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Influence of stimulus amplitude on African Clawed Frogs' choices between two stimuli

College of Sciences and Health Professions

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Abstract

African clawed frogs locate prey using their lateral line systems to sense water movements the prey make. We've previously studied how the frogs choose between two stimuli; their choice is influenced by several factors including most importantly which stimulus is more rostral (i.e. more in front of them) and which is closer, which also means it arrives first with a larger amplitude. Here, we test whether stimulus amplitude affects choice. We generated surface waves by dipping two rods of different sizes into the water. Rods make waves both entering and leaving the water; both the material and diameter affect wave size. We first tested Plexiglas rods of 1/8" and 1/16" diameter; waves from the latter were 63% that of the former. We replaced the 1/16" rods with size 00 insect pins (diameter 0.3mm), dipped point first, producing waves that were only 6% of that of the larger rod. Frogs could detect waves from the smaller Plexiglas rod and even from the insect pins, as shown by orienting turns to each. Our hypothesis was that when given a choice between a large and small stimulus, frogs would show a bias for the larger stimulus simply because larger waves represent a stronger stimulus.