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BACKGROUND:

Animal welfare research is concerned with assessing the experienced quality of life of animals, and has been mostly focusing on mammals in farm contexts. The field is mainly following the paradigm of sentientism, which implies that suffering of sentient beings should be avoided and positive experience promoted. As insect farming for food production becomes more common, interest for insect welfare has intensified, while recent evidence suggests that many insects including bees are indeed sentient.

PROBLEM DESCRIPTION:

Bees fill a complex space in this landscape of insect farming: they are not equally spatially restricted or killed for harvesting as are insects kept as feed, yet they are exposed to human impact, including disease exposure, management and housing, frequent handling, and breeding. Yet, their welfare as livestock has so far been little explored. So far, bees' functions have been valued through conservation and production, usually not considering the subjective experience of individuals.

METHODOLOGY:

We conducted a literature review synthesizing existing knowledge, knowledge gaps and opportunities to advance honey bee welfare. We then utilised insights from the literature to design focus group discussions with beekeepers in order to explore values underlying different beekeeping practices related to bee health and welfare.

RESULTS AND CONCLUSION: We conclude that recent advances in animal welfare science including concepts and applied methodologies can now be expanded to all taxa including insects and that welfare concepts can advance through such expansion. Considering welfare of honey bees will strengthen conservation efforts by providing earlier indicators for declining welfare which allow the possibility for early action and more efficient and welfare-sensitive protection.

PRACTICAL IMPLICATIONS FOR BEEKEEPERS:

A lot of evidence is emerging from different fields of research regarding the sentience and cognitive abilities of bees, as well as potential for their health management. Exploring where new scientific insights meet already existing practice of beekeepers and reflect their intuitions and experiences will both, help to close the gap between stakeholders and welfare science. Honey bee welfare measures will also improve the sustainability of beekeeping and beekeeper livelihood.

Considering honey bee welfare to support sustainable beekeeping and honey bee protection

