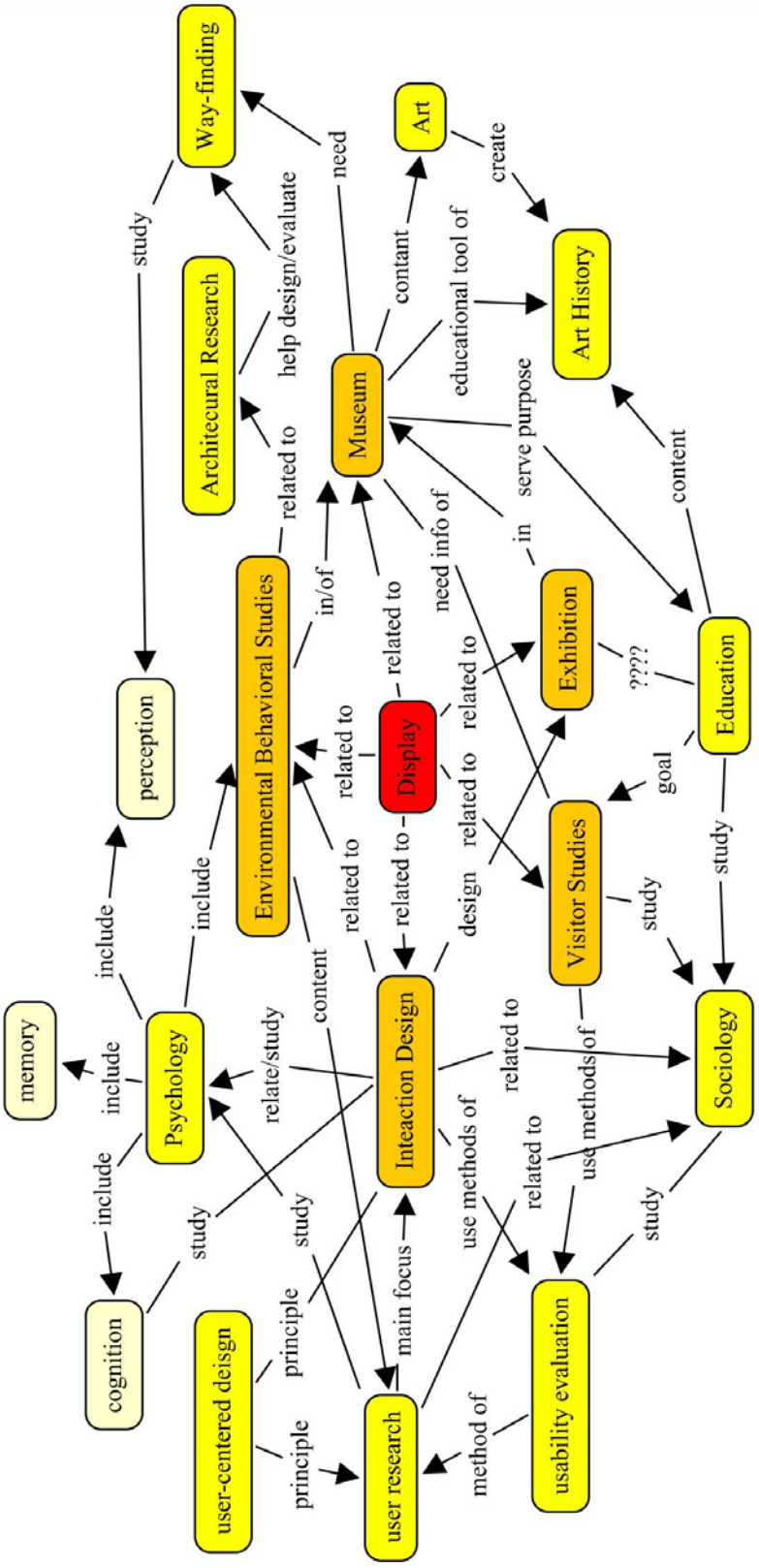


Diagram 1. The relationships among research disciplines related to this study

To study how humans behave and interact within and toward a built environment is one of the useful user-centered methodologies that help researchers evaluate the design of a setting. Several user-centered research methods have been used by professionals in these fields, including field observation, tracking, questionnaire, personal interviews, focus groups and video-recording (Suchman 1991, Zeisel 2006, Bitgood 2002, Zimring and Dalton 2003). Researchers have also completed studies using methods such as questionnaires to investigate how art pieces' names are related to visitors' learning experiences (Bourdeau 2003, Johnston 1998, Bitgood 1993); and how semantic differences of the designs of labels would affect/attract the memory/attention of visitors (Taxen 2003). Tracking movements in built environments has also been used by the researchers in these and other related topics (Choi 1997, Harvey 1998, Beatriz 2007, Klein 2007, Peponis & Datton 2004).

This researcher used only field observation and visitor's paths tracking for the present study. The researcher, accordingly, looked at the context of the setting, including the environment, the actors and activities (Zeisel 2006), which are discussed elaborately later in this chapter.

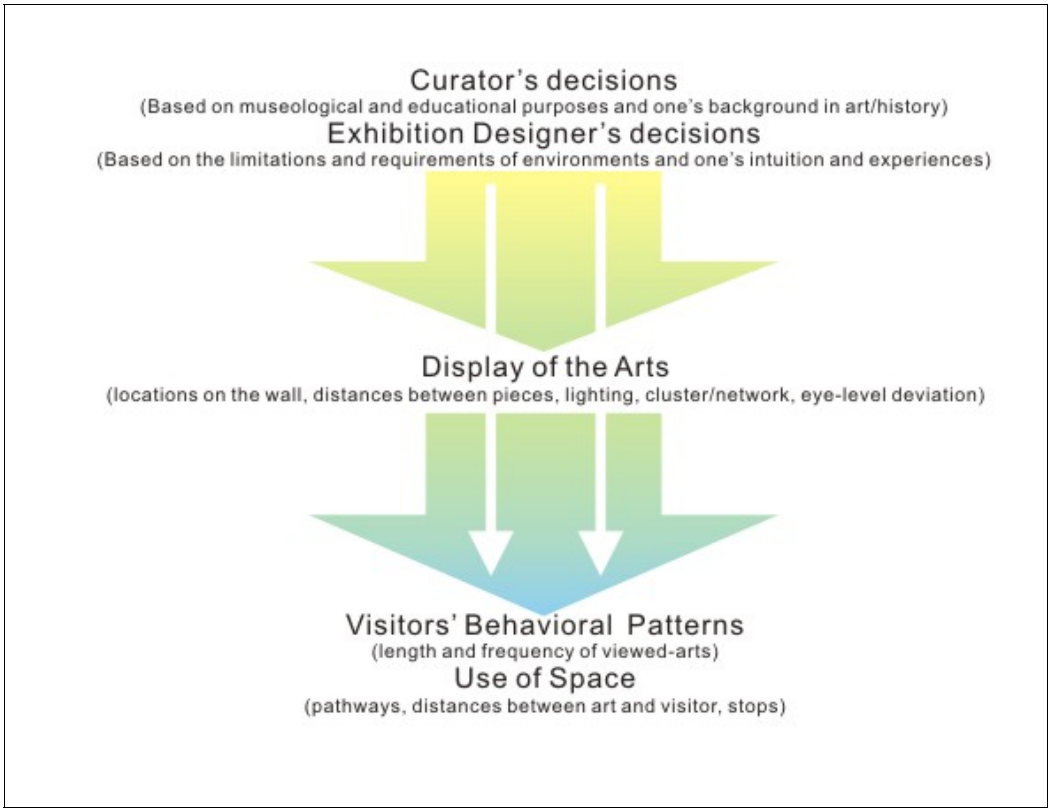


Diagram 2. Function model of this study

Based on the function model (Diagram 2), the researcher broke down the study into three main categories, including the physical setting of the design, the rating of the curator and the visitors' behavior. The research methods used to examine the interplay among the data are correlation analysis and graph/visual representation.

Furthermore, the overall assumption here is that the physical design of the display in an exhibit often follows distinct layout principles despite differences among curators and exhibition designers' expertise including education, experiences and intuition. So, one of the primary aims of this research is to

uncover some of the basic principles that guided designers as they constructed the visitor-exhibit interfaces.

By comparing the measurements of the physical setting of display and the viewing paths of visitors, the research also aims to identify the design qualities of display (such as the location of art pieces, the cluster of the display and the lighting level at art pieces) and their impacts on visitors' behavior.

Context

Based on Zeisel's study (2006), the researcher tried to understand the context of the designed environment by studying: 1) the belief system of the curator and the exhibition designer; 2) design solutions and the environment; and 3) behavior in the setting by visitors.

- **Belief system (black-box) of the curator and the exhibition designer**

Belief systems of the curator and the exhibitions designer are the "black-boxes" that produce the decisions and design of the exhibition. To understand the belief systems of the curator and exhibition designer, the researcher should try to understand their background including the formal training/education, such as art-history studies, knowledge of art and design, and professional experiences. Certainly intuition also plays an important role in design. An exhibit might be designed with many different missions in mind, including educational purposes, the expectation of publics, and the goals of the funders, which, in this case, was to state the awareness of social issues and globalization. While the curator and exhibition designer have multiple missions and expectations on their shoulders, they also face limitations in the forms of:

the standards of the architecture, the collection availabilities, the regulations and the nature of material decay. More specific limitations and standards of exhibition design are mentioned in the later chapters.

- **Design solutions/designed environments**

The “real” environment is always complex. To design an exhibit for an visiting experience is like to set up the “mise en scène”, there are always many factors need to consider. In this study of the 20/21 gallery, it is possible to identify several possible interplays that occur simultaneously among visitors and the environment. So, this researcher studied the visitors’ behavioral patterns with a Gestalt mind-frame rather than focusing on self-reported opinions or self-administered questionnaires.

The 20/21 gallery was described by the curator as having the atmosphere of a contemporary storage-room-like gallery rather than that of a traditional-national museum-like linear space with bright daylight. The exhibition designer expressed a vision of a contemporary art gallery where the display itself is an art-installation piece.

The specific factors such as the choice not to have any labeling provide direct interaction between visitors and art pieces without distraction and

prejudicial assumption. They also planned that the open ceiling with less focused lighting and the dark colored flooring would exude a modern and non-traditional theme that would allow visitors to act and interact freely with the display and environment.

- **Behavior in the setting**

The physical settings of a display can obviously affect behavior toward and movement around it. For example, a popular and prominent art piece would attract more traffic and attentions. The physical limitations of a setting also have an effect on visitors' behavior. Such limitations might include the safe distance from art pieces, blocked pathways, inappropriate lighting, and the location of entrances and exits. Visitors' behavior could also reflect other conscious and unconscious motivations, ex. a plan of visit or an assignment.

The researcher anticipated the possibility that visitors would like to have maximum interaction with and freedom of movement through the gallery. In this particular setting in the 20/21 gallery, visitors could move freely while navigating the space. A typical patron might walk, stop, look, read, sit, write or/and talk at their own whim. The designer and the researcher did not preplan the path of viewing.

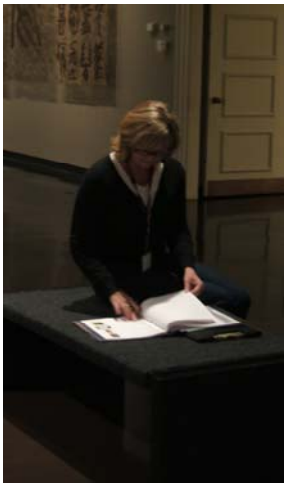


Image set 1. Visitors' activities in the gallery

Question and Hypotheses

The question investigated in this study was: what environmental features--related to design decisions--have an impact on visitors' behavior? In relation to the question, the following set of hypotheses were proposed and then tested in the study.

1) The subject matter of the art affects how the curator displays art pieces. How the curator displays art pieces affects the way visitors view it, specifically the time spent looking at each piece.
2) Visitors tend to visually group art pieces that are displayed closer together on a wall/two-dimensional surface; therefore, they would be expected to stop their flows of navigation and view a "group" of art pieces rather than move continuously and sequentially view individual pieces.
3) The physical settings of display have impacts on how visitors group art pieces into a holistic, pattern-like "image", which affect where to stop and from where to go inspect the art. The settings include eye-level height of an art piece, the lighting level at an art piece, the size of an art piece, the

distances among pieces, any contrast of media, and the similarity of appearance of art pieces.

4) Visitors spend more time on art pieces displayed toward the center (node) of a cluster of art pieces on a two-dimensional surface.

5) Visitors spend more time on pieces displayed near the eye level (median 62”, Bailey 1996) on a two-dimensional surface.

Methods

Setting

Physical Setting of the Museum

The Spencer Museum of Art is a five-story building, sharing spaces with an art library and an art history department. There is one main entrance to the Museum. The exhibits are on the 3rd and 4th floor. An elevator is used to take visitors in-between as well as to take officers working on the 5th Floor.

The study was conducted at the 20/21 Art Gallery of the Museum. The gallery reopened in July 2007 after a year of renovation. The 20/21 gallery is on the 4th floor of the museum, while the main entrance is on the 3rd floor. The 20/21 gallery has an east entrance near the elevator and a west entrance connected to the 19th art century gallery.

The 20/21 gallery displays contemporary, non labeled, large-scale art pieces. It is a 39.6 by 114.6 ft. open space floor with twenty-three floor pieces, one desk, two benches and five chairs. The prominent spatial features of the 20/21 gallery are: open space with open ceiling, non-linear display, mix-media, and subdued lighting. These characteristics offer visitors freedom of selection. This study is

focused only on the north wall of the gallery, which holds 29 pieces. In contrast, the other galleries in the Museum are mostly sectioned by historical period, and the displays in all these galleries are designed as traditional linear, labeled displays. (For the Spencer Museum of Art map, see appendix)

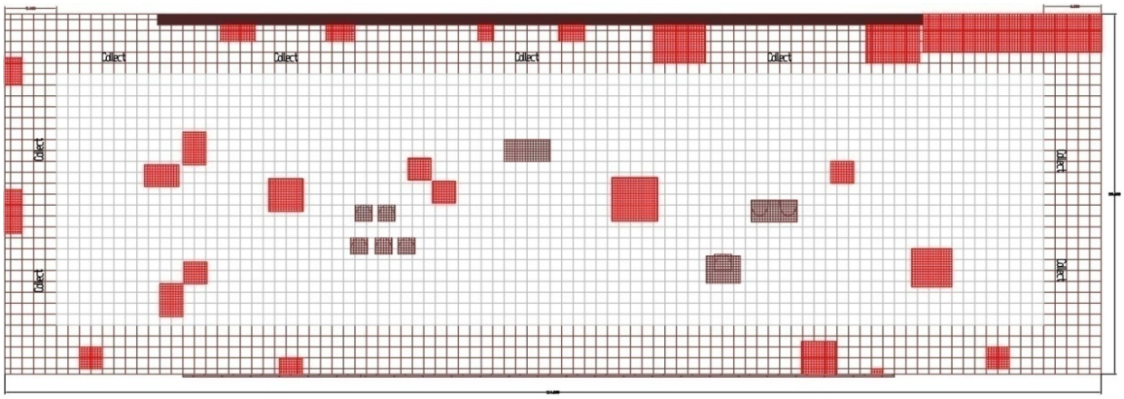


Diagram 3. 20/21 gallery floor plan

Culture of 20/21 Gallery and the Spencer Museum of Art (SMA)

The museum has a general goal to reach out more to the regional community and students. The mission states: “to explore the capacity of art to spark curiosity, inspire creativity, and create connections among people.” and “to sustain a diverse, global collection of art and visual culture to encourage interdisciplinary inquiry and to explore the ways in which people make and express meaning at the intersection of art, ideas, and experience. Engaging with these collections, the context of their creation, and their evolving cultural relevance, SMA sparks curiosity, inspires creativity, and creates provocative

connections involving art, artists, scholars, students, alumni, staff, and the public. The Spencer strengthens the academic research and teaching of the University of Kansas and is committed to serving communities of learners across Kansas and beyond." (For complete Mission Statement, see appendix)

During the research, the researcher sense that the design process in SMA is fairly utilitarian, and potentially reflects how the 20/21 was built, for example, the massage/opinion board was used to get self-voluntary opinion of the renovation. The renovation process is an on-going process that open to add-ons, jump-ins and is not afraid of changes.

The museum had about 130,000 visitors in FY2007, which represented 10% growth from the previous fiscal year (Table 1). The main visitors are students of the University of Kansas, local 3rd to 11th grade school groups, and regional adult visitors. The students and the regional visitors were selected as subjects and the reason is mentioned later.

Visitor counts for Fiscal Year 2006 and 2007

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	total
06	7007	8382	15196	12592	11626	7136	8535	8595	10895	11121	9754	6857	117696
07	4312	1572	15196	13550	19612	11106	7631	10200	12512	11746	12309	10295	130041

Table 1. Visitor-Counts of FY06 and FY07

The Renovation of the 20/21 gallery

The recent renovation of 20/21 gallery was aimed to create "acknowledgment of subjective experiences; recognition that we live in a global society; engagement of the broader campus community." (For the original Statement of the Renovation Goal, see appendix.)

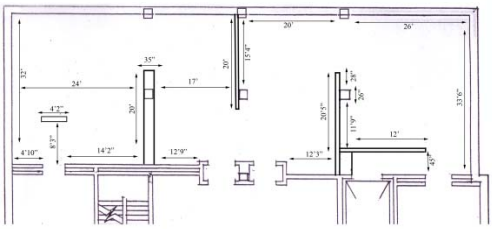
The focused changes were made and differences are shown as the Image set 2. The open space contents more pieces with less feeling of crowded than the sectioned space, especially for the group visitors. The open entrances give a sense of welcoming and allows visitors to glance through with more options.

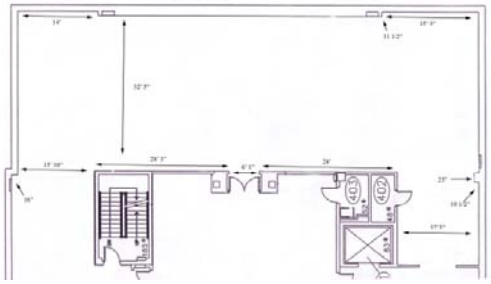
Setting as observed by the researcher:

The researcher saw qualities and actions in the setting/gallery such as experimenting with the non-traditional values; seeking changes for better solutions; following the nature of the design: there's no perfect design, always more space for improvement; valuing the fun of the "never finished clay" which one would play, change and shape with time. As a result, the 20/21 environment/gallery is a place that changes frequently, about every three months, with experimental designs that depend primarily on the intuition of the exhibition

designer and the curator. It is non-traditional (non-linear, not according to timeline), yet follows the educational purpose of the university.

Before Renovation **After Renovation**





Sectioned space Open space

Narrow doors Open entrances

Image set 2. 20/21 gallery before and after the renovation

About 20/21 Art Pieces

The art pieces are from the 20th and 21st centuries and are collected from different regions around the world. The uniqueness the collections are:

1) Time: the pieces are made in our time, and

2) Media: larger scale, multi-media and

3) International, multi-cultural, and versatile in terms of content/expressing styles. Out of one hundred-and-fifty art pieces displayed regularly in the gallery, twenty-nine pieces are on the north wall of the gallery. Out of the twenty-nine pieces, there are twenty-three paintings, five sculptures and one cabinet of the prints. There are twenty-three pieces displayed on the floor in the 20/21 gallery.

Background of curator and exhibition designer

The curator of 20/21 gallery is Emily Stamey, who is a PhD candidate in 20th Century American Art History.

The exhibition designer is Richard Klocke, who has a Master of Fine Arts degree in sculpture and has many years of experiences in exhibition design for museum/gallery settings.

Things about the design of the exhibition in 20/21

A paper mock-up was used as a tool by the exhibition designer and the curator to visualize the design of the display/setting and communicate/brain-storm with each other the arrangement on site before the actual set-up. The visualization tool helped the designer to judge the settings by intuition, referring to the “black-box” of the designer discussed earlier (Images 3 & 4).

