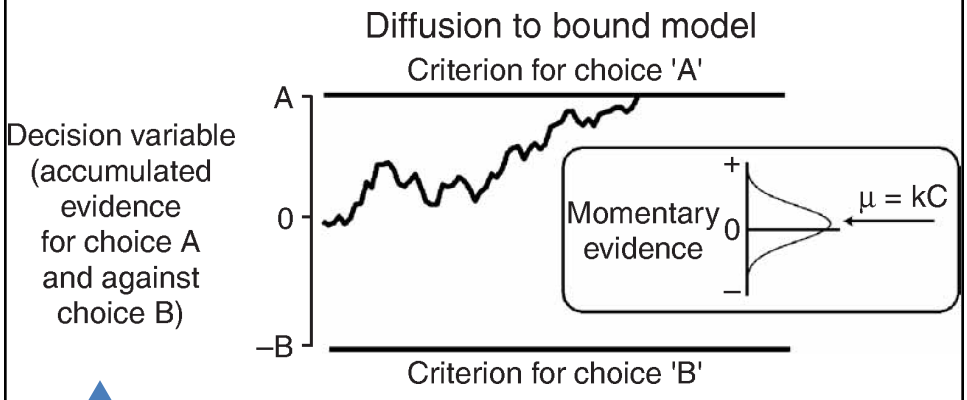
Diffusion model of a perceptual decision



I.e. integrates the difference between evidence for and against

Timing of Consciousness

1. Eagleman: is perception predictive, "online," or "postdictive"
2. Libet: "subjective back-dating" of perception

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Motion Integration and Postdiction in Visual Awareness

David M. Eagleman[1,2,4*] and Terrence J. Sejnowski[2,3,4]

In the flash-lag illusion, a flash and a moving object in the same location appear to be offset. A series of psychophysical experiments yields data inconsistent with two previously proposed explanations: motion extrapolation (a predictive model) and latency difference (an online model). We propose an alternative in which visual awareness is neither predictive nor online but is postdictive, so that the percept attributed to the time of the flash is a function of events that happen in the ~80 milliseconds after the flash. The results here show how interpolation of the past is the only framework of the three models that provides a unified explanation for the flash-lag phenomenon.

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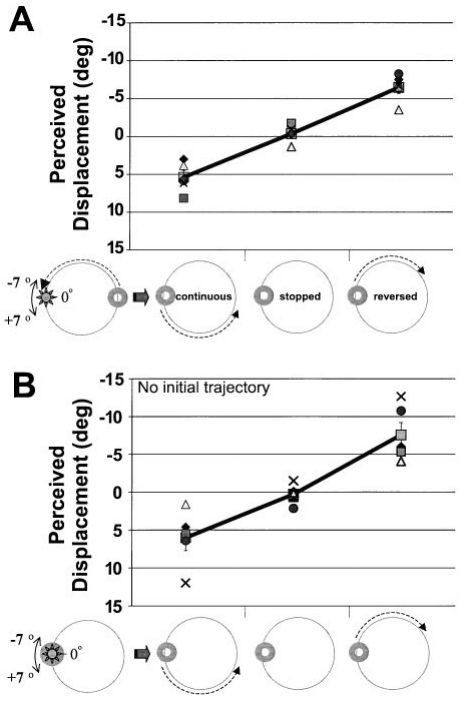

The perceived position of the moving ring is shifted along the direction it moved <u>after the flash</u>

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Conclusion from Eagleman

- Conscious perception is "postdictive:"
- "…the visual system consults the ongoing input of information from the near future of an event before committing to a percept."