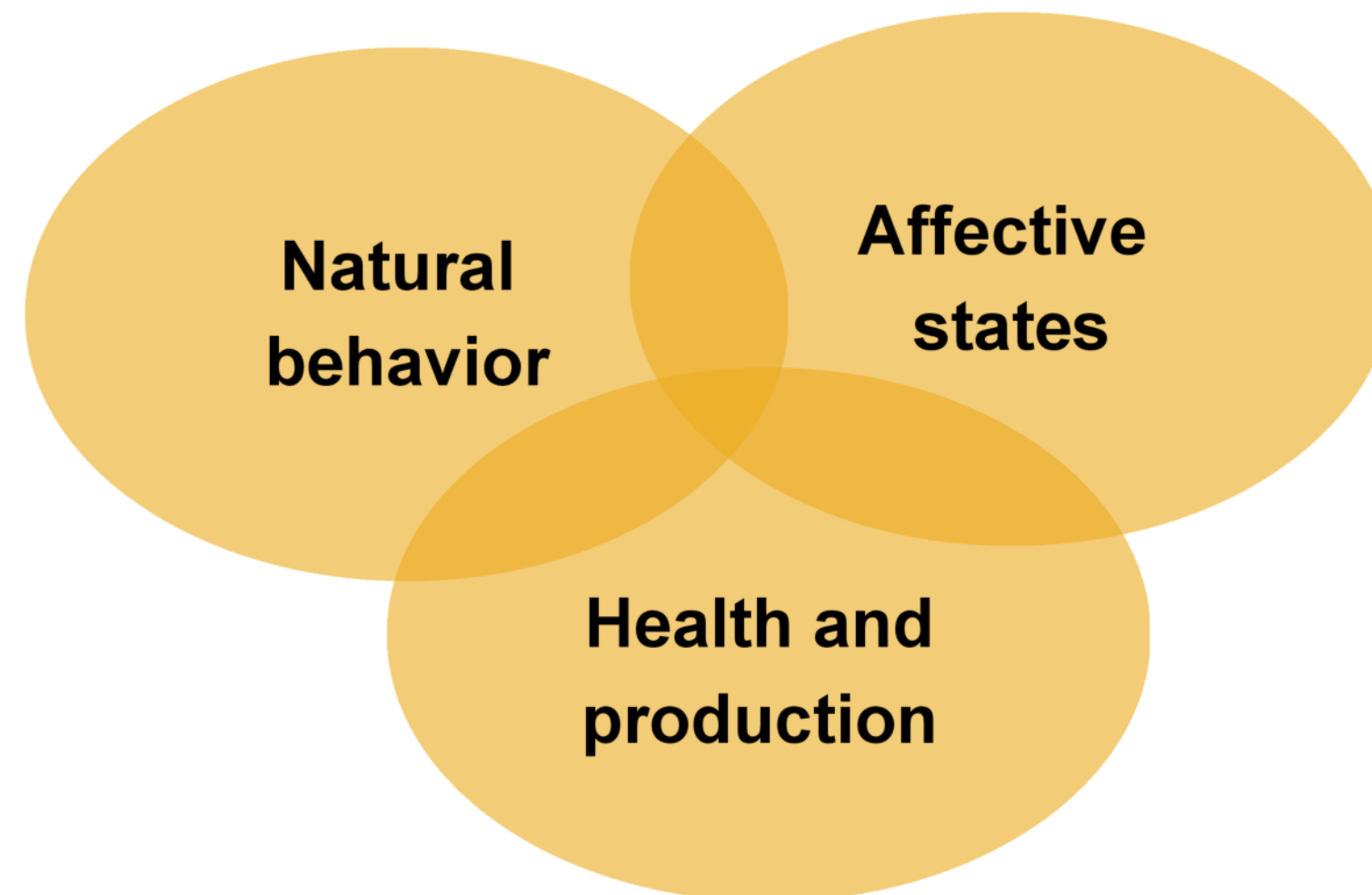
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