**The visual pathway (convergence of receptive fields):** rods/cones (fields) -> ganglia (fields) -> **LGN**: **magno** (big, motion + change, rods) + **paro** (small, colour + detail, cones) -> V1 (receptive fields)

**Perspective**

**Phantom hand illusion** (sensory integration)

Other illusions (**Kanizsa’s triangle**)

**Explanations for the illusion** (compensating for faults: afterimage, temporal disparities)

Priming (processing of sensory information without awareness)

100 ms is threshold for much of perception (motion, primes)

**Authors’ conclusions**

Experiment 1: Sound-induced illusory flashing effect can be achieved. The temporal window is roughly ± 100ms.

Phenomenological change in percept.

**Figure 8:** ***Discontinuous***stimuli (here, the beeps), interfere with***continuous***stimuli (the flashes).

* Goes against the **modality appropriateness hypothesis**
* Illusory flash effect is different from **auditory driving** (changing perceived frequency of flashes by changing frequency of initially synchronous auditory stimulus – 10 flashes/sec can be perceived as 7 or 22) because **auditory driving is ‘more’ temporal and thus favours hearing**. This illusion also mainly works one way: more flashes rather than fewer

**Experiment 1**

Examines whether the sound-induced illusory flashing effect is a perceptual illusion or due to artefacts.

**Method**

Figure 1: Computer-based experiment

Figure 2: Stimulus Onset Asynchrony (23 ms)

**Results**

-Fig. 3: Sound-induced illusory flashing effect. If **more than 1 beep is heard participants perceived more than 1 flash**. The effect is not linear.

-4a: testing the difficulty of the task, control data. Linear increase confirms that participants are **able to perceive the flashes within the given time intervals**.

-4b: ensuring that **participants didn’t report number of heard beeps** rather than number of perceived flashes (cognitive bias).

**Fig. 5: 1 flash + 2 beeps perceptually = 2 flashes + 0-1 beeps**

**Experiment 2**

Behaviourally **measuring temporal window** within which sound can alter vision.

**Method**

Figure 6: Altering **SOA**

**Results**

Figure 7: If the beeps occur long enough before or after the flashes, we do not see the sound-induced illusory flashing effect. **About 100 ms temporal window.**

**Criticism**

-Error bars quite large; conclusions based on means (**Fig. 7**)

-Might not go against the **modality appropriateness hypothesis**:

--**Spatial tasks** are usually determined mainly by vision, as no other modality provides as much information

--**Hearing provides greater temporal accuracy** so may be prioritized over vision as this task might be more temporal

-Different study: **auditory influence depends on volume**

**Perception**

Conscious **experience** of the world

Combining information from **several modalities** (such as auditive and visual information)

Combines bottom-up and top-down processes

Shams, Kamitani & Shimojo (2002): Visual Illusion Induced by Sound