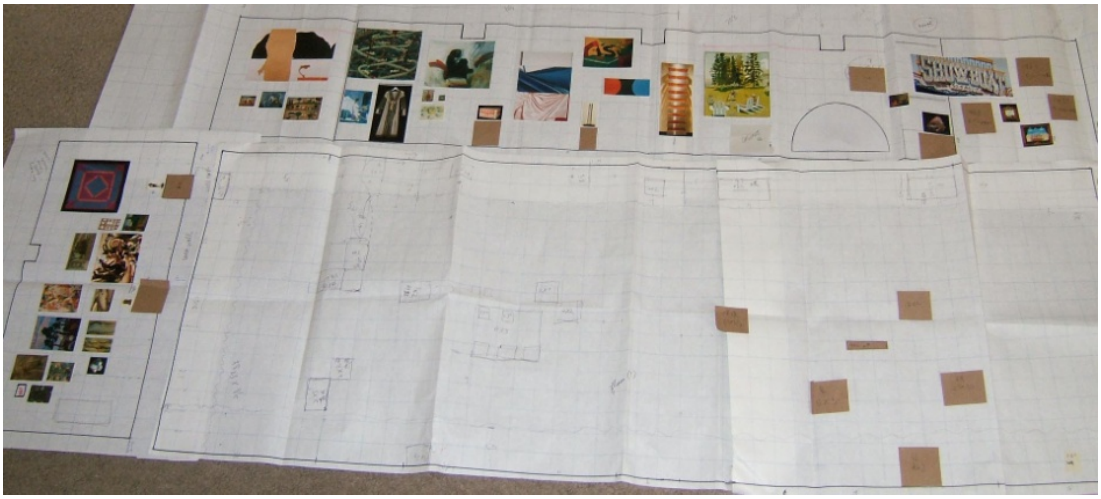


Image 3. Paper mock-up for the 20/21 gallery

Image 4. Paper mock-up for the north wall

Lighting Design

The lighting design of the gallery is based on the standards/requirements for the materials of the art pieces and the visibility for visitors. The lighting levels standards provided and used by the exhibition designer are as follows:

Piece type	Lighting standards
Works on paper	5-7 foot candles.
Photos	7-10 foot candles but can depend on some variables.
Textiles	5-7 foot candles.
Oil and Acrylic paintings	As high as 20 foot candles.
Water color paintings	Low, 5-7 foot candles but many variables can be at play here to allow more light.
Ceramic and metal objects	can be quite high as in well over 20 foot candles

Table 2. Lighting standard by the exhibition designer of the Spencer Museum of Art

Subjects

Visitors of the Spencer Museum of Art

The subjects of this study included only single adult visitors. They included both university students and community/regional visitors. 161 subjects were observed during a study period of two weeks. All subjects entered the 20/21 gallery either from the right or left entrance and made at least one stop to view art pieces.

In order to understand the pattern of visitors' movement/behavior in the setting, a floor plan was used to track the paths of visitors and to document the art pieces that were viewed.

The group visitors and K-12 students were excluded from the study due to the fact that the conversations and interactions among visitors would be potential distractions for the interaction between the display/environment and individuals; and that the eye-level height is different for the K-12 students.

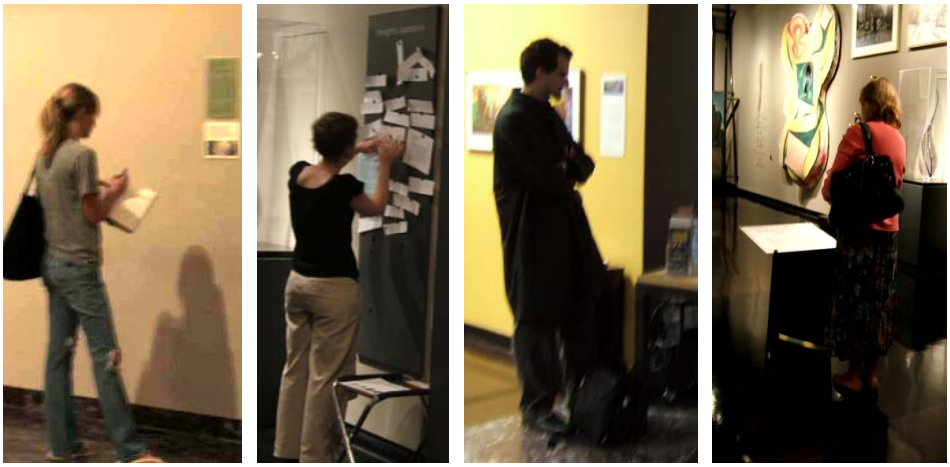


Image set 5. Students and regional visitors

Observed-subject counts:

Date / Time	12/4	12/5	12/6	12/7	12/8	12/12	12/13	12/14	12/15	total
10~11	3	3	2	0	2	4	1	0	0	15
11~12	4	1	5	0	1	5	3	0	1	20
12~13	6	2	1	3	3	3	0	6	2	26
13~14	1	4	4	4	14	2	1	0	6	36
14~15	2	1	0	3	1	5	5	0	5	22
15~16	0	4	1	0	10	5	4	2	1	27
16~17	0	5	1	0	8	0	1	0	0	15
Total subjects	16	20	14	10	39	24	15	8	15	161

Table 3. Observed-subject counts

Common scenarios for visitors

1) Student visitors:

a) *Free time between classes.* Walk in without goals, use benches, and often talking on cell-phone.

b) *Class assignment.* Art/art history students often need to write a report or do

certain art collections related assignments; they come in with notepad, sketch paper or/and laptops, mostly go directly to the piece they are looking for and stay for a longer period of time.

c) *Event attending.* There are many campus events holding in the Spencer Museum of Art such as lectures, films and opening shows for arts, architecture, design and music. They come with purposes other than the exhibits therefore one most likely uses the common areas (center court and auditorium) and skips the exhibits.

d) *First dates.* According to the museum guards, the museum is one of the favorite spot for first dates; a couple would tour around in the museum while talking about general questions; usually happens in the afternoons and evenings on Thursdays and Fridays.

2) Family visitors:

a) *Holidays/weekends visits.* Family visitors mostly come in during the weekends. They would tour in the museum as a group while talking about art and/or daily subjects. They would like to spend time together rather than learning something about art.

b) *Event attending.* There are many family-oriented events holding in the Spencer Museum of Art during the weekend, such as art classes, films and opening shows for arts, architecture, design and music. They come with purposes other than the exhibits therefore one most likely uses the common areas (center court and auditorium) and skips the exhibits.

3) Regional visitors:

One could show up anytime of the day, any day of the week; usually get the museum map and/or an audio guide from the reception desk. One would spend a longer period of time and walk through each and every gallery. One would tend to look at the "must see" pieces, which are rated highly by the curators on either the canonical scale and/or the popularity scale. One could be very potentate and/or professional about art. The researcher met curators from other museums and artists from the region that fall in this category.

4) Community visitors:

a) *Event attending.* There are many socialization events held in the Spencer Museum of Art on Thursdays during extended hours and on the weekends, such as community gathering, book clubs, lectures, films discussions,

holiday events(for example, signing for Christmas) and opening shows for arts, architecture, design and music. They come with purposes other than the exhibits therefore one most likely uses the common areas (center court and auditorium) and skips the exhibits.

b) *Com-in to see the "must sees" and the "new releases"*. They live in the neighborhoods and show up regularly to see the regular displays and most importantly, the new releases. One tends to walk fairly fast and precise since one knows where to go, only the "must see" and "new releases" pieces would make them stop and view.

5) K-12 student group field trips

They come during the week, scheduled ahead with docents and follow the planned paths.

Types of data

Goal of observation

The main goals are: to observe how visitors interact in the gallery; to evaluate how the display of art pieces affects visitors' selections of viewing such as the lighting effects how visitors stop to view art pieces; to identify the paths of visitors in order to examine the pattern of movements and its relation with the environmental setting, possibly the arrangement of three dimensional art pieces/installation on the floor; to use the representations the logic of the designs of display/space, and to document the behavior of visitors in order to see the potential interplays.

Behavioral data

- *Visitors' viewing paths*. When one enters the setting/gallery, one's movement may be driven by his/her goal or by the display.
    1) Stopping locations; when the subject moves in the setting, one may decide to stop at certain spots for many reasons including attractions and/or blocks.
    2) Time spent at each stop; how long one stops at a location might be

determined by the content of attraction, for example, how many pieces could one views at a stop.

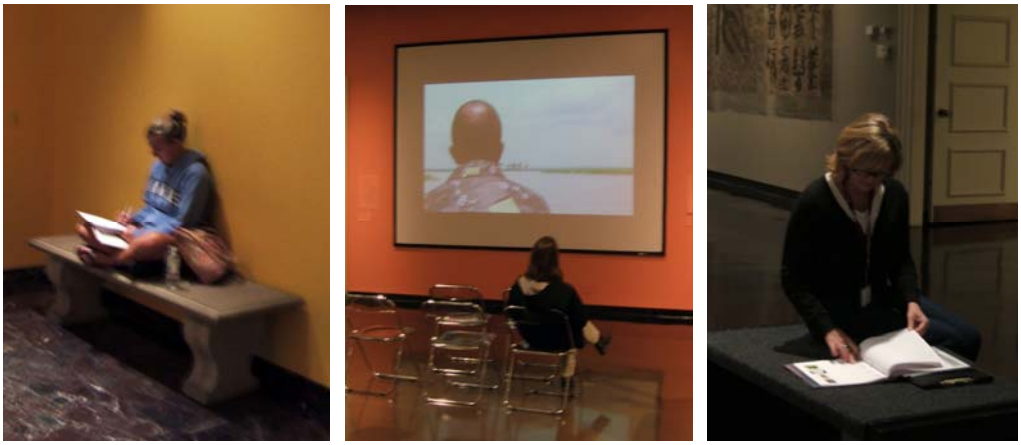


Image set 6. Behavior observed in the museum

Physical data of the setting/display

The data collected both from the setting/gallery and during observation were broken into three categories: 1) physical setting of design, 2) rating of art pieces, and 3) visitors' behavior.

- *Physical setting of design*

1) Art pieces:

There are twenty-nine art pieces on the north wall of 20/21 gallery. They are created by different artists from around the world with various styles and media. The basic information of the art pieces included their names, artists, year made and media (Image 7, Diagram 4 and Table 4).

i. Display of art pieces:

Image 7. North wall of 20/21 gallery

ii. Basic information:

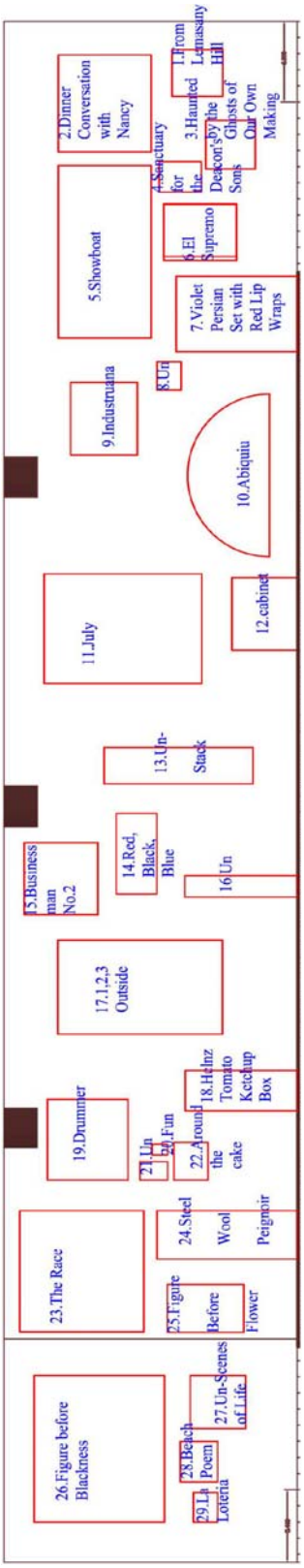


Diagram 4. Art pieces' names and location on the north wall of 20/21 gallery

iii. Demographic information (Table 4):

piece	Piece Name	year	type	artist
1	From Lemasany Hill	1995	Painting	Robert N. Sudlow
2	Dinner Conversation with Nancy	1983	Painting	Roger Shimomura
3	Haunted by the Ghosts of Our Own Making	1995	Painting	Hollis Sigler
4	Sanctuary for the Deacon's Sons	2000	Sculpture	Renée Stout
5	Showboat	1972	Painting	Robert Cottingham
6	El Supremo (from the "Serie Paraguay)	1988	Painting	Carlos Colombino
6	Sitting Bull and Kicking Bear	1989	Painting	Beatrice Riese
7	Violet Persian Set with Red Lip Wraps	1990	Sculpture	Dale Chihuly
8	untitled	1972	Painting	Harvey Dinnerstein
9	Industriana	1965	Painting	Robert Berkeley Green
10	Abiquiu	1968	Painting	Carol Haerer
11	July	1971	Painting	Fairfield Porter
12	Cabinet for plat files	N/A	N/A	N/A
13	untitled (Stack)	1967	Sculpture	Donald Judd
14	Red, Black, Blue	1962	Painting	Ellsworth Kelly
15	Business Man No. 2	1962	Painting	Peter Saul
16	untitled	1900s	Sculpture	Harry Bertoia
17	1, 2, 3 Outside	1963	Painting	James Rosenquist
18	Heinz Tomato Ketchup box	1964	Sculpture	Andy Warhol
19	Drummer	1960	Painting	Larry Rivers
20	Fun	1961	Painting	Robert Indiana
21	untitled	1964	Painting	Elsa Gramcko
22	Around the Cake	1962	Painting	Wayne Thiebaud
23	The Race	1962	Painting	Irving Norman
24	Steel Wool Peignoir	1966	Sculpture	Mimi Smith
25	Figure with Flowers	1961	Painting	Paul John Wonner
26	Figure Before Blackness	1960	Painting	Robert Motherwell
27	untitled (scenes of life)	1958	Painting	Clementine Hunter
28	Beach Poem	1900s	Painting	Theodoros Stamos
29	La Loteria	1952	Painting	Francisco Amighetti

Table 4. Art pieces' information

2) Physical factors of display

i. Sizes of art pieces (Table 5, Diagram 5 & 6):

The size of art pieces could be a factor of attraction for viewers. With the help of the exhibition designer, the curator and the collection manager, the actual sizes of all twenty-nine art pieces on the north wall were measured with frames, which represent the actual area taken on the wall.

piece	1	2	3	4	5	6	6	7	8	9
Length(inch)	32.75	60.00	32.00	27.25	60.00	46.85	47.00	78.00	21.00	40.25
Weigh(inch)	34.75	72.00	36.00	22.75	128.15	38.65	42.15	56.00	15.50	54.00
Size (inch^2)	1138.06	4320.00	1152.00	619.94	7689.00	1810.75	1981.05	4368.00	325.50	2173.50
piece	10	11	12	13	14	15	16	17	18	19
Length(inch)	44.10	101.50	42.00	243.84	26.00	47.50	72.50	106.00	72.00	72.00
Weigh(inch)	100.00	81.50	54.00	68.58	60.00	53.50	16.00	70.00	30.00	60.00
Size (inch^2)	4410	8272.25	2268	16722.5	1560	2541.25	1160	7420	2160	4320
piece	20	21	22	23	24	25	26	27	28	29
Length(inch)	10.00	17.70	22.00	80.00	89.00	49.25	83.90	31.50	24.00	15.65
Weigh(inch)	8.00	13.75	28.00	89.88	36.00	35.50	109.00	35.25	29.88	21.88
Size (inch^2)	80	243.375	616	7190.4	3204	1748.38	9145.1	1110.38	717.12	342.422
										Size Mean= 3360.3, STDEV=3645.54

Table 5. Sizes of art-pieces

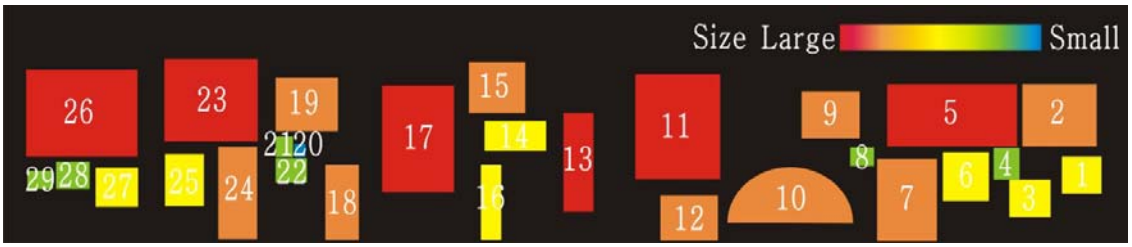


Diagram 5. Size shown on the wall

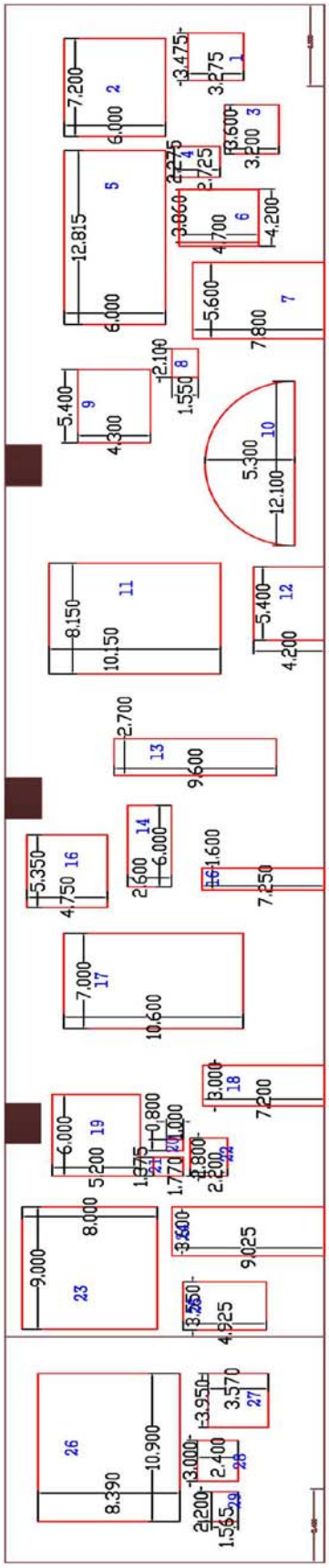


Diagram 6. Sizes of art piece

ii. Distances between art pieces (Table 6, Diagram 7 & 8 & 9 & 10 & 11)

The assumption is that the distances between art pieces could affect how viewers group art pieces on the wall as a whole image affecting how one would move in the setting. The average distance for one art piece from one's center to the other surrounded pieces' centers (ave c-c distance) and from one's edge to the edges of other surrounded pieces (ave e-e distance) were measured and calculated in AutoCAD.

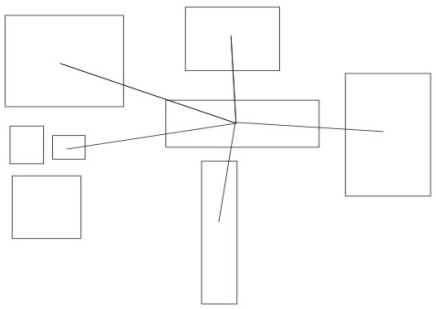


Diagram 7. Distance from center to center

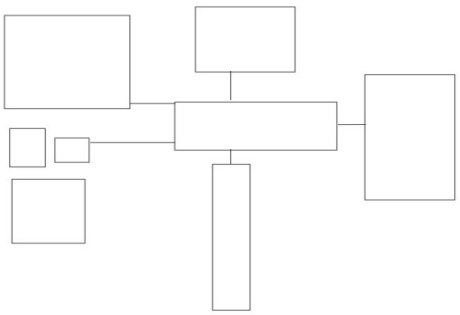


Diagram 8. Distance from edge to edge

piece	1	2	3	4	5	6	6	7	8	9
ave c-c distance	66.433	83.468	62.77	61.456	94.872	59.643	59.643	86.643	74.925	105.813
ave e-e distance	26.583	19.5	20.563	16.313	15.062	13.875	13.875	19.833	16.903	42.235
piece	10	11	12	13	14	15	16	17	18	19
ave c-c distance	106.408	122.38	107.53	103.296	73.33	86.897	89.537	105.707	84.103	83.472
ave e-e distance	27.596	45.663	35.8	50.8	21.563	24.917	39.417	40.417	28.725	26.31
piece	20	21	22	23	24	25	26	27	28	29
ave c-c distance	54.814	48.954	42.008	91.963	70.148	70.525	76.713	65.065	48.393	57.565
ave e-e distance	26.73	12.46	13.563	17.35	18.288	17.125	15.233	13.2	9.283	13.225
Distance(c-c): Mean=78.55, STDEV=20.83; Distance(e-e):Mean=23.41, STDEV=11.07										

Table 6. Distance (inch) between art pieces from edge to edge and from center to center

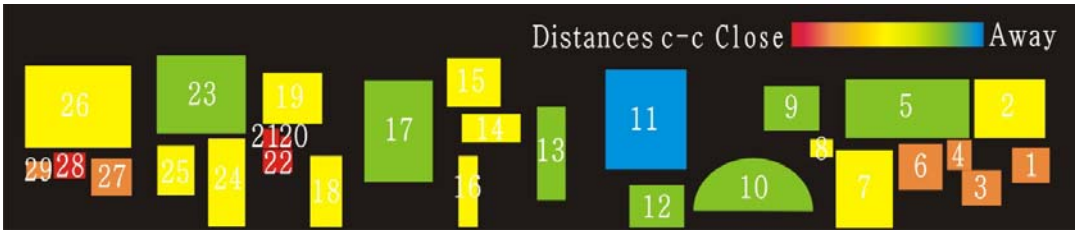


Diagram 9. Distance c-c shown on the wall

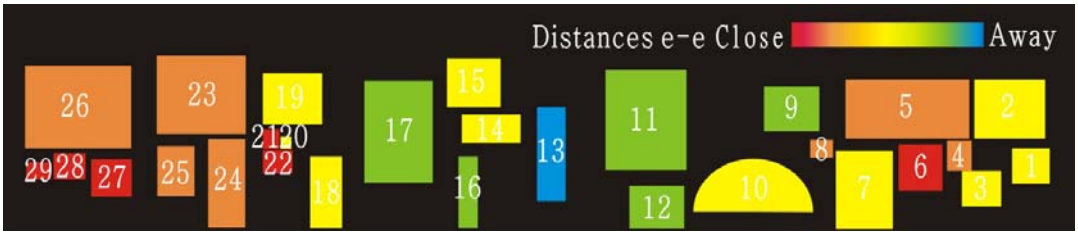


Diagram 10. Distance e-e shown on the wall

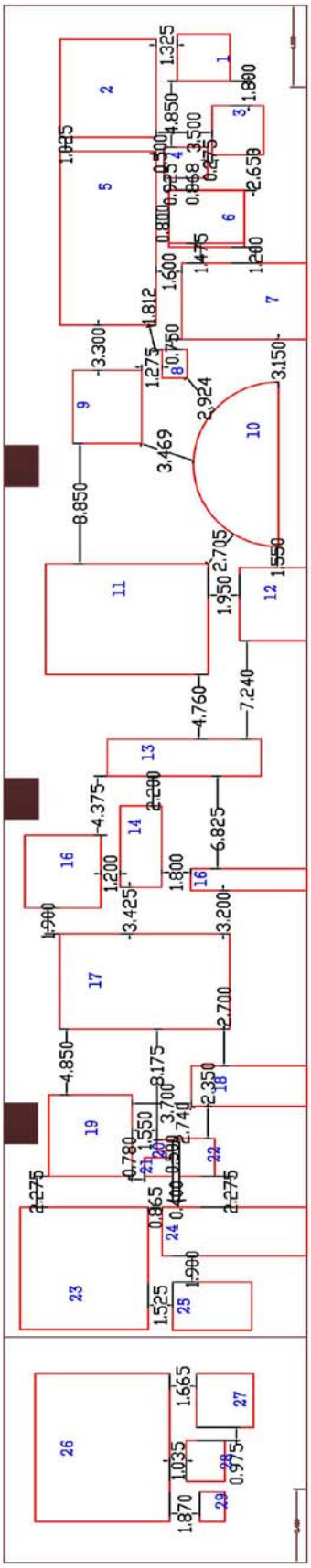


Diagram 11. Distance between art piece

iii. Clusters/Grouping art pieces (Table 7, Diagram 12 & 13 & 14)

The clusters of art pieces were identified by the physical locations on the wall. The assumption is that the “grouping” behavior in terms of viewing art pieces could affect the way visitors interact with the art, for example: which art pieces are noticed more often and viewed for a longer period of time, and how one move and/or stop in the setting to view a “group” of art pieces on the wall.

