Intermittent stimuli increase alternation of ambiguous figures

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Abstract. Using the repetitive appearance–disappearance stimuli of the Necker cube, we studied how perceptual alternations between two interpretations differed depending on whether the stimulus was shown intermittently or continuously. We found alternations were faster when stimuli were presented intermittently than when presented continuously...
### Results and discussion

Fig. 1B shows a series of perceptual alternation timings for one subject. Fig. 1C shows the netARIs of a continuous and intermittent stimulus with an appearance period of 0.4 s and a disappearance period of 0.6 s. As can be seen, the continuous netARIs are slower. Fig. 1D shows how netARI varies with appearance period when the ratio of appearance to disappearance period is fixed. The bold red curve is the average result of five subjects and the continuous netARI is shown in green. It can be seen that netARIs of both flickering and wider intermittent stimuli are shorter than of continuous stimuli.

In Fig. 2, we compare average results of netARI and ARI with an intermittent stimulus. Fig. 2A shows how ARI varies with appearance period for a fixed ratio of appearance to disappearance period. The longer the appearance period, the longer the ARI. Except for the ARI corresponding to the appearance period of 0.4 s, all intermittent ARIs are longer than the continuous ARI. Fig. 2B shows that both netARI (red) and ARI (blue) change with the appearance period. Two different aspects in this figure are shown. If using ARI to evaluate, except for the ARI corresponding to the appearance period of 0.4 s, as reported by Leopold (2002) that perceptual alternations can be slowed by intermittent stimuli. But if using netARI, a conclusion that intermittent stimuli produce more frequent perceptual alternations than continuous stimuli can be made.

![Fig. 1](image1.png)

**Fig. 1.** Perceptual alternations in presenting a stimulus continuously and intermittently. (A) An example of intermittent stimuli. (B) A subject’s perceptual reversals during the intermittent stimuli shown in A. (C) NetARI from continuous (CON) and intermittent (INT) stimuli. (D) NetARI from different appearance periods, with the ratio of appearance to disappearance period fixed.

![Fig. 2](image2.png)

**Fig. 2.** Comparison of ARI and netARI from different appearance periods. (A) ARI from different appearance periods. (B) Average netARI and average ARI from different appearance periods.

### References

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