Varieties of felt presence: Three surveys of presence phenomena in the general population and their relations to voice-hearing.

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ABSTRACT

Experiences of felt presence (FP) are well documented in neurology, neuropsychology, and bereavement research, but systematic research in psychiatry is limited. Reports of FP are a feature of body disruption in psychosis, hypnagogic and hypnopompic experiences, solo pursuits, and spiritual encounters, yet systematic research comparing these phenomena is rare. Here we present a mixed-methods analysis from three online surveys as part of a comparative analysis of FP across three diverse contexts: a population sample which included people with experience of psychosis and voice-hearing (study 1, N = 75), people with spiritual & spiritualist beliefs (study 2, N = 47), and practitioners of endurance/solo pursuits (study 3, N = 84). Participants were asked to provide descriptions of their FP experiences and completed questionnaires on FP frequency, hallucinatory experiences, dissociation, paranoia, social inner speech, and sleep. Hierarchical linear regression analysis indicated that FP frequency was predicted by a general tendency to experience hallucinations in all three studies, although paranoia and gender (female > male) were also significant predictors in sample 1. Qualitative analysis highlighted shared and diverging phenomenology of FP experiences across the three studies, including a role for immersive states in FP. These data combine to provide the first picture of the potential shared mechanisms underlying different accounts of FP, supporting a unitary model of the experience. Data and code for the study are available via [OSF](#).

INTRODUCTION

Felt presence (FP) represents one of the most unusual examples of hallucinatory phenomena. FP is characterised by a basic feeling that someone is present in the immediate environment, but without any clear sensory content¹⁻³, and can occur in survival situations⁴, bereavement⁵, hypnagogia⁶, and during solo/endurance pursuits^{7,8}. FPs present in neurological disorders including epilepsy⁹ and Parkinson's disease^{10,11}, and can be induced via neurostimulation¹² and virtual reality¹³. Despite this variety, the underlying basis of FP remains unclear, as does the question of whether differing accounts of FP represent the same intrinsic phenomenon.

The occurrence of FP in psychosis provides a model example of this. Presences are described in case reports by Jaspers² and Bleuler's accounts of extracampine hallucinations¹⁴, but investigations of FP in psychiatry are relatively limited¹. More recently FPs have begun once more to be recognised as one of many complex experiences that can occur within psychosis¹⁵. A variety of disruptions to the bodily self have been described in schizophrenia^{16,17}, while phenomenological work on auditory verbal hallucinations (AVH) has described FP in relation to voice-hearing¹, with some voices being experienced as present even when silent^{7,18}. One recent study reported an incidence of 52% for FP in a sample of voice-hearers with early psychosis¹⁹.

FPs are often treated as a kind of hallucination and appear in some questionnaires of hallucinatory experience²⁰. But in psychosis – and to some degree in dementia – the lack of sensory content could suggest that presences are instead a kind of delusion – what Jaspers distinguished as “gedankliche Bewusstheit”, or an ideational awareness of presence³. FP could also be a secondary consequence of hallucinations or passivity experiences; i.e., a post-hoc inference that “someone is here” when faced with other signs of agency. If so, the tendency to experience FP may be expected to associate with trait measures of paranoia, above and beyond an association with other hallucinations. Assuming a continuum model²¹, this could be evident in clinical populations, but also those in the general population having similar experiences.

Alternatively, given the range of non-self and embodied experiences associated with dissociation²², FP may be better characterised as an example of a dissociative state akin to depersonalisation, as has also been proposed for voice-hearing more generally²³. Understanding presence as a form of depersonalisation would fit with its occurrence in survival accounts, in which presence and other autoscopic phenomena regularly occur at the limits of endurance²⁴.

Aside from psychopathology, factors that could plausibly underpin FP include social imagery²⁵ and sleep disruption²⁶. Some models of bereavement, for instance, conceptualise FP as a kind of continued relationship²⁷. Imagining speech involving others' voices and viewpoints is one example of representing a kind of illusory “other”²⁸, and who is represented is often thought to reflect life experiences and important relationships. A vivid inner social world could therefore be a “general” factor underlying FP, in healthy and clinical samples alike⁶. Similarly, sleep disruption represents another potential general factor for FP given its associations with psychotic experiences generally²⁹, hypnagogic experiences in particular

¹ In contrast to auditory hallucinations, voice-hearing is often a preferred term used by people with lived experience.

(including sleep paralysis³⁰), and situations of extreme stress and exertion, such as polar expeditions⁴.

In three online surveys, we set out to explore a range of presence experiences – their phenomenology, who has them, and what traits they may associate with – deploying measures relating to psychopathology, social imagery, and sleep. First, we invited members of the general public to share their accounts of presence (**study 1**). This included a specific invitation to those who consider themselves voice-hearers, with the aim of exploring when and how FP was experienced in the context of AVH. We followed this up with contrasting samples from two populations who also report FP: people who experience spiritual presences, (**study 2**), and practitioners of extreme sports and solo pursuits (**study 3**). While previous surveys have examined specific elements of presence in relation to these contexts³¹, to our knowledge this is the first phenomenological survey to take a comparative view across multiple contexts.