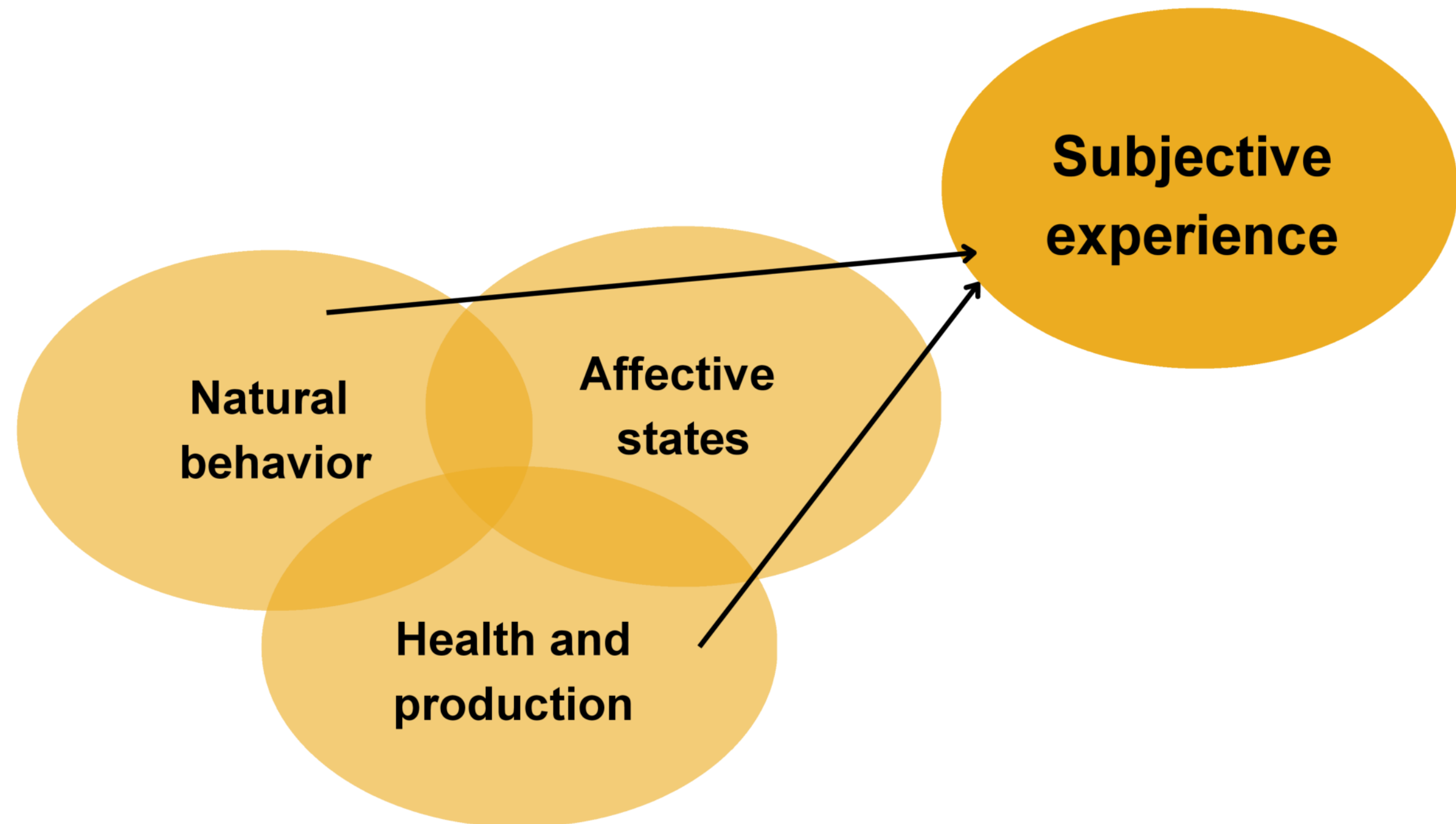
HONEY BEE
RESEARCH
CENTRE



