

Supplementary Materials

Additional participant information

Participants were all recruited from an outpatient participant pool at Vanderbilt University Medical Center. All clinical information was collected through trained research personnel familiar with schizophrenia. Chlorpromazine (CPZ) equivalents were recorded for all participants but one (mean = 467 ± 248 mg/day). CPZ equivalents did not correlate with auditory TOJ thresholds ($p = 0.92$), visual TOJ thresholds ($p = 0.71$), TBWs measured with flash-beep stimuli ($p = 0.71$) or speech stimuli ($p = 0.77$), or hallucinations ($p = 0.19$).

Premorbid intelligence of SCZ patients was measured using the National Adult Reading Test (NART; mean = 104 ± 8). NART scores did not correlate with auditory TOJ thresholds ($p = 0.71$), visual TOJ thresholds ($p = 0.46$), TBWs measured with flash-beep stimuli ($p = 0.58$) or speech stimuli ($p = 0.50$), or hallucinations ($p = 0.74$).

The Social Functioning Scale (Shergill et al., 2000) was used to assess multiple aspects of social functioning in participants with SCZ: *Withdrawal Social Engagement* (mean=102.3±12.7), *Interpersonal Functioning* (mean=125.9±19.1), *Independence Performance* (mean=108.8±7.2), *Independence Competence* (mean=110.9±11.2), *Recreation Activities* (mean=112.1±15.1), *Prosocial Activities* (mean=111.5±16.2), and *Employment* (mean=95.3±11.1).

Additional stimulus information

The visual stimuli used in the visual TOJ consisted of two identical white circles (1.5 cm) in diameter presented on a black screen. Each circle was located 2.5 cm above or below a fixation cross which was 1 x 1 cm. Stimuli in the visual-only task were presented at a luminance of 215cd/m², on a black background of 0.28 cd/m². The distance between stimuli during short SOAs leaves open the possibility that participants could have bound the visual stimuli into a single percept, creating an apparent motion effect (Baruch et al., 2013). Similarly, during the auditory TOJ task, participants may have bound the multiple beeps into a single perception with a rise or fall in pitch at the shortest SOAs (Fostick and Babkoff, 2013). Furthermore, it should be noted that, given the lack of overlap between pairs of unisensory stimuli, participants may have used both the onset *and* the offset of stimuli to inform their judgements.

Supplemental References

Baruch, O., Yeshurun, Y., & Shore, D. I. (2013). Space and time: an impact of spatial separation, apparent motion, and perceptual grouping on TOJ performance. *Perception*, 42(5), 551-561.

Fostick, L., & Babkoff, H. (2013). Different response patterns between auditory spectral and spatial temporal order judgment (TOJ). *Experimental psychology*.

Table S1.**Table S1 |** Simultaneity judgments with flash-beep stimuli

SOA	Mean \pm SD		p	t
	SCZ	HC		
-300	0.39 \pm 0.28	0.06 \pm 0.08	5.88e ⁻⁵	4.67
-250	0.52 \pm 0.29	0.10 \pm 0.12	8.23e ⁻⁶	5.37
-200	0.55 \pm 0.20	0.18 \pm 0.16	1.71e ⁻⁶	5.93
-150	0.70 \pm 0.21	0.38 \pm 0.21	2.22e ⁻⁴	4.21
-100	0.81 \pm 0.20	0.64 \pm 0.22	0.04	2.21
-80	0.82 \pm 0.17	0.70 \pm 0.23	0.10	1.70
-50	0.85 \pm 0.16	0.81 \pm 0.21	0.56	0.59
-20	0.88 \pm 0.13	0.83 \pm 0.14	0.43	0.80
-10	0.92 \pm 0.12	0.81 \pm 0.18	0.09	1.74
0	0.89 \pm 0.14	0.82 \pm 0.19	0.61	0.52
10	0.85 \pm 0.15	0.84 \pm 0.15	0.91	0.12
20	0.88 \pm 0.14	0.82 \pm 0.15	0.34	0.96
50	0.84 \pm 0.19	0.78 \pm 0.23	0.56	0.59
80	0.85 \pm 0.17	0.76 \pm 0.24	0.24	1.19
100	0.83 \pm 0.18	0.69 \pm 0.21	0.06	1.94
150	0.84 \pm 0.13	0.59 \pm 0.23	1.09e ⁻³	3.61
200	0.77 \pm 0.17	0.44 \pm 0.26	6.70e ⁻⁴	3.79
250	0.65 \pm 0.21	0.33 \pm 0.23	1.43e ⁻⁴	4.36
300	0.67 \pm 0.23	0.30 \pm 0.28	7.52e ⁻⁴	3.75

SD = standard deviation

SOA = stimulus onset asynchrony

SCZ = schizophrenia

HC = healthy control

Table S2.**Table S2 |** Simultaneity judgments with flash-beep stimuli

SOA	Mean \pm SD		p	t
	SCZ	HC		
-400	0.42 \pm 0.25	0.13 \pm 0.14	3.86e ⁻⁴	4.00
-300	0.56 \pm 0.18	0.30 \pm 0.19	3.89e ⁻⁴	3.99
-250	0.60 \pm 0.14	0.35 \pm 0.21	4.16e ⁻⁴	3.97
-200	0.74 \pm 0.16	0.47 \pm 0.28	1.99e ⁻³	3.39
-150	0.86 \pm 0.14	0.59 \pm 0.24	5.08e ⁻⁴	3.90
-100	0.92 \pm 0.11	0.73 \pm 0.21	4.38e ⁻³	3.08
-50	0.92 \pm 0.13	0.84 \pm 0.15	0.09	1.75
0	0.91 \pm 0.12	0.87 \pm 0.13	0.37	0.90
50	0.93 \pm 0.12	0.93 \pm 0.09	0.97	0.04
100	0.93 \pm 0.15	0.91 \pm 0.12	0.63	0.48
150	0.92 \pm 0.11	0.85 \pm 0.17	0.17	1.42
200	0.92 \pm 0.12	0.79 \pm 0.23	0.06	1.94
250	0.81 \pm 0.18	0.65 \pm 0.29	0.08	1.82
300	0.80 \pm 0.17	0.64 \pm 0.27	0.05	2.04
400	0.71 \pm 0.25	0.41 \pm 0.28	3.46e ⁻³	3.17

SD = standard deviation

SOA = stimulus onset asynchrony

SCZ = schizophrenia

HC = healthy control