Intelligence, Situation Awareness, and Context Sensitive Choice:

From Brain Plasticity to Consciousness to Incentive

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Intelligence refers to the ability to perceive situations in general and make decisions towards accomplishing goals (Chew and Ebstein, 2025). In *The Principles of Psychology*, James (1890) describes consciousness as a “stream", a continuous, dynamic process that facilitates the perception of the environment. In *Wy Consciousness*, Aumann (2024) argues that consciousness evolved to enable the experience of incentives, underpinning goal seeking behavior such as preference maximization implicit in economic decision making, Auman leaves open the question of “*How*" which we address by relying on brain plasticity at the synaptic level. We hypothesize that the experience of *incentive* emerges from the modulation of synaptic plasticity respectively by the gain- and loss-oriented neurochemicals of dopamine and serotonin. We further associate the attention function in *Attention Weighted Utility* (AWU – Chew, 1983; Chew, Wang, Zhong, 2025) with the pair of neurochemicals – acetylcholine and norepinephrine – modulating top-down attention and bottom-up salience respectively. This delivers a neurobiological foundation for AWU which is being applied to model situation awareness and the associated context sensitive choice.

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