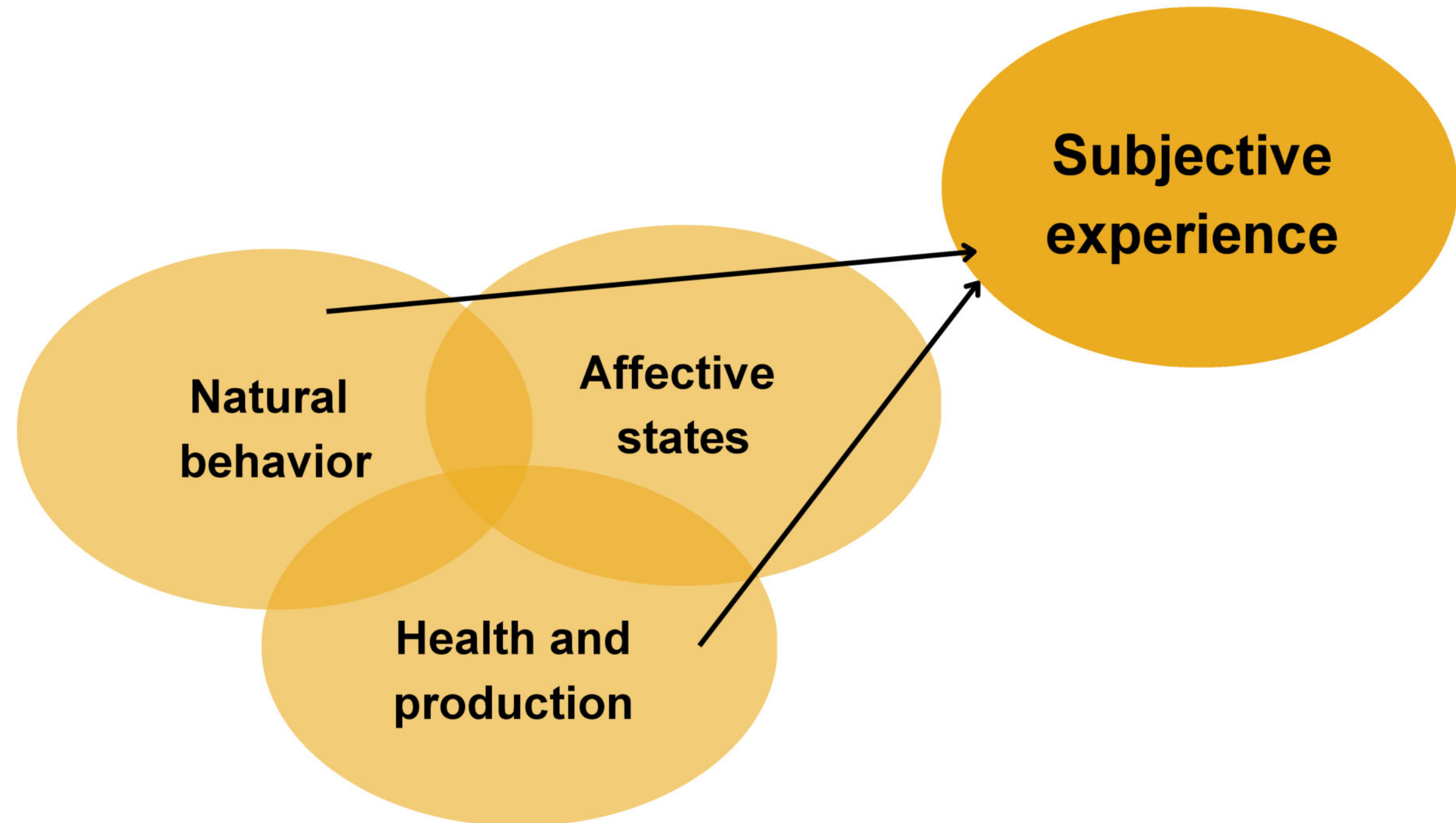
What is animal welfare?