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Timing of Consciousness

1. Eagleman: is perception predictive, "online," or "postdictive"
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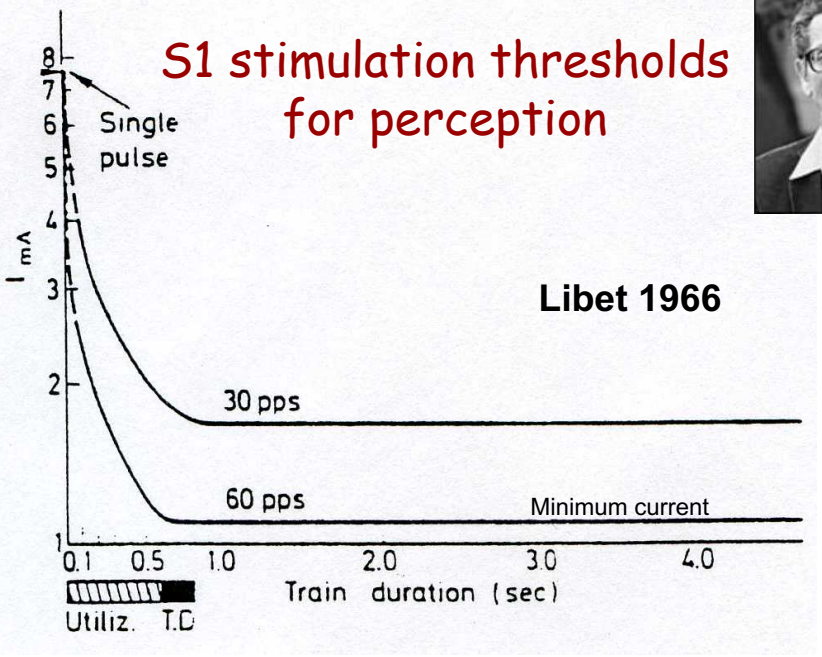
S1 stimulation thresholds for perception



Libet 1966

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- S1 stimulation requires a minimal duration to be perceived
- Briefer natural skin stimuli are perceived
- But—perception of skin stimuli can be **masked** or altered by S1 stimulation 300-600 ms later
- → Even normal stimuli require persistent neural activation to be perceived!
- So why does it seem instantaneous?

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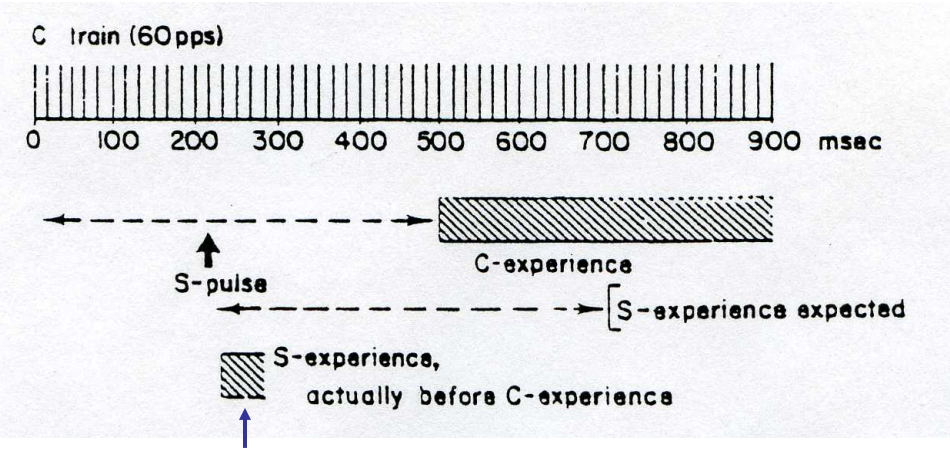
"Subjective referral of sensory experience backward in time"



Skin stimulus starts later, but is perceived as earlier!

Libet et al 1979

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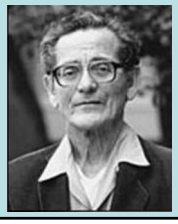
NCC Conclusions

- Most cells in higher visual areas (STS,IT) "follow the percept" during rivalry, fewer in lower areas (V4, MT, V1/V2), suggesting that the NCC is not in V1.
- Perception may also correspond to bursts of gamma synchronization organized by theta rhythms
- Cortex must be activated for ~200 ms or more to generate a conscious percept, which is then "backdated," or "referred" to the time of the initial stimulus

Benjamin Libet 1916 - 2007



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