

The Influence of Social Groups on the Use of Selected *Northern Shores* Graphics at the Denver Zoo

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Introduction

The following paper is a summary of a 40-page report prepared for the Denver Zoological Foundation (DZF). Complete data may be requested from William Turner, Curator of Education.

The Denver Zoo seeks to work both for the benefit of wildlife and to provide a service to its public. The two goals are intertwined since the nature of cultural and scientific institutions not only reflects their role in the community but how they influence visitors' perspective about their role in the world at large.

Progressive zoological parks work to bring an awareness to their visitors about wildlife and an appreciation of the natural world. These objectives can be met only partially through the display of animals. The development of an educational graphic system as part of animal displays represents a commitment on the part of the Denver Zoo to give its visitors the opportunity to enter a world they probably have little experience with, and to wonder at the complexity and ingenuity of natural processes.

Evaluation findings can be used to examine the validity of long-held assumptions. They are useful in documenting a zoo's activities for governmental bodies that provide funding. Some studies can be used to strengthen grant proposals submitted to educational foundations or granting agencies. This is particularly true of program and exhibit evaluations.

The *Northern Shores* Graphics

Visitors entering the *Northern Shores* area move up a wide walkway into several spacious exhibit areas. The areas examined in this study included primarily polar bears and sea lions. The *Polar Three* area contains three graphics located to the left of visitors moving up the walkway, and set the tone for the overall graphic design. Each is composed of a light-colored background with black-and-white photos. All graphics in the system have three sizes of typeface, with vocabulary set for the sixth-grade level or higher. One of the *Polar Three* graphics is entitled "Polar Ploys." It has

sliding doors that move up and reveal animals in camouflage. The detail on the images of camouflaged animals is somewhat sophisticated for children, even those experienced in television watching.

The "Bear Reproduction" graphic appears as visitors move towards the upper viewing area for the bears and is similar to those above, comprised of text with plain photos. Its distinguishing feature is a life-size model of a tiny bear cub which protrudes from the graphic. Even visitors who do not stop to read the graphic frequently brush the model with their hands as they walk by it.

Both graphics in the *Underwater Viewing* area contain interactive components. "All the White Moves" enables visitors to push buttons to access information. "Cold Comfort" is more complicated, containing an oversized model of translucent polar bear hair fibers accompanied by text at the adult level, along with different fiber densities set at the elementary level, and a three-dimensional model of a bear paw set at the pre-school level.

With the exception of the "Dive" graphic, which also requires that visitors slide windows up to read about successive adaptations to diving, the remaining graphics located in the upper and lower *Sea Lion* areas are simply text and photos in a format consistent with the *Polar Three* area. While the "Dive" graphic attracts young users, the text on adaptations is geared to adult readers.

Evaluation Questions

The overall goal of the evaluation was to review visitors' response to a select group of *Northern Shores* graphics to determine the kinds of graphics that the DZF might want to invest in for future exhibits, and whether improvements were needed for the existing graphics. The following specific evaluation questions were raised:

1. Would the selected graphics differ in their ability to attract visitors?
2. Would the selected graphics hold visitors' attention?
3. Would the selected graphics differ in the kinds of visitors they attract?
4. Are visitors interested in graphics that they can touch and manipulate?

To determine the effectiveness of specific graphic areas, the following evaluation questions were asked:

5. Do visitors who have been "cued" to read selected graphics perform well on question items related to those graphics?
6. Do the selected graphics attract members from at least a third of the groups passing by?

7. Do the selected graphics hold visitors' attention long enough for them to read at least half of the graphic?
8. Are the selected group of graphics being used by visitors of the appropriate age and sex categories?
9. Are the graphics appealing to family groups?

In all, 1,193 groups and 742 individuals participated in the study. Over a six-day period, observational and interview data were gathered on visitors in the *Northern Shores* exhibit.

Section I, below, reports the responses of interview subjects to two survey questions about participatory graphics. Section II presents an overview of the findings from observations of visitors attracted to and reading or using the graphics.

Section I: Responses to Survey Questions

Two of the questions all visitors in the interview sample were asked to respond to were related to their preferences for participatory activities. Fifty-one percent of the sample (N=250) agreed with the statement "I like to make things move on zoo signs by lifting windows and pushing buttons." The older the respondent (all respondents were over 18 years of age) the less likely they were to state that they liked interactive exhibits. The more frequently visitors attended the zoo, the more likely they were to state that they liked to manipulate exhibits.

Forty-seven percent of the sample agreed with the statement "I prefer exhibits where you can touch different parts of the animals." Visitors attending the zoo more frequently were more likely to agree with this statement.

