



Psychological Reality: Why We See the World the Way We Do

Video Transcript

Could it be explained otherwise?

When we explain a trait as an adaptation, we often tell a convincing story. A feature seems well suited to its function. It appears “designed” for a purpose. Richard Dawkins once described this intuition in simple terms. A biological structure, he suggests, can appear well designed – as if an engineer had built it to achieve a purpose, such as seeing, moving, or reproducing.

This way of thinking is useful. But it can also be misleading. Because good design does not always mean that a trait was shaped by natural selection for that specific function. We can use abilities in ways for which they were never specifically selected.

So, usefulness alone is not enough to explain how a trait evolved. Some traits arise not because they were selected directly, but because they are constrained by how organisms develop. To see this, consider a simple thought experiment.

Imagine all the possible forms an organism could take. In principle, this space is vast. But in reality, we observe only certain forms — and they tend to cluster. Why? One explanation is selection. Non-functional forms are eliminated, leaving only viable ones. But another explanation is constraint. Some forms never arise at all, because the organism cannot develop in those ways. In other words, evolution does not start from unlimited possibilities. It works within a restricted space shaped by developmental and structural constraints.

This has an important consequence. When we observe a trait that appears well adapted, we cannot assume that natural selection is the primary cause. The trait may reflect limitations in how variation can occur, rather than a direct response to environmental demands.

Returning to our earlier example, the tendency to interpret ambiguous signals as threats may indeed be useful. Specific threat detection systems may even be genuine adaptations. But usefulness alone does not tell us how the trait originated – and the general pattern of erring on the side of caution may not itself be a single trait at all.

To explain a trait as an adaptation, we must also consider alternative explanations — and ask whether they can be ruled out.