

# Independent Study 490H: The Effects of Environmental Enrichment during the Holding Period of Shelter Dogs on Rate of Adoption

## A.S. Leaflet R2781

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### Summary and Implications

The objective of this study was to determine the effects of providing dogs with environmental enrichment (EE) during the holding period on stereotypic behavior and if providing EE reduced the time to adoption. A total of 14 large dogs were selected for data analysis as they meet the following study inclusion criteria of being observed for 4 consecutive days. Dogs were assigned to one of three treatment groups: TRT 1: **Control no toy** (n=6), TRT 2; **Empty Kong** (n=3), TRT 3; **Kong** stuffed with kibble and peanut butter (n=5). Treatments were provided at the beginning of each day's observation period. Dogs resume to normal shelter care after D<sup>-1</sup> or once moving to the adoption area. Dog postures and behavior were observed every 3 mins using live scan sample for 2-h (1500 and 1700 h). A baseline observation for each dog was established on D<sup>-4</sup> prior to the introduction of treatments. Treatment observations were recorded on D<sup>-3</sup>, D<sup>-2</sup>, and D<sup>-1</sup>. Results show the dogs were mainly inactive. Dogs that were provided with enrichment were less vocal than the control group. Toy interaction was overall low, as were definite instances of stereotypical behavior. Eight dogs moved onto adoption and were typically adopted between 1 to 2 days regardless of treatment. The sample size was too small to make conclusions regarding if the use of an EE device reduced the number of days dogs were available for adoption or instances of stereotypies.

### Introduction

It has been reported that keeping animals in small, barren environments can result in stereotypic behaviors: these are repetitive behaviors that lack any obvious purpose to the animal performing them. Stereotypic behaviors are thought to be a coping mechanism for frustration and stress and may include benign- pacing and circling, to the more dangerous, self-mutilation. The instances of these behaviors are often exaggerated in an animal shelter environment due to typically barren housing conditions and increased stress levels. Potential adopters are unlikely to choose a shelter dog that seems to have behavioral problems. This could

result in (1) the dog being held at the shelter for longer or (2) euthanasia. Environmental enrichment (EE) may limit stress and reduce stereotypic behaviors. EE can be defined as an improvement to the biological functioning of captive animals resulting from modifications to their environment. Good EE is thought to reduce stereotypies by reducing frustration and stress or by allowing the choice for a more preferred behavior. Typical EE in an animal shelter includes the provision of a toy(s) to an animal. Several studies suggest that providing toys as enrichment lowers the instances of stereotypic behaviors. Provision of EE can take place during several periods of the animals' stay, including the initial holding period and/or at the time before a dog becomes available for adoption. The objective of this study was to determine the effects of providing dogs with environmental enrichment during the holding period on stereotypic behavior and if providing EE reduced the time to adoption.

### Materials and Methods

The protocol for this experiment was approved by the Iowa State University Institutional Animal Care and Use Committee (7-11-7178-K). The experiment was conducted January through March 2012.

**Animal details:** This study observed 46 large transfer and stray dogs of mixed sex and age at the Animal Rescue League in Des Moines, IA (ARL-Iowa). Large dogs were defined as any dog that weighed ~22+ kg. Transfer dogs were defined as those caught by animal control and brought to the shelter whereas stray dogs were those found by the public and brought into the shelter. A total of 14 dogs were selected for data analysis as they meet the following study inclusion criteria of being observed for 4 consecutive d.

**Housing:** All dogs were individually housed in stray hold room 1 or 2, containing 23 and 27 kennels, respectively. The kennels were a guillotine style with 3 length x 1.2 width x 1.8 height m in dimensions. The long sides were plastic and both short end had metal bars spaced ~2.8 cm apart. Dogs were fed once per day and have *ad libitum* access to water. Food and water bowls were the only items in the kennel.

**Treatments:** Dogs were assigned to one of three treatment groups: TRT 1: **Control no toy** (n=6), TRT 2; **Empty Kong** (n=3), TRT 3; **Kong** stuffed with kibble and peanut butter (n=5). Treatments were provided at the beginning of each day's observation period. Dogs resumed to normal shelter care after D<sup>-1</sup> or once moving to the adoption area.

**Observations and Measures:** Dog postures and behaviors were observed every 3 mins using live scan sample for 2-h (1500 and 1700 h). A baseline observation for each dog was established on D<sup>-4</sup> prior to the introduction of treatments. Treatment observations were recorded on D<sup>-3</sup>, D<sup>-2</sup>, and D<sup>-1</sup> (Table One). Time between moving from the holding area to adoption area and adoption date were also collected. Results will be presented descriptively.