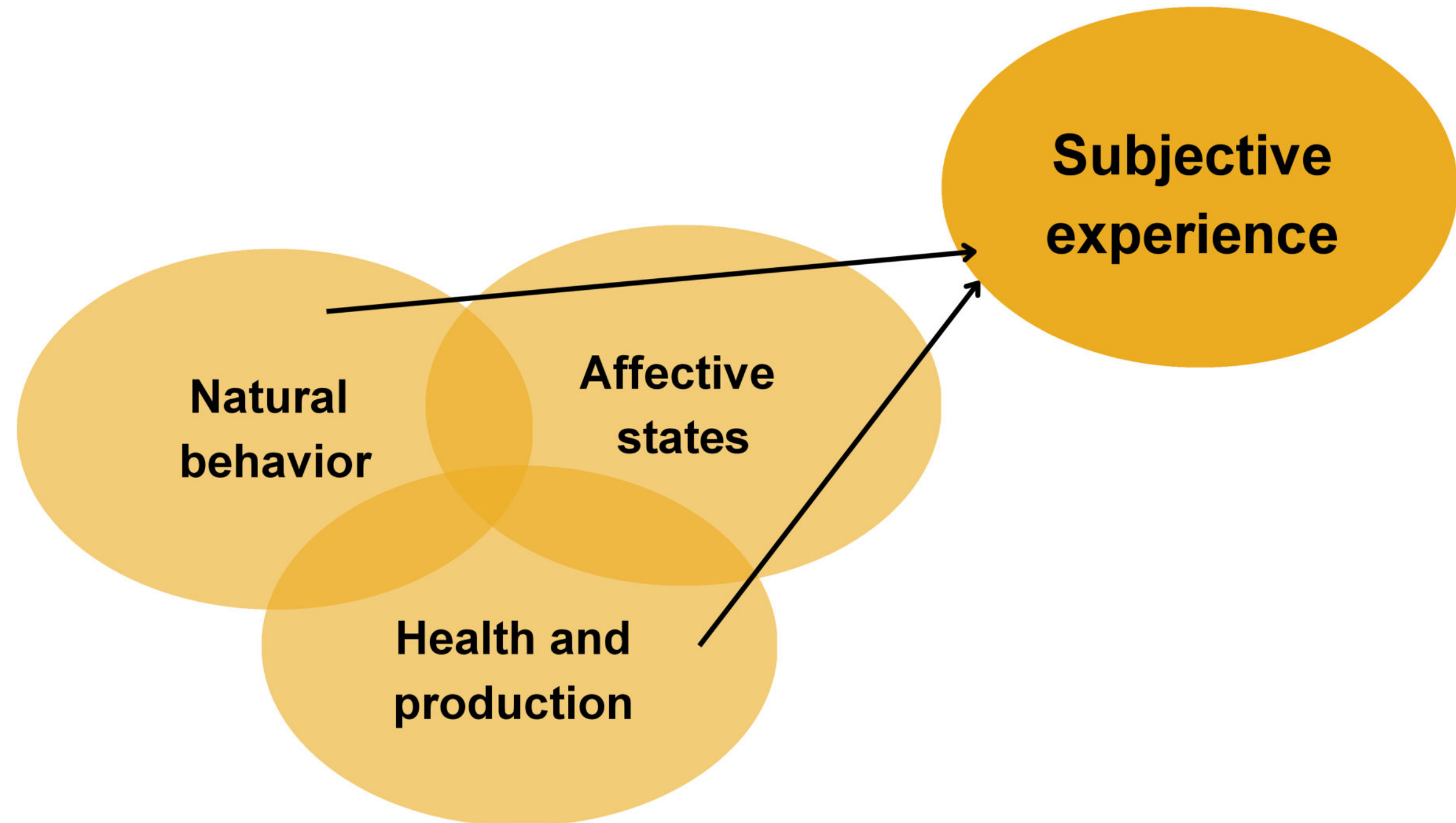
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