



Stop Guessing, Start Building: W.I.S.E. Enrichment Strategy



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About Me

- Senior Animal Care Specialist - Philadelphia Zoo, United States
- Animal Behavior Management Alliance (ABMA)
 - Board Member 2021-2024
 - Executive Board Member 2024-Present
 - Global Connections Committee Co-Chair
 - Host and Creator of “Animal Behavior Conversations: The Podcast of the ABMA”
- General Member of AZA Behavior Scientific Advisory Group - Enrichment Working Group



Animal Behavior Management Alliance

The Animal Behavior Management Alliance (ABMA) is a not-for-profit 501(c)(3) corporation with a membership comprised of animal care professionals and other individuals interested in enhancing animal care through training and enrichment.

Professional Resources

- Online Member Community
- Video recordings of past conference presentations
- Glossary of Terms
- Quarterly Publications



● ABMA Conferences

2026 Virtual Mid-Year Conference

- November 4-5, 2026
- Keynote Speaker: Dr. Susan Friedman

2027 Annual Conference in Gold Coast, Australia

- March 10-16, 2027
- Three Site Visits and pre-conference trip to Australia Zoo
- Keynote Speakers: Ken Ramirez, Jim Mackie, Dr. Christy Alligood



ABMA Podcast

“Animal Behavior Conversations: The Podcast of the ABMA”



Over 80 episodes focusing on the science of behavior change and animal welfare, leadership in animal care professional settings, and other animal care topics

Releases every other week on Fridays, available on all major platforms

<https://anchor.fm/theabmapodcast>

ABMA Sliding Scale Membership

Region A: Income per capita USA and 75-100% of USA	Lifetime Professional Member	Professional Member (1 year)	Emeritus Member (1 year)	Active Member (1 year)	Associate Member (1 year)
	\$450	\$55	\$50	\$50	\$45
American Samoa, Andorra, Australia, Bermuda, Bouvet Island, British Indian Ocean Territory, Cayman Islands, Christmas Island, Cocos (Keeling) Islands, Cook Islands, Denmark, Falkland Islands (Malvinas), Faroe Islands, Metropolitan France, French Southern Territories, Guadeloupe, Heard and McDonald Islands, Iceland, Ireland, Isle of Man, Liechtenstein, Luxembourg, Martinique, Monaco, Netherlands, Netherlands Antilles, Niue, Norfolk Island, Norway, Pitcairn, Qatar, Reunion, Singapore, South Georgia and the South Sandwich Islands, St. Helena, St. Pierre and Miquelon, Svalbard and Jan Mayen Islands, Swaziland, Sweden, Switzerland, United States, United States minor outlying islands, Wallis and Futuna Islands.					
Region B: Income per capita 50-74% of USA (62%)	Lifetime Professional Member	Professional Member (1 year)	Emeritus Member (1 year)	Active Member (1 year)	Associate Member (1 year)
	\$279	\$35	\$31	\$31	\$28
Austria, Belgium, Canada, Finland, Germany, Gibraltar, Holy See, Vatican City State, Hong Kong, Israel, Italy, Japan, Kuwait, Macau, New Zealand, San Marino, United Arab Emirates, United Kingdom.					
Region C: Income per capita 25-49% of USA (37%)	Lifetime Professional Member	Professional Member (1 year)	Emeritus Member (1 year)	Active Member (1 year)	Associate Member (1 year)
	\$167	\$21	\$19	\$19	\$17
Aruba, Bahamas, Bahrain, Barbados, Brunei Darussalam, Croatia (local name: Hrvatska), Cuba, Cyprus, Czech Republic, Estonia, Greece, Hungary, Republic of Korea, Latvia, Lithuania, Malta, New Caledonia, Oman, Portugal, Puerto Rico, Saudi Arabia, Slovakia (Slovak Republic), Slovenia, Spain, St. Kitts and Nevis, Turks and Caicos Islands.					
Region D: Income per capita <24% of USA (12%)	Lifetime Professional Member	Professional Member (1 year)	Emeritus Member (1 year)	Active Member (1 year)	Associate Member (1 year)
	\$54	\$7	\$6	\$5	\$5
Afghanistan, Albania, Algeria, Angola, Anguilla, Antarctica, Antigua and Barbuda, Argentina, Armenia, Azerbaijan, Bangladesh, Belarus, Belize, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cabo Verde, Cambodia, Cameroon, Central African Republic, Chad, Chile, China, Colombia, Comoros, Congo, the Democratic Republic of the Congo, Costa Rica, Cote d'Ivoire, Curacao, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Fiji, French Guiana, French Polynesia, Gabon, Gambia, Georgia, Ghana, Greenland, Grenada, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, India, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Democratic People's Republic of Korea, Kosovo, Kyrgyzstan, Lao People's Democratic Republic, Lebanon, Lesotho, Liberia, Libya, Madagascar, Malawi, Malaysia, Maldives, Mali, Marshall Islands, Mauritania, Mauritius, Mayotte, Mexico, Federated States of Micronesia, Republic of Moldova, Mongolia, Montenegro, Montserrat, Morocco, Mozambique, Myanmar, Namibia, Nauru, Nepal, Nicaragua, Niger, Nigeria, North Macedonia, Northern Mariana Islands, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Romania, Russian Federation, Rwanda, Samoa, Sao Tome and Principe, Senegal, Serbia, Seychelles, Sierra Leone, Solomon Islands, Somalia, South Africa, Southern Sudan, Sri Lanka, St. Lucia, St. Vincent and the Grenadines, Sudan, Suriname, Syrian Arab Republic, Taiwan, Tajikistan, United Republic of Tanzania, Thailand, Timor-Leste, Togo, Tokelau, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, Uruguay, Vanuatu, Venezuela, Vietnam, Virgin Islands (British), Virgin Islands (U.S.), West Bank and Gaza, Western Sahara, Yemen, Yugoslavia, Zambia, Zimbabwe.					

