

# Cognitive Bias Tests

Optimism, Pessimism, or a Matter of Risk Tolerance

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DOI: [10.17605/OSF.IO/8CF27](https://doi.org/10.17605/OSF.IO/8CF27)

## Recommended citation

Schuck-Paim, C. & Alonso, WJ (2023). Cognitive Bias Tests: Optimism, Pessimism, or a Matter of Risk Tolerance? Technical Paper Series. Welfare Footprint Institute. DOI: [10.17605/OSF.IO/8CF27](https://doi.org/10.17605/OSF.IO/8CF27)

# Cognitive Bias Tests: Optimism, Pessimism, or a Matter of Risk Tolerance?

July, 2023

## Executive Summary

This article delves into the world of animal emotions, addressing traditional interpretations of ‘optimistic’ and ‘pessimistic’ choices in judgment bias tests. It discusses whether these choices should be interpreted as directly reflecting an animal’s emotional state, as they may emerge from an animal’s tolerance for risk and propensity for exploration. It suggests that terms like ‘novelty-seeking’ or ‘risk-seeking’ are more appropriate (affectively neutral) descriptors of an animal’s seemingly optimistic choices.



# Introduction

In the animal welfare literature, “judgment bias” typically refers to the notion that an animal’s emotional state can influence its decision-making or interpretation of ambiguous stimuli. Judgment bias tests have been widely used in welfare research as an indicator of animal affective states [\[2\]](#), and assume that animals in a positive state will interpret ambiguous situations more optimistically, while those in a negative state will be more pessimistic.

For example, in a typical test, an animal might be trained to associate one signal (like a high-pitched tone or white color) with a reward, and another signal (a low-pitched tone or black color) with a negative outcome. After training, the animal’s reaction to ambiguous signals (like a mid-pitched tone or gray color) is observed. If the animal treats the ambiguous signal as if it leads to a reward (like the high-pitched tone or white color), it’s considered to have an ‘optimistic’ bias, suggesting it’s in a positive state. On the other hand, if the animal acts as if the unclear signal will lead to the negative outcome, it’s seen as having a ‘pessimistic’ bias, indicating a negative affective state. Indeed, positive states can make rewards seem better and lead to hopeful expectations about uncertain outcomes. On the other hand, negative emotions like fear and anxiety can make threats seem bigger and potential negative outcomes more likely [\[3\]](#), reducing the animal’s willingness to take risks.

However, it’s not always this straightforward. Animals with limited resources might take more risks and make ‘optimistic’ choices as taking risks might be the only or most adaptive way to increase the chances of survival. Similarly, negative states like acute stress and anger (potentially manifested as aggression) can also lead to more risk-taking, which might seem like ‘optimistic’ behavior. For example, acute stress can lead to risky decisions due to stress-induced increased levels of dopamine [\[5,6\]](#).

Training conditions can also impact how animals perceive the value of rewards and make choices. For instance, it’s often the relative gain from a choice, not the absolute gain, that influences an animal’s decision [\[7\]](#). This means that animals living in less ideal conditions might see a reward as more valuable, which could change their motivation to explore uncertain options.

Instead of labeling animals as ‘optimistic’ or ‘pessimistic’, it might be more accurate to use terms like ‘novelty-seeking’ and ‘novelty-averse’. These terms describe an animal’s behavior without assuming their emotional state. ‘Novelty-seeking’ animals are more likely to explore new things, showing they’re more tolerant with uncertainty, while ‘novelty-averse’ animals tend to avoid unfamiliar situations. Other useful terms could be ‘risk-prone’ and ‘risk-averse’, which describe whether an animal tends to take or avoid

risks. These terms focus on what we can observe and don't suggest a specific emotional state like 'optimistic' and 'pessimistic' do..

In conclusion, while judgment bias tests can provide valuable insights into animal affective states, it's crucial to interpret results with caution. The terms 'optimistic' and 'pessimistic' may oversimplify the complex interplay of emotions, risk tolerance, and state-dependent factors that influence an animal's perception of choice options and responses. By adopting more neutral and descriptive terms we can focus on observable behaviors and avoid potential misattributions of affective states.

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