

Three orange and yellow patterned snakes, likely ball pythons, are coiled on a grey concrete surface. The snakes have a light pinkish-orange base color with large, irregular yellow and orange spots. They are positioned in a triangular arrangement, with one in the foreground and two behind it. The background is a plain, slightly textured concrete floor with a few scattered dry leaves.

Snakes in Animal-Assisted Interventions? Considerations for practice

Nicole Cousins, MSW, LICSW
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YORK'S WILD KINGDOM
1995



Of All Animals, Why Snakes?

Snakes have several characteristics that can be beneficial for kids (or anyone) with autism spectrum disorder:

- More Predictable Behaviors
- Slow-Moving
- Positive Sensory Input from scales and/or pressure
- Uncomplicated emotional and physical responses

The Human-REPTILE Bond (HRB???)

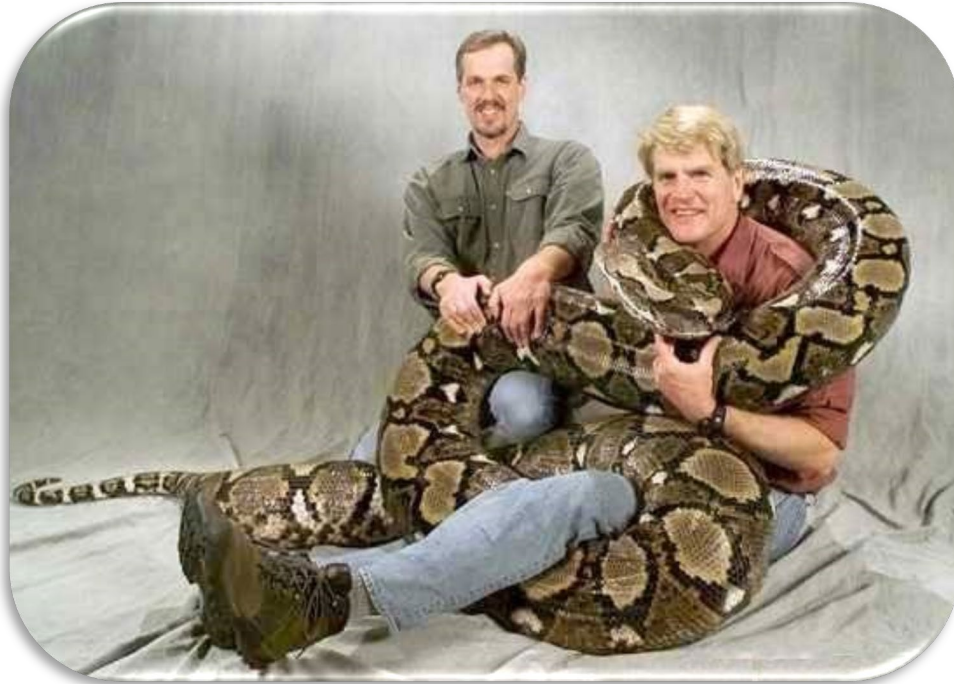


“Pet reptile ownership is driven by the same underlying feelings of empathy, duty of care, attachment, and companionship that drive traditional pet ownership.” - Azevedo et al. (2022)

“Snakes do not require social interaction for their mental health, but regular handling helps the snake stay tame and can be a good opportunity for exercise” - Healey (2002)

“We also found [...]evidence for the capacity of reptiles to feel pleasure, emotion, and anxiety. [...] This has implications for how reptiles are treated in captivity, [...]and consumer behaviour change programmes.” -Lambert (2019)

In Case You Didn't Know: Snakes come in a **WIDE** variety of sizes!



The longest scientifically recorded reticulated python was nearly 23 ft long, but larger ones likely exist