Section II: Findings from Observational Data

Observations of visitors suggest quite clearly that however complex visitors' responses to diverse graphics may be, there are measurable differences between individual signs. Three kinds of data are presented here. Attracting power was gathered on 1193 groups at different locations in *Northern Shores*. Holding power was assessed for each exhibit after observing 398 readers. In addition, the sex and estimated age of the 398 were recorded to examine whether the exhibits differed in who used them.

Attracting power of *Northern Shores* graphics

Overall, "Cold Comfort," "White Moves," and "Dive" had the highest level of attracting power (see Table 1). All three graphics have some interactive component associated with them. The graphics which drew the least portion of visitors to them were "Sea Lions," "Shore Thing," and "Swim-Suited."

Attracting power alone is an insufficient measure of a graphic's success since highly appealing graphics may or may not hold the attention of the visitor after they have been attracted to it. Conversely, once visitors notice a graphic with low appeal, they may still become engaged in it for some length of time.

Holding power of *Northern Shores* graphics

Table 2 shows that the three graphics with the strongest holding power were "Cold Comfort," "Bear Reproduction," and "Shore Thing." The three graphics that performed the most poorly in holding the visitors' attention long enough for them to complete their reading were "Polar Ploys," "Big Chill," and "Swim-Suited." All of these were two-dimensional and positioned along walls in such a way that they seemed part of the architecture.

Who read the *Northern Shores* graphics?

The findings clearly demonstrated that graphics of different types and those with different content material attracted different visitors (see Table 3). Overall, 52% of the users were female. Adults comprised 64% of the users and children estimated to be between 6 and 12 years old comprised 31% of the sample.

"Cold Comfort" was the only graphic that drew adult and school-aged visitors in similar proportions to the overall group (65% adults and 35% children). Adults were overwhelmingly the primary readers of the "Big Chill," "Polar People," "Bear Reproduction," "Sea Lions," and "Shore Thing" graphics. Children clearly made use of the interactive graphics and a greater portion of them were found among users of "Polar Ploys," "White Moves," "Finny Feet," and "Dive," even though the actual content of these graphics was too sophisticated for young children.

There were definite sex differences for some graphics. Males were the dominant readers in the *Polar Three* area. Two-thirds of the readers at the "Bear Reproduction" graphic were female. "A Shore Thing" was read by more adult females. The latter contained a header that read, "If looks could kill... ."

Other Factors Related to Time Spent at *Northern Shores* Graphics

Was the time visitors spent at various graphics related to factors other than the strength or weakness of the graphic itself? Four factors were examined (see Table 4). Animal activity was not important for most graphics, with two exceptions: absent or resting bears were associated with higher amounts of time spent at the "Polar People" graphic, while a quiet sea lion pool was associated with higher times at the "Sea Lions" graphic.

In contrast, low animal activity in the underwater area was associated with a lower use of the underwater graphics.

The most powerful factor found to be related to the time visitors spent at the graphics was the group's behavior toward the reader. Some graphics were more sensitive to how groups influenced their readers than others.

The highest level of group support for graphics users was found at "Cold Comfort" where 44% of the readers were joined by other members of their groups, and "A Shore Thing" where 40% of the readers were joined by their group.

Groups most often separated themselves from visitors trying to read the "Sea Lions" (46%), and those graphics placed along walkway areas were more susceptible to group pressure than those placed in designated areas. Still, other visitors stood their ground while reading "Reproduction" graphics (49%), "White Moves" (48%) and "Dive" (42%). Females tended to persist in reading the "Reproduction" graphic. Children persisted in manipulating the broken spinner in "White Moves" while the rest of the group moved on.

Conclusion and Recommendations

As is the case with most exhibits, the *Northern Shores* graphics selected for evaluation had both strengths and weaknesses.

What kinds of general observations can be gleaned from the findings of this study that could aid the development of graphic systems for future exhibits at the Denver Zoo?

Question 1: Individual graphics do indeed differ in their ability to attract visitors. Those that offered visitors the opportunity for a hands-on experience had the strongest attracting power. However, most of the graphics did well with respect to attracting power. Those parallel to walkway areas or in busy traffic-flow areas suffered the most.

Question 2: The graphics did indeed show differences in their holding power. The presence of hands-on experiences is not a guarantee of holding power. The graphics here that targeted adults did so successfully. Adults in family groups are best targeted, however, when the adult graphic is accompanied by an exhibit component that engages children.

Question 3: Younger adults and frequent visitors are more likely to respond to interactive graphics than are older visitors. There are also sex differences in whether some material appeals to visitors.

Question 4: There is sufficient public interest in hands-on opportunities for the Zoo to make an investment in this type of visitor experience. Whether the interactive exhibits involve sophisticated technology or operate mechanically, it is recommended that future exhibits offer opportunities for this type of learning.