Each art piece has a network count/value of the number of pieces displayed surrounded it that could be viewed as a group/cluster (Table 7, Diagram 12).

The weighted location of an art piece is calculated by the total value of the rating of the surrounded pieces. The assumption is that the locations of art pieces could be defined by which art pieces displayed nearby. An art piece display right next to the most popular piece could get more attention/time-spent because of one’s location (Table 7).

The researcher also attempts to see the relation between the importance and the display location, with the assumption of more important art pieces are often placed at the center of a network.

piece	1	2	3	4	5	6	6	7	8	9	10	11	12	13	14
Cluster count	3	3	4	4	6	4	4	4	4	4	5	4	3	5	4
weighted location	28	27	37	35	47	37	37	27	28	26	34	27	23	44	45
piece	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Cluster count	3	3	6	4	5	5	5	4	4	4	2	3	2	3	2
weighted location	32	32	56	42	47	55	53	38	32	35	23	19	16	23	16
Cluster: Mean=3.87, STDEV=1.04; Weighted location: Mean=34.03, STDEV=10.96															

Table 7. Cluster-count and weighted-location

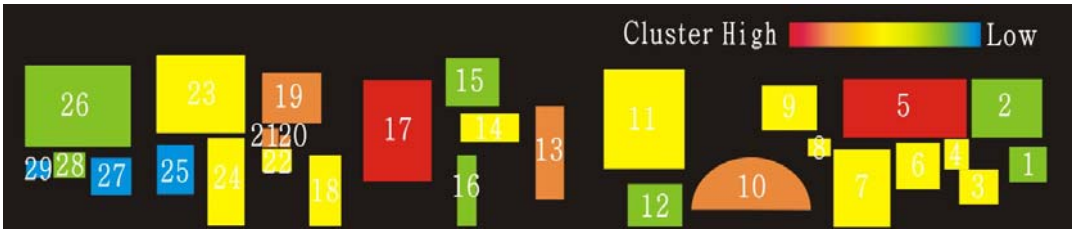


Diagram 12. Cluster shown on the wall

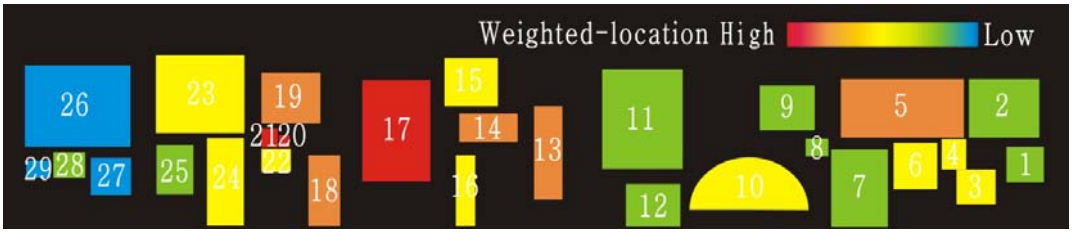


Diagram 13. Weighted-location shown on the wall

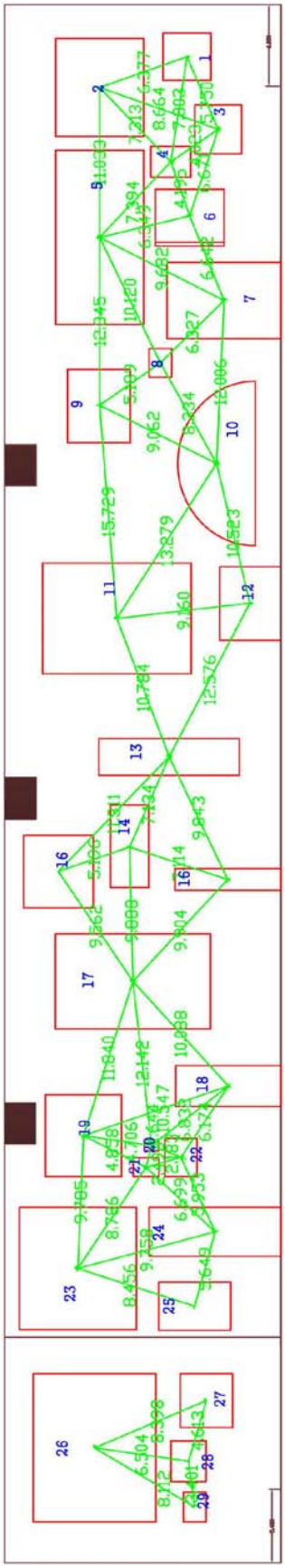


Diagram 14. Clusters of art pieces

iv. Eye-level deviation (Table 8, Diagram 15 & 16)

The standards used in this study are based on Bailey's human factors study (1996); the eye-level is 62 inches for the 50th person, 57.5 inches for the 5th and 66 inches for the 95th. The distance from the center of each art piece to the 62 inches horizontal-line was measured as the eye-level height deviation.

The assumption is that an art piece displayed more toward eye-level would be viewed more often and longer. It is also likely that the exhibition designer place a more important art piece on the eye-level area expecting more visitors' attention.

piece	1	2	3	4	5	6	6	7	8	9
Eye-level height deviation(inch)	2.38	62.00	19.00	13.38	62.00	0.50	0.50	23.00	20.50	62.50
piece	10	11	12	13	14	15	16	17	18	19
Eye-level height deviation(inch)	17.85	50.25	40.65	14.50	41.50	90.25	25.75	39.25	26.00	69.00
piece	20	21	22	23	24	25	26	27	28	29
Eye-level height deviation(inch)	26.50	30.35	6.50	76.90	16.87	2.98	65.55	10.90	1.25	2.92
Eye-level height deviation: Mean=30.72, STDEV=25.80										

Table 8. Eye-level deviation

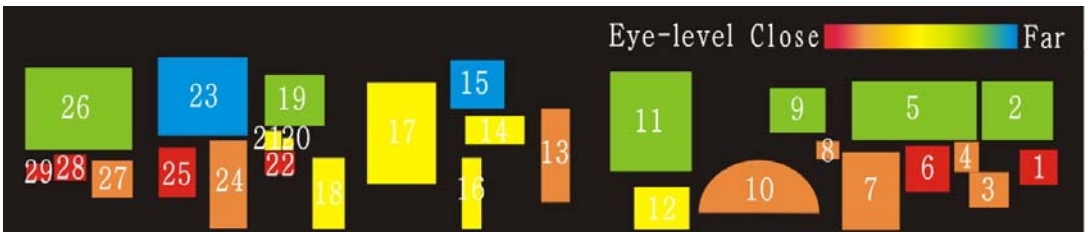


Diagram 15. Eye-level shown on the wall

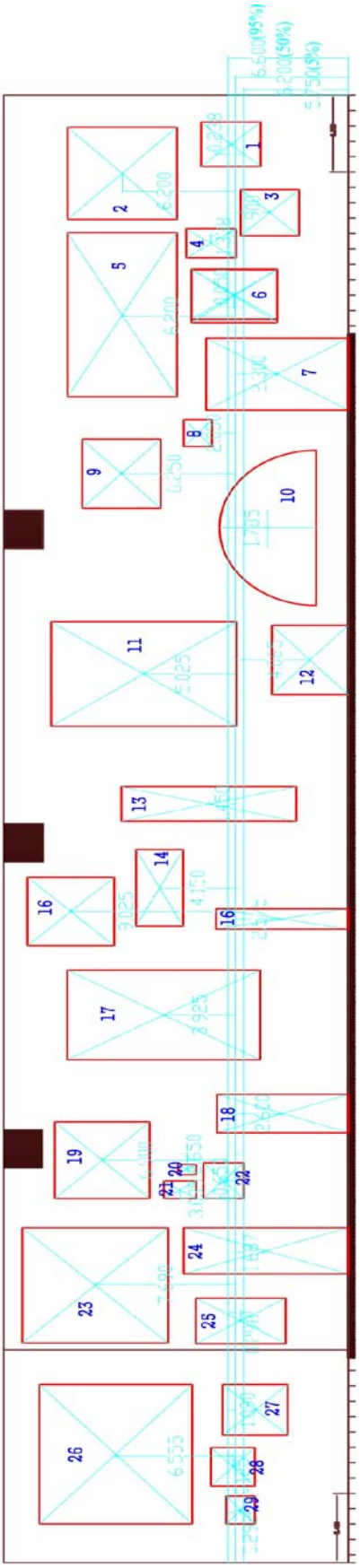


Diagram 16. Eye-level deviation of art pieces

v. Lighting (Table 9, Diagram 17)

Due to the limitations of the materials of art pieces, exhibition designers commonly follow standards for the lighting.

The lighting was measured by the researcher and the exhibition designer using a light-miter. By placing the miter at the center of each art piece, the reading of the lighting in foot candle was documented as below.

The assumption is that the lighting affects the visitors' behavior in the setting. One would tend to stand at certain spots to view art pieces with appropriate lighting; on the other hand, lack of lighting or too much lighting would be a factor that makes an art piece invisible or not viewable.

The researcher also attempts to see the relation between the importance and the lighting design for the art pieces, with the assumption of more important art pieces get more lighting.

piece	1	2	3	4	5	6	6	7	8	9	10	11	12	13	14
Lighting (foot candle)	6.6	19.3	4.5	4.8	17.9	6.9	7.6	50.1	8.7	5.6	9.4	26.5	14.3	18.8	13.5
piece	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Lighting (foot candle)	14.6	8.4	16.7	17.1	9.5	13.0	9.6	8.4	13.3	9.2	7.0	8.3	4.3	7.3	6.0
Lighting: Mean=12.24, STDEV=8.91															

Table 9. Lighting on each piece in foot candle

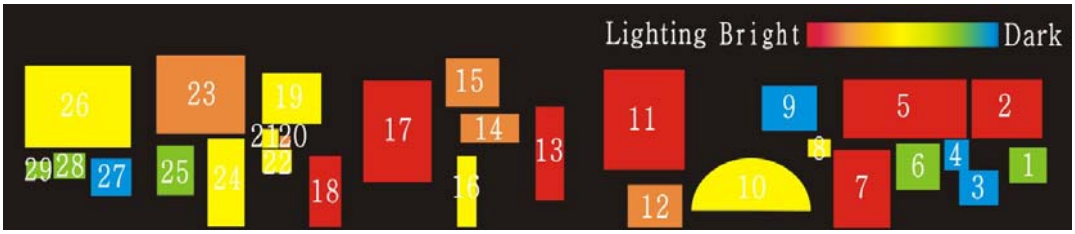


Diagram 17. Lighting shown on the wall

- *Rating of art pieces* (Table 10, Diagram 18 & 19 & 20)

The rating standard was created jointly by the researcher and the curator. The art pieces were rated by the curator of 20/21 gallery, who is an expert in 20th century American art history, following the similar qualities that were used originally to decide which art pieces of the entire collection were chosen to be displayed. The qualities include the opinions of the art history expertise, the curriculum of 20th century art history, the popularity of the collection, the museum professionals and the nomination of education department. The three standards are 1) canonical value, which is based on art-historical canon shaped by American academics, including art works that are often considered as well-established permanent collections in national galleries or Smithsonian museums; 2) popularity, which is based on the curator's experience working with the public and the inputs of education department and the museum guards; and 3) Spencer Museum of Art purpose, which is based on the curator's missions to stage the exhibit in 20/21 for this particular groups of visitors. The rating result listed as below (For the complete rationale of rating system by the curator, see appendix).

piece	1	2	3	4	5	6	6	7	8	9	10	11	12	13	14
Canonical Importance	1	3	2	3	5	2	1	3	1	1	1	4	3	5	5
Popularity	4	4	2	1	4	1	1	5	3	1	1	2	2	2	1
SMA20/21 goal	4	5	4	4	1	5	1	3	1	1	2	1	3	5	4
rating sum	9	12	8	8	10	8	3	11	5	3	4	7	8	12	10

piece	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Canonical Importance	4	2	5	5	4	4	1	5	2	4	1	5	1	1	1
Popularity	1	5	2	2	1	1	1	5	4	4	1	1	1	1	1
SMA20/21 goal	3	4	5	5	4	1	5	5	4	5	1	4	4	4	5
rating sum	8	11	12	12	9	6	7	15	10	13	3	10	6	6	7

Canonical Importance: Mean=2.83, STDEV=1.62; Popularity: Mean=2.16, STDEV=1.46; SMA 20/21 goal: Mean=3.43, STDEV=3.13

Correlation between ratings	Canonical Importance	Popularity	SMA20/21 goal
Canonical Importance	1		
Popularity	0.172	1	
SMA20/21 goal	0.222	0.150	1

**. Correlation is significant at the 0.01 level (2-tailed).

Table 10. Rating of art pieces and the correlation among the ratings

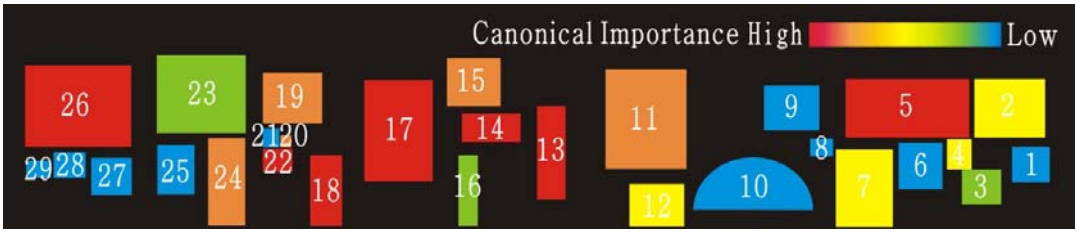


Diagram 18. Canonical-importance Rating shown on the wall

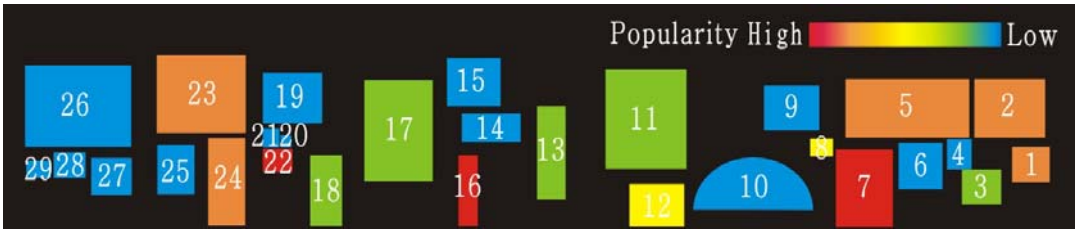


Diagram 19. Popularity Rating shown on the wall

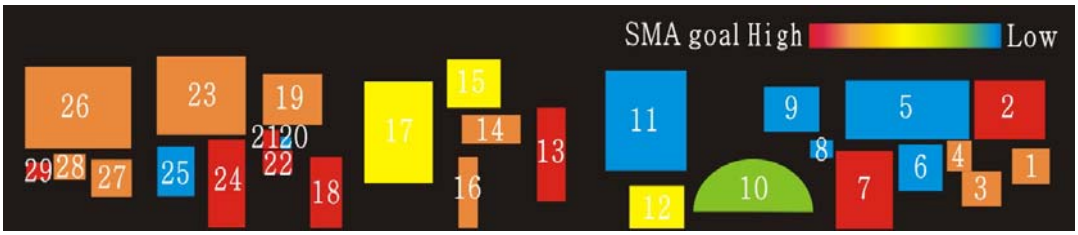


Diagram 20. SMA-goal Rating shown on the wall

- *Visitors' behaviors*

There were initially 161 subjects conducted during the observation. The data of the subjects included: one's time-spent stops and pays attention at any art piece(s) (noted as "total time", shown in Table 11); the average-time-spent when one makes a stop and pays attention on art piece(s) (noted as "ave-time/stop", shown in Table 12); and the frequency of subjects made a stop and paid attention on art piece(s) (noted as "total frequency", shown in Table 13).

