

Evolutionary and comparative perspectives

Supported GRE teaching and original transfer practice

Identify the evidence

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Apply kin selection and inclusive fitness to helping

Use the overview measurement lesson VI for research inference.

Concepts 1 (1)

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Kin selection explains helping by inclusive fitness: a gene spreads by aiding relatives who share it. Hamilton's rule says helping pays when $rB > C$ — benefit to the recipient weighted by relatedness exceeds cost to the helper. With benefits and costs held equal, closer relatedness makes the inequality more likely to hold: compare siblings ($r=.5$) with first cousins ($r=.125$). The rule predicts direction and rough ordering, not exact human behaviour. Ethology studies species-typical behaviour.

Concepts 1 (2)

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A fixed action pattern is an invariant sequence released by a specific sign stimulus and run to completion, as in classic egg-retrieval or mating displays. Because it is triggered rather than assembled, a fixed action pattern can be hijacked by supernormal stimuli — models with exaggerated features.

Concepts 2

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Evolutionary explanations ask about function: how a behaviour raised reproductive success in ancestral environments. They compete or combine with learning accounts; prepared learning (fast acquisition of evolutionarily relevant fears like snakes) shows both at once. An evolutionary story is a hypothesis about history, and needs comparative or experimental evidence, not plausibility alone.

Comparative caution cuts both ways: do not read human motives into animal behaviour (anthropomorphism), and do not assume a human behaviour is learned when cross-species patterns suggest otherwise. The examinable skill is matching each explanation to its evidence type.

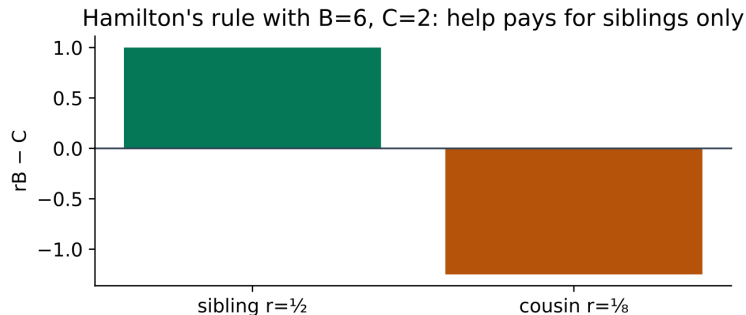
Reason through the worked case

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In a fictional fitness model, $B=8$, $C=3$ and $r=.5$. Test the inequality. Repeat for $r=.125$.

$rB > C$. For $r=.5$, $rB=.5 \times 8 = 4 > 3$, so the stated condition holds. For $r=.125$, $rB=.125 \times 8 = 1 < 3$, so it does not. Benefits and costs must use compatible fitness measures. Relatedness alone cannot rank helping when B or C differs across cases.

Read the reviewed representation



Original schematic for Evolutionary and comparative perspectives. Illustrative relationships and numbers are not research results.

Attempt an unfamiliar case

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An animal quickly learns one fear association. Explain why this can be compatible with both learning and an evolutionary account, and what evidence is needed.

Pause and write the explanation before continuing.

Check the transfer argument

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Experience supplies the association; evolved predispositions could affect how readily particular associations are learned. Compare acquisition across relevant stimuli with exposure, salience and reinforcement controlled, and use comparative evidence where justified. Speed alone cannot establish an ancestral history or eliminate all learning alternatives.

Accept a different explanation when its evidence and limits are justified.

Limit the conclusion

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Treating Hamilton's rule as a precise human calculator, or explaining any observed behaviour as adaptive after the fact; an evolutionary claim needs evidence, not a plausible story.

Original classroom cases are not official questions or personal clinical advice.

Check yourself

Independent retrieval

Helping relatives is costly. What quantities are needed to evaluate an inclusive-fitness account, and why is a story insufficient?

Write your reasoning before comparing it with the methods and limits taught in this lesson.