

# Behavioral Response to a Novel “X” Shape Target Stimuli in a Harbor Seal

## A.S. Leaflet R2868

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### Summary and Implications

The objective of this study was to provide an environmental enrichment device (shape target) to determine if it improved the Harbor Seal’s visibility in the underwater viewing windows when housed at the Blank Park Zoo. One male harbor seal (*Phoca vitulina*) 3-years of age weighing 39 kg was used. Testing occurred Saturday through Tuesday over 6 consecutive weeks between 1300 and 1330 h. Live observations were collected continuously by one observer. Latency, frequency, and duration were measured. All data is presented descriptively. During baseline the Seal had no interest in the window. Upon presenting the “X” target, he approached quickly and interacted well. However by week 5, the seal’s interest to approach took longer but once the seal targeted he spent more time interacting with the device. Within the context of this study, the use of novel target enrichment for the seal showed promise in causing the seal to be more active towards the target and he was more visible in the underwater viewing windows.

### Introduction

Housing animals in a captive environment has many challenges. When natural behavior such as food acquisition is altered, it could result in abnormal behavioral changes. For example, animals may display stereotypic behaviors and/or increased lethargy. Therefore, providing differing stimuli that interests the animal may redirect these abnormal and unwanted behaviors. According to the Yerkes-Dobson Law, animals seek optimum level of arousal so they are not too bored or stressed. In turn their behaviors are more typical for that species and performance is optimal. One tool that can be incorporated into the zoological enclosure is environmental enrichment. However, environmental enrichment devices must be biologically relevant to the species. Before exposing an animal to environmental enrichment, it is useful to understand their behavioral repertoire. Harbor Seals (*Phoca vitulina*) swim approximately 85% of their active time budget, and this swimming is to locate and consume food. It has been

reported in captive Harbor Seals that when their foraging behaviors are reduced that they increase stereotypically swimming patterns which consist of swimming in a pattern, decreasing the public’s visibility of the seal. Therefore, if a target environmental enrichment could reduce stereotypical swimming patterns it may (1) improve the well-being of the seal and (2) provide a rewarding experience for the zoo visitors. Therefore, the objective of this study was to provide an environmental enrichment device (shape target) to determine if it improved the Harbor Seal’s visibility in the underwater viewing windows when housed at the Blank Park Zoo.

### Materials and Methods

The protocol was approved by the Marine Mammal Team, the Animal Curator the Director of animal care and conservation at Blank Park Zoo. The study was conducted from June to July, 2013 as part of a summer internship program.

**Animals and housing:** One male harbor seal (*Phoca vitulina*) 3-years of age weighing 39 kg was used. The seal was housed in an outdoor enclosure of 634 m<sup>2</sup> in area.

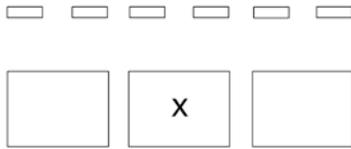


**Figure 1. Schematic of the Harbor Seal enclosure at the Blank Park Zoo**

The pool area was 24.4 m wide and 1.83 m deep. The 3 underwater viewing windows were 1.5 m x 1.3 m with 0.75 m between each window. The seal was checked in the morning and fed three times a day (900, 1130 and 1530 respectively) a diet of capelin and herring (2.7 kg) daily. The zoo was open to the general public from 0900 to 1700.

**Novel Object Test:** Testing occurred Saturday through Tuesday over 6 consecutive weeks between 1300 and 1330 h. Week 0 was defined as baseline where the “green X” target was not presented to the seal, and weeks 1 through 5 the seal visually saw the “X” target. The target was made of foam board (25.4 cm height x 24 cm wide) and it was placed

in the center of the middle underwater viewing window (Figure 2). The “X” target was left in this location on the viewing window for the 30-minute testing period and then was removed.

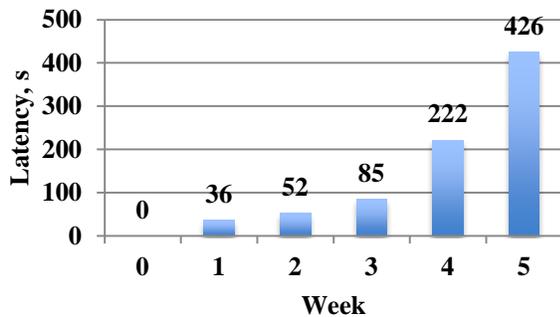


**Figure 2. Dimensions of the viewing window to the Harbor Seal enclosure and placement of the target object.**

**Measures:** Live observations were collected continuously by one observer. During the novel object test the observer was located behind the “X” target shape. Data was collected on latency, frequency, and duration to touch the glass where the “X” target was located on the window. Touch was defined as when the Harbor Seal actively stopped swimming at the window and targeted onto the shape by touching his nose against the shape target. Latency refers to the time to Seal’s first target. Frequency is the total number of targets, and duration is the total length of time Seal touches “X” target during testing period. Data will be averaged by week and presented descriptively.

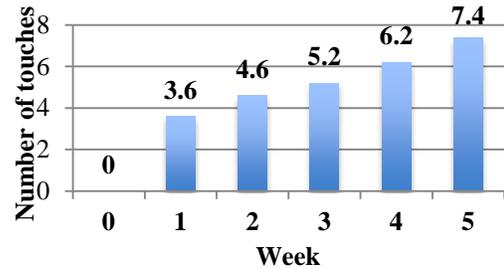
**Results and Discussion**

During the baseline week when the target was not present, the seal did not show interest in the window. In the first week, the seal’s time to first approach was 36 seconds. For the next two weeks when the “X” target was present he approached the X target within 85 seconds. However, by week 4, it took him an additional 137 sec before first latency to touch and by week 5 this week 5 this had increased again 4 fold (Figure 3).



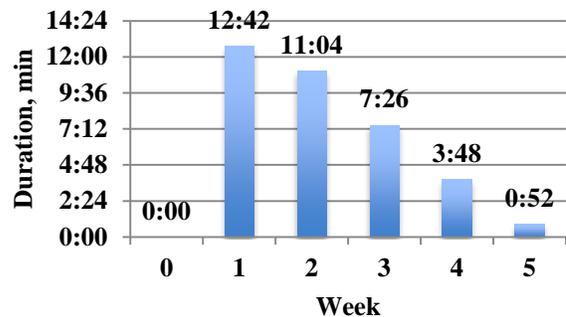
**Figure 3. Latency in seconds for the Harbor Seal to make first contact with the glass where the “X” target environmental enrichment was placed over the study.**

In the baseline week, the seal did not interact with the window. The first week that the “X” target was presented, the seal began targeting and interacting with the shape at a low frequency (~3 times over a 30-minute session) but over the subsequent weeks this increased 4 fold by week 5 (Figure 4).



**Figure 4. Total number of target touches (frequency) onto the glass where the “X” target for the Harbor Seal environmental enrichment was placed over the study.**

The duration of touches increased 12 fold from baseline to week one, indicating an interest in the target. However, over the remainder of the study, the duration of touches decreased 5 minutes by week 3 and continued to decline over weeks 4 and 5 (Figure 5).



**Figure 5. Total duration in min of target touches for the Harbor Seal to make contact with the glass where the “X” target environmental enrichment was placed over the study.**

In conclusion, during baseline the seal had no interest in the window. Upon presenting the “X” target, he approached quickly and interacted well. However by week 5, the seal’s interest to approach took longer but once the seal targeted he spent more time interacting with the device. Within the context of this study, the use of novel target enrichment for the seal showed promise in causing the seal to be more active towards the target and he was more visible in the underwater viewing windows.