The researcher tried to understand the complexity of the behavioral patterns by categorizing the data in different ways. The following categories were used to prepare the data for further analysis:

i. Divided time-spent by the numbers of cluster-viewed art pieces, for example, if a subject stopped at one spot looking at 3 pieces for 15 seconds, instead of the original 15 seconds recorded for all three pieces, re-count it as 5 seconds for each piece. (noted as "fixed time" and "fixed ave-time/stop", shown in Table 11)

ii. Sum the time-spent and frequency only when subjects viewed more than one piece at a stop. (noted as "cluster time", shown in Table 11;

"cluster ave-time/stop", shown in Table 12; and "cluster frequency" shown in Table 13)

Total Time:

piece	1	2	3	4	5	6	6	7	8	9
total time	1254	1712	1353	739	1034	659	659	643	257	207
fixed time	524	795.68	670.08	224.48	403.36	241.6	241.6	421.28	159.84	80.32
cluster time	388.96	489.76	279.04	189.6	246.4	133.6	133.6	108.32	72.8	67.36
piece	10	11	12	13	14	15	16	17	18	19
total time	196	246	2131	191	159	237	2606	233	227	355
fixed time	74.56	201.6	526.08	122.56	64.32	106.88	2572.8	151.68	166.08	214.24
cluster time	60.48	43.68	120	49.44	52.32	81.76	73.12	49.6	45.12	98.24
piece	20	21	22	23	24	25	26	27	28	29
total time	82	75	320	1529	499	1166	5358	536	534	445
fixed time	50.4	24.96	181.12	1098.9	298.72	773.6	4900.3	176.48	159.36	144.96
cluster time	13.28	24.96	113.12	314.88	105.6	299.52	200.32	145.44	150.4	115.04

	Ave	Stdev
total time	854.73	1062.59
fixed time	525.73	959.442
cluster time	142.20	114.238

Table 11. Sum of time-spent (second) on each art piece

Diagram 21. Viewed-time shown on the wall

Average Time per Stop:

piece	1	2	3	4	5	6	6	7	8	9
total ave-time/stop	32.154	31.127	30.75	24.633	19.509	21.258	21.258	12.365	10.708	14.786
fixed ave-time/stop	13.435	14.468	15.228	7.485	7.611	7.794	7.794	8.102	6.66	5.738
cluster ave-time/stop	12.155	12.244	7.751	7.02	6.317	5.81	5.81	6.37	5.202	5.179
piece	10	11	12	13	14	15	16	17	18	19
total ave-time/stop	15.077	5.721	125.35	6.821	11.357	13.167	50.115	6.297	7.094	12.679
fixed ave-time/stop	5.731	4.69	125.06	4.375	4.595	5.935	49.465	4.099	5.19	7.388
cluster ave-time/stop	6.05	3.97	120	3.808	4.361	5.455	12.195	4.138	5.01	5.458
piece	20	21	22	23	24	25	26	27	28	29
total ave-time/stop	16.4	15	11.429	26.825	16.633	27.762	116.48	21.44	25.429	31.786
fixed ave-time/stop	12.583	4.998	6.467	19.279	9.956	18.419	106.53	7.057	7.591	10.357
cluster ave-time/stop	4.443	4.998	5.654	8.512	6.604	9.362	9.102	7.271	7.521	9.583

	Ave	Stdev
total ave-time/stop	26.05	27.63
fixed ave-time/stop	17.14	28.23
cluster ave-time/stop	10.58	20.81

Table 12. Average time-spent (second) at each stop on each art piece

Frequency:

piece	1	2	3	4	5	6	6	7	8	9
total frequency	40	55	44	30	53	31	31	52	24	14
cluster frequency	35	47	40	30	46	26	26	16	15	14
piece	10	11	12	13	14	15	16	17	18	19
total frequency	13	44	16	28	14	18	53	37	32	29
cluster frequency	11	11	1	13	12	16	6	13	10	20
piece	20	21	22	23	24	25	26	27	28	29
total frequency	4	5	27	58	30	42	45	26	21	14
cluster frequency	3	6	22	38	17	34	24	20	20	12

	ave
total frequency	31
cluster frequency	20.13

Table 13. Frequency of each art piece was viewed

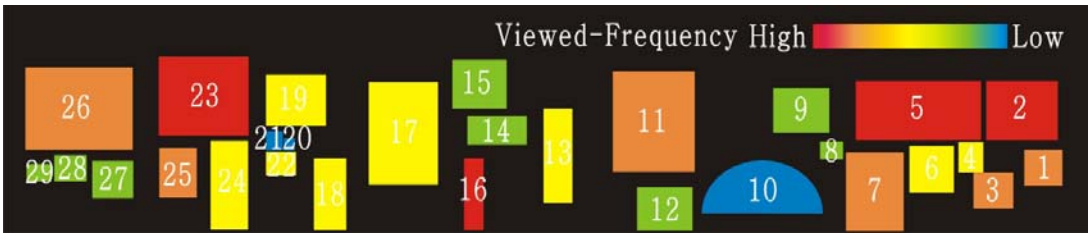


Diagram 22. Viewed-frequency shown on the wall

Methods of data collection

All research methods offer opportunities as well as limitations. In the case of this study, the intention was to try to gage the natural behavior of the population, without any intrusion or experimental manipulation. Obviously, such a stance for the researcher does not allow asking any direct question from the people observed.

During the study period, visitors were allowed to enter/exit from either the left/right entrances. They were allowed to spend any amount of time spent on site. They were also allowed to take any paths. Finally, they were not assigned any particular protocol regarding with art pieces to view. Controlled features of this study include the observer, the access options to the gallery, the art pieces, the settings/environment, and the lighting condition.

The research methods included:

1) Mapping and measuring physical settings, including:

    - Display of pieces on the wall, locations and sizes
    - Lighting, using light-meter to measure the foot candle brightness on each art pieces on the north wall
    - Eye-level height deviation, measured from the center of art pieces to the 62” eye-level height (median, Bailey 1996)

- Distance between art pieces, measured from the edge of one art piece to the edge of the others, as well as from the center of one piece to the center of the others.

2) Ranking art pieces by their importance, from 5 as the most important to 1 as the least important, as weighed by the curator. Three scales included in the study: 1) canonical value, which is based on art-historical canon shaped by American academics, including art works that are often considered as well-established permanent collections in national galleries or Smithsonian museums; 2) popularity, which is based on the curator's experience working with the public and the inputs of education department and the museum guards; and 3) Spencer Museum of Art purpose, which is based on the curator's missions to stage the exhibit in 20/21 for this particular groups of visitors.

3) Tracking each visitor's path and recording the amount of time spent by the visitors at art pieces during a period of two weeks. The contents of observation were:

    - A visitor's moving path on a marked 2-foot square floor

- ♦ Stop locations, where a visitor arrests his/her progress through the gallery and view art pieces
- ♦ Time spent, how long a visitor spends at each stop viewing art pieces
- ♦ The direction of a visitor's path
- ♦ Any basic (observable) demographic and socio-graphic information about the visitor, including gender and class (student, community members, etc.)

4) Taking note of any "noise events," that is, intrusions in the path of viewing by other parties (such as museum guard or other patron)

(For the observation sheet, see appendix)

Analysis Methods

Grouping data

As an intensive investigation, the data were grouped by different meaningful standards such as the directions of movement, the path pattern, the complication degree of the experiences and the clustered viewing behavior. Details as below:

1. Directions of movement; the data were divided into three categories, the clock-wise, the counter-clock wise and the same entrances. There are two entrances at the gallery/setting, therefore visitors could come in from one entrance and leave from the other, as well as using the same entrance/exit (Diagram 23).

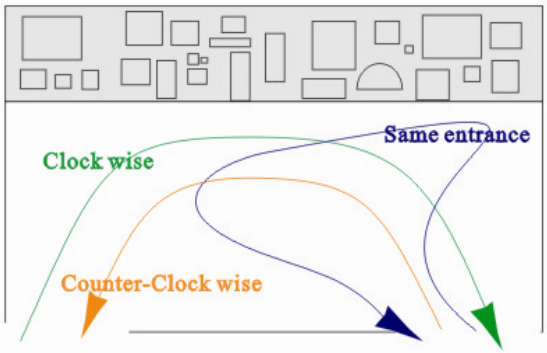


Diagram 23. Directions of paths

2. Path patterns; the data were divided into three categories, linear, twist and circle. The linear path moves through the space without return. The twist path tends to go back and forth, especially around the floor pieces. The

circle path generally reflects to one whom makes a “grand tour” of the space/gallery (Diagram 24).

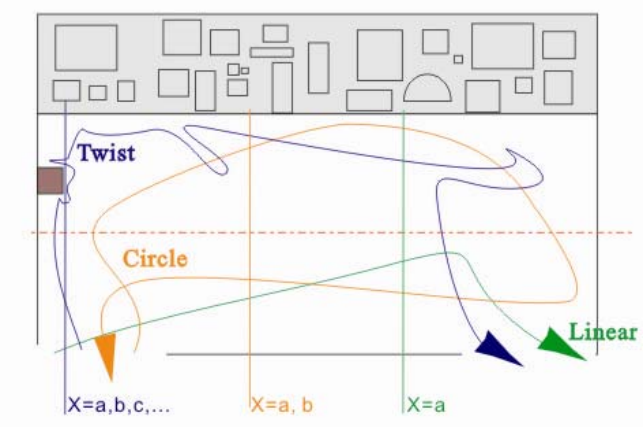


Diagram 24. Path-patterns

3. 80% plus path; subjects who moved through more than 80% of the length of the whole north wall were selected (Diagram 25).

4. Clustered-view path; only the subjects clustered-viewed pieces at least once were selected for this category (Diagram 25).

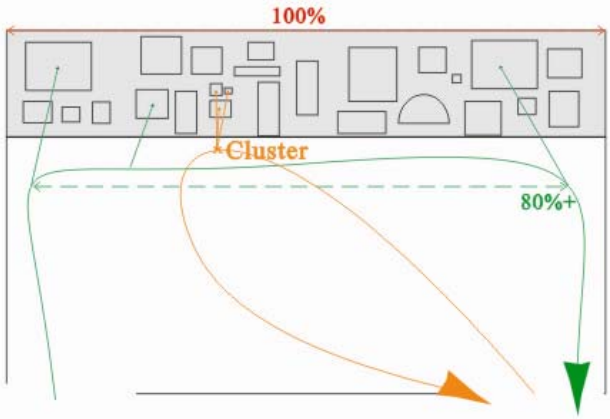


Diagram 25. 80% and cluster-viewed paths

Graphs analysis

The purpose of graphs analysis is both to identify the pattern of visitors' movements in the setting and to quantify the characteristics of display/setting. The researcher used AutoCAD to set up the floor plan of the setting where the visitors' movements were documented as well as the wall where the art pieces were displayed.

After the observation the researcher input each visitor's path and stopped-location on the floor plan (Diagram 26). By comparing the paths and stopped-locations all subjects made, the researcher was able to study visitors' paths and stopped-locations as patterns of behavior. The wall of display was also documented in AutoCAD as diagrams to visualize the qualities that the researcher focused on in this report without using images with all the information in the complex reality.

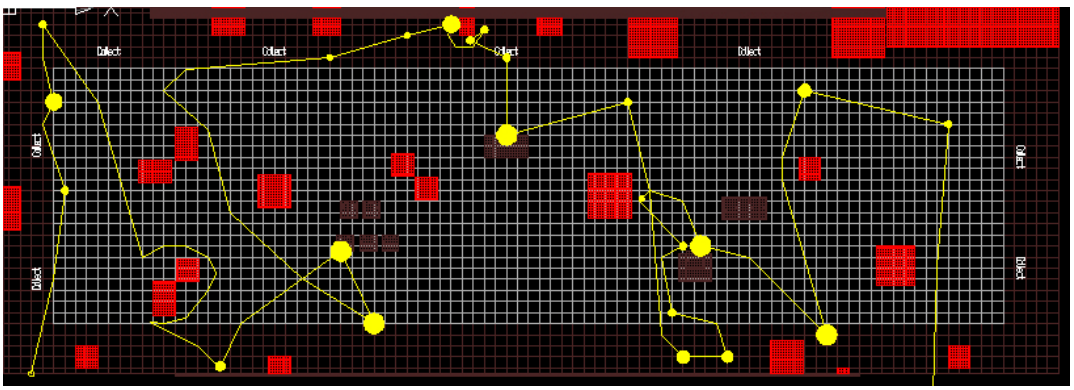


Diagram 26. One visitor's path and stopped-locations documented on a floor plan in AutoCAD

Quantitative analysis

Correlation analysis was used to discover the relations between:

- the curator's ratings (canonical importance, popularity, and the Museum goal) and design of display (cluster, weighted locations, distances between art pieces, sizes, lighting design and the types of art pieces) were studied to define the impacts of exhibition designer's and curator's decisions on the design of display.
- the design of display (as above) and the behavioral data (visitors' viewing time and stopped frequency) to determine whether the display of art affect how visitors' behave in the setting.
- the curator's rating (as above) and the behavioral data (as above) were studied to reflect the indirect impact from the curator through the display to the visitors' behavior.

The goal is to determine the impacts from the curator's ratings to the design of display, and from the design of display to visitors' behavior. Then define the impact directly from the curator's decisions to visitors' behavior. This correlation analysis result would reflect the function model of this study (Diagram 2, page 5).

Findings

The information gathered during observation were studied and analyzed both quantitatively and qualitatively. The paths and stop locations were entered into AutoCAD and looked at as a part of graph studies. The length of stops and the viewed frequency were entered and studied mainly looking for correlations among the design features of display and the visitors' behavioral data.

- *Stop locations*

  The stop locations of visitors showed both the physical settings of display and the environment attracted/affected visitors' behavior. The visitors' stops were documented on the observation sheet with where one stopped, how long one stopped and which art-pieces were viewed when one stopped. The data of stop locations were discussed in five categories:

  1. High-frequency locations (Diagram 27)

     The visitors stopped in this zone very often. The assumption is that the two zones are both located at the access of two entrances as well as the locations of viewing well-networked/high frequency art

pieces display.

2. Low-frequency locations (Diagram 27)

   The visitors rarely stopped in this zone. The assumption is that the zones with low-frequency are mainly locations with no attractions such as detail-oriented art pieces display or sculpture pieces. It could also be associated by the visitors as hallways or un-used spaces.

3. Long-time location (Diagram 27)

   The visitors stopped at this location for a longer period of time. It located nearby two art pieces displayed closely to the eye-level (No.1 with 2.38inch and No.6 with 0.50inch). The assumption is that the visitors tend to stop at the 4 feet spot looking at the art pieces displayed closer to the eye-level for a longer period of time.

4. Long-time location for specific pieces (Diagram 27)

   The visitors stopped at these locations for a longer period of time close to the art pieces. The stop-locations mainly located within arm-distance (thirty-one inch, 1996). The specific art pieces with this type of stops are either highly interactive or detail-oriented, which are

sound installations, photography and sculptures. The assumption is that the visitors tend to stop without distance when one views interactive and detail-oriented art pieces for a longer period of time.

5. Continuous high-frequency locations with same distance from display (Diagram 27)

The visitors stopped at these locations along a path with the same distance (four feet) from the wall/display for a longer period of time. The assumption is that the visitors tend to continuously stop four feet from the walls of display. It seemed that visitors would build a "pathway" of the "right distance" of viewing, the "hot spots" and the safety distance for the art in ones' minds.

The stop-locations showed that the visitors' viewing flows are not continuously/consistence in a setting of mix-media, art-pieces displayed fully on four walls and the floor. One might pick and choose while moving freely in the space. The attractions created by both the physical setting of display and the environment could be an important factor to consider for the exhibition designers and the curators.

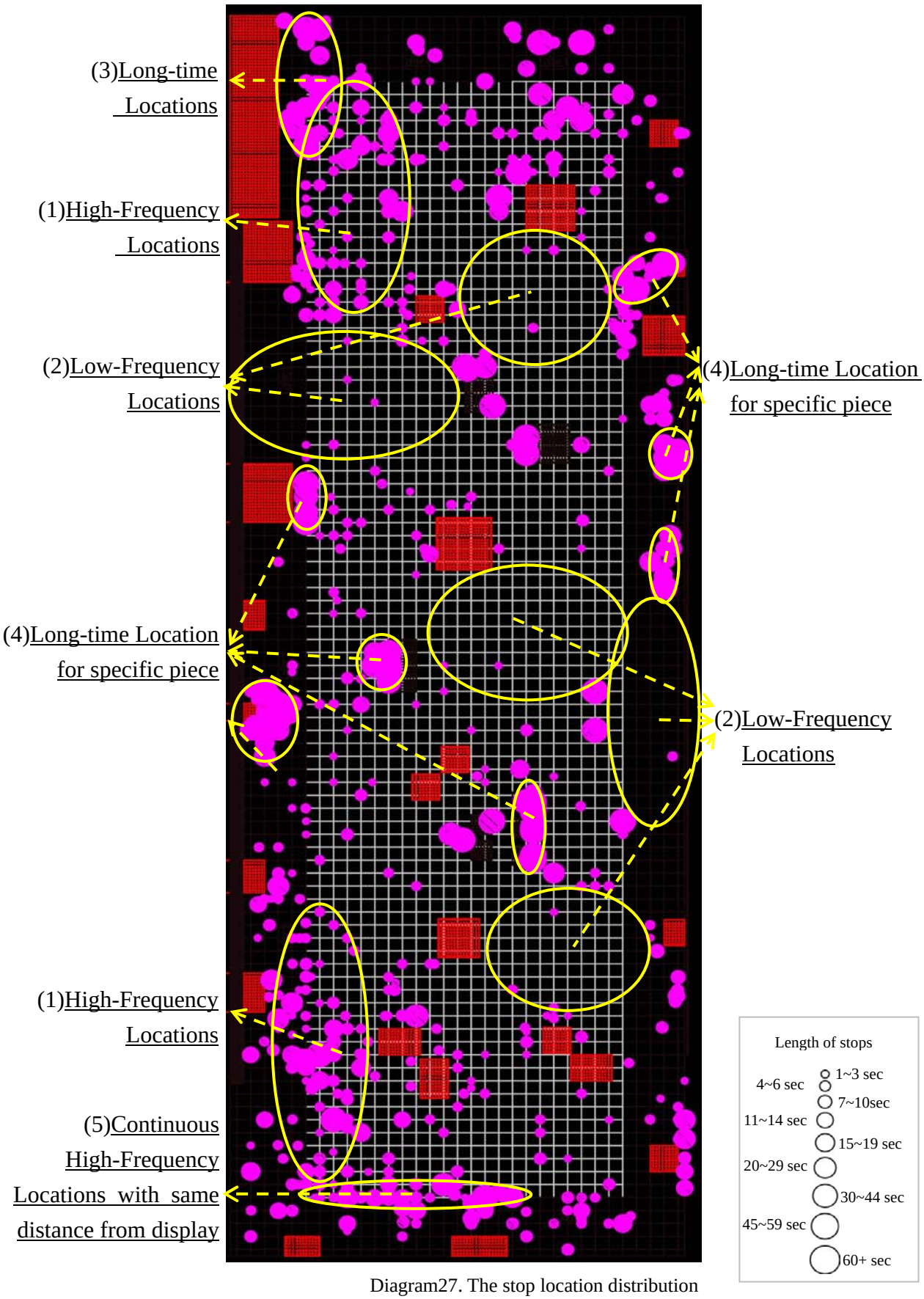


Diagram27. The stop location distribution

- *Paths*

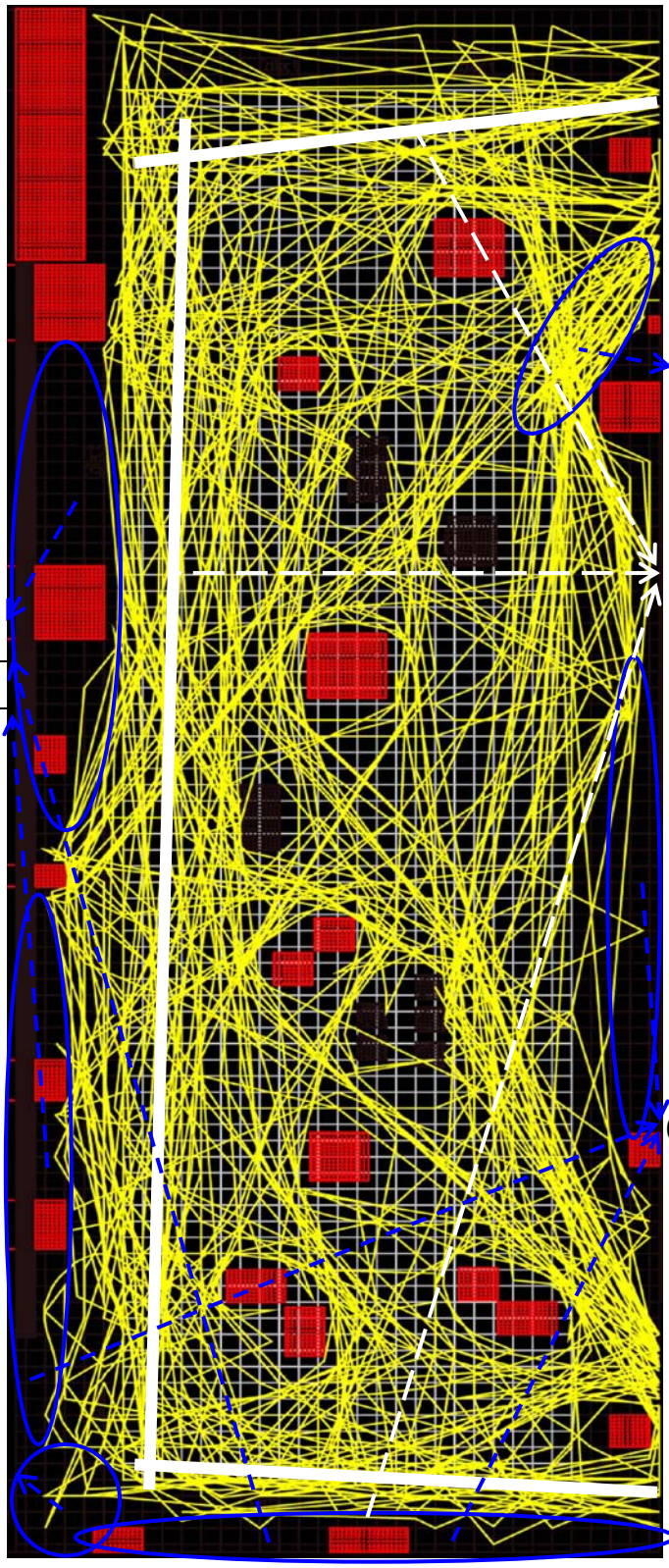


Diagram18. The paths of visitors

The paths of visitors show that both the physical settings of the display and the design of the environment could attract/affect visitors' behavior. The visitors' movements were documented on a observation sheet with how one moved in the space. The data of paths were discussed in five categories:

1. Main-Pathway (Diagram 28)

   The paths of visitors showed a common pathway from one entrance along the walls to the other entrance with safety distance from the art displays.

   Here the data show that although the gallery is an open space with spreading floor pieces, the visitors still moved along the walls while viewing art displays.

2. Gorges Created by two floor-pieces (Diagram 28)

   The paths of visitors showed that when a wall of two-dimension art display trapped by three-dimension art-pieces on both sides, visitors tend to not walk into a dead-end like gorges.

3. Safety Distance Between art and visitors (Diagram 28)

   The paths of visitors showed a common safety distance from the

wall of art displays.