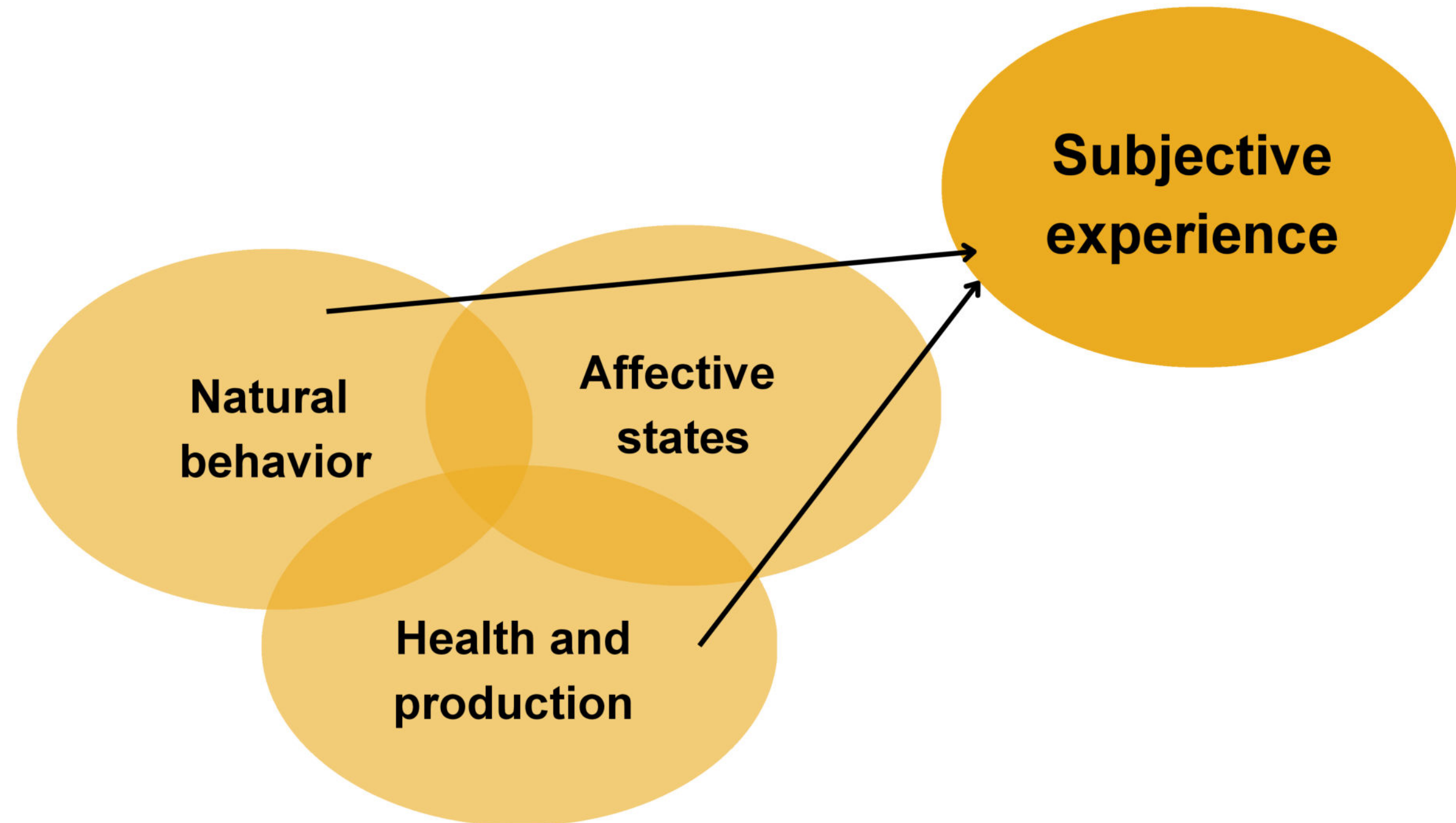
Differences in species