METHOD

Participants

In **study 1**, adults over 18 were invited to participate via social media and the Hearing the Voice website (www.hearingvoice.org). 75 participants ($Age_{M(SD)} = 39.10 (12.47)$ years) responded to the survey (see **Supplementary Table 1** for full demographics). 58 spoke English as their first language, with most participants (50/75) coming from the UK or USA. Reflecting the main recruitment route, a large minority (34/75) reported having received a psychiatric or neurological diagnosis (the most common being schizophrenia, 11/34), and 25 identified as being a “voice-hearer”.

For **Study 2** we recruited specifically via spiritual organisations, including the Spiritualists National Union ($N = 47$, $Age_{M(SD)} = 57.02 (10.61)$ years). The majority (30/47) were based in the UK and spoke English as their first language (38/47). Almost half identified as voice-hearers but only six reported psychiatric or neurological diagnoses, the most common of which was ADHD ($n = 2$). 46/47 described having had clairaudient experiences in the past (i.e., involving verbal messages or sound), 43/47 clairvoyant (i.e., visions), and 44/47 clairsentience (feelings or sensations).

For **study 3** ($N = 84$, $Age_{M(SD)} = 43.32 (11.49)$ years), recruitment took place via email lists and societies that promoted solo, endurance and extreme sports activities. Most (66/84) spoke English as their first language and were based in the UK or USA (55/84). Similar to study 2, diagnosis rates were generally lower than sample 1, and featured PTSD ($n = 3$) and depression ($n = 4$), including five participants identifying as voice-hearers. The most common activities reported were diving (48), climbing (27), mountaineering (25), caving (24), cycling (21), running (19), walking (17), sailing (15), and swimming (15).

Measures

Each sample received the same questionnaires via an online survey system. To gather data on the frequency and nature of FPs participants experienced, we used:

- i) The presence subscale of the **Multimodality Unusual Sensory Experiences Questionnaire (MUSEQ)**²⁰, which includes four items assessing FP frequency rated on a five-point Likert scale (Never – Frequently).
- ii) Five questions about the kinds of presence people experience, selected from the **PatientsLikeMe extracampine hallucinations questionnaire**¹¹, a survey on presence hallucinations used in people with Parkinsonian disorders;
- iii) Two free-text, open-ended questions about FP: **(1)** “Please describe your experiences of a feeling of a presence, in your own words”, and **(2)** “Please describe the context or situation you were in when you had a feeling of a presence”.
- iv) Additional questions that collected quantitative data on presence location (see **Fig.1**)

To assess predictors of FP experiences, we included:

- iii) The 11-item version of the **Revised Launay-Slade Hallucination Scale**^{28,32}, focusing on auditory experiences (five items) and visual experiences (four items);
- iv) The **Paranoia Checklist**³³, an 18-item scale selected to assess proneness to paranoid and delusional ideation;
- vi) The **depersonalisation/derealisation subscale** of the Dissociative Experiences Scale (version 2³⁴); this consists of six items relating to unusual, non-self experiences confirmed via factor analysis of the DES-2³⁵
- v) The “dialogic” and “other people” subscales of the **Varieties of Inner Speech Questionnaire (VISQ)**²⁸ selected as a proxy of social imagery.
- vii) The **Sleep Condition Indicator**³⁶ (Espie et al., 2012), a measure of sleep quality and sleep problems.

Data Analysis

Quantitative variables were analysed using Spearman’s correlation tests (due to non-normal distributions on almost all variables), non-parametric partial correlation tests using the “ppcor” R package³⁷, and hierarchical regression. Residuals >2 SD and Cook’s distance values were used to identify outliers and influential cases. *B* values reported in the text represent standardised beta values.

Directed content analysis³⁸ was used to analyse free-text descriptions by groups of 3, 2 and 2 raters in each study respectively. For study 1, each rater read the full dataset, generated an initial list of codes, and discussed their codes with the coding team. A coding scheme was then applied to 20% of the data, tested for reliability, and then applied to the remaining dataset. Coding for studies 2 and 3 followed a similar procedure but began with the coding frame from study 1, adding new codes based on the content of each sample. Reliability was checked using Krippendorff’s alpha for studies 1 and 3; for study 2, the sample was smaller and therefore fully co-coded by each rater and disagreements resolved. Log odds ratios centred on 0 were generated to examine differences in coding frequency by sample and other factors. They are included here for descriptive purposes rather than inferential statistics (e.g., chi-square tests) due to the limited sample sizes. For clarity, in the text we only focus on odds ratios with confidence intervals that do not cross zero (for a similar approach, see¹⁹).

RESULTS

Characteristics of felt presence in study 1

Table 1 displays the self-report ratings for FP on the MUSEQ and PatientsLikeMe scales, indicating that 38.7% of participants experienced frequent FPs. Frequent presences were described as angelic or malevolent at similar rates (9.3% vs. 10.7%), more likely to be human than not, and familiar to individuals 58.7% of the time. Perhaps surprisingly, presences were also described as being sensed via touch in half the sample and being heard by nearly as many. Presences were most likely to be placed behind the person (50%) and close by (44%) (**Figure 1a**).

Sixty-three participants also completed free-text descriptions of the presences they experienced (**Box 1**). Descriptions could be relatively minimal (“It feels like someone is standing behind me and watching me.”) and sometimes experienced with a specific valence (“I feel the presence of someone near me in a comforting way”; “A feeling of utter terror, as if this presence had the power to hurt me”). Codes for those descriptions are displayed in **Table 2**, indicating that FPs often had a distinct *identity*, were experienced in *indoor* settings, and were described as simply been *felt or known* to be there without any other sensory cues.

Associations with psychopathology (study 1)

To explore associations with FP experiences, the four items from the MUSEQ subscale were summed to give a total “FP score” (Cronbach’s $\alpha = 0.69$). Spearman’s correlation tests indicated that, apart from Dialogic VISQ scores ($r = 0.23$, $p = 0.05$), all of the other trait predictors (LSHS, Paranoia Checklist, DES, VISQ-O and SCI) were significantly associated with FP score (all $r > 0.35$, all $p < .002$; see **Supplementary Materials**). However, there was also considerable intercorrelation amongst these variables, particularly for LSHS scores (r paranoia = 0.62, r DES = 0.83). Partial correlation analysis – controlling for LSHS – resulted in no other variables being significantly associated with FP, apart from DES scores ($r = 0.31$, $p = 0.008$). This suggested that a general propensity towards hallucinatory experiences fully mediated most associations with FP (all $r < 0.38$, all $p > .05$).

We then used regression modelling to establish a demographics model, a “psychopathology” model (including LSHS, Paranoia and DES scores; **model 1**) and a “non-clinical” model (adding VISQ and sleep scores; **model 2**). The demographics model ($F(6,65) = 3.82$, $p = 0.003$, adj. $R^2 = 0.19$) included significant associations for FP score with Gender ($B = -0.27$, $p = .0017$, $CI = -0.49, -0.05$) and Diagnostic status ($B = 0.35$, $p = 0.002$, $CI = 0.13, 0.57$), such that men and those without a psychiatric diagnosis reported fewer presences². Age ($B = -0.14$, $p = 0.204$) and Education (4 factor levels, p -values 0.50-0.86) made no significant contribution to the model. Gender and Diagnosis were therefore retained for a parsimonious demographics model to which subsequent models were compared (**model 0**).

Initial results for **model 1** indicated significant fit with a high proportion of variance explained ($F(5,66) = 13.73$, $p < 0.001$, adj. $R^2 = 0.47$), but only Gender and Paranoia making significant contributions, despite the high bivariate correlations observed previously (**Supplementary Table 3**). Diagnostic tests indicated significant multicollinearity specific to hallucinations, paranoia, and dissociation, suggesting that at least one predictor needed to be

² Due to the small number of participants reporting their gender as “Other”, these cases were removed from regression analysis, resulting in an n of 72 for sample 1.

removed. Given the primary relevance of hallucinations to our research question, and the very high LSHS-DES correlation, we removed the DES and reran the model (**model 1b**). The resulting model explained significantly more variance than the demographics alone ($\Delta R^2 = 0.32$, $F(2,67) = 19.71$, $p < 0.001$), with predictive associations now evident for Gender ($B = -0.29$, $p = .001$, $CI = -0.46, -0.12$), LSHS ($B = 0.32$, $p = .010$, $CI = 0.08, 0.57$), and paranoia ($B = 0.32$, $p = .015$, $CI = 0.06, 0.58$; **Supplementary Table 4**).

Model 2 included dialogic VISQ, other people VISQ and sleep condition scores, but did not account for significantly more variance and identified no new significant predictors ($F(3,64) = 1.35$, $p = 0.266$, $\Delta R^2 = 0.0087$). It appeared to affect the overall power of the model – with paranoia and LSHS scores marginally significant and non-significant, respectively –but at the expense of parsimony (as indicated by rising AIC scores). Reverting to model 1, it was therefore apparent that both general hallucination-proneness and paranoia made an independent contribution to FP occurrence.

Voice-hearing and FP (study 1)

To explore FP for people who would consider themselves voice-hearers, odds ratios were generated for each of the codes from the qualitative analysis. Voice-hearing was associated with presences that were more likely to be *tactile* ($\lg OR = 1.29$, $CI = 0.09, 2.50$). Non-voice-hearers in contrast were more likely to describe FPs as just *felt/known* to being there, i.e. in the absence of other senses ($\lg OR = -1.58$, $CI = -2.76, -0.41$), and FPs occurring *multiple times* in the same context. ($\lg OR = 1.38$, $CI = 0.21, 2.55$). We ran a similar analysis to check for the influence of diagnosis, but no notable differences were observed (with all CI 's crossing zero).

Characteristics of FP in studies 2 and 3

Figure 1 and **Table 2** display characteristics of FP reported in studies 2 and 3. In study 2, 43/47 participants provided free-text descriptions. Two additional codes were necessary to include: i) involuntary presences and ii) spiritualist practices (this was because FP often came during deliberate practice in many cases – thus participants were keen to distinguish different contexts). In contrast, presences being experienced as *mundane* did not feature in sample 2. Although the *spiritual* code may be expected to be by definition redundant for this sample, in practice participants reported a range of experiences, not all of which were described as being explicitly spiritual in nature. For study 3, 47/84 wrote free-text descriptions. Codes added included specific references to a sporting activity, physical tiredness, and situations of danger.

While some codes were common in each sample – such as presences being experienced as having a particular *identity* – odds ratios also indicated qualitative differences between the groups (**Table 2**). Predictably, *spiritual* presences were most associated with study 2, but they were also more common in sample 1 compared to the sports sample. A similar pattern was evident for presences occurring in *multiple different contexts*. In contrast, the feeling of *being watched* was more common in the sports sample than the spiritual sample.

Sample 1 was distinguished from the spiritual sample by being more associated with *stress and illness*, and feelings of *fear and dread*, while they differed from the sports sample by including more *auditory-verbal* experiences. FP in study 2 were most likely to be associated with states of *immersion* and were further distinguished from study 3 by being more likely to

be *interactive, tactile*, positioned in *personal space*, and recognised by a basic *feeling or knowing* that “someone” was present.

Associations with psychopathology (studies 2 and 3)

Although not the focus of our research questions, **Table 3** displays the mean scores for each predictor variable in samples 1, 2 and 3, showing that the groups varied considerably on all outcomes. Notably, DES scores for the spiritual and sports samples only had a small number of cases with a score >1 and the large majority of cases clustered at zero, rendering the measure redundant for assessing meaningful correlations and assessing potential predictors (see Supplementary Materials).

Removing DES scores, the same analytic procedure was otherwise applied to studies 2 and 3 as in study 1. For **study 2**, pairwise correlations indicated significant associations with FP for the LSHS only ($r = 0.44, p = 0.002$). Regression analysis indicated an effect of diagnosis in the demographics model ($B = 0.32, p = .036, CI = 0.02, 0.63$). There was a significant effect of LSHS in model 1 ($B = 0.31, p = .029, CI = -0.05, 0.68$), but no other significant predictors. For **study 3**, FP score correlated with LSHS ($r = 0.44, p < 0.001$), Other People VISQ ($r = 0.27, p = 0.014$) and sleep condition scores ($r = -0.29, p = 0.008$), but regression modelling only identified LSHS scores as a consistent predictor of presence experiences (model 1: $B = 0.54, p < .001, CI = 0.33, 0.75$). Education was a significant predictor in the initial demographics model ($B = 0.33, p = .043, CI = 0.01, 0.69$).

DISCUSSION

Our main findings were that i) FP frequency was consistently related to general hallucination-proneness, ii) paranoia and gender significantly predicted FP in sample 1, and iii) qualitative characteristics of presence differ across contexts and samples, but with large degrees of overlap.

The high rates of psychiatric diagnosis (>50%) and voice-hearing (25%) in our initial sample made study 1 the most relevant for considering potentially pathological FP. This sample was unique in showing significant roles for both hallucination-proneness and paranoia suggesting that thoughts and feelings of persecution are important to consider when trying to understand FP. Those who considered themselves voice-hearers were more likely to report presences involving tactile cues and bodily changes. This is consistent with reports of voice-hearing which have emphasised the voices’ embodied nature, including how tactile cues can be associated with anticipating the occurrence of voices¹⁸. It also coheres more broadly with an emerging literature on body disruptions in psychosis^{16,17} and fluidity in agency judgements when presences are induced^{39,40}. Notable also was a distinct gender effect in this sample, with female participants much more likely to report FP in study 1. Given that AVH are often perceived as male, with aggressive and persecutory characteristics⁴¹, an important avenue for clinical research may be to explore whether women with psychosis are particularly affected by intrusive FP.

In studies 2 and 3, we anticipated that other factors such as social imagery or poor sleep would predict FP. Instead, we again found that only general hallucination-proneness predicted FP, suggesting that, among various populations and groups, FP may simply reflect another kind of hallucinatory state. Perhaps more surprisingly, we also observed very low

dissociation scores in these samples, despite the fact that dissociative processes offer a plausible framework to link unusual presence-like phenomena in a variety of contexts^{4,42}. Our qualitative results may shed some light on why this would be the case. In sample 2, participants from spiritual communities were more likely to describe presences that occurred during a state of “immersion”, i.e., when fully engrossed in a focused mode of internal attention. This is comparable to a state of absorption⁴³, which has been proposed recently as a key process by which spiritual and hallucinatory experiences can be cultivated^{13,44}, and is sometimes considered a form of dissociation. We measured depersonalisation in the DES because of its direct relevance to unusual sensory and bodily experiences, but it is possible that absorption scores could have instead picked out FP occurrence, had they been measured.

Our qualitative coding also picked out key points of difference and similarity between the varieties of presence described. FP in sample 1 were more likely to be frightening and associated with illness, but FP experiences reported by sample 3 were the most likely to feature a feeling of being watched. FP in the context of our latter sample (i.e., sports) were less likely to be spiritual and tended to occur in the same context when outside – as would be expected for largely one-off phenomena in a predominantly non-clinical group. Nevertheless, our analyses suggested that there were more similarities than differences in the types of FP experiences reported by the three samples. Participants in each group describing presences with a specific form and identity, and examples relating to bereavement were evident throughout (either as a trigger for FP or being reflected in its contents). Similarly, in all three samples, FP occurred when people were falling asleep or waking up.

There are important limitations to consider when interpreting these data. First, they are cross-sectional, so establishing causality is impossible.. Second, the collinearity evident in the data in study 1 shows how closely related unusual perceptions, paranoia, and dissociation are, and we were unable to analyse them as planned. Further work is required in larger clinical groups to establish how these factors can be separated. Experience-sampling designs may useful for investigating how feelings and experiences of threat and depersonalisation dynamically contribute to hallucinatory perceptions of another entity (for an example see⁴⁵). Finally, all our data were gathered online, and we therefore cannot verify reported diagnoses, nor explore FP descriptions in depth. Diagnostic status did not appear to greatly affect FP phenomenology (compared to voice-hearing, for example), but face-to-face interview methods will be an important next step in exploring the phenomenology and clinical relevance of FP. This is particularly crucial given the difficulties individuals have in describing FP, which can often vary considerably in their distinctiveness while sometimes also being abstract and diffuse in nature⁵.

Notwithstanding the above considerations, it is nevertheless possible to posit a *prima facie* set of predictions with relevance to clinical and non-clinical FP. First, many presences are characterised by perceptions of a specific “other”, with spatial location, and with bodily/tactile characteristics. It seems likely that people prone to FP are more susceptible to experimental inductions of presence⁴⁶, full body illusions⁴⁷, and changes to agency judgements following such interventions³⁹. In other words, many instances of FP will result from disruption to bodily self-awareness. Second, context will shape the character and quality of FP, with identity and valence varying with situations and across clinical and non-clinical groups. For example, presences during endurance sports may result from disruptions to bodily self-awareness, but be experienced as “being watched” due to the context of being alone and outside. It remains to be seen whether absorption contributes to either of these processes, or instead represents a second route towards FP which is more characterised by

intense states of imagination, as seen in readers'⁴⁸ and writers'⁴⁹ experience of fictional characters with a vivid sense of presence. Given that some FP lack clear embodied characteristics, it seems likely that other kinds of illusory presence are possible and demand further investigation.

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References

1. Critchley M. The Idea of a Presence. *Acta Psychiatr Scand*. 1955;30(1–2):155–68.
2. Jaspers K. *Über leibhaftige Bewusstheiten (Bewusstheitstauschungen)*. *Ein Psychopathol Elem*. 1913;151–61.
3. Koehler K, Sauer H. Jaspers' sense of presence in the light of Huber's basic symptoms and DSM-III. *Compr Psychiatry*. 1984 Mar 1;25(2):183–91.
4. Suedfeld P, Geiger J. The sensed presence as a coping resource in extreme environments. In: *Miracles: God, science, and psychology in the paranormal: Parapsychological perspectives*. Westport, CT: Praeger Publishers; 2008. p. 1–15. (Psychology, religion, and spirituality).
5. Kamp KS, Steffen EM, Alderson-Day B, Allen P, Austad A, Hayes J, et al. Sensory and Quasi-Sensory Experiences of the Deceased in Bereavement: An Interdisciplinary and Integrative Review. *Schizophr Bull*. 2020 Nov 1;46(6):1367–81.
6. Solomonova E, Nielsen T, Stenstrom P, Simard V, Frantova E, Donderi D. Sensed presence as a correlate of sleep paralysis distress, social anxiety and waking state social imagery. *Conscious Cogn*. 2008 Mar 1;17(1):49–63.
7. Alderson-Day B. The silent companions. *The Psychologist*. 2016;29(4):272–5.
8. Palinkas LA, Suedfeld P. Psychological effects of polar expeditions. *The Lancet*. 2008 Jan 12;371(9607):153–63.
9. Brugger P, Regard M, Landis T. Illusory Reduplication of One's Own Body: Phenomenology and Classification of Autoscopical Phenomena. *Cognit Neuropsychiatry*. 1997 Feb 1;2(1):19–38.
10. Reckner E, Cipolotti L, Foley JA. Presence phenomena in parkinsonian disorders: Phenomenology and neuropsychological correlates. *Int J Geriatr Psychiatry*. 2020;35(7):785–93.
11. Wood RA, Hopkins SA, Moodley KK, Chan D. Fifty Percent Prevalence of Extracampine Hallucinations in Parkinson's Disease Patients. *Front Neurol*. 2015;6:263.
12. Arzy S, Seeck M, Ortigue S, Spinelli L, Blanke O. Induction of an illusory shadow person. *Nature*. 2006 Sep 21;443(7109):287–287.
13. Erickson-Davis C, Luhrmann TM, Kurina LM, Weisman K, Cornman N, Corwin A, et al. The sense of presence: lessons from virtual reality. *Relig Brain Behav*. 2021 Jul 3;11(3):335–51.
14. Bleuler E. Extracampine Hallucinationen. *Psychiatr-Neurol Wochenschr*. 1903;25:261–4.

15. Pienkos E, Giersch A, Hansen M, Humpston C, McCarthy-Jones S, Mishara A, et al. Hallucinations Beyond Voices: A Conceptual Review of the Phenomenology of Altered Perception in Psychosis. *Schizophr Bull.* 2019 Feb 1;45(Supplement_1):S67–77.
16. Benson TL, Brugger P, Park S. Bodily self-disturbance in schizophrenia-spectrum populations: Introducing the Benson et al. Body Disturbances Inventory (B-BODI). *Psych J.* 2019 Mar;8(1):110–21.
17. Lee H-S, Hong S-JJ, Baxter T, Scott J, Shenoy S, Buck L, et al. Altered Peripersonal Space and the Bodily Self in Schizophrenia: A Virtual Reality Study. *Schizophr Bull* [Internet]. 2021 Apr 12 [cited 2021 Jun 16];(sbab024). Available from: <https://doi.org/10.1093/schbul/sbab024>
18. Woods A, Jones N, Alderson-Day B, Callard F, Fernyhough C. Experiences of hearing voices: Analysis of a novel phenomenological survey. *Lancet Psychiatry.* 2015;2(4):323–31.
19. Alderson-Day B, Woods A, Moseley P, Common S, Deamer F, Dodgson G, et al. Voice-Hearing and personification: Characterizing social qualities of auditory verbal hallucinations in early psychosis. *Schizophr Bull.* 2021 Jan 1;47(1):228–36.
20. Mitchell CAA, Maybery MT, Russell-Smith SN, Collerton D, Gignac GE, Waters F. The structure and measurement of unusual sensory experiences in different modalities: The Multi-modality Unusual Sensory Experiences Questionnaire (MUSEQ). *Front Psychol.* 2017;8.
21. Van Os J. Is there a continuum of psychotic experiences in the general population? *Epidemiol Psychiatr Sci.* 2003;12(04):242–52.
22. Allen JG, Coyne L. Dissociation and Vulnerability to Psychotic Experience. *J Nerv Ment Dis* [Internet]. 1995;183(10). Available from: http://journals.lww.com/jonmd/Fulltext/1995/10000/The_Dissociative_Experiences_Scale_and_the_MMPI_2.1.aspx
23. Longden E, Madill A, Waterman MG. Dissociation, trauma, and the role of lived experience: toward a new conceptualization of voice hearing. *Psychol Bull.* 2012;138(1):28–76.
24. Suedfeld P, Mocellin JSP. The “Sensed Presence” in Unusual Environments Peter Suedfeld. *Environ Behav.* 1987 Jan 1;19(1):33–52.
25. Nielsen T. Felt presence: Paranoid delusion or hallucinatory social imagery? *Conscious Cogn.* 2007 Dec;16(4):975–83.
26. Cheyne JA. The ominous numinous. sensed presence and “other” hallucinations. *J Conscious Stud.* 2001 May 1;8(5–6):133–50.
27. Hayes J, Leudar I. Experiences of continued presence: On the practical consequences of ‘hallucinations’ in bereavement. *Psychol Psychother Theory Res Pract.* 89(2):194–210.
28. McCarthy-Jones S, Fernyhough C. The varieties of inner speech: Links between quality of inner speech and psychopathological variables in a sample of young adults. *Conscious Cogn.* 2011;20:1586–93.
29. Reeve S, Sheaves B, Freeman D. Sleep Disorders in Early Psychosis: Incidence, Severity, and Association With Clinical Symptoms. *Schizophr Bull.* 2019 Mar 7;45(2):287–95.