Here the data show that although the gallery did not have a sign of safety distance, there was still an invisible safety distance from the art display on the wall defined in visitors' minds.

4. Highly-used enter-path (Diagram 28)

   The paths of visitors showed a common use of enter-path.

5. Dead Corner (Diagram 28)

   The paths of visitors showed that visitors tend not to walk into the end-corner.

The visitors' paths are complex and spread in an open setting. One of the assumptions is that the floor pieces located nearby both entrances separated the visitors' flows. It also shows that although the gallery is an open space with spreading floor pieces, the visitors still moved along the walls while viewing art displays. The paths of visitors also show a safety distance from the wall of art displays commonly created in visitors' head.

Paths divided by the direction

In order to understand the complex visitors' paths, the data were divided into three categories by the directions of visitors:

1. Subjects who entered from the left entrance and exited from the right one (Diagram 29). The diagram shows a linear pathway going through the floor pieces. The assumption is that visitors try to maximum ones' experience while moving in the setting.

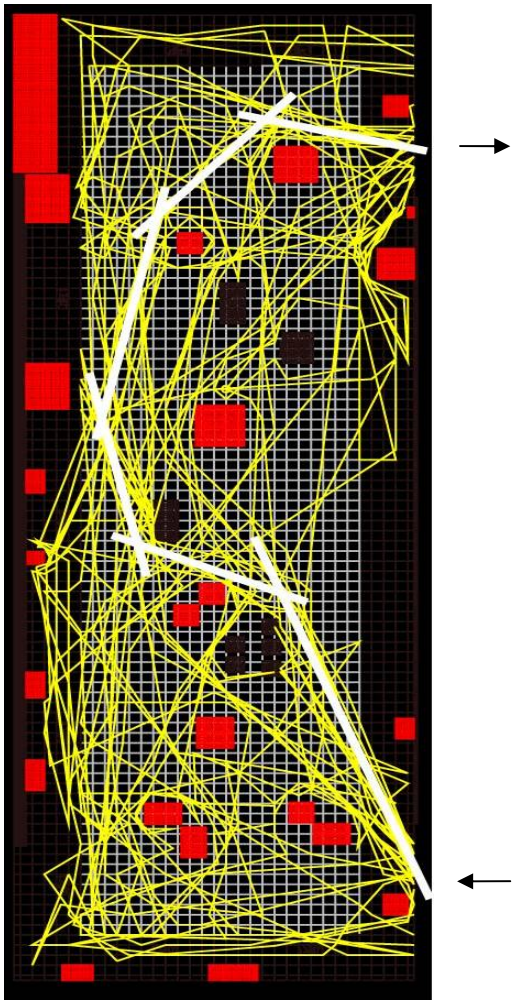


Diagram 29. The paths of visitors left to right

2. Subject who entered from the right entrance and exited from the left one (Diagram 30). The diagram shows a circle-like pathway in the setting. The assumption is that visitors try to tour through the space while moving in the setting.

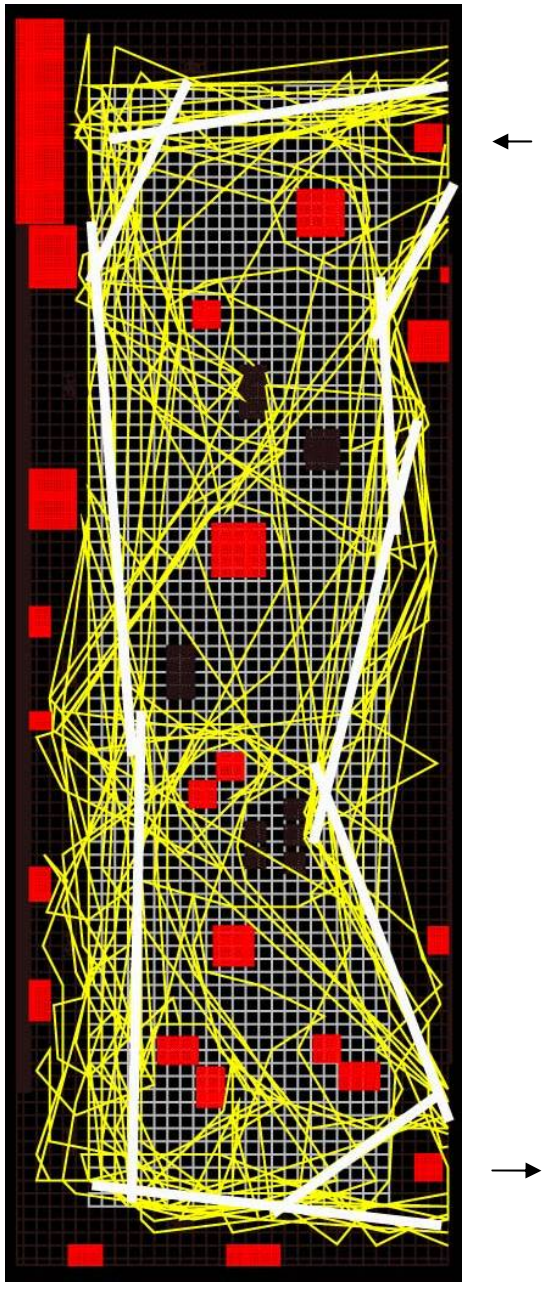


Diagram 30. The paths of visitors right to left

3. Subjects who entered and exited from the same entrances (Diagram 31)

   The diagram shows random paths in the setting. The assumption is that visitors tend to do in-and-out when they have specific goals/art pieces.

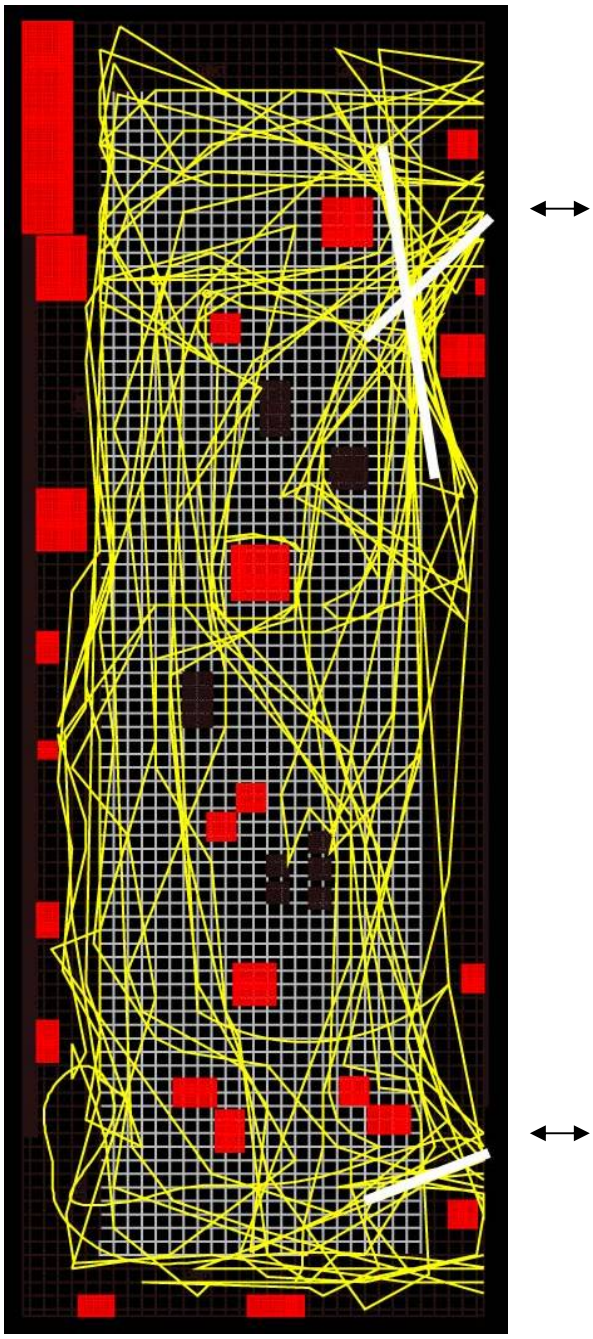


Diagram 31. The paths of visitors same entrances

- *Correlations*

The correlations among visitors' quantitative data, rating and physical setting of display measured were studied in order to determinate which features affect the behavioral patterns. The mark (**) represents that the correlation is significant at the 0.01 level (2-tailed) and the mark (*) represents that the correlation is significant at the 0.05 level (2-tailed).

1. Correlations between ratings and visitors' behavior (frequency/time/time-spent-per-stop)

1) Correlation: canonical importance and viewed-time/time-spent per stop (Table 14)

	Time ave linear	Time ave circle	Time ave/stop linear
Canonical rating	-.523(**)	-.416(*)	-.374(*)

Table 14. Canonical importance and behavior

The data correlation shows that the canonical/educational importance is not an attraction factor for the visitors and/or their goal of visit. The more "important" the piece is, the less time visitors averagely spend on. One could also argue that the more important art pieces were not displayed at valuable locations of display/lighting.

2) Correlation: rating and viewed-frequency (Table 15)

	total frequency	frequency ave linear	Frequency ave twist	frequency ave circle
Rating sum	.395(*)	.505(**)	.365(*)	.374(*)
	frequency ave (80%)	frequency ave clock	frequency ave same entrance	
Rating sum	.381(*)	.443(*)	.371(*)	

Table 15. Rating and behavior

The significant relations between the rating created by the curator and the visitors' viewing behavior are positive correlated with the frequency of viewing but not the length of time. It could mean that visitors tend to look at commonly-promoted/famous art pieces but may not necessarily spend more time looking into the art pieces.

3) Correlation: popularity and viewed-frequency/time/time-spent per stop

(Table 16)

	total frequency	frequency ave clock	frequency ave counter-c	frequency ave same entrance	frequency ave (80%)	frequency ave linear	frequency ave twist	frequency ave circle
Popularity rating	.621(**)	.572(**)	.554(**)	.585(**)	.622(**)	.594(**)	.565(**)	.633(**)
	time ave	time ave count-c	time ave circle	time ave twist	ave time/stop twist	ave time/stop circle	ave time/stop linear	
Popularity rating	.424(*)	.471(**)	.648(**)	.400(*)	.365(*)	.472(**)	.559(**)	

Table 16. Popularity and behavior

The significant relations between the popularity rated by the curator and the view-frequency of each art piece show that the curator has good understanding of visitors' preferences. Popular art pieces could be used as attractions in display design if curators know how to create a continuous flow in the setting where the display is well-networked and provides visitors a "visual tour."

2. Correlations between physical settings of display and visitors' behavior (frequency/time/time-spent per stop)

1) Correlation: cluster and viewed-time/time-spent per stop (Table 17)

	time ave circle	time ave	time ave twist	time ave circle	total ave. time/stop	ave time/stop twist	ave time/stop circle
cluster	-.487(**)	-.363(*)	-.414(*)	-.389(*)	-.400(*)	-.373(*)	-.412(*)

Table 17. Network and behavior

The correlations between cluster count of each art piece, which represents the number of other art pieces displayed around as a cluster, and the time/time-spent per stop show negative significances; the assumption is that when one art piece displayed next to more art pieces, it got less viewed-time. The cluster did not have effects on viewed-frequency but the time-spent. It tells that if the curators want a piece to be viewed longer, it needs to be displayed by itself.

2) Correlation: weighted location and viewed-time/time-spent-per-stop (Table 18)

	total time	time ave circle	time ave twist	total ave time/stop	ave time/stop same entrance	ave time/stop circle
weighted location	-.404(*)	-.466(**)	-.362(*)	-.439(*)	-.379(*)	-.404(*)

Table 18. Weighted and behavior

The negative correlations between the weighted location and the time/time-spent per stop show that if an art piece displayed next to other higher rated art pieces, one got less viewed time, but not necessarily viewed-frequency. When the nearby art pieces are more important, it likely to become a distraction that gets more attention (time and frequency).

3) Correlation: average distance from the center of one art piece to the centers of other art pieces nearby and viewed-frequency (Table 19)

	frequency ave clock
ave distance center-center	.506(**)

Table 19. Distance(c-c) between art pieces and behavior

It shows that when one art piece displayed more apart from the

other art pieces nearby, one got more viewed-frequency, only when visitors came in from the left entrance and went out from the left exit.

4) Correlation: average distance from the edges of one art piece to the edges of other art pieces nearby and viewed- frequency/ time-spent-per-stop (Table 20)

	frequency cluster	ave time/stop circle
ave distance edge-edge	-.435(*)	-.381(*)

Table 20. Distance (e-e) between art pieces and behavior

The negative correlations between the average distance from the edges of one art piece to the nearby art pieces and the viewed-frequency/time-spent-per-stop (when visitors viewed art pieces as a cluster) shows that when an art piece displayed more away from the other art pieces nearby it is less likely been viewed as a cluster/group of display.

5) Correlation: size of art pieces and viewed-frequency (Table 21)

	total frequency	frequency ave linear	frequency ave clock	frequency ave same entrance
size (in^2)	.378(*)	.492(**)	.419(*)	.393(*)

Table 21. Sizes of art pieces and behavior

The correlations between the size of art pieces and the viewed-frequency show that when an art piece is larger, it tends to get more viewed-frequency, but not necessary longer viewed-time.

6) Correlation: lighting of art pieces and viewed-frequency/time (Table 22)

	frequency ave linear	frequency ave clock	time ave linear
Light(foot candle)	.469(**)	.461(*)	-.369(*)

Table 22. Lighting and behavior

The correlations between lighting and the viewed-frequency show that when an art piece gets more lighting, it likely to be viewed more often. On the other hand, when an art piece gets more time, it was viewed for a shorter period of time. It could be the lighting helped visitors to understand the art pieces quicker or the lighting might be too much for visitors to focus on it for longer period of time.

7) Correlation: type of art pieces and viewed-frequency/time (Table 23)

	time ave	time ave clock	time ave center-c	ave time/stop	ave time/stop twist
type	.370(*)	.560(**)	.415(*)	.403(*)	.391(*)

Table 23. Type of art pieces and behavior

The art pieces were divided into two categories, 1 for paintings and 2 for sculptures. The correlations show that visitors would spend more time viewing sculptures, but sculptures were not necessarily viewed more often (no correlations shown).

3. Correlation: physical settings of display and ratings (Table 24)

	size (in^2)	Lighting (foot candle)	network count	Eye-level height deviation(in)	weighted location rating
Canonical Importance	.503**	.378*	.436*	.405*	.470**
Popularity		.405*			
SMA20/21					

Table 24. Ration and design of display

The correlations between three different rating systems show that the physical settings of display reflect to the goal/purpose/importance of curators' belief system. The physical settings of display reflect to the canonical importance in many perspectives and earlier in this chapter the correlation between canonical importance has significant impacts on visitors' viewing time. On the other hand, the Spencer Museum of Art goal for 20/21 gallery did not show any significant impact on the display.

Summary of correlations

While the art pieces with higher canonical-importance tended to be larger, were displayed more toward the center of the display wall, had more lighting, and were located toward the centers of clusters, they also got more viewed-time and time-spent per stop (Table 25).

		Canonical Importance	Popularity	SMA20/21 goal	frequency	time
display	Lighting	positive	positive		positive	negative
	Size	positive			positive	
	Network	positive				negative
	eye-level	positive				
	weighted location	positive				negative
time		negative	positive			
frequency			positive			

Table 25. Correlation summary

According to the correlations, lighting, clusters and weighted locations had negative correlations with viewing time. In contrast, the canonical importance had positive correlations with lighting, clusters and weighted location. Finally, the canonical importance had negative impact on viewing time.

Based on the relationships described above, the assumptions are: the canonical importance has an impact on lighting, clusters and weighted locations; the lighting, clusters and weighted locations (design features) have impacts on

visitors' behavior; finally, the canonical importance has a direct impact on visitors' behavior. The data reflect the assumption made earlier in the function model (Diagram 2, page 5) where the curator's and the exhibition designer's decisions influence the display of art, and the display of art influence visitors' behavior, and lastly, the curator's and the exhibition designer's decisions influence the visitors' behavior.

The popularity rating has positive impact on the lighting of display. The lighting also shows positive correlation with the viewed-frequency, while the popularity of art pieces has direct positive correlation with the viewed-frequency of art pieces. The suggestion is that the popular art pieces could have been used as attractions to build a continuous viewing path.

According to the data of this study, the Spencer Museum of Art goal for 20/21 exhibit did not show any impacts on the display, nor on the visitors' behavior.

