

Supplemental Methods

	Age (y)			Race (n)		Ethnicity (n)		Sex Assigned at Birth (n)		Migraine Status (n)		Substance use (n)	
	n	Mean Age	Age Range	White	African-American	Not Hispanic	Hispanic	Female at birth	Male at birth	Migraine	No Migraine	Cannabis	Hallucinogen
Controls	5	32	20-58	3	2	5	0	2	3	1	4	3	1
VSS small group	5	31	25-39	5	0	4	1	4	1	3	2	2	0
VSS large group	25	30	18-50	25	0	23	2	16	9	12	13	15	5

Supplemental Table 1. Demographics table. Data are shown for controls, the VSS small group, and the VSS large group. Data include total n, age (y), race, ethnicity, sex assigned at birth, migraine status, and substance use.

Participants were recruited through several methods including letters and MyChart messages sent through the Fairview Health System, word of mouth, postings on University of Minnesota websites, announcements on local visual snow support groups, and flyers posted in academic buildings around the University of Minnesota campus. As is traditional in psychophysics, internal participants (i.e., lab members) were also allowed and precautions were taken to minimize potential coercion or undue influence. Informed consent, screening procedures, and clinical measures of visual and mental functioning were obtained during an initial study visit, either in person or over Zoom, on a separate day from our visual task experiments.

Participants were eligible for the VSS small group if they met the following inclusion criteria: age between 18-80 years, ability to comply with study instructions, endorsement of experiencing visual snow across one’s entire field of vision for three months or longer. VSS small group exclusion criteria were as follows; lack of fluency in English, a diagnosed or self-reported intellectual disability, assigned a court-appointed legal guardian, visual acuity poorer than 20/25 assessed with a Snellen chart at 100

cm with both eyes open wearing contacts/glasses, severe central nervous system disease (e.g., multiple sclerosis), history of brain surgery, brain lesion or brain mass, stroke or transient ischemic attack followed by cognitive dysfunction, presence of a physical problem that would render study measures difficult or impossible to administer or interpret (e.g., visual field loss), current episode of psychosis (assessed with self-report and the Brief Psychiatric Rating Scale¹), conditions that would make it difficult to perform tasks (e.g., paralysis, arthritis), and any ophthalmological condition that could result in visual snow symptoms.

The control group consisted of participants meeting the same criteria as above, with the addition that they had never experienced visual snow.

Participants in the VSS large group had to meet the same criteria as the VSS small group, with a few differences including: 18-60 years of age, a current diagnosis of VSS from a neuro-ophthalmologist or self-report of meeting diagnostic criteria of VSS (i.e., endorsement of experiencing visual snow across one's entire field of vision for at least three months and at least two of the following visual symptoms: afterimages, blue field entoptic phenomena, trails or trailing behind moving objects, light sensitivity, or poor night vision). Participants in the VSS large group were excluded if any of the following criteria were met: substance dependence (besides nicotine) or drug dependence with tolerance or withdrawal within the past 12 months, hallucinogenic/dissociative substance use within the past 12 months (LSD, psilocybin, peyote, DMT, ayahuasca, PCP, ketamine, dextromethorphan, salvia divinorum) or hallucinogenic substance use within 12 months prior to the onset of VSS symptoms, lifetime use of inhalants exceeding 3 uses, history of epilepsy, seizures (permitted if in childhood) or encephalitis, severe central nervous system disease (e.g., multiple sclerosis), history of brain surgery, brain lesion or brain mass, stroke or transient ischemic attack followed by cognitive dysfunction, moderate to severe traumatic brain injury with loss of consciousness for more than 30 minutes, eye abnormalities (e.g.,

strabismus, amblyopia, cataract etc.). 5 participants with VSS had used psychedelics at some point in their lifetime, 4 of which used them after the onset of their visual snow and 1 used them 10 years before the onset of visual snow.

1. Overall, J. E. & Gorham, D. R. The Brief Psychiatric Rating Scale. *Psychol. Rep.* **10**, 799–812 (1962).