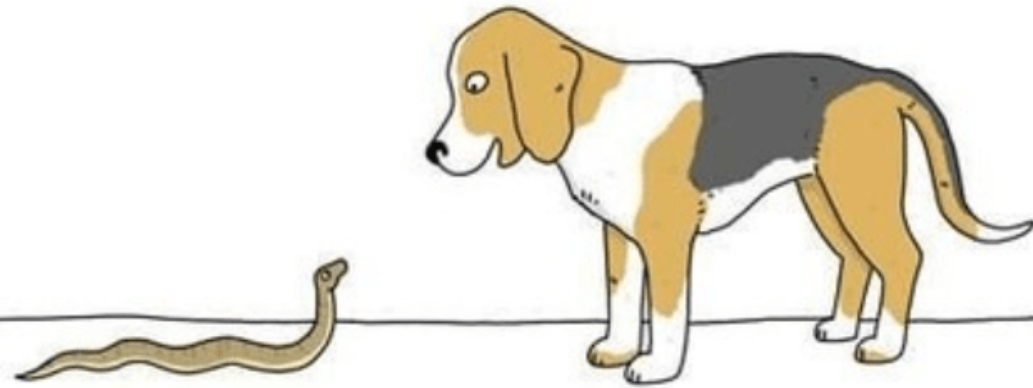


Green anacondas can grow as long as 30ft and weigh up to 550lbs

Meanwhile, the Barbados thread snake only grows to 4 inches in length!



theycantalk.com



hah, this tail has a little face.

The Ball Python!

- The smallest species of African Python.
- Native to West and Central Africa.
- Can grow up to six feet long, but five feet is more common.
- A healthy adult will weight, at maximum, around 5 pounds.
- Imported into the US pet trade since the 70s, but became extremely popular in the 90s. Easy to find captive bred individuals at a low cost (and sometimes even free!).
- Second most popular species of reptile kept in captivity.
- Can live 15-30 years in captivity, but the oldest recorded was 62 as of 2020. She lives at the St Louis Zoo.
- Medium-Bodied.
- Docile.
- Not inclined to bite.
- Semi-arboreal.
- Non-Venomous.



Husbandry



- Solitary Animals. One snake per enclosure!
- An adult needs an enclosure (usually made of glass or PVC) that's at least 4' x 2' x 2', though bigger is always better.
- Younger snakes need smaller enclosures and then are sized up as they grow.
- Snakes need enrichment for psychological health! Branches for climbing, hides, plants (real or artificial).
- Substrate that can hold some moisture without molding.
- Access to a water dish (with fresh water!).
- A temperature gradient of 72-80 degrees Fahrenheit on the cool end to 86-90 degrees Fahrenheit on the warm end (nighttime temperatures can drop to 70-78 degrees).
- Humidity around 55%.
- A light cycle to mimic their circadian rhythm (No red night bulbs!).
- UVB isn't required, but snakes do benefit from UVB (even nocturnal ones like the ball python!).
- Most snakes are carnivorous, as is the ball python, feeding intervals vary, but adults typically eat one prey item (of appropriate size) every two weeks. They should not be handled 24-48 hours before or after feeding so they can digest properly.

Welfare

For Animal Partners

- Husbandry needs promote animal welfare. Poor Husbandry = poor health outcomes = poor intervention outcomes.
- Thermostat and hydrometer to measure enclosure conditions.
- Snakes *need* enrichment in their enclosures.
- Having an established veterinarian who has experience with reptiles is extremely important. Ball pythons are generally very hardy, but can get respiratory infections, bacterial/viral infections, parasites
- Pay attention to behavior! Snakes, in general, are very good at masking pain, illness. Knowing the animals you're working with is exceptionally important, so that unusual behavior is noticed and addressed in a timely manner.
- Captive Bred vs Wild-Caught
- Multiple animals available for interventions
- The animal(s) get to decide if/when they're done (this goes back to behavior)

For Human Participants

- Consent
- Education, Education, Education
- Waiver for guardians to sign regarding appropriate animal interactions/ liability for vet care coverage
- Intervention guided by the client. Don't force animal touch on a client who is still working on comfortability with the snake(s)
- Opportunity to end sessions, if needed. Make external referrals to a different provider, if necessary