Presentation Road Map

1. Overview of Enrichment & Changing Our Perspective
2. New Frontiers of Enrichment
 - a. The Experience Approach
 - b. The Free Operant Approach
3. **W.I.S.E.** Enrichment Strategy
4. Example and Walk Through of **W.I.S.E** Enrichment Workbook

Environmental Enrichment

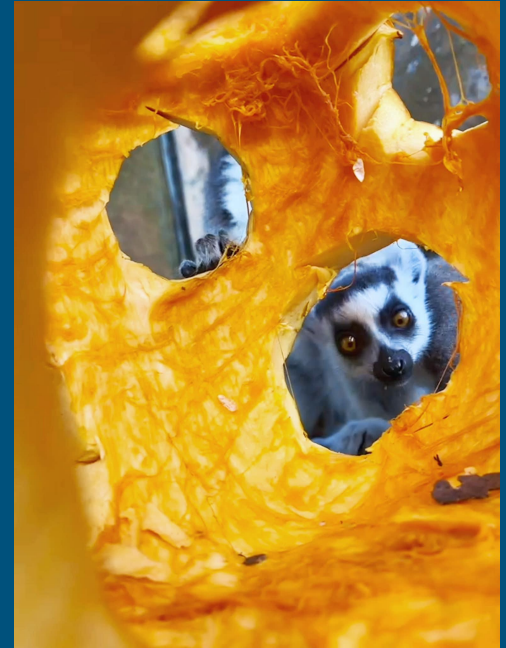
A **dynamic process** for enhancing animal **environments** within the context of the animals' **behavioral biology** and natural history. Environmental changes are made to ensure an animal's psychological and physiological needs are met with the goal of increasing the animal's behavioral choice and **drawing out their species-appropriate behaviors**, thus enhancing animal welfare.

- Enrichment is not a “Thing”, it is a goal-oriented process
- Ask WHY we are doing something before



Benefits of Enrichment

- Induce physical activity/exercise, improved body condition
- Increase habitat utilization
- Health benefits for teeth/gums/claws
- Physical therapy for injured and/or geriatric
- Cognitive stimulation
- Increased resilience to change/novelty
 - Prepared for anything, positively cope
- Improved guest satisfaction, increased empathy



Goals to Increase

- Behavioral diversity
- Duration of fundamental behaviors
- Animal fitness and body condition
- Behavioral choices
- Control of those choices
- Purposeful lives for animals
 - Don't be the giver, be the facilitator



Goals to Decrease

- Stereotypic behavior
 - It's not “unpurposeful”, there is a reason the animal is expending energy
- Anticipatory behavior
- Self-injury

Changing Our Perspective

- Discrete Trial Training (DTT)

- Trainer led interactions with planned contingencies
 - Antecedents, Behavior, Consequence
- Restricted by trainers' decisions
- Trainers provide the cues, set the behavior criterion, deliver reinforcers, and control the number of repetitions that are possible.

- Most “traditional” enrichment falls into the same category

- The animals are left “waiting” for us



The New Frontiers of Enrichment

- Experience Approach
 - “The Animals are Looking”
 - How do we provide environments that create signals for multiple behaviors to occur?
- Free Operant Approach
 - “The Animals are Waiting”
 - How do we provide environments where signals do NOT have to come from us?