- *Graph comparisons:*

1. Ratings and Visitors' behavior

1) Viewed-Time and the ratings

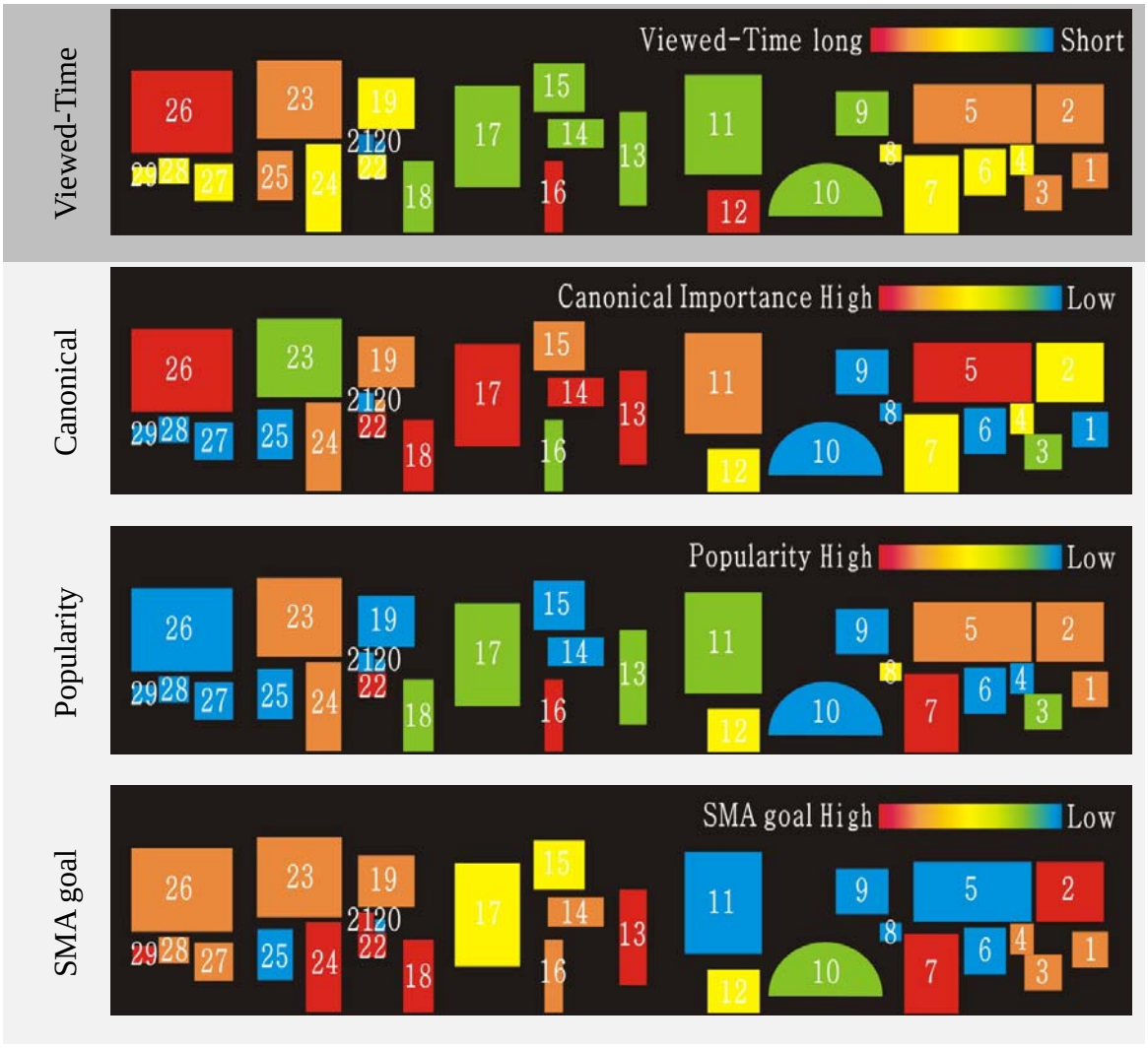


Diagram 32. Graph-comparison time & ratings

2) Viewed-Frequency and the ratings

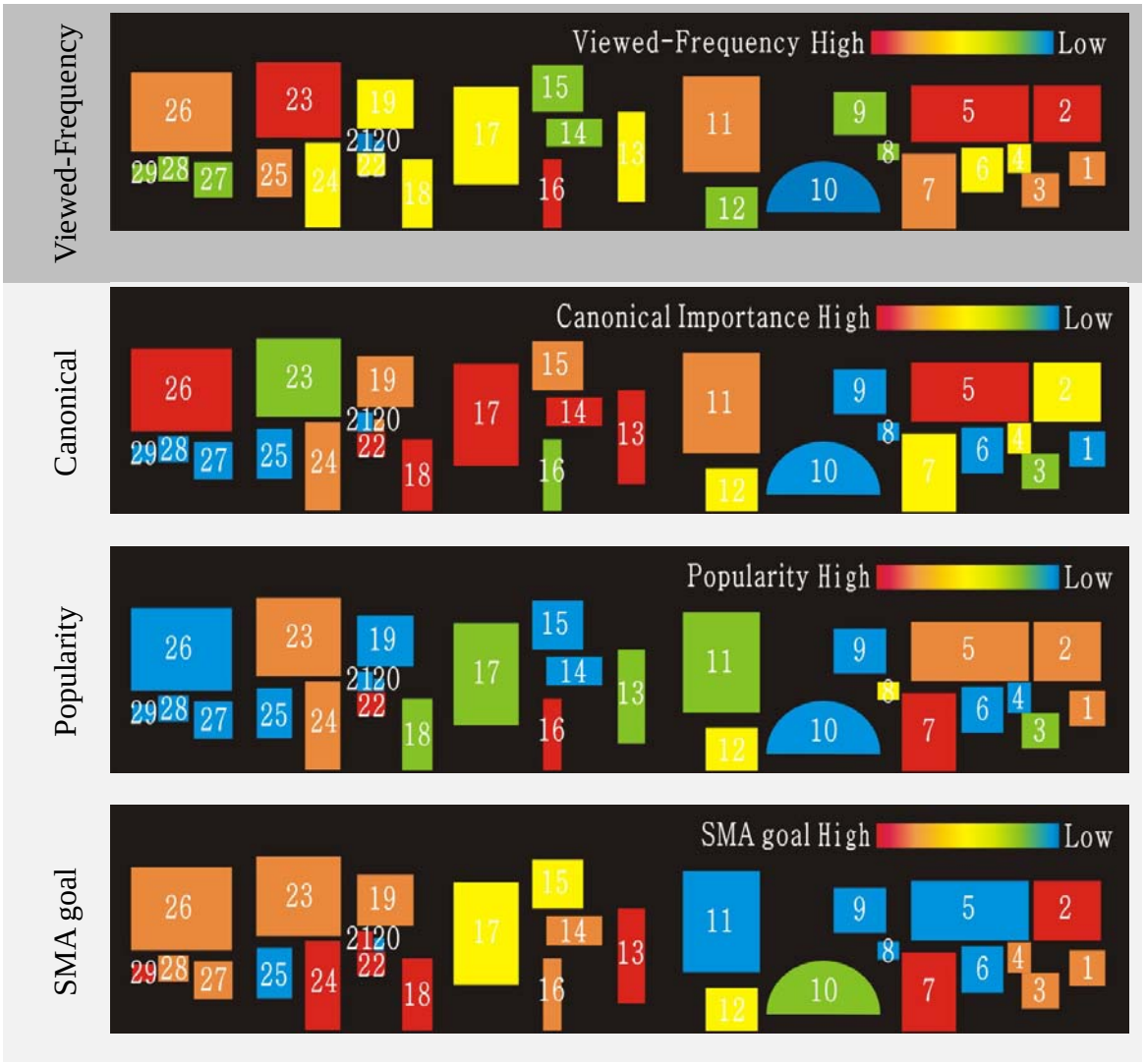


Diagram 33. Graph-comparison Frequency & ratings

2. Physical settings of display and Visitors' behavior

1) Viewed-Time and the physical settings of display

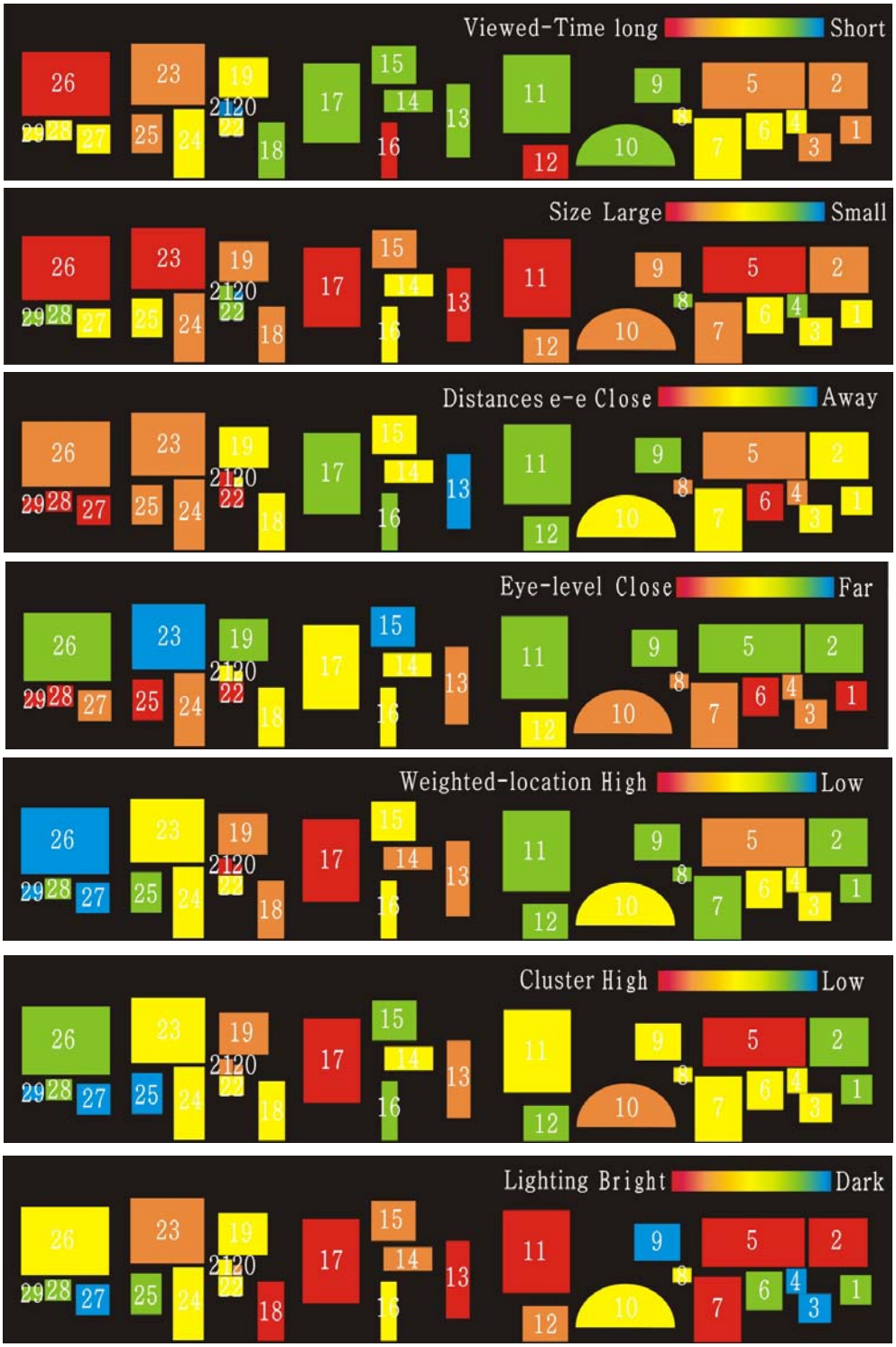


Diagram 34. Graph-comparison time & displays

2) Viewed-Frequency and the physical settings of display

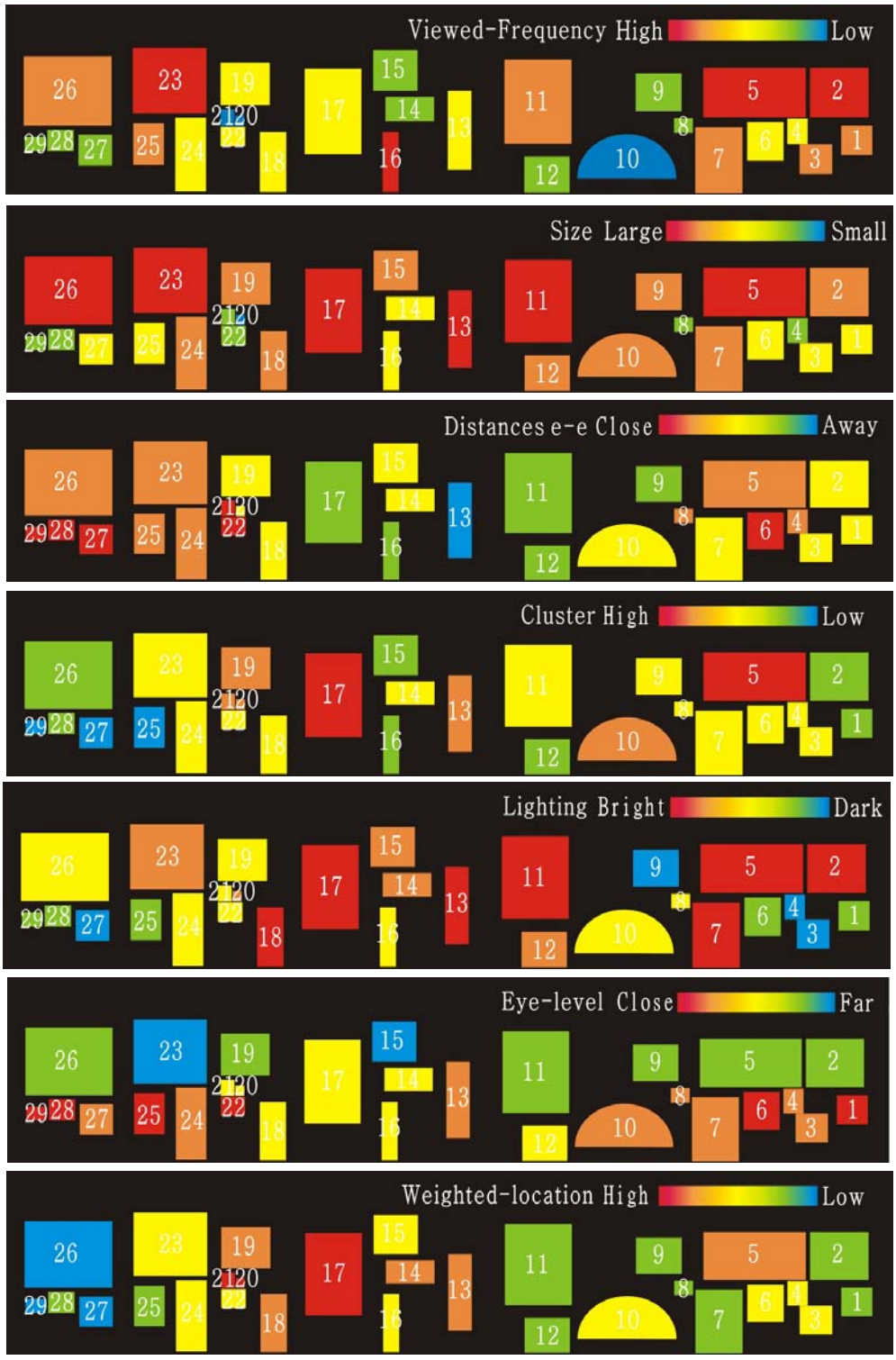


Diagram 35. Graph-comparison Frequency & displays

3. Physical settings of display and Ratings

1) Canonical importance and the physical settings of display

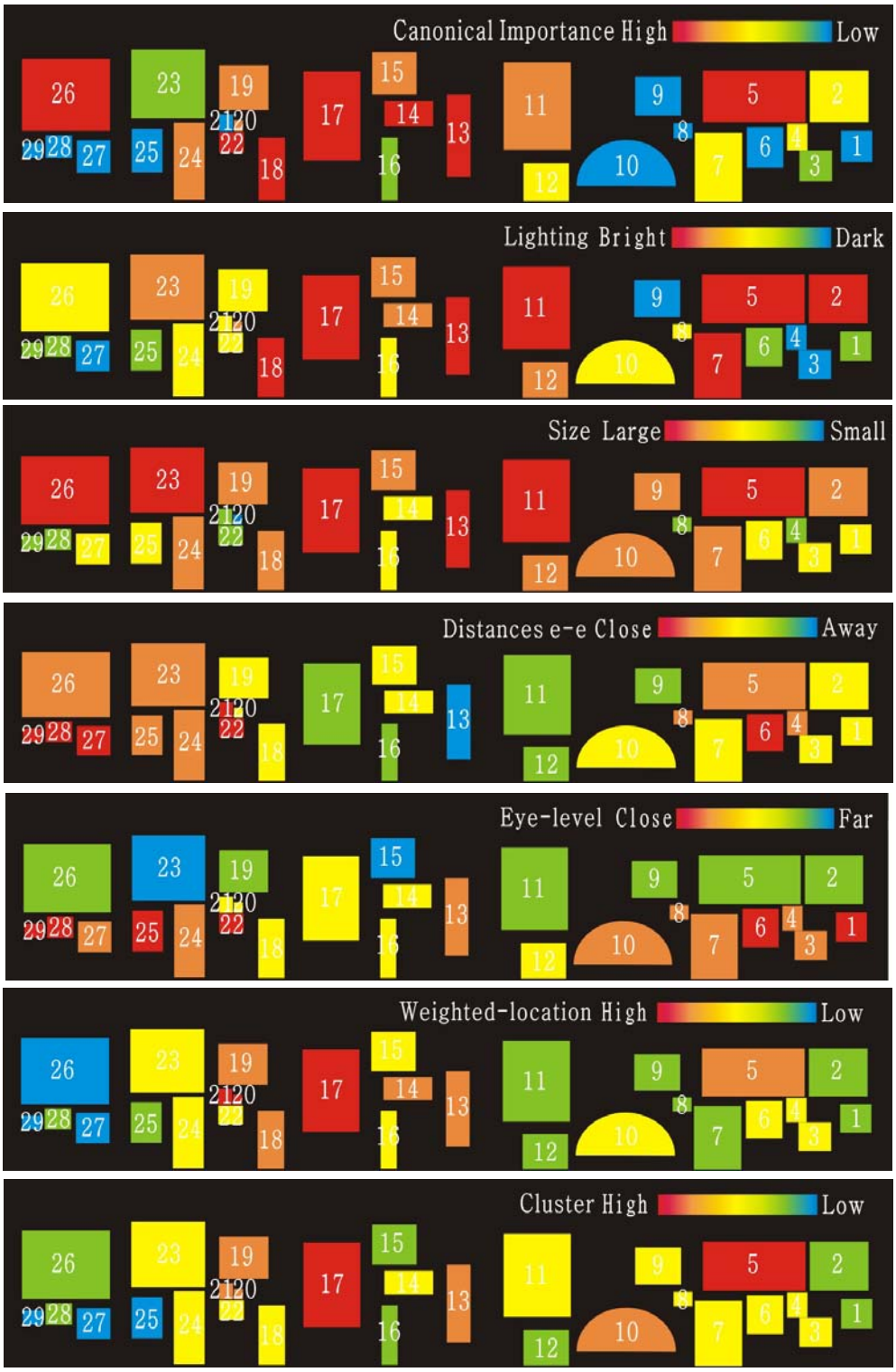


Diagram 36. Graph-comparison canonical importance & displays

2) Popularity and the physical settings of display

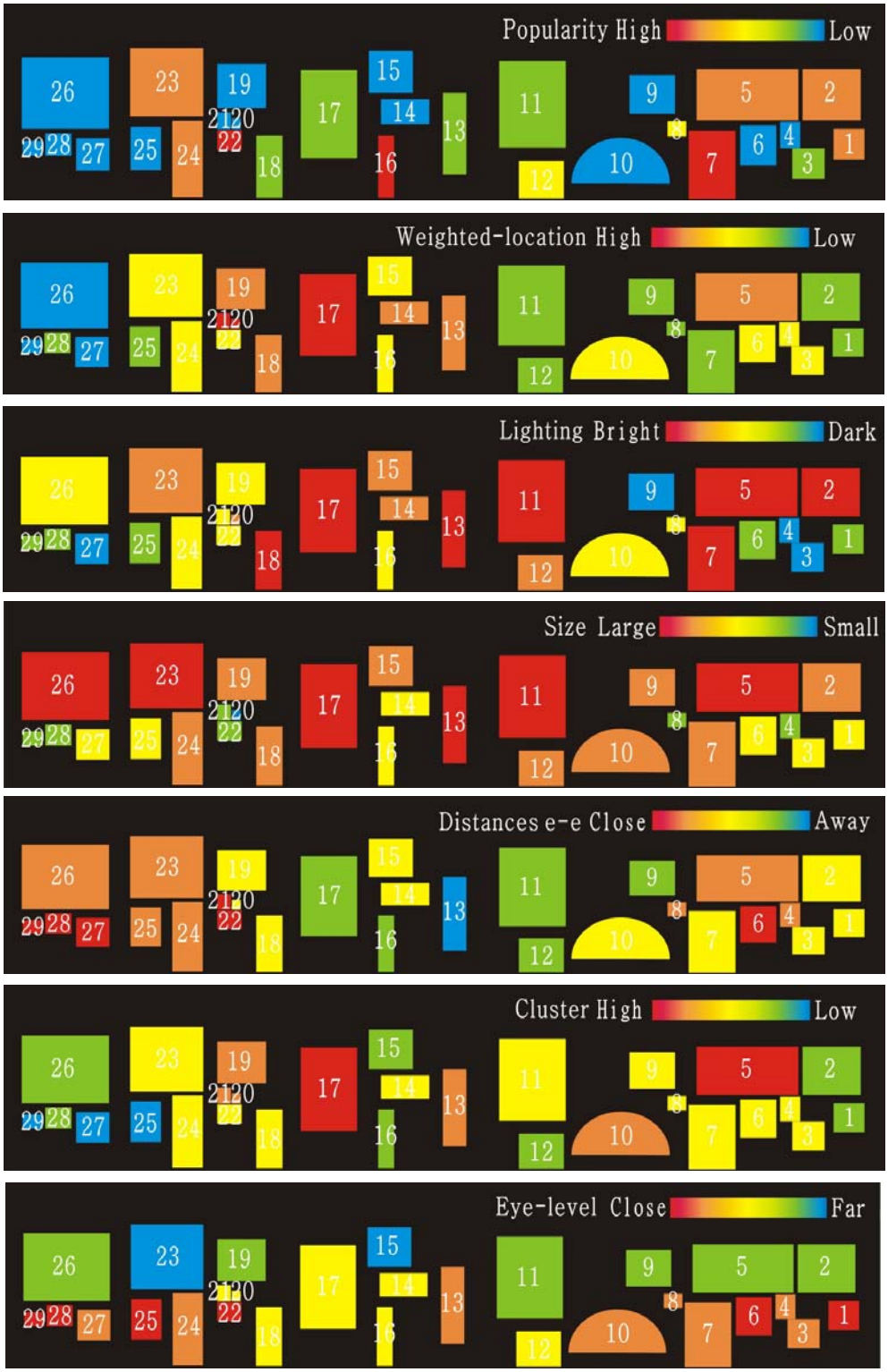


Diagram 37. Graph-comparison Popularity & displays

3) SMA goal and the physical settings of display

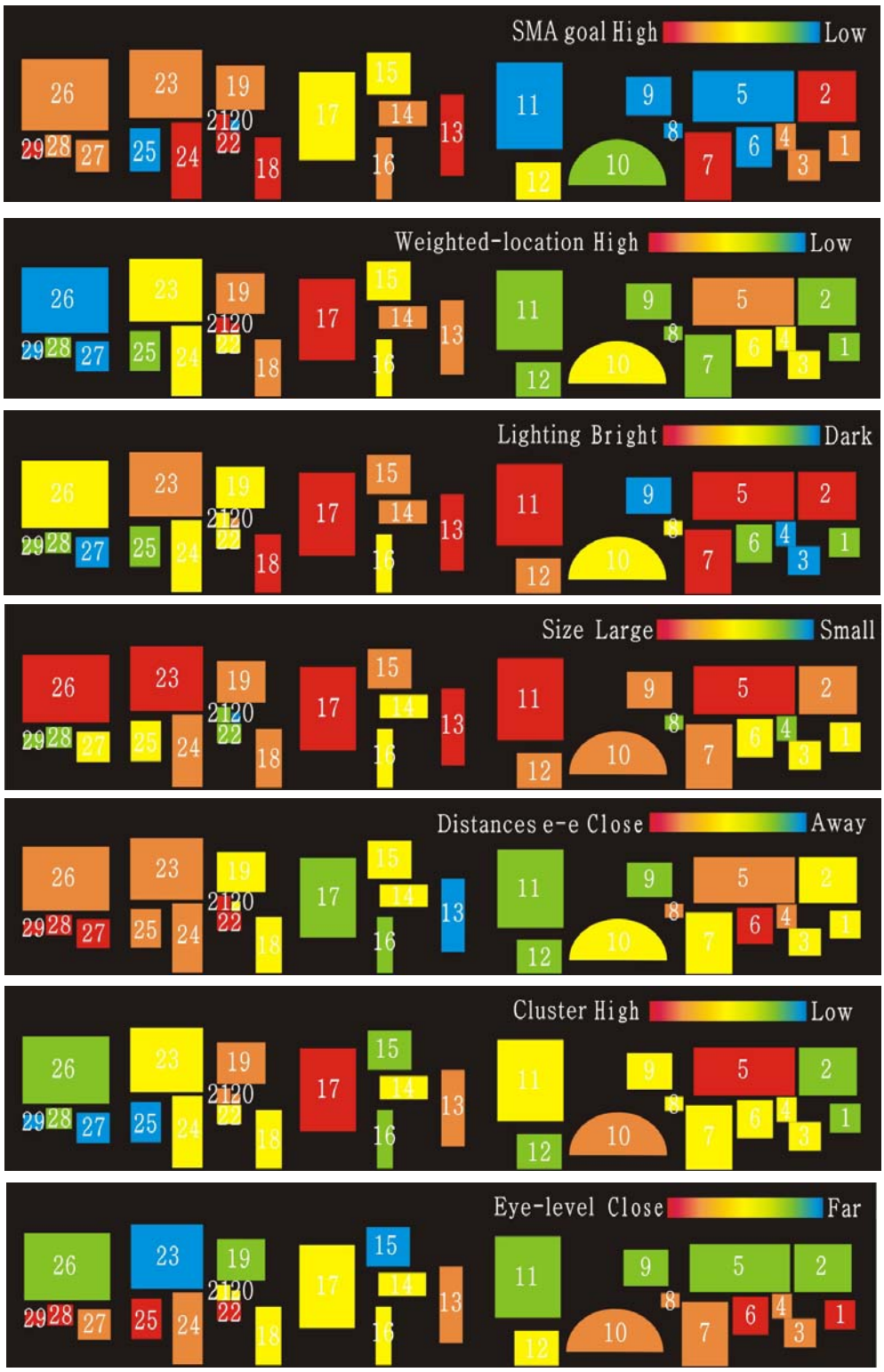


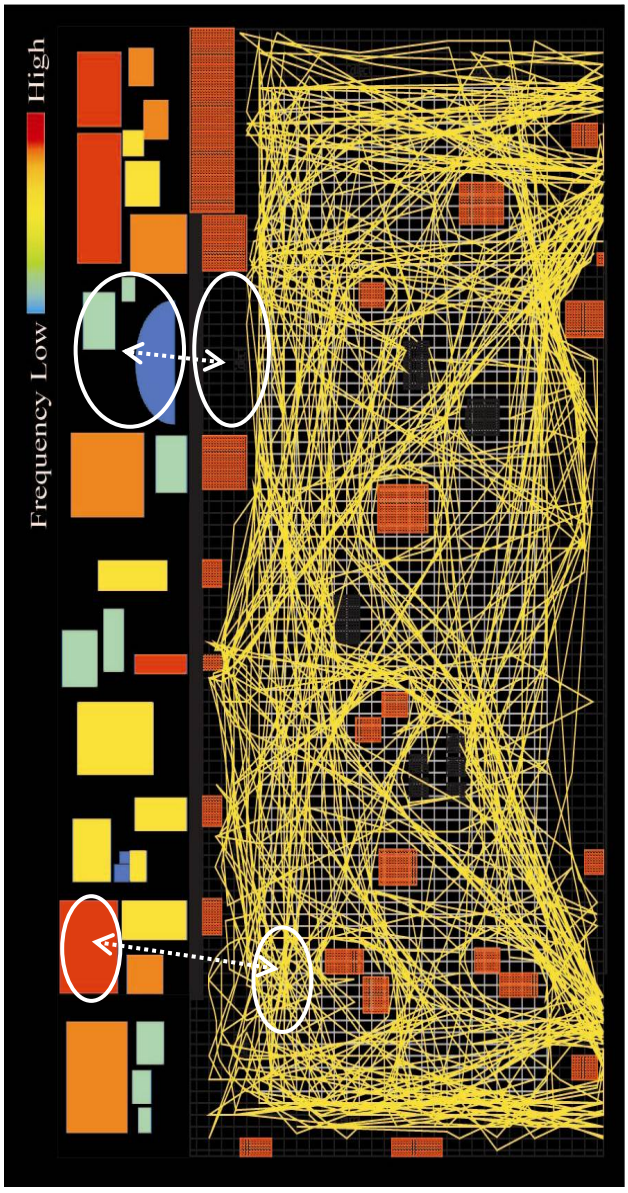
Diagram 38. Graph-comparison SMA goal & displays

- *Pattern comparisons:*

By comparing the viewed-frequency of art-pieces displayed on the north wall and the visitors' viewing paths, one might be able to define the relationships between the movements and the displays.

1. Viewed-frequency versus paths (Diagram 39)

(2)Low viewed-frequency coordinated with low-traffic way



(1)High viewed-frequency coordinated with high-traffic way

Diagram 39. Frequency versus paths

2. Viewed-frequency versus stop locations (Diagram 40)

By comparing the viewed-frequency of art-pieces displayed on the north wall and the visitors' stop locations, one might be able to define the relationships between the stop locations and the viewing frequency of art pieces.

(1)High viewed-frequency coordinated with frequent-stopped locations

(2)Low viewed-frequency coordinated with less-stopped locations

(1)High viewed-frequency coordinated with frequent-stopped locations

(1)High viewed-frequency coordinated with frequent-stopped locations

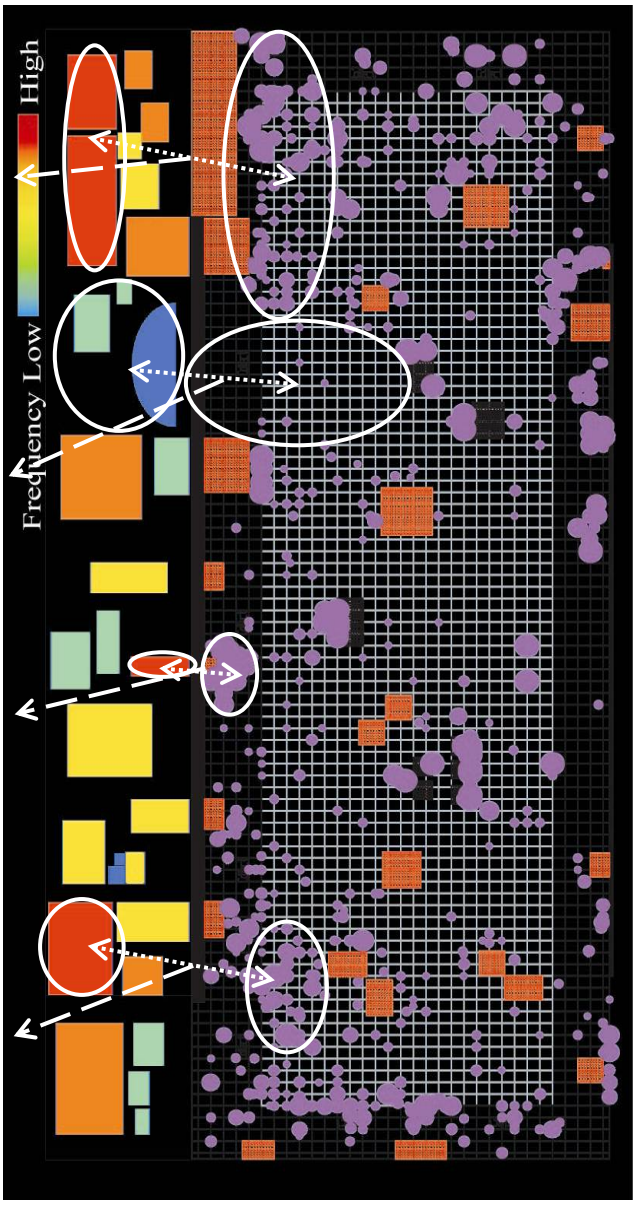


Diagram 40. Frequency versus stop-locations

Conclusion

The goal of this study was to understand effects of the exhibition designer's and curator's decisions on visitors' behavior through the design of the display in an exhibit, and how the setting of an exhibit influences/interacts with the visitors. The researcher barrowed knowledge and research methods from other disciplines to study the behavioral issues in the real setting with many complex factors.

Methods of field-observation and tracking visitor's paths were used in this particular study. The researcher constructed the study by looking at the context of the setting, including the environment, the actors and activities.

The stop-locations graph showed that the visitors' viewing flows are not continuously/consistence in a setting of mix-media, art-pieces displayed fully on four walls and the floor. The visitors' paths are complex and spread in an open setting. One of the assumptions is that although the gallery is an open space with spreading floor pieces, the visitors still tend to move along the walls while viewing art displays. The paths of visitors also show that there is a safety distance from the wall of art displays commonly created in visitors' head.

Based on the correlations discovered in this study, the assumptions are: the

curator's ratings have impacts on the lighting, clusters and weighted locations (design features), which have impacts on visitors' behavior, while the ratings have direct impacts on visitors' behavior. The data reflect the assumption made earlier in the function model (Diagram 2, page 14) where the curator's and the exhibition designer's decisions influence the display of art, and the display of art influence visitors' behavior, and lastly, the curator's and the exhibition designer's decisions influence the visitors' behavior.

The findings help the researcher to understand the context of the setting, the exhibition designer/curator, the physical setting of display, and the visitors' behavior. In curators' mind, there are scales to value each art piece in a whole gallery setting; in this case, the canonical importance, popularity and the importance for the audiences of this particular museum. This study shows that the designed display/environment is influenced by the curators' purpose and the value system. The visitors, on the other hand, may not react to the goal/purpose of curators' decision. It could be due to the factors of display, but more so, visitors' behavior is a result of a far more complex system that functions both consciously and subconsciously.

While an art piece on the wall gets high view frequency, it is identifiable to

find a “hot spot” (Bitgood 2002) where visitors tend to stop at and view that particular art piece. The “hot spot” could be understood as the result of how visitors react to the setting; it may be due to the lighting, for example, the photography display on the conversation (south) wall; the eye-level, for example, the “Race”, painting displayed at 76.9 inches above the eye-level (median, 62 inches, Bailey 1996), made visitors stop at the same spot to view the art piece with a distance of 4 to 6 feet. Display design could be very helpful if curators know how to create a continuous flow in the setting where the hot-spot is well-networked and provides visitors a “visual tour.”

In this study, the observation showed that the “open-space” makes visitors move freely in the setting, while the main pathways indentified by the visitors are still from the entrances along the wall. The paths of visitors show that the visitors have a common understanding of “safety distance” between one and art pieces on the wall. On the other hand, visitors tend to go fairly close when one views sculpture, and even more so, interactive pieces, in this case, the sound installation (piece#16, at the center of north-wall). Visitors tend to spend a long period of time at a close spot interacting with the piece. The path pattern also shows that visitors would like to have maximum possible interaction/experience with the

display/environment during one's "tour/path/visit"; so instead of straight linear paths, individuals tend to meander around, both goal-oriented and non-goal-oriented.

Visual representation was used in this study both to identify the pattern of behavior and to quantify the data. It is extremely beneficial to use this method to help visual-thinkers, people in design-oriented professions, to understand/analyze the information and communicate with each other.

Limitations

It is often pointed out that social science can address any particular problem, issue or question through many approaches: using one does not negate the others. In this case, as stated in the introduction, explorations of human-space-exhibit-object interfaces in art and museum settings can be studied via self-administered questionnaires or third person tracking and observation or other ways. Obviously then many other approaches might have addressed other issues and questions that might arise from the disciplinary outlook and agenda of the researcher, such the points of view of psychology, architecture, museology, sociology, art and many other fields.

Another structural limitation was that the observation was done in a natural setting with many complex factors involved. Within many complicated variables in the context of this museum setting, the researcher only chose three main factors that served the purpose of this study--to understand the behavior within and the reasons related to the design features. Though some related elements such as the observer, the physical setting, the art pieces and the curator and exhibition designer were controlled, there are still many uncontrollable elements. These

