Two interacting pathways of neural scaling

The paper proposes a gradual baseline and an episodic intensification pathway acting on an already burdened nervous system.

A GRADUAL BASELINE

01 Changing behaviour and connectivity

Manual freedom, tool-assisted activity and increasingly complex behaviour extend the demands placed on neural networks.

02 Rising cellular servicing burden

Larger signaling territories require maintenance, energy, transport and synaptic renewal.

03 Minimum-sufficient structural scaling

The model proposes selection for additional neurons to redistribute servicing demands across generations.

B EPISODIC INTENSIFICATION

01 Ecological compression and fallback

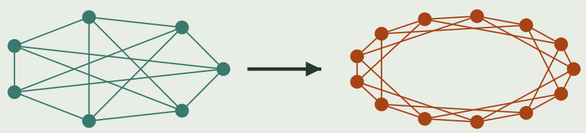
Western highland refugia: reduced preferred fruit leads to proposed reliance on ancestral caffeine-bearing Coffea.

02 Sustained caffeine exposure

Adenosine-receptor antagonism supplies the pharmacological starting point; the model proposes intensified neural servicing strain.

03 Accelerated structural scaling

The hypothesis proposes selection for additional neurons under recurrent, prolonged exposure across generations.



One evolving architecture; two proposed sources of pressure. The baseline continues during and between fallback episodes. The model proposes that larger networks progressively buffer the caffeine-associated burden, reducing its later selective impetus.

Tolerance and clearance: hepatic caffeine metabolism, fluid balance and cardiovascular accommodation form the proposed supporting physiology. AHR variation is one candidate contributor, not a demonstrated caffeine sensor or a required switch.

Source: corrected Version 2, neural-scaling, fallback and synthesis sections. Both evolutionary pathways and the buffering explanation are the author’s hypotheses. Network drawings are conceptual, not measured neuron counts; arrows do not depict immediate brain growth after caffeine consumption.