**Table 1. Ethogram for dog behaviors.**

Measure	Defined
Active	Summation of <i>standing</i> : in an upright position with at least 3 paws on the ground, <i>jumping</i> : back paws on the ground and front paws not or all 4 paws off ground, and <i>walking</i> : moving in a 4-beat pace
Inactive	Summation of <i>sitting</i> : hind end and at least 3 paws on the ground, <i>laying</i> : majority of the body is touching the ground, and <i>bowing</i> : forearms touching the ground with the hind legs straight
Vactive	<i>Vocalization</i> : barking, whimpering, growling, or any other vocal sound made by the dog, while performing one of the active behaviors
Vinactive	<i>Vocalization</i> while performing one of the inactive behaviors
Tactive	Dog is interacting with EE toy while performing one of the active behaviors
Tinactive	Dog is interacting with toy while performing one of the inactive behaviors
Eat/Drink	Head in food bowl or drinking water
Other	Any behavior that does not fit into another category; includes stereotypical behaviors
Out of Sight	Dog is outside of its kennel or on the other side of a closed guillotine door during routine kennel cleaning

### Results and Discussion

Inactive behaviors decreased on D<sup>-3</sup> and returned to baseline levels on D<sup>-2</sup> and D<sup>-1</sup>. Dogs engaged in more inactive postures compared to all other categories (active postures showed an inverse relationship to inactive). Tactive was highest on D<sup>-3</sup> (first day of enrichment) but returned back to baseline levels for the remainder of the study. Overall time spent interacting with the toys were low. The first day of observation out of sight was lower than the other 3-d (Table 2).

Dogs with the filled Kong toy were more active than dogs that did not have a toy. Toy use, although different between treatments, was still very low (less than 2% of their

behavioral time budget). Previous work with dogs in shelters have cited that toy interaction was very low (< 8% of their overall time budget). Dogs without a toy engaged in more vocalization than the enriched groups. Out of sight was higher for dogs that had a toy compared to controls. For all other postures and behaviors there were no real differences (Table 3). Activity was lower and inactivity higher from hour one to two. Out of sight was lower for the second hour (cleaning by staff occurred during the first hour) but for all other postures and behaviors there were no differences (Table 4).

**Table 4. Means for behavior of dogs over the two hours of observation at the ARL-Iowa.**

	Hour	
	One	Two
<b>Measures, %</b>		
Active	46.28	27.62
Inactive	33.25	65.21
Vactive	2.47	1.75
Vinactive	0.07	0.16
Tactive	0.14	0.02
Tinactive	1.48	0.32
Eat/drink	0.61	0.35
Other	1.65	1.39
Out of Sight	14.05	2.64
<b>Total</b>	<b>100</b>	<b>100</b>

Eight of the 14 dogs moved into adoption. The rate of adoption was between 1 and 2 d regardless of treatment. The level of stereotypical behaviors for these dogs was very low (only 1 out of the 14 showed definite signs). The sample size was too small to make conclusions regarding if the use of an EE device reduced the number of days dogs were available for adoption or instances of stereotypies. The use of the toy seemed to decline over the days of study and overall toy use was low. Future studies should assess (1) time of day the EE devices are offered (2) the type of EE devices provided (3) use of an empty Kong with a bone and (4) film dog postures and behaviors so that the human observer is not a distraction.

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**Table 2. Means for behavior of dogs over four consecutive days at the ARL-Iowa.**

	Day			
	Baseline	D <sup>-3</sup>	D <sup>-2</sup>	D <sup>-1</sup>
<b><u>Measures, %</u></b>				
Active	41.82	39.67	37.71	28.60
Inactive	51.37	39.59	46.37	59.59
Vactive	2.74	1.66	2.74	1.31
Vinactive	0.00	0.00	0.33	0.16
Tactive	0.00	4.36	0.10	0.10
Tinactive	0.00	1.48	0.77	1.30
Eat/drink	0.17	1.06	0.05	0.17
Other	1.09	1.92	1.03	2.10
Out of Sight	2.81	10.26	11.12	6.67
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Table 3. Means for behavior of dogs when given an enrichment device at the ARL-Iowa.**

	Treatment		
	Control	Empty Kong	Filled Kong
<b><u>Measures, %</u></b>			
Active	31.77	35.83	43.25
Inactive	59.48	46.49	41.75
Vactive	5.00	0.21	1.13
Vinactive	0.21	0.00	0.13
Tactive	0.00	0.07	0.17
Tinactive	0.00	0.83	1.88
Eat/drink	0.52	0.42	0.50
Other	1.14	2.29	1.13
Out of Sight	1.88	13.86	10.06
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>