Differences in context



How can we apply and expand welfare concepts to honey bees?





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Improving honey bee welfare and protection



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Postdoctoral project
Ecology x Welfare x Ethics



How can we apply and expand welfare concepts to honey bees?

Capabilities

Sentience

**Human-animal
relationship**

“Is it like anything to be a bee?”

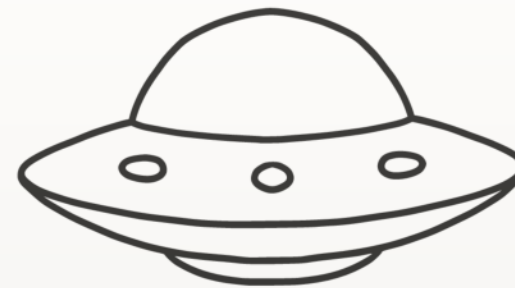
Capabilities

Sentience

Human-animal
relationship

Subjective experience

Point of view



Insects often excluded:
“too different from us”
“alien life on earth”

“Is it like anything to be a bee?”

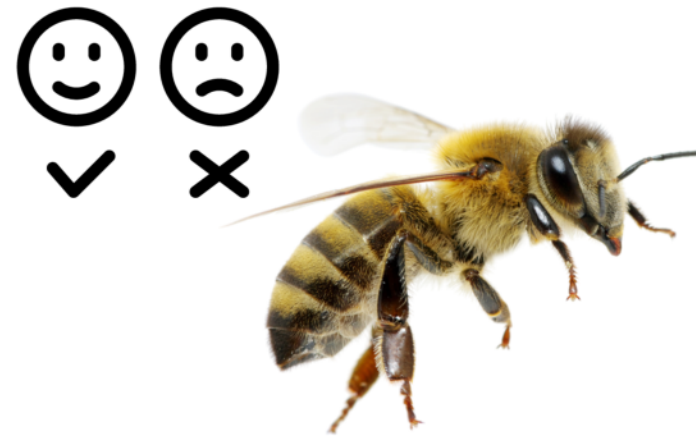
Capabilities

Sentience

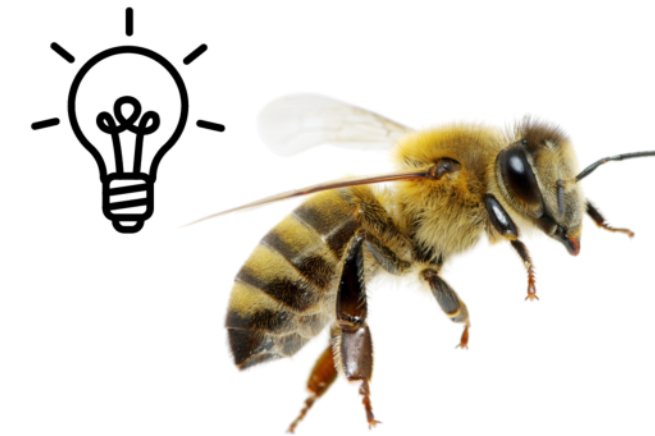
Human-animal
relationship



Pain perception



Emotion like states



“Sentience candidates”



The New York Declaration on Animal Consciousness

April 19, 2024 | New York University

“Where there is a realistic possibility of conscious
experience in an animal, it is irresponsible to ignore that
possibility.”

Andrews, K., Birch, J., Sebo, J., & Sims, T. (2024)

What matters to bees?

Capabilities

Sentience

Human-animal
relationship



Sociality, learning, decision making, navigation...

What is our relationship to bees?

Capabilities

Sentience

**Human-animal
relationship**



Longstanding relationship & domestication

What is our relationship to bees?

Capabilities

Sentience

Human-animal
relationship



Challenges to health and population persistence

Human care and responsibility

How) do we consider honey bee welfare?

Capabilities

Sentience

**Human-animal
relationship**

Human perception

Consideration of animal welfare

“ Animal welfare is a societal concept that evolves with human knowledge and humans’ acceptance of animals capacity to experience and perceive”

Camerlink 2022



Investigating beekeeper perceptions

- Focus group discussions
- 26 Swedish beekeepers (5 groups)
- Separated into “small” and “larger” scale



- 2 h discussions online
- Exploring views linked to welfare and sentience



Focus group discussions



Beekeeping motivation and practices



Bee sentience, likes and dislikes



Relationship and responsibilities



Beekeeping motivation

Why do you
keep bees?

How do you
keep them?

Do you consider
their welfare?



Beekeeping motivation

Why do you
keep bees?

How do you
keep them?

Do you consider
their welfare?

- Experience nature, harmony with nature
- Sense of responsibility for environment and bees
- Fascination: complexity, abilities
- Want to care for them: disease control, providing naturalness, breeding

“...that’s why we have them, because otherwise we won’t exist”.



Bee sentience, likes and dislikes

Do bees have likes
and dislikes?

How do you
know?

Subjective
experience



Bee sentience, likes and dislikes

Do bees have likes and dislikes?

How do you know?

Subjective experience

- Indicators of dislikes: smell, sound, aggressiveness
- Assumed negative: Interaction with humans, disease, smoke
- “Likes”: more complex, inferred from survival and fitness
- Hesitant to agree to sentience despite likes / dislikes
- Difference to other animals emphasized



Relationships and responsibilities

Are bees wild or
domesticated?

Are they
captive?

