## Experiment description

This experiment was motivated by the results of Jazayeri and Shadlen (2010; *Nature Neuroscience*). In that paper, the authors showed that estimates of duration were biased by the context in which they were seen; Specifically, that duration estimates regressed to the mean of the durations exposed during an experiment session, indicating the influence of a dynamic perceptual prior for duration judgements. We were interested in whether it is possible to concurrently acquire and maintain multiple, modality contingent duration priors. We showed participants trials in which a series of four punctate events was presented (Figure). The first three events in the series were isochonrous in presentation, with the inter-stimulus-interval (ISI) drawn from a distribution centred on either 650 ms or 1550 ms (Figure bottom panel). The timing of the fourth event in the series was jittered around physical isochrony, presented in a pseudo-random uniform distribution before or after physical isochrony. Participants reported whether the final event in the series occurred early or late relative to the expected rhythm. In one experimental session, auditory event series timing was drawn from the short mean distribution, and visual event series timing from the long, while in another session this was reversed. Short and long mean trial types, and thus auditory or visual event types, were pseudo-randomly interspersed throughout a given experimental session. We have conducted other experiments using different combinations of signals for the event series' and will hopefully be updating the data to include these conditions and producing a full manuscript shortly.
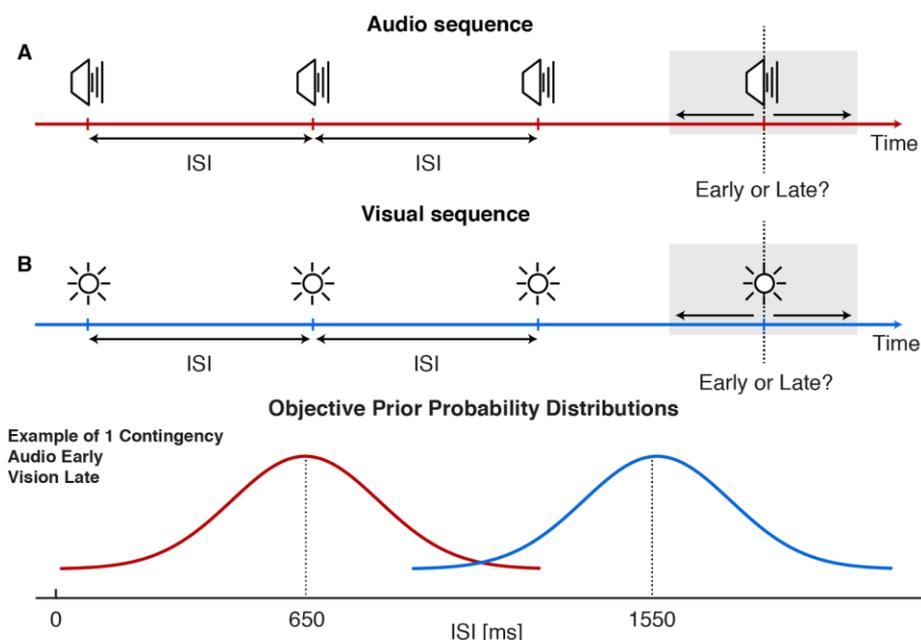
Data details

The data is contained in two files, one for the session in which the short mean ISI was visual and the long mean ISI auditory, and the other with the opposite contingency. Each file contains the data for all participants. The file headings are as follows:

'Subject' is the unique participant identifier. The reason these are not sequential is that they were allocated to people who had signed up for the study and then either didn't show up in the first instance, or didn't come for the second session rendering their first session data of no use.

'Condition' is the experimental session identifier. 5 means vision short mean ISI, audio long mean ISI; 6 means audio short mean ISI, vision long mean ISI. This is fixed relative to the file contents so is redundant.

'Trial' is the trial number in each experiment block. Participants completed 5 blocks of each experiment session, each block containing 96 trials (there are some exceptions to this where there was equipment failure or the participant left before finishing. In these cases, we include however many trials they completed in that block). The order of trials in the file is the order in which they were completed.

'Short_Long' indicates whether the trial is drawn from the short mean or long mean distribution, and therefore whether it contained an auditory or visual event series, dependent on the Condition identifier being 5 or 6.

'Trial_ISI' is the trial ISI in ms.

'Test_Timing' is the offset (in seconds) of the fourth event in the series relative to physical isochrony. Negative values mean the event occurred before physical isochrony, positive after.

'Response' is the participant's binary response, 0 for fourth event in the series was early, 1 for it was late.