Experience Approach

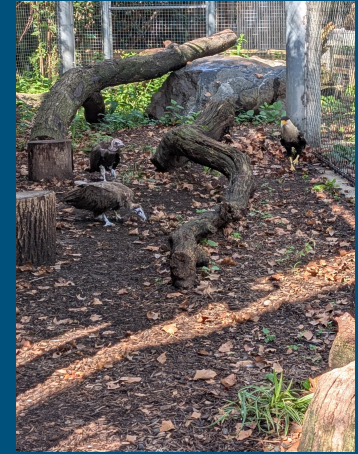
- Aim to mimic natural signals that set the stage for specific behaviors
 - Create the antecedents for the goal enrichment behavior
 - Multifaceted and can last over a period of time
 - Animals may need to learn what signals mean over time
-
- Experiences elicit multiple behaviors



Example Experiences

- Prey Emergence Event after a Storm
 - In nature, the ending of a storm is a signal that prey will emerge and hunting can begin.
 - Lower lighting
 - Play storm noises
 - Create wind with a fan
 - Rainfall with sprinkler or hose
 - Animal shelters in place
 - After “storm”, give prey
 - Overtime, animal will begin to associate a storm with access to food
- Behaviors: Hunting, Sheltering, Self-Maintenance

Example Experiences



- Scavenger Carcass Event

- In nature, the presence of prey and predators signal opportunities for food
 - Prey fecal matter
 - Predator fur
 - Spread blood in habitat moving towards the carcass
 - Visual but not physical access to carcass
 - Mimics a scavenger waiting for a predator to finish with kill
 - Physical access to carcass
- Overtime, animals will begin to associate fecal matter and fur with access to a carcass

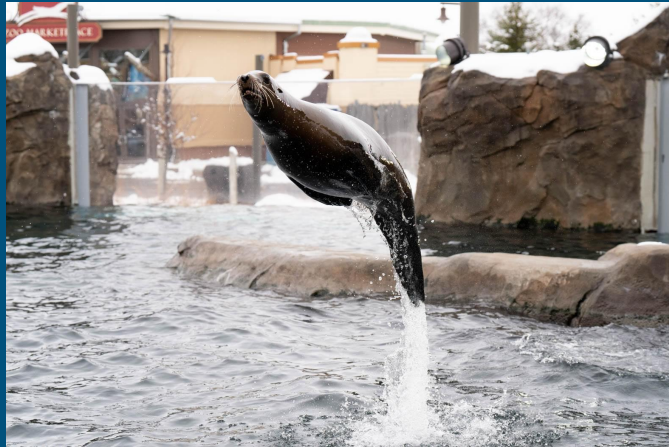
- Behaviors: Social Eating, Social Basking, Object Manipulation

The New Frontiers of Enrichment

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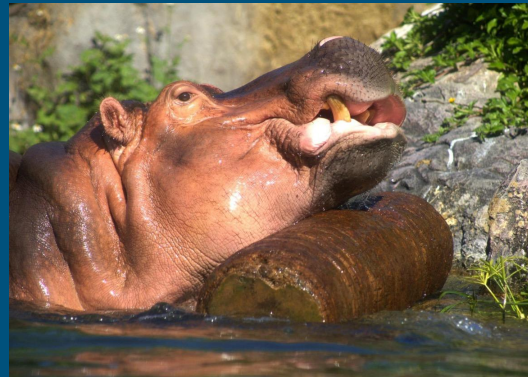
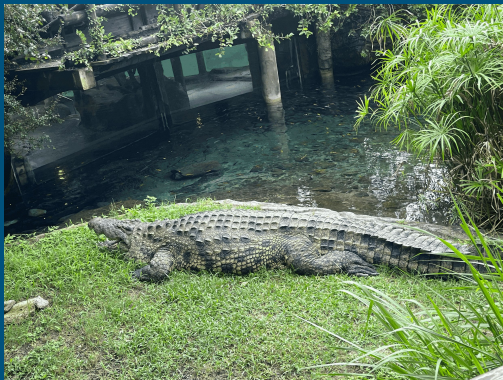
Free Operant Behavior

- **Operant** - animals operate (act) on the environment and the outcomes of their actions select for future behaviors (outcomes)
- **Free** - the animal is operating in conditions where they are free to perform any response at any time.