elements included: 1) visitors moved freely in a open space with different purposes and varied possible paths; 2) the setting and environment were not an experimental setting built for this particular observation but existed for the exhibition designed by the curator and exhibition designer; 3) not all subjects traveled through the whole exhibit, and, thus, did not view all twenty-nine art pieces on the north wall; and 4) the subjects were not distributed evenly in terms of time of visit.

Next, in terms of limitations, among many other analysis methods, the researcher only used correlations and graphs for this study. When the observational data didn't highly correlate to the design features measured, the researcher decided not to use regression analysis, factor analysis, structural equation modeling or other many possible methods.

Finally, the other main limitation for this study is that it was done in a very short period of time. While environmental behavior studies such as Roger Barker (1955) were conducted over years of observation, this study need to be completed in two weeks, due to the constraints of the location and the time available for the research.

Future directions

As stated above, in the process of conducting this study, the researcher faced many issues in selecting a research method and what specific topics to study. Obviously, then, many other questions and approaches remain for future research. A few of them follow:

Instead of mainly quantitative approaches, the researcher is open to qualitative point of views, such as "thick descriptions", a narrative way to analyze the results of the observation (Geertz1973), interviews or questionnaires. It would also be interesting to see the results of comparing data using different analysis methods such as regression, factor analysis, structural equation modeling or more.

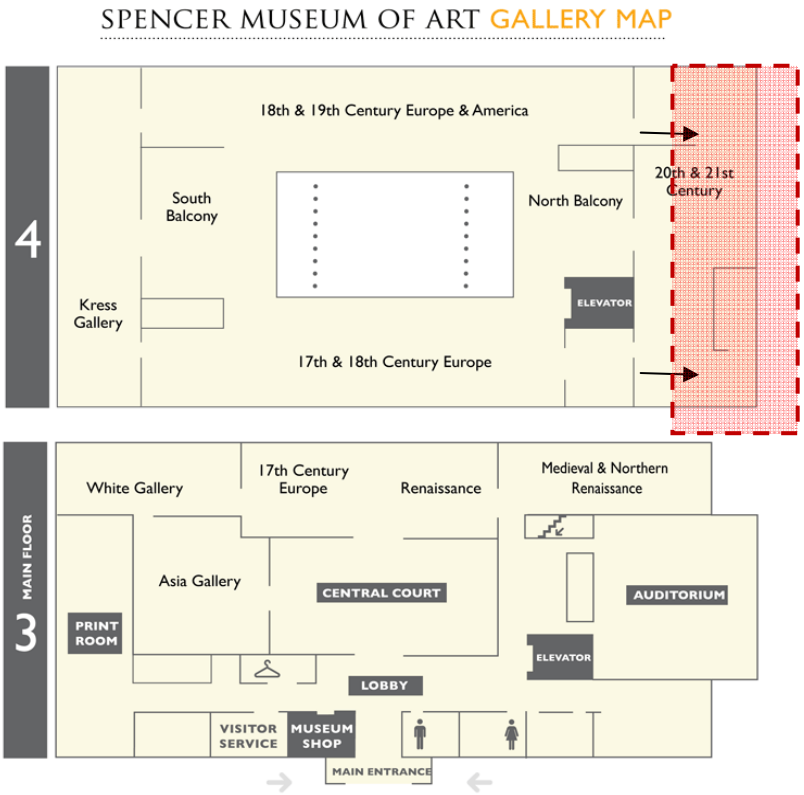
As said as well, if the researcher has a longer period of time for future studies, for example, six months, the research could be done with at least two different comparative observations in order to study. Such a study could be done in the same physical setting but with a change in the location of art pieces or the display of the art pieces (e.g., eye-level height, lighting, clusters) to understand the effects of the particular display design factors; or in the same physical setting

but change the art pieces to understand the impact/interactions between arts and visitors; or in different environmental settings with same art pieces, such as a linear gallery instead of a squar-ish open space.

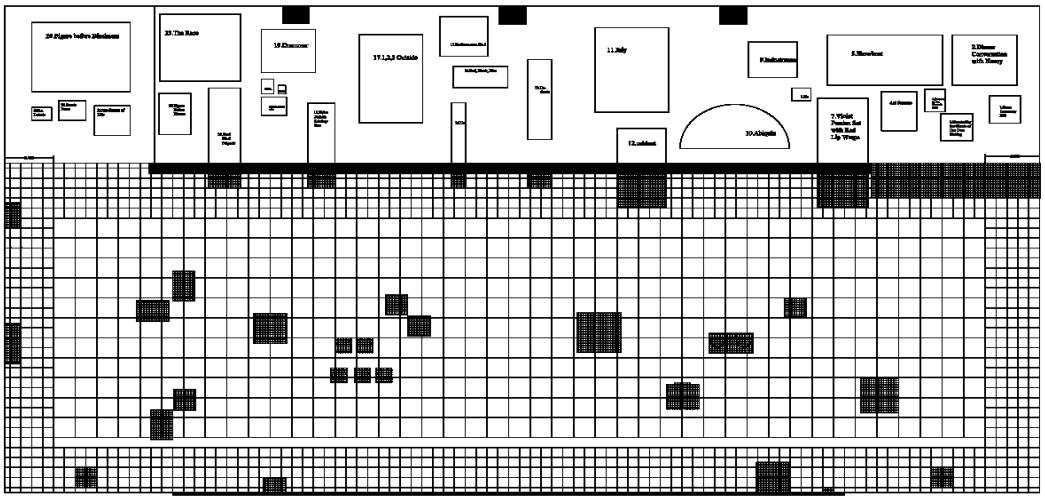
Another possibility is to simplify the setting or make it purely experimental. It would be helpful to eliminate floor pieces in the original setting to avoid the non-goal oriented movements in the space. Or alternately, one could, eliminate different art pieces media such as for example, the paintings and sculptures, to limit the interactive differences for visitors. Another possibility would be to build a virtual reality program or laboratory to specify the controlled elements or even to control the visitors' path of viewing, length of viewing and objects to be viewed. Last, a researcher could use a questionnaire or interviews to solicit visitors' opinions in terms of the particular setting.

Appendix

Spencer Museum of Art Gallery Map:



Observation sheet:



[ ]Female [ ]Male [ ]KUstudent [ ]Comunity [ ]Introboard-use [ ]Book-use in-from:[ ]R [ ]L Total-time spend:[ ]

20/21 Rating System rationale, as completed by Co-Curator Emily Stamey

Canonical Importance

In rating these items I considered the frequency with which the artist is discussed in art historical literature. Specifically, I kept in mind the survey text books with which I am most familiar and the works most often placed on view in well-established permanent collections, such as those at the National Gallery or Smithsonian museums. Given these factors, one might think that this was a rather objective rating, but that certainly is not the case. The canon as I know it has been shaped by the professors with whom I have studied, the fact that all of my study has taken place in the United States, my own personal interests, etc. Another art historian trained in a different set of institutions and with different interests would surely provide a different ranking.

Popularity

In rating these items I considered both my own personal experiences with visitors in the gallery, and the experiences of my colleagues as they have shared them with me. With popularity it is easier to say which pieces people love -such as the Chihuly and the Bertoia than to say which they do not like. Someone is far more likely to come in to the museum and say "Can you show me that big purple glass piece because that's one of my favorites?" than one is to come in and say "Please take down such and such a piece, I really hate that." Thus, I am quite confident in the works that I ranked high (5), but less confident in the works that I ranked low. Although I try to pay close attention to direct visitor feedback and to talk with those on our Education and Security teams (who have many more opportunities to work with the public), I do not pretend to know exactly which works people like the most or least.

SMA *20/21* Goals

The goals for the *20/21* Gallery were multifaceted: we wanted the gallery to recognize that we live in a global society where art is made by women and men from a vast array of backgrounds; we wanted the gallery to be a resource for departments across campus, while still acknowledging that it is of particular importance to the Art History and Art departments; we wanted to respect that our visitors have time-honored favorite pieces; we wanted the gallery to encourage people to find new favorite pieces. When selecting the works that are now on display in the gallery, we surveyed professors in the Art History department, curators in the museum, and the museum's docents -who give tours to KU, Lawrence Public Schools, and community groups. We asked these various constituents which works were most important to how they teach and use the gallery. Keeping in mind that they were likely familiar with works that had previously been on view, but not necessarily with works that had historically been kept in storage, we developed a list of objects that reflected both their needs and our attempts to make the gallery more meaningful for a wider campus audience.

(Emily Stamey, PhD candidate in 20th Century American Art History)

Renovation, Innovation, Reinstallation A Cross-Campus Approach to the Spencer Museum of Art's 20/21 Gallery

Emily Stamey, the University of Kansas

University Museums and Experimentation: A Model Project

How does a university museum encourage faculty to use its collections in their research and teaching? How does a university museum better utilize professors' expertise in its research and exhibitions? The Spencer Museum of Art at the University of Kansas is developing one model for such collaborations. As an integral part of renovating and reinstalling its 20th and 21st century gallery (now affectionately renamed 20/21) the Spencer has created an interdisciplinary faculty task force, comprising professors from the departments of American Studies, Architecture, Art, Art History, Economics, English, Geography, History, Physics and the University Honors Program. This task force offers an opportunity for the museum to collaborate with scholars across the campus and for those scholars to connect with one another. By inviting people to work with us and with each other simultaneously, we position the museum as a creative campus forum. This essay outlines the process and touches upon the highlights of working with the faculty task force and suggests possibilities for future applications of this model.