Which societal
changes are needed



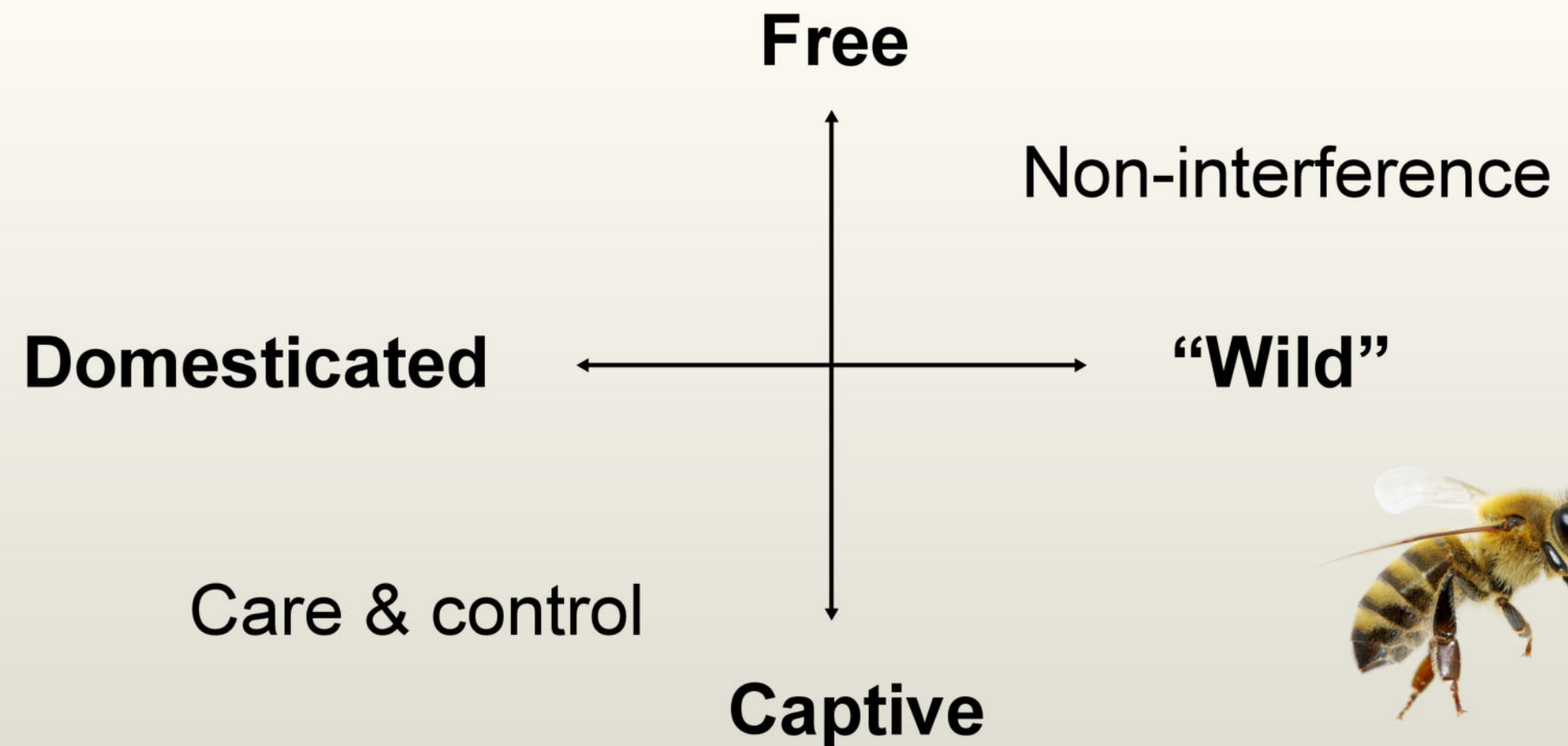
Relationships and responsibilities

Are bees wild or domesticated?

Are they captive?

Which societal changes are needed

Disagreements:



How should we care for bees?



Multiple & interacting
challenges

Varroa destructor

How should we care for bees?



Multiple & interacting
challenges

Varroa destructor

Intensified care &
disease control



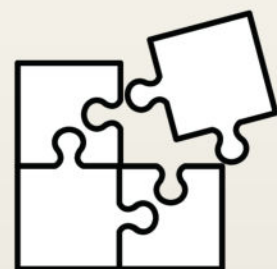
Non-interference &
potential adaptive
evolution



Implications



Integrate potential for sentience into research and beekeeping practice

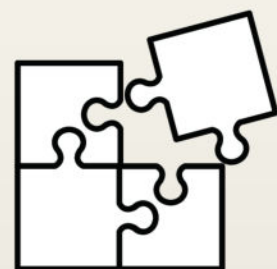


Re-consider and investigate our relationship with bees

Implications



Integrate potential for sentience into research and beekeeping practice



Re-consider and investigate our relationship with bees



Expand welfare concepts and identify indicators for welfare



Test assumptions empirically: smoke, management intensity

Honey bee welfare and protection



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