SELECTIVE ATTENTION, ORDER JUDGEMENT AND
THE PRIOR ENTRY HYPOTHESIS

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Summary

The prior entry hypothesis, which arose as an explanation of the findings of the complication experiment of the late nineteenth century, states that attending to one of two sources of signals results in signals from that attended source being perceived as occurring sooner than signals from the other source. Since this idea is intriguing in the light of recent work on attention and short-term memory, the present investigation set out to assess this hypothesis using Signal Detection Theory analyses of order judgement performance.

In Experiments 1 and 2, psychometric functions were obtained in order to establish suitable intervals for the TSD experiments which followed. Experiments 3 and 4 showed significant decreases in sensitivity on order judgement performance, but no significant changes in bias under conditions where the subject was required to decide which of the two lines of the visual display was the longer as well as having to decide whether the visual signal preceded the auditory one. This result, which contradicts the prior entry hypothesis, is further supported by the results of Experiments 5, 6 and 7, which respectively eliminated inadequate masking of the visual stimulus, the type of visual decision and attending to the visual signal rather than the auditory one as possible sources of artefactual results. In Experiment 8, subjects were instructed to attend to visual decision or to attend to the order judgement. Unlike previous experiments this produced a significant change in bias in the direction predicted by the
prior entry hypothesis, but no change in sensitivity. Experiments 3 to 7 produced results comparable to those of earlier investigators, and it was concluded that attending to one signal rather than another did not result in its being perceived as occurring sooner, although attending to one source and disregarding the other might produce this effect.

Having established that the prior entry hypothesis was unable to account for the order judgement data, the complication experiment was re-examined with a view to clarifying its findings and exploring the judgement strategies adopted by subjects. In Experiment 9, subjects had to judge the position of a radius arm on a briefly-exposed semi-circular display. The pattern of errors obtained, though consistent, bore no relation to the pattern of errors subsequently obtained with dynamic displays, showing that the systematic pattern of displacements with static displays is not a possible explanation of the complication experiment. Experiments 10 and 11 were closely modelled on the classical complication experiment, subjects being required to judge the position of a moving pointer at the onset of an auditory signal. Both experiments gave rise to a similar pattern of errors as a function of the onset position of the complicating stimulus. As with the classical studies, a predominance of negative or anti-clockwise errors was found. This anti-clockwise error increased from the starting point on the semi-circular dial, eventually levelling off. It was hypothesised that subjects generated this pattern of errors by working back round the dial until they arrived at a scale position which they were certain the
pointer had passed before the onset of the auditory signal. This notion was tested and confirmed in Experiment 12, which involved the reversal of the rotation direction of the pointer. Finally, in Experiment 13, the effect of the intensity of the auditory signal on constant error was examined. No significant effects were found for intensity with either regular block or random presentation. Though this finding conflicts with the commonly-reported findings of intensity effects on perceptual delay, it can be reconciled with them when the strategy outlined above is taken into account.

The results of these experiments and the results of the order judgement experiments are both considered as cases where a bисensory array confronts the subject with information overload.