Free Operant Behavior

- **Free-operant behavior** - Occurs without any agent (ex person) delivered cue and consequences
 - Ex) basking, grooming, and interacting with conspecifics
- Naturally occurring consequences shape and maintain their behavior



Lindsley (1996) Four Free Operant Freedoms

- 1. The freedom to present stimuli - start, stop, start over and skip an activity
 - Choose how to pursue
- 2. The freedom to repeat responses many times to each “signal”
 - Choose how often
- 3. The freedom to form responses - to intentionally select and vary the most comfortable response to overcome boredom or fatigue
 - Choose what reinforcers to pursue
- 4. The freedom to speed, or slow, responses (self-pace)
 - Choose for how long

The Keys to Freeing the Operant

- **Satiation** - Reduction in the reinforcing effect of a stimulus after repeated presentations or prolonged periods of continued access
- **Depletion** - The time in which a resource is completely consumed

The Keys to Freeing the Operant

- **Dosage** - How frequently or how much of a specific resource is made available at any given time
 - Is there enough of a resource so that it sets the stage for behavior to occur?



Giraffe Foraging Case Study

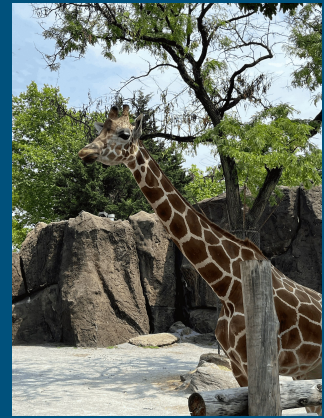
Rick Hester,
Cheyenne Mountain Zoo & Behavior Works

“The Animals are Waiting: A Free-Operant Approach to Environmental Enrichment to Support Optimal Welfare” Presentation at 2024 ABMA Annual Conference

“Freeing Up the Operant” by Rick Hester and Dr. Susan Friedman in June 2024
Publication of AZA “Connect”

Giraffe Foraging Case Study

- Stereotypic Behaviors of Licking
 - Lacking a meaningful interaction with environment
- Depleting browse quickly, in order to keep behavior going would need 5,000 lbs of browse!?
- Look to Nature: Giraffes use lips and tongue to get small bites of leaves, not large chunks



Rick Hester,
Cheyenne Mountain Zoo & Behavior Works

“Freeing” the Operant

- Put leaves in a mesh container so had to use tongue and lips to eat individual leaves
- Saw giraffes repeat the behavior because resource wasn't depleted, didn't have to worry about a keeper to provide resource



Rick Hester,
Cheyenne Mountain Zoo & Behavior Works

Spotted Hyena Sleeping Case Study

- Abnormal Repetitive Behavior during zoo hours
- Ethogram data to complete an activity budget
- Look to Nature: Compare activity budget of individuals to activity budget of hyenas in nature
 - During the day, hyenas were only sleeping 50% of the day compared to 70% naturally



“Freeing” the Operant

- Filled cave with two bales of hay to mimic burrowing
- Saw the abnormal repetitive behavior practically extinguish and hyena sleeping during the day rose to 65%



W
I
S
E

Watch

Identify

Strategize

Experiment

W.I.S.E. Enrichment Strategy

- Output-Based
 - What are the fundamental behaviors the animal exhibits in their natural environment?
 - Describes a **specific** behavioral outcome to the enrichment strategy
 - Goes beyond just “foraging” as the goal. Specifically identifies what behavior is being performed.

Focus Areas

1. Environmental Change
2. Multifaceted Experience
3. Item Based



W.I.S.E. Enrichment Activity

1. Choose Target Animal
2. Research Natural History

Watch

- Watch a video(s) of the animal in their natural environment
- Record all of the behaviors that you observe
 - Foraging, Resting, Hunting, Basking, Digging, etc.



Identify

- Identify target behavior
- What are the fundamental behaviors of “identified behavior”
 - What is the function?
 - Clearly defined topography, what does it look like?
 - What are the eliciting stimuli?
 - What are the consequences?



Strategize

- Brainstorm enrichment strategies to elicit target behaviors
 - **NO** limitations: cost, materials, practicality, skill set, approvals, etc.
 - Don't think about why you can't, think about why you can
- “If you think small, your world will be small. If you think big, your world will be big.”
 - -Paulo Coelho



Experiment

- Take your idea from the previous step and now think about how we can do this practically.
 - What was the goal of the enrichment strategy?
 - What part(s) of the idea will work for us?
- What area(s) can we focus on?
 - Environmental Change
 - Multifacet Experience
 - Item Based
- What is our new Actionable Enrichment Strategy?

W.I.S.E. Enrichment Activity

[W.I.S.E. Enrichment Workbook](#)

- This workbook template is available for download

W.I.S.E. Enrichment Activity

1. Chose Target Animal

- Southern Ground Hornbill

2. Research Natural History

- Social birds, spend majority of time on the ground. Diet consists of invertebrates, reptiles, small mammals and birds. Cooperative Breeders.



