Anticipatory Planning paradigm

Purpose. This document reconstructs the temporal organization of the Anticipation Timing task. The aim is to clarify why consecutive targets are separated by different intervals and to identify the appropriate temporal reference for Needleman-Wunsch realignment.

1. Sources

- Audio file: inciso1_01_random_10(1).wav; stereo PCM, 16 bit, 44.1 kHz; duration 83.592 s.
- E-Prime log: Timing_Anticipation_kb_v4. The ten target times for audio ID 01 are stored in the t_ref variable.
- Paradigm description checked against the current manuscript: ten occurrences of the same rhythmic cluster; the final sound of the cluster is the target and is marked by a synchronous hand-clap; children press the spacebar in response.

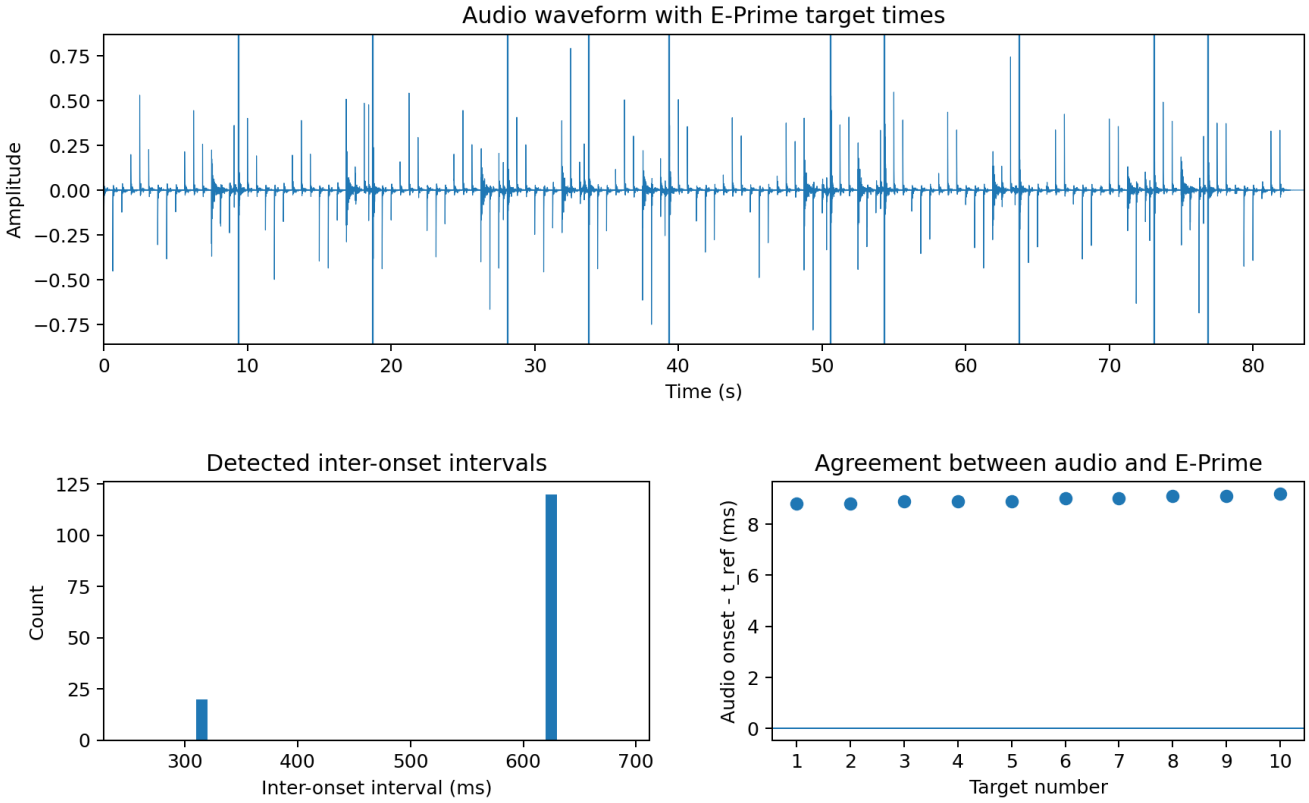

Figure 1. Waveform, distribution of detected inter-onset intervals, and correspondence between acoustic onsets and E-Prime target times.