Background

Situated on a campus of roughly twenty-six thousand students, the Spencer Museum of Art serves a large community of scholars. Prior to the current renovation and reinstallation project, the 20/21 Gallery was home to a traditional, chronological installation of approximately seventy-five European and American paintings and sculptures.

Three primary goals drive the reinstallation project: acknowledgment of subjective experiences, both the individual voices of artists and the individual responses of our visitors; recognition that we live in a global society; and engagement of the broader campus community, recognizing that the museum has something to offer that community and much to learn from it. Though conceived with the third objective in mind, the faculty task force has aided us in achieving all of these aims.

Process

On June 2, 2006, we began the 20/21 initiative by mailing an invitation containing the following excerpt to professors across campus:

> *...imagine broadly and think deeply with us* as *we explore the roles of art and artists over the last 106 years. We envision that you will help us connect our object collections to* a *variety of academic disciplines and to the world outside the museum. You will be asked to share your own knowledge* as *well* as *to suggest other resources. ...* As a *group, you will not be asked to produce any work beyond attending meetings and offering your thoughts.*

We followed each letter with a phone call, making clear to the professors that we were not asking them to produce anything, simply to engage with us in thinking, questioning, and imagining as we prepared for our reinstallation. Although we asked for a year-long commitment, we concentrated the group's activities on four meetings during the summer, prior to beginning reinstallation of the gallery.

Meeting 1: *Thinking About the 20th and 21st Centuries*

Our first meeting was not at the museum and did not take art as its subject. Instead, we considered recurring themes and important changes that have arisen over the last century. We asked the participants to list on color-coded squares of paper people, events, and concepts that they considered important to the 20th and 21st centuries. The messy pin-up boards that resulted proved emblematic of the task-force process as a whole: We had asked the group to help us think broadly and deeply-and rarely is such thinking neat and tidy. This brainstorming session brought to our attention the challenging complexity of issues that we must consider for a gallery expected to give expression to this time period. The session also revealed the pool of resources we have to tackle such questions: we have faculty members, and their knowledge, their curiosity, and their creativity.

Meeting 2: *Introduction to the Collection*

We began the second meeting with an introduction to the Spencer's database, teaching the participants how to search for objects in the collection by time period, subject matter, geographic locations, artists' ethnicities, and other criteria. We scheduled a half-hour for this activity, but over an hour later the faculty members were still asking questions and were eager to try new searches while remaining engaged with the capabilities of the database and the variety of objects it revealed.

Following this introduction we moved to the gallery to explore the subjective experiences that we sought to acknowledge. We asked each participant to select an object of interest and, from his or her own scholarly perspective, write a question for its creator. By addressing the artist, rather than an imagined critic or art historian, we hoped to elicit questions that would lead us to operate on a more personal level. These

questions then provided starting points for discussions about individual works of art. The result of first posing and then responding to these questions from multiple scholarly and personal perspectives demonstrated the wide range of connections to be made between objects in the museum and the interests of those across campus and beyond.

For example, a physics professor chose to ask artist Wendell Castle about his sculpture, *Hanging in the Balance, Why isn't this falling over?* The conversation that followed considered time, the desire to construct narratives, dreams, the uncanny, Sigmund Freud, and the spaces and circumstances in which things come together in seemingly random ways, such as attics and hurricanes.

Following our time in the gallery, the group went through the museum's storage. As we did with the database exercise, we wanted to demonstrate the depth of the museum's holdings by introducing people to objects they had never seen. The task force quickly shifted the conversation, however, from the objects themselves to the broader topics of organization and categorization. The group discussed labels, systems of naming and grouping, and the concept of specimens. As they discovered the various markings and stamps on the backs of paintings, the group also expressed an interest in the histories of objects as commodities that have been variously lent, sold, and used as currency. All three parts of the meeting underscored the fact that the museum is not only a place in which to talk and learn about art, but to use art in posing and grappling with questions of both scholarly and personal significance.

Meeting 3: *Themes and Connections*

During the third meeting, we broke the group into two "teams" and gave them identical decks of cards we had created. Each card depicted an object from the collection that was being proposed for the new installation. We asked the teams to sort the cards into thematic groups based on the connections (of form, content, medium, etc.) that they saw among the objects. This task was completed in five-minute intervals, after which the themes were compiled, both team members and cards redistributed, and the exercise repeated. From this rapid-fire brainstorming activity emerged a great variety of potential exhibition topics: *absence, loss, language, verticality, shape, interiors and exteriors, fragmentation, the body, mindscapes, American icons, sound, boundaries, inversions, nature, senses, multiples,* and *negotiations.*

After the team activity, we asked the participants to reflect on the list of themes individually and select, or add, topics that they found especially compelling. This second activity yielded these categories: *memory, self-fashioning, political activism, histories of objects, families, pilgrimage, exploration, home, justice, artistic movements, fractals,*

health, chemicals and materials, and *the sacred.*

That many of the objects on our decks of cards were assigned to multiple categories, and that professors from different disciplines expressed interest in the same categories, stressed that no one discipline or school of thought holds a monopoly on interpretation. We need to guard against singular explanations of objects and foster a space for exploration of and experimentation with the many possible understandings.

Meeting 4: *Experiencing Art and Strategies of Interpretation*

We began the fourth meeting with another self-reflective task: We asked the participants to write a description of their ideal museum experience, taking into consideration the factors of physical setting, social context, and interpretive materials. The professors shared their descriptions, and then continued with a group discussion about the gallery experience. Following this discussion, we divided the participants into three smaller groups and gave each pen, a selection of cards, and a large sheet of paper. The cards came from the decks that had been used at the last meeting, but were chosen according to the themes listed at that meeting. Thus, one group received the cards depicting objects sharing the common theme of *shape,* another received those associated with *mindscapes* and the third group those that had something to do with *loss.* We asked each group to "design an exhibition" using these materials. We intentionally made the instructions vague so creativity would not be compromised.

Those working on *shape* lined their cards up in neat rows on the paper: one row for rectangular forms and one row for circular forms. The participants working on *mindscapes* spent so long thinking and talking that they never actually put a diagram or plan down on the paper. The faculty members thinking about *loss* folded their cards so that they would stand up and used coffee cups and pencils to demarcate the concrete, physical spaces and structures among the pictured objects. To watch the groups simultaneously address and conceptualize this task in such distinct ways was instructive. It reiterated the need, as discussed at the beginning of the meeting, to allow for multiple modes of experience.

End of the Summer

At the close of the fourth meeting, we had a far better understanding of the myriad interests that the gallery would need to sustain. We also had a group of faculty members who were truly invested in the museum. They were sharing articles of interest with us and with each other, they were returning with questions, and-perhaps the truest sign of caring-they were arguing about the shape and content of the new gallery. Had our

involvement with the task force ended here, we would have been satisfied that we had taken a significant step beyond the museum into the campus community. However, to our great delight, the task force prompted us to engage them further.

Continuing Collaboration

During the Fall 2006, three of the task force members worked with us to develop 20/21Gallery projects for their classes. Students in an architecture studio proposed design solutions for the new gallery; they then presented these designs as models to the task force, which used them as catalysts for a discussion of the relationship between objects and spaces. An environmental studies class analyzed the gallery, prior to reinstallation, as a cultural landscape, then proposed ways in which this landscape could be made more meaningful. We shared excerpts from their papers with the task force to prompt conversations about relationships among different themes and subthemes in the gallery. In addition, a print connoisseurship seminar selected works on paper from the Spencer's collection, paired them with paintings and sculptures proposed for the gallery, and wrote wall labels for each pairing. Several of these students are now suggesting ideas for the installation. The most promising and exciting aspect of these projects is that, in each instance, students not only learned about objects in the museum, but also generated new knowledge for the museum.

Design Plan

Working with faculty task force members and their students highlighted two important facts: As anticipated in our original goals for the gallery, these participants enjoyed making their own connections among objects and engaging with the art on a subjective level. They also made clear their interest in how the museum functions and how it collects and organizes its objects and information. As a result, we conceived a design plan for the gallery based on two conceptual spaces reflecting these twin interests: the *Collection* and the *Conversations.*

The *Collection* will be akin to storage, arranged on the gallery's exterior walls chronologically, with paintings hung salon-style, three-dimensional works in the open and in cases, and works on paper displayed both on the walls and in flat files. Visitors will have access to a wide range of objects in this area, our database, selections from curatorial files, and a variety of work and study spaces. We envision the *Collection* as a living archive-a space for research and discovery.

The *Conversations* consist of small, flexible spaces spread throughout the gallery. In them we can create small installations that will bring a handful of objects into

dialogue with one another. These *Conversations* might respond to a current event, provide visual texts for a class, partake in a campus-wide discussion, answer a visitor's question, or function in any number of ways. Some *Conversations* may continue for a semester or more, with a changing selection of works, whereas others may rotate after just a month or two.

Together, the *Collection* and *Conversations* will provide a microcosmic experience of the museum's larger function: caring for a store of objects, then selecting works from that archive to explore an idea and engage in dialogue. As objects move back and forth between these spaces, we hope that visitors will investigate and participate in the fluid relationship between the *Collection* and the *Conversations.*

The new 20/21 Gallery opens later this spring, at which point we will bring the task force back for reflection, critiques, and suggestions. We will also invite them to continue their participation by using the *Collection* in their studies, developing new ideas for *Conversation* topics, and inviting their colleagues and students to do the same. In this manner, as a result of growing interest and a sense of ownership, the gallery is expected to be an important forum for interdisciplinary discussions on campus.

Lessons

This project, although still in process, provides a number of valuable lessons. First, engaging the entire campus requires engaging the whole museum. Curators, educators, exhibition designers, the museum photographer, the collections manager, security staff, and others all played critical roles in the success of the faculty task force by sharing expertise, participating in activities, and making available the spaces for those activities. Second, to engage campus interest in the museum, the museum must ask people to *do* things-whether to consider a simple question posed in a label, participate in an exercise that takes twenty minutes, or pursue a project involving multiple class sessions, people need to learn about *and* actively connect with objects in order to produce meaning.

Future Directions

We are now putting the faculty task-force model to work in a variety of new ways. As part of our deliberations when considering a video acquisition, we invited groups of faculty to screen the piece and share with us the ways it could be incorporated into their classes. We are also in the early stages of assembling a new faculty task force to help develop a temporary exhibition. In the future, we may develop such groups to help us think about aspects of our long-term strategic plan. As the museum considers its collecting goals, we hope to anticipate teaching and learning needs across the campus so that the museum becomes more deeply embedded in the life of the University.

Time plan

	tasks	details
WK1~4	conduct data	Literature review, layout mapping
	define interests	Nov 1 with Emily, Nov2, 3,4 map out pieces
	literature review	Nov3n4 start building excel file for collections
WK5	set up instruments	Nov 5 1:30pm measure with Richard
	measurements	Build map for observation
	rate piece photograph of 20/21	Nov7 meet MR talk about instruments, hypothesis, measurement, observation-documentation goal, KUCR proposal, rating sheets
WK6	set up instruments	Nov 13 rate pieces with Emily
	measurements	new photos from Robert
	rate piece with Emily	set up in 20/21(tape on the floor2*2, observation sheet)
	photograph of 20/21	
WK7	pre-testing	Nov 19 meet MR make sure ready for pre-testing, show ppt/proposal draft
		Nov 20 or 21 find a pre-testing day
		prepare ppt for meeting (photo of north wall, background, question, study methods-> in details: how (observation sheet, note taking), how long (88hours, 2wks), data goal (what will be conducted), analyze method (regression). Also a page of timeframe, bibliography.
		try out analyze method(regression)
WK8	Observation testing thesis meeting	1st thesis meeting MR, RB, JJ, KS
		talk about goal of findings, method of research (say, what to observe, how to document…), method of analysis(how to make data into argument?), thesis writing/presenting guidelines(say, APA? #page, what should be in…)(oral)
		Nov 30 meet with Gina for thesis rules
WK9	observing	10-5 Tu-Sa, 10-9 TH, 12-5 Su(44hours in total)
WK10	observing	10-5 Tu-Sa, 10-9 TH, 12-5 Su(44hours in total)
WK11/12/13	analyzing data	thesis meeting, look at data, define (detailed) analyzing method and scale, thesis structure, oral guidelines.
WK14/15	nter data, analyze data	look at data
WK16	analyzing data	look at analysis
WK17	drafting thesis	look at analysis, need more/less? Fix?

		What to put in "the book"(thesis)? (Detailed)
WK18/19/20	Early drafting thesis	
WK21/22	Late drafting thesis	
WK23	Thesis 1st draft complete	hand thesis draft to MR
WK24	fix thesis	thesis meeting, go over ppt, talk about oral
WK25	prepare ppt	
WK26/27	Oral?	open presentation (in 20/21 gallery)
WK28	final fix	official oral deadline for school: April 14th
WK29	Thesis final due	official summiting deadline for school: April 23rd

Observed Visitors:

		gender	Demogaph	in R/L	out R/L	intro board use	book use	total time(Sec)
1	dec 4th 1	male	student	left	left			212
2	dec 4th 2	female	student	right	left			63
3	dec 4th 3	female	student	left	right		X	68
4	dec 4th 4	male	student	right	left			62
5	dec 4th 5	male	student	left	left	X		10
6	dec 4th 6	male	student	left	right	X	X	572
7	dec 4th 7	female	community	right	right			44
8	dec 4th 8	male	community	left	right		X	1400
9	dec 4th 9	male	student	right	left			217
10	dec 4th 10	female	community	right	right		X	540
11	dec 4th 11	female	student	left	left			30
12	dec 4th 12	male	community	right	left			237
13	dec 4th 13	male	student	left	left			254
14	dec 4th 14	male	community	left	right			220
15	dec 4th 15	female	community	right	left			445
16	dec 4th 16	male	community	right	left		X	465
17	dec 5th 1	female	community	left	left			112
18	dec 5th 2	female	student	left	right			146
19	dec 5th 3	male	student	left	right		X	144
20	dec 5th 4	male	student	right	left			36
21	dec 5th 5	female	community	left	right	X		754
22	dec 5th 6	female	community	left	right	X		754
23	dec 5th 7	female	community	right	left			176
24	dec 5th 8	female	community	right	left			127
25	dec 5th 9	couple	community	right	right			267
26	dec 5th 10	female	student	left	left			42
27	dec 5th 11	female	student	left	right			112
28	dec 5th 12	male	community	left	right			393
29	dec 5th 13	male	community	right	left			331
30	dec 5th 14	male	student	left	right		X	1608

31	dec 5th 15	female	student	right	right			339
32	dec 5th 16	female	student	right	right			337
33	dec 5th 17	male	student	right	left	X		106
34	dec 5th 18	male	community	right	right			375
35	dec 5th 19	male	student	right	right			285
36	dec 6th 1	female	community	left	right			137
37	dec 6th 2	male	student	right	left			229
38	dec 6th 3	female	community	left	right	X		357
39	dec 6th 4	male	community	right	left		X	251
40	dec 6th 5	female	student	left	right		X	357
41	dec 6th 6	male	community	left	right	X	X	65
42	dec 6th 7	female	student	right	left			487
43	dec 6th 8	male	community	right	right			42
44	dec 6th 9	female	student	left	right			142
45	dec 6th 10	male	student	left	right			142
46	dec 6th 11	couple	student	right	left			1975
47	dec 6th 12	male	student	right	left			28
48	dec 6th 13	male	student	left	right			17
49	dec 7th 1	male	student	right	left			122
50	dec 7th 2	female	community	left	right			220
51	dec 7th 3	male	community	left	right			341
52	dec 7th 4	female	community	right	right			986
53	dec 7th 5	male	community	right	right			1038
54	dec 7th 6	male	community	right	left			231
55	dec 7th 7	female	community	left	left			31
56	dec 7th 8	male	community	right	right			220
57	dec 7th 9	male	student	left	left			154
58	dec 7th 10	male	student	left	right			248
59	dec 8th 1	male	student	right	right			4575
60	dec 8th 2	male	student	left	right			39
61	dec 8th 3	female	community	left	right			79
62	dec 8th 4	female	community	left	right			39
63	dec 8th 5	male	community	right	left			208
64	dec 8th 6	female	community	right	left			420
65	dec 8th 7	female	student	right	left			340

66	dec 8th 8	female	student	left	right			130
67	dec 8th 9	male	student	left	right			130
68	dec 8th 10	female	community	right	left		X	353
69	dec 8th 11	male	community	right	left			353
70	dec 8th 12	male	community	right	left	X		361
71	dec 8th 13	female	student	left	right			242
72	dec 8th 14	female	student	left	right			242
73	dec 8th 15	male	student	left	right			242
74	dec 8th 16	female	community	right	left	X	X	1559
75	dec 8th 17	male	community	right	left	X	X	1667
76	dec 8th 18	female	student	right	right	X		901
77	dec 8th 19	female	community	left	right		X	215
78	dec 8th 20	male	community	left	right	X		279
79	dec 8th 21	female	community	left	left		X	301
80	dec 8th 22	female	community	right	left	X		723
81	dec 8th 23	female	community	right	left			779
82	dec 8th 24	male	community	right	left		X	861
83	dec 8th 25	male	community	left	right			424
84	dec 8th 26	female	community	left	left			172
85	dec 8th 27	male	community	left	right			31
86	dec 8th 28	male	student	left	right			382
87	dec 8th 29	female	community	right	right	X	X	236
88	dec 8th 30	female	community	right	right			942
89	dec 8th 31	female	community	right	right			922
90	dec 8th 32	male	community	right	left	X	X	289
91	dec 8th 33	male	community	left	left			244
92	dec 8th 34	male	community	left	left	X		111
93	dec 8th 35	male	community	left	right			317
94	dec 8th 36	female	community	left	left			373
95	dec 8th 37	male	community	left	right		X	410
96	dec 8th 38	female	community	left	left	X		76
97	dec 8th 39	female	community	left	left	X		127
98	dec 12th 1	male	community	right	right			693
99	dec 12th 2	male	student	left	right	X		765
100	dec 12th 3	male	student	right	right	X	X	704

101	dec 12th 4	male	student	right	left			226
102	dec 12th 5	female	student	right	right			121
103	dec 12th 6	female	student	right	right			121
104	dec 12th 7	female	student	right	right			121
105	dec 12th 8	female	community	left	left			103
106	dec 12th 9	male	student	right	right			113
107	dec 12th 10	female	student	left	right			40
108	dec 12th 11	male	student	right	right			201
109	dec 12th 12	female	student	left	right			45
110	dec 12th 13	female	community	left	left			153
111	dec 12th 14	male	community	right	right			60
112	dec 12th 15	male	student	right	right			718
113	dec 12th 16	male	student	right	right			586
114	dec 12th 17	female	community	right	right			319
115	dec 12th 18	female	student	left	right			383
116	dec 12th 19	male	student	left	right			383
117	dec 12th 20	male	community	left	right			152
118	dec 12th 21	female	student	right	left			301
119	dec 12th 22	female	community	left	right			302
120	dec 12th 23	male	student	right	left			157
121	dec 12th 24	female	community	right	left	X		233
122	dec 13th 1	female	student	right	left			51
123	dec 13th 2	male	community	left	right			9
124	dec 13th 3	male	community	left	left			219
125	dec 13th 4	female	community	left	right			117
126	dec 13th 5	male	student	right	left			34
127	dec 13th 6	male	community	right	left		X	262
128	dec 13th 7	male	student	left	right	X		1539
129	dec 13th 8	female	student	left	right		X	1470
130	dec 13th 9	male	community	left	right			28
131	dec 13th 10	male	community	left	left	X	X	1856
132	dec 13th 11	male	community	right	left			467
133	dec 13th 12	female	student	right	left	X	X	466
134	dec 13th 13	male	student	right	left			57
135	dec 13th 14	male	student	left	left			407

136	dec 13th 15	female	student	right	right	X		103
137	dec 14th 1	female	student	right	left			150
138	dec 14th 2	male	student	right	left			132
139	dec 14th 3	female	student	left	right			77
140	dec 14th 4	female	student	left	right	X		91
141	dec 14th 5	male	student	left	left			164
142	dec 14th 6	female	student	left	left			149
143	dec 14th 7	male	community	right	left			61
144	dec 14th 8	female	student	right	right	X		233
145	dec 15th 1	male	community	right	left			291
146	dec 15th 2	female	student	right	left	X		138
147	dec 15th 3	female	community	right	left		X	491
148	dec 15th 4	male	community	right	left			414
149	dec 15th 5	female	community	right	left		X	360
150	dec 15th 6	male	community	right	left			438
151	dec 15th 7	male	community	right	right	X		1072
152	dec 15th 8	female	community	right	right	X		481
153	dec 15th 9	female	community	left	right			1116
154	dec 15th 10	male	community	left	right	X		262
155	dec 15th 11	male	community	left	right			67
156	dec 15th 12	male	community	left	left			321
157	dec 15th 13	female	community	left	left			284
158	dec 15th 14	male	community	left	left			152
159	dec 15th 15	female	student	left	left			222
160	dec 15th 16	female	community	right	right	X		706

meam	382.21
STDEV	505.90

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