Watch

- Watch animal in their natural environment
 - Record all of the behaviors that you observe
-
- https://www.youtube.com/watch?v=J_k1x0IIBwc
 - <https://www.youtube.com/watch?v=FjkkHtadGXI>

Watch

- Watch animal in their natural environment
- Record all of the behaviors that you observe
 - Foraging
 - Locomoting & Scanning: Walking with eyes looking at the ground, scanning for insects
 - Beak Manipulation:
 - Repeatedly pecking at the ground, moving large grasses with beak
 - Picks up small items with the end of beak, throws in the air and catches
 - Grabs item in beak and vigorously shakes back and forth
 - Hammering: With beak closed, repeatedly hits tortoise

Watch

A	B	C
Watch	Links to Videos of Target Animal	 Ground Hornbills Foraging - YouTube
		 GROUND HORNBILL Cracking A TORTOISE Like a Nut 🐢 - YouTube
	Record All Observed Behaviors	Foraging - Locomotion and Scanning
		Foraging - Beak Manipulation
		Hammering

Identify

- Identify target behavior
 - Locomoting & Scanning
- What are the fundamental behaviors of “identified behavior”
 - What is the function?
 - Traveling to find food
 - Clearly defined topography
 - Walking with eyes looking at the ground, scanning for insects



Identify

- What are the fundamental behaviors of “identified behavior”
 - What are the eliciting stimuli?
 - Hunger
 - Dispersed food source
 - Availability of food source
 - Past reinforcement history of success with foraging technique
 - What are the consequences
 - Behavior is reinforced by finding and successfully eating food
 - Behavior continues by finding and NOT successfully eating food

Identify

Identify

Identify	Target Behavior	Locomotion and Scanning
	What is the function?	Traveling to find food
	Topography (What does it look like?)	Walking with eyes looking at the ground, scanning for insects
	What are the eliciting stimuli? (Why does it occur?)	Hunger
		Dispersed food source
		Availability of food source
		Past reinforcement history of success with foraging technique
	What are the consequences? (What happens after the behavior?)	Behavior is reinforced by finding and successfully eating food
		Behavior continues by finding and not successfully eating food

Strategize

- Brainstorm enrichment strategies to elicit target behaviors
 - **NO** limitations: cost, materials, practicality, skill set, approvals, etc.
 - Don't think about why you can't, think about why you can



LASERS!!!!

Strategize

- Set up motion sensor lasers and automated feeders throughout the habitat. Underneath the automated feeders we will plant tall grasses. When the hornbills walk to certain areas of the habitat, it will trigger the motion sensors to release crickets from an automated feeder into the tall grasses.

Strategize

Strategize

Brainstorm Idea

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Experiment

- Take your idea from the previous step and now think about how we can do this practically.
 - What was the goal of the enrichment strategy?
 - Provide a free operant foraging experience that encourages travel throughout habitat and fine motor beak manipulation
 - What part(s) of the idea will work for us?
 - Setting up feeders in multiple locations around the habitat.
- What area(s) can we focus on?
 - Environmental Change
 - Multifacet Experience
 - Item Based
- What is our new Actionable Enrichment Strategy?

Experiment

- Action Enrichment Strategy
 - Multiple (at least 5) PVC pipes with an enclosed bottom and an open top will be installed around the habitat. Underneath we will place dead grasses and/or browse. Live crickets will be placed in the PVC pipe. Crickets will have the ability to climb out of the PVC pipe at any time, ideally into the browse underneath. In order to obtain resource, hornbills will have to travel to the 5 different locations to search for food.

Experiment

Experiment

Experiment	What was the goal of the enrichment strategy?	Provide a free operant foraging experience that encourages travel throughout the habitat and fine motor beak manipulation.
	What part(s) of the idea will work for us?	Setting up feeders in multiple areas around the habitat
	Can we make this into...	Environmental Change Yes
		Multifacet Experience
	Actionable Enrichment Strategy	Multiple (at least 5) PVC pipes with an enclosed bottom and an open top will be installed around the habitat. Underneath we will place dead grasses and/or browse. Live crickets will be placed in the PVC pipe. Crickets will have the ability to climb out of the PVC pipe at any time, ideally into the browse underneath. In order to obtain resource, hornbills will have to travel to the 5 different locations to search for food.
	What supplies or resources are needed?	PVC and caps
		Dead grasses/browse

Now we can be
more **W.I.S.E.** with
our Enrichment
Strategies



Thank You

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<http://www.theabma.org>



<https://anchor.fm/theabmapodcast>