What specific recommendations can be made for the *Northern Shores* graphics?

Question 6: Most of the graphics had a healthy attracting power. The graphics most in need of attention are "The Big Chill," "Polar Ploys," and "Sea Lions." One ambitious solution would be to fold the "Big Chill" and "Polar Ploys" graphics out so that they protrude into the visitor walkway at a slight angle. A less ambitious solution is to experiment with other kinds of subject matter to find something more compelling.

Question 7: The lack of some graphics' holding power is the most serious area requiring the attention of program developers.

Question 8: Many *Northern Shores* graphics were targeting the correct audience. Graphics composed solely of text were read by disproportionately high numbers of adults. However, text and photographs on the manipulative slide panels were too sophisticated for the children who were drawn to it.

Question 9: Graphics do not succeed as well as they could in appealing to family groups—an objective stated in the exhibit's concept plan.

It is recommended that the Zoo give close attention to the attributes of the "Cold Comfort" graphic, which had the highest attracting power, holding power, and was least susceptible to negative social influences. In sum, the most important actions for the Denver Zoological Foundation to take to improve the *Northern Shores* exhibits area would be those which increase the graphics' holding power with close attention to the susceptibility of those graphics to social influences.

Table 1
Observed Attracting Power of
Northern Shores Graphics

Graphic/graphic area	Number of groups observed	Attracting power
<i>The Polar Three Area</i>		
Both directions	214	.19
Left side of walkway only	132	.31
"Bear Reproduction"	147	.30
<i>Underwater Viewing Area</i>		
"All the White Moves"	200	.36
"Cold Comfort"	200	.50
<i>Upper Sea Lion Area</i>		
"Sea Lion," "Lioness"	193	.11
"Shore Thing"		.12
"Finny Feet"	89	.29
<i>Lower Sea Lion Area</i>		
"Dive"	150	.35
"Swim-Suited"		.12

Table 2
The Holding Power of Individual Graphics and
the Median Time Readers Spent Looking at Them

Graphic	Sample N	Holding power	Time in Seconds		
			Low	Medium	High
"Cold Comfort"	49	.57	4	33	109
"Reproduction"	39	.46	3	15	103
"Shore Thing"	43	.41	3	27	100
"Sea Lions"	35	.39	3	21	64
"Polar People"	25	.38	2	15	88
"Dive"	74	.33	2	15	114
"White Moves"	60	.31	4	17	94
"Polar Ploys"	25	.25	2	15	36
"Big Chill"	27	.25	3	10	64
"Swim-Suited"	22	.23	2	8	83
"Finny Feet"	25	...	5	30	189

Table 3
Frequency Distributions Showing
the Sex and Estimated Ages of Visitors
Who Read or Used Graphics, in Percents

Graphic	N	Sex		Estimated Age Groups		
		Female	Male	Adults	Elementary	Preschool
Overall%		.52	.48	.64	.31	.05
Frequency	398	207	191	253	122	23
"Big Chill"	27	.37	.63	.85	.15	--
"Polar Ploys"	25	.28	.72	.44	.52	.04
"People"	25	.36	.64	1.00	--	--
"Reproduction"	39	.66	.33	.85	.12	.03
"White Moves"	60	.43	.57	.48	.43	.09
"Cold Comfort"	49	.51	.49	.65	.35	--
"Sea Lions"	35	.57	.43	.89	.11	--
"Shore Thing"	43	.60	.40	.98	.02	--
"Finny Feet"	25	.32	.68	.24	.56	.20
"Dive"	74	.60	.40	.45	.40	.15
"Swim"	22	.59	.41	.64	.27	.09

Table 4
The Type of Social Influence Readers
Experienced From Their Group While
Trying to Look at Individual Graphics

Graphic	Sample N	Group Behavior Towards Reader		
		Separated	No influence	Joined
All Readers	398 (100)	148 (37)	145 (36)	105 (26)
"Big Chill"	27*	16 (59)	6 (22)	5 (19)
"Polar Ploys"	25*	16 (64)	4 (16)	5 (20)
"People"	25	13 (52)	9 (36)	3 (12)
"Reproduction"	39	13 (33)	19 (49)	7 (18)
"White Moves"	60	17 (28)	29 (48)	14 (23)
"Cold Comfort"	49	13 (27)	14 (29)	22 (44)
"Sea Lions"	35	16 (46)	11 (31)	8 (23)
"Shore Thing"	43	10 (23)	17 (40)	16 (37)
"Finny Feet"	25	10 (40)	7 (28)	8 (32)
"Dive"	74	25 (34)	31 (42)	18 (24)
"Swim"	22	8 (36)	9 (41)	5 (23)

*Extreme caution must be taken in interpreting percents, due to low sample sizes