2. The audio is metrically regular

The detected events do not occur at arbitrary intervals. The dominant inter-onset interval is approximately 624.0 ms. A second, shorter interval of approximately 311-316 ms appears at specific points and corresponds to a half-grid subdivision. The inter-onset distribution therefore indicates a stable base grid of approximately 625 ms, occasionally subdivided into two parts.

The E-Prime target times are not separated by equal numbers of milliseconds because the targets occupy selected, non-consecutive positions on this regular grid. Thus, the variability of diff(out_tref) reflects the number of grid positions between selected targets, not a change in tempo.

From target	Difference (ms)	625-ms units
1->2	9375	15
2->3	9375	15

From target	Difference (ms)	625-ms units
3->4	5625	9
4->5	5625	9
5->6	11250	18
6->7	3750	6
7->8	9375	15
8->9	9375	15
9->10	3750	6

All target-to-target distances are exact multiples of 625 ms: 3,750 = 6 units; 5,625 = 9 units; 9,375 = 15 units; and 11,250 = 18 units. This confirms that the apparent irregularity lies in target selection, not in the underlying acoustic timing.

3. Correspondence between E-Prime targets and the audio stimulus

Target	t_ref (ms)	misura	resp_misura	Nearest audio onset (ms)	Difference (ms)
1.0	9375.0	5.0	1.0	9383.8	8.8
2.0	18750.0	10.0	2.0	18758.8	8.8
3.0	28125.0	15.0	3.0	28133.9	8.9
4.0	33750.0	18.0	2.0	33758.9	8.9
5.0	39375.0	21.0	1.0	39383.9	8.9
6.0	50625.0	27.0	3.0	50634.0	9.0
7.0	54375.0	29.0	1.0	54384.0	9.0
8.0	63750.0	34.0	2.0	63759.1	9.1
9.0	73125.0	39.0	3.0	73134.1	9.1
10.0	76875.0	41.0	1.0	76884.2	9.2

The nearest detected acoustic onset follows each E-Prime t_ref by only 9.0 ms on average (range 8.8-9.2 ms). The nearly constant offset is compatible with a small leading-silence or onset-detection offset and demonstrates one-to-one correspondence between the programmed target times and acoustic events in the waveform.

The E-Prime field measure is also exactly related to time: for audio ID 01, t_ref = misura x 1,875 ms. Since 1,875 ms equals three 625-ms grid units, misura indexes successive higher-order temporal units used to place the ten targets.

4. Local acoustic structure around each target

Target	t_ref (ms)	Earlier grid onset relative to target (ms)	Immediate pre-target onset (ms)	Target onset offset (ms)	Next onset (ms)
1.0	9375.0	-618.2	-301.8	8.8	635.7
2.0	18750.0	-618.1	-301.7	8.8	635.8
3.0	28125.0	-618.1	-301.7	8.9	635.8
4.0	33750.0	-618.0	-301.7	8.9	635.9
5.0	39375.0	-618.0	-301.6	8.9	635.9
6.0	50625.0	-617.9	-301.6	9.0	636.0
7.0	54375.0	-617.9	-304.4	9.0	636.0
8.0	63750.0	-617.8	-304.4	9.1	636.0
9.0	73125.0	-617.8	-304.3	9.1	636.1
10.0	76875.0	-617.8	-304.3	9.2	636.1

The same local pattern occurs around all ten targets: an onset approximately 618 ms before the target, an additional onset approximately 302-304 ms before it, the target onset itself, and the next regular-grid onset approximately 636 ms later.

5. Paradigm

- A continuous musical sequence is organized on a stable acoustic grid of approximately 625 ms, with occasional half-grid subdivisions near the target clusters.
- Ten target events are embedded at selected positions of that grid. Their programmed times are 9,375; 18,750; 28,125; 33,750; 39,375; 50,625; 54,375; 63,750; 73,125; and 76,875 ms.

- Each target is the final event of a recurrent local cluster and is acoustically highlighted by a synchronous clap, according to the manuscript description.
- The number of base-grid intervals separating successive targets varies. Consequently, target-to-target intervals range from 3,750 to 11,250 ms even though the underlying beat structure remains regular.
- Participants can respond at any point during the continuous sequence. E-Prime appears to export response and target vectors positionally; an isolated extra response or omission can therefore shift all subsequent pairings, creating spurious large out_tdelta values.