30. Cheyne JA, Rueffer SD, Newby-Clark IR. Hypnagogic and Hypnopompic Hallucinations during Sleep Paralysis: Neurological and Cultural Construction of the Night-Mare. *Conscious Cogn*. 1999 Sep 1;8(3):319–37.
31. Barnby JM, Bell V. The Sensed Presence Questionnaire (SenPQ): initial psychometric validation of a measure of the “Sensed Presence” experience. *PeerJ* [Internet]. 2017 Mar 28 [cited 2020 Dec 14];5. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5372834/>
32. Morrison AP, Wells A, Nothard S. Cognitive factors in predisposition to auditory and visual hallucinations. *Br J Clin Psychol*. 2000;39(1):67–78.
33. Freeman D, Garety PA, Bebbington PE, Smith B, Rollinson R, Fowler D, et al. Psychological investigation of the structure of paranoia in a non-clinical population. *Br J Psychiatry*. 2005 May;186(5):427–35.
34. Carlson E, Putnam F. An update on the dissociative experiences scale. *Dissociation Prog Dissociative Disord*. 1993 Mar 1;6:16–27.
35. Stockdale GD, Gridley BE, Balogh DW, Holtgraves T. Confirmatory Factor Analysis of Singleand Multiple-Factor Competing Models of the Dissociative Experiences Scale in a Nonclinical Sample. *Assessment*. 2002 Mar 1;9(1):94–106.
36. Espie CA, Kyle SD, Hames P, Gardani M, Fleming L, Cape J. The Sleep Condition Indicator: a clinical screening tool to evaluate insomnia disorder. *BMJ Open*. 2014 Mar 1;4(3):e004183.
37. Kim S. ppcor: Partial and Semi-Partial (Part) Correlation [Internet]. 2015. Available from: <https://CRAN.R-project.org/package=ppcor>
38. Hsieh H-F, Shannon SE. Three Approaches to Qualitative Content Analysis. *Qual Health Res*. 2005 Nov 1;15(9):1277–88.
39. Salomon R, Progin P, Griffa A, Rognini G, Do KQ, Conus P, et al. Sensorimotor Induction of Auditory Misattribution in Early Psychosis. *Schizophr Bull*. 2020 Jul 8;46(4):947–54.
40. Orepic P, Rognini G, Kannape OA, Faivre N, Blanke O. Sensorimotor conflicts induce somatic passivity and louden quiet voices in healthy listeners. *Schizophr Res*. 2021 May 1;231:170–7.
41. Nayani T, David A. The auditory hallucination: a phenomenological survey. *Psychol Med*. 1996 Jan;26(1):177–89.
42. Luhrmann TM, Alderson-Day B, Bell V, Bless JJ, Corlett P, Hugdahl K, et al. Beyond Trauma: A Multiple Pathways Approach to Auditory Hallucinations in Clinical and Nonclinical Populations. *Schizophr Bull*. 2019 Feb 1;45(Supplement_1):S24–31.
43. Tellegen A, Atkinson G. Openness to absorbing and self-altering experiences (“absorption”), a trait related to hypnotic susceptibility. *J Abnorm Psychol*. 1974;83(3):268–77.
44. Luhrmann TM, Weisman K, Aulino F, Brahinsky JD, Dulin JC, Dzokoto VA, et al. Sensing the presence of gods and spirits across cultures and faiths. *Proc Natl Acad Sci* [Internet]. 2021 Feb 2 [cited 2021 May 7];118(5). Available from: <https://www.pnas.org/content/118/5/e2016649118>
45. Jongeneel A, Aalbers G, Bell I, Fried EI, Delespaul P, Riper H, et al. A time-series network approach to auditory verbal hallucinations: Examining dynamic interactions using experience sampling methodology. *Schizophr Res*. 2020 Jan;215:148–56.

46. Blanke O, Pozeg P, Hara M, Heydrich L, Serino A, Yamamoto A, et al. Neurological and Robot-Controlled Induction of an Apparition. *Curr Biol CB*. 2014 Nov 17;24(22):2681–6.
47. Petkova VI, Ehrsson HH. If I Were You: Perceptual Illusion of Body Swapping. *PLOS ONE*. 2008 Dec 3;3(12):e3832.
48. Alderson-Day B, Bernini M, Fernyhough C. Uncharted features and dynamics of reading: Voices, characters, and crossing of experiences. *Conscious Cogn*. 2017;49:98–109.
49. Foxwell J, Alderson-Day B, Fernyhough C, Woods A. ‘I’ve learned I need to treat my characters like people’: Varieties of agency and interaction in Writers’ experiences of their Characters’ Voices. *Conscious Cogn*. 2020;79:102901.

Figure 1. Spatial and contextual characteristics of presences in experiment 1 (A), experiment 2 (B) and experiment 3 (C)

Box 1: Examples of presence

“I experience a sense of presence about once every few weeks. It is as real as turning to acknowledge another person only to find there is no-one there. The sense of presence can be weaker or stronger and tends to fade and disappear after a brief period, usually from a few moments to a few minutes. I first noticed the experience when I was in my early twenties (I’m now in my late thirties). In the past 5 years or so I’ve experienced it more frequently. Over the past year it’s been accompanied by a slight sense of panic and disorientation.”
[Study 1, P53. Example codes: *Knowing/Feeling, Familiarity*]

“It is like the personification of a feeling I have and is related to the particular context I am in, these come from within me. Others feel more like what people describe as a haunting, they come from outside and are about things that are not about me just now. I just feel that it is there and what qualities the presence has. Sometimes it feels like I should be able to see it or hear it as I am looking at it, but there is nothing there or it seems to be moving but there is no sound. I can feel certain that it is there while seeing that it is not there and being equally certain that there is nothing there to see. The feeling may arrive suddenly or I may feel the presence creeping up more slowly”.
[Study 1, P54. Example codes: *Identity/Form, Multiple Different Contexts*]