Behavior



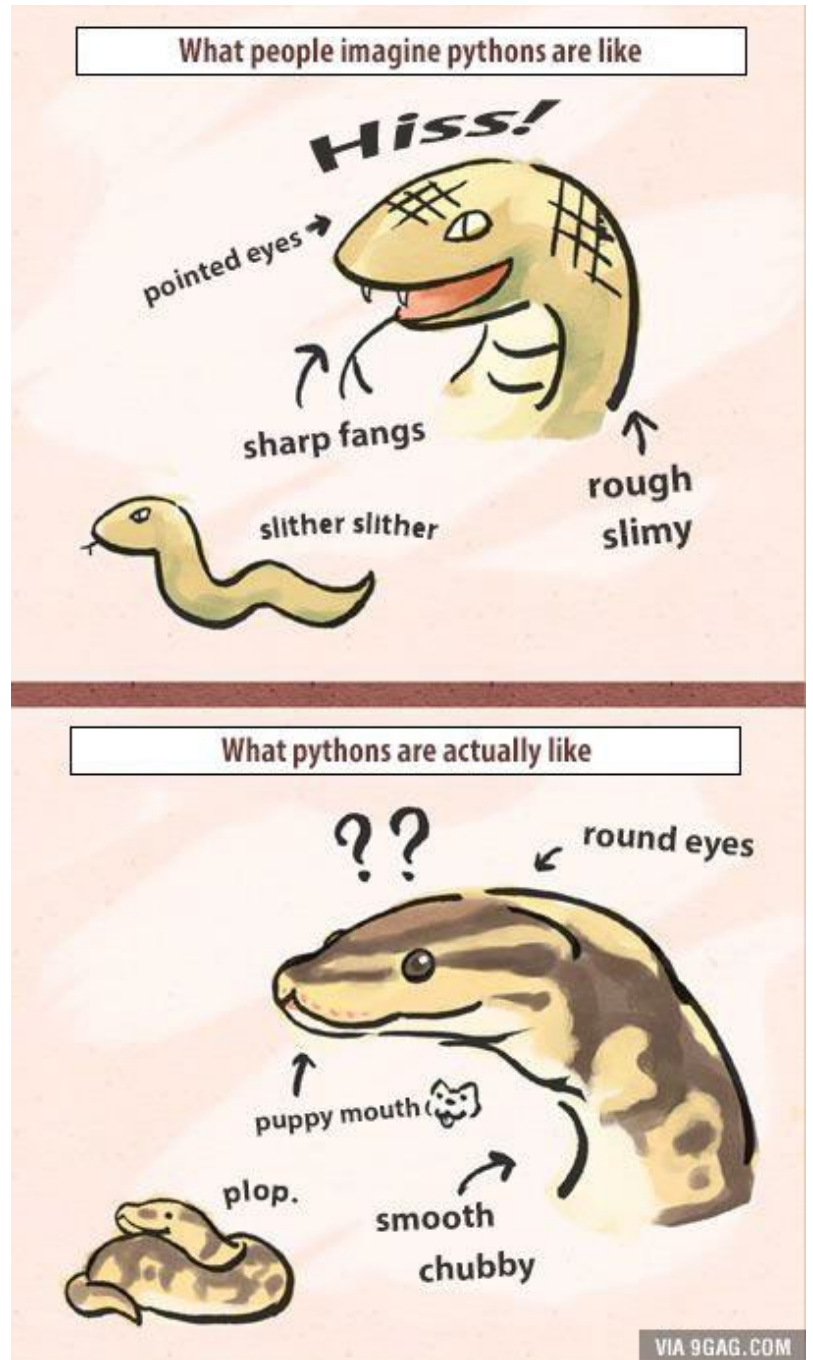
But Can They Be Trained?

- While snake and reptile training look different compared to mammalian training, reptiles can and do get used to handling, can recognize their keepers and when it's time for food and when it's time for handling. This can be achieved by hook training or target training.

- Exotic animals kept in zoos can be trained (through positive reinforcement) to engage in a behavior to allow their care team to provide medical care.



**Get These @#\$!*% Snakes
in My @#\$!*% Animal-
Assisted Interventions**



Some (Tentatively) Promising Data

In 1996, Shalev and Ben-Mordehai conducted a study in which several groups of children were selected:

- Four groups of children with learning and communication problems,
- One group of boys with PDD (pervasive developmental disorder [now ASD]) and ADD [now ADHD],
- A group of boys with “behavior problems”,
- A control group of kindergarten age children (boys and girls) without disabilities (p. 183).

The intervention took place every week or every other week for one hour and included 20-30 minutes of physical interaction with animals (the choices were (dog, chinchillas, parrots, guinea pigs, hamsters, rabbits and snakes) and 30-40 minutes of discussion or video on a given subject of human animal interaction (p. 183).

During the first session, the snakes were introduced for ten minutes and participants were allowed to ask questions about the snakes. This was the only time there was an introduction for the animals (p. 183). Animal interaction activities primarily included touching, holding, or petting the animals (of the choices mentioned previously) (P. 182).

And the Outcome

After at least three exposures to the snakes, 50%-100% of children (depending on the group) wanted to interact with the snakes. Of the children, at least five overcame their initially fearful responses and made contact with the snakes (P. 184-185). When given the choice between a snake, a rabbit, and a dog, 39% of all the children (including the control group) chose snakes (P. 185). Most significant, was the group of children with learning and communication problems, where 47% of the children chose the snake. One third of the PDD/ADD group chose the snake (P. 185).

BUT, there were some (BIG) problems with this study

- Limited sample size
- Limited definitions around behaviors/ disabilities/ the actual education program about the snakes
- Why were only the snakes introduced? Parrots and chinchillas seem like they'd be pretty exotic to most children too
- A bunch of animals mentioned early on, only three to choose from in the end?
- Did we not care about animal and/or client welfare in 1996?
(There is a reference in the literature that states some children “ran out of the room screaming” when introduced to the snakes)





AFP

BRAZIL

PIONEERING
'REPTILE THERAPY'



But We Have Way More Evidence About AAI for ASD in General

The Study: Grigor & Bazgan (2017) explored the impact of Animal Assisted Therapy on children with ASD in a recovery center for ASD with a 6-month-old puppy named Cara.

Looking for: Impacts to development of interaction skills with adults, improvements in social behavior, improvements in emotional self control, improvements to emotional expressiveness, and improvements to recognition and interpretation of emotional expressions

Outcome: The implementation of AAI did seem to lead to measurable development in all areas assessed

The Study: London, Mackenzie, Lovarini, Dickson, and Alvarez-Campos (2020) explored the impact of five sessions of AAI in the Occupational Therapy setting on 17 children with ASD with the support of several trained dogs.

Looking for: Qualitative data to support change elicited by AAI through parent interviews.

Outcome: “The presence of the dog in occupational therapy is valuable for addressing communication, behavioral regulation, and community participation goals. The participants’ reflections on dogs as nonjudgmental, nonverbal communicators supports the notion that a dog’s interaction and responsiveness to humans has therapeutic potential.”

The Study: Ávila-Álvarez et al. (2020) explored the impact of AAI on young children with ASD in Spain via Occupational Therapy with trained dogs.

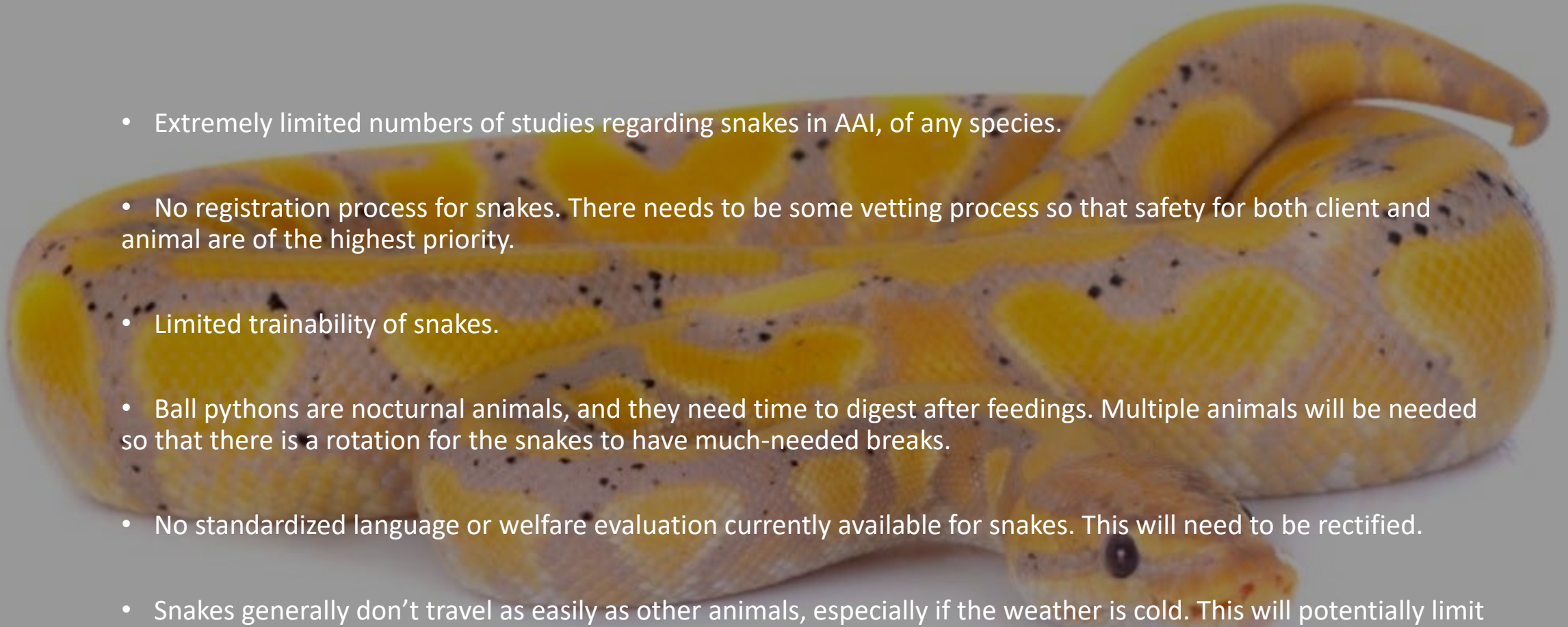
Looking for: “Explor[ing] the feasibility of this intervention at the earliest ages [children aged 30mo-6 years]. The second was to examine the impact of this AAI on the social participation of children with ASD”