“The very first time; in bed, feeling that I am awake but unable to move and completely aware that there is a malevolent presence moving towards me and I can't move or look at it or even scream. I managed to get my fingers to move then I could move and it went. But it completely freaked me out and left me terrified that night...they came nightly for months. I learnt to wake myself up by repeatedly trying to speak and as soon as I actually vocalised something I could move/wake. I had these on a very regular occurrence for over a year. In the last 10 years it has probably happened fewer than 5 times.”
[Study 1, P10. Example codes: *Sleep, Fear/Dread, Multiple Occurrences in Same Context*]

“I awoke from sleep to feel the presence of my late ex-boyfriend standing in the middle of the room. He was not visible to me, but I knew he was there, and that it was him rather than anyone else. About 18 months later, I felt his presence in bed beside me. Again I could not see him, but I could feel the pressure of his body along the length of mine.”
[Study 1, P2. Example Codes: *Tactile, Personal Space, Familiarity*]

“The last time I was sat at my desk concentrating on my work and I felt spirit touch me at the back of my head. it's a comforting experience, not at all disturbing.”
[Study 2, P2. Example Codes: *Warmth/Comfort, Inside, Spiritual*].

“I know the person whose presence I experience. She is a young woman with her own problems and life story which is completely different from and separate from me and my life, yet we are linked. Sometimes there are words, images and always emotions that I pick up from her. Sometimes I can see her as an overlay on my normal vision. when this occurs there is a background around her of her surroundings which are different from those in my flat.”
[Study 2, P4. Example Codes: *Visual, Identity/Form, Purpose*].

“I had succumbed to hypothermia in a race and had basically decided to sleep in some marshalls and give up. Something told me to open my eyes and ahead I saw a light. I sprung

back into life and found my way back to the finish of the race. If I hadn't I would be dead no question about it."

[Study 3, P7. Example Codes: *Purpose*, *Physical Tiredness*].

"The feeling that someone is watching me, not necessarily for my benefit either.[It occurs] in an old mine, usually when I'm alone or at the rear of a party."

[Study 3, P17. Example Codes: *Being Watched*, *Outside*].

N.b. Examples do not represent complete responses in all cases (due to length).

Table 1. Felt presence frequency & characteristic ratings for study 1

	Frequency (%)				
	<i>Never</i>	<i>Hardly Ever</i>	<i>Rarely</i>	<i>Occasionally</i>	<i>Frequently</i>
a. MUSEQ FP subscale					
i) I felt the presence of someone, even though I could not see them (e.g., behind me, or in another room).	9.3	18.7	12.0	21.3	38.7
ii) I have felt an unseen evil presence around me.	36.0	34.7	6.7	12.0	10.7
iii) I have felt an unseen angelic presence around me.	42.7	26.7	9.3	12.0	9.3
iv) I have felt the presence of a relative or friend who has passed away.	38.7	26.7	18.7	9.3	6.7
b. Qualities of presence (PatientsLikeMe)					
v) Do you feel as though this presence is human?	<i>Human</i>	58.7	<i>Non-human</i>	34.7	
vi) Is the presence familiar to you?	<i>Yes</i>	58.7	<i>No</i>	32.0	
vii) Does the presence ever speak to you or make another noise?	<i>Yes</i>	46.7	<i>No</i>	46.7	
viii) Does the presence ever touch you?	<i>Yes</i>	50.7	<i>No</i>	42.7	
ix) Are these experiences always the same?	<i>Yes</i>	25.3	<i>No</i>	66.7	

Table 2. Felt presence characteristics from free-text responses in studies 1, 2 and 3.

Code	Definition	Study 1 (Population)	Study 2 (Spiritual)	Study 3 (Sports)	logOR
Auditory/Verbal	Specific content relating to sound & language	34.9%	25.6%	12.8%	1>3: 1.28
Visual	Presences described with visual outlines/cues	22.2%	27.9%	25.5%	
Tactile/Bodily	Body felt to be changed or touched	25.4%	37.2%	14.9%	2>3: 1.22
Smell	Specific content relating to smell	4.8%	2.3%	4.3%	
Personal Space	Explicitly described in peripersonal space	27.0%	44.2%	21.3%	2>3: 1.07
Fear/Dread	Presences described as scary, frightening	25.4%	9.3%	19.1%	1>2: 1.18
Warmth/Comfort	Experience described as comforting, pleasant	28.6%	37.2%	27.7%	
Familiarity	Familiar/ previously known to person	34.9%	32.6%	29.8%	
Identity/Form	Distinct identity (human, angel)	57.1%	62.8%	46.8%	
Being Watched / Followed	Feeling FP is watching you	14.3%	2.3%	19.1%	3>2: 2.30
Sense of Purpose	Feeling FP is present for a reason/function	20.6%	32.6%	31.9%	
Knowing/Feeling	FP "just" felt or known to be present	44.4%	62.8%	36.2%	2>3: 1.09
Grief/Bereavement/Death	Associated with past