Outcome: A significant increase in the frequency of the child's eye, verbal and physical contact with the animal, as well as his/her participation in activities with the dog.

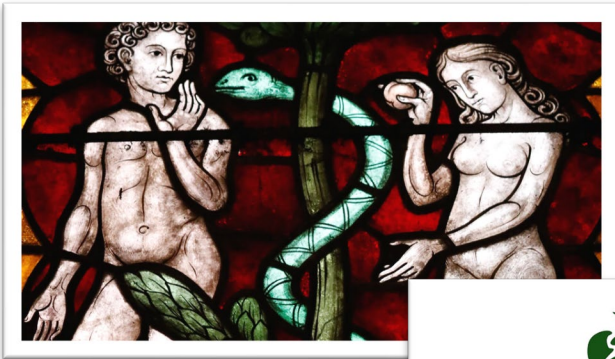


Limitations That Need to Be Addressed

- Extremely limited numbers of studies regarding snakes in AAI, of any species.
- No registration process for snakes. There needs to be some vetting process so that safety for both client and animal are of the highest priority.
- Limited trainability of snakes.
- Ball pythons are nocturnal animals, and they need time to digest after feedings. Multiple animals will be needed so that there is a rotation for the snakes to have much-needed breaks.
- No standardized language or welfare evaluation currently available for snakes. This will need to be rectified.
- Snakes generally don't travel as easily as other animals, especially if the weather is cold. This will potentially limit intervention options, though George in the above Youtube Short did travel and he appeared non-stressed in the clip. More research needs to be done.

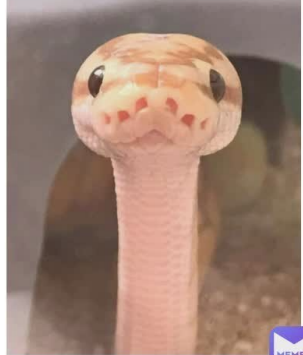


Snakes In Culture



my parents: "snakes are scary and dangerous"

the snake:



Myths About Snakes

- Snakes are slimy!
- Your snake will "size you up" and try to eat you!
- Snakes are aggressive, and they will chase you!
- Snakes dislocate their jaws to swallow large prey!
- Snakes are fast!
- All snakes are venomous!
- Snakes can hypnotize their prey!
- Snakes are deaf!

Them : omg snakes are so terrifying

The snakes :



Quick Takeaways. AAI, Snakes in AAI, and Development

- Welfare needs first. No one can engage in growth (or making progress) when their most basic safety needs aren't being met.
- The animal needs to suit the intervention to suit your client, in that order.
- Consider the human-animal bond. The intervention is the work, but the *relationship* is also the work.
- Culture of origin, previous trauma, socioeconomic barriers, and other influences impact how your clients may see working with a specific animal. Some cultures LOVE domestic dogs, some cultures think domestic dogs are unclean, some cultures eat domestic dogs.
- Even undomesticated animals can learn behaviors that can result in better outcomes for them.
- Newer field of practice = lots of room for growth, development, and exploration (if done in a safety-oriented manner).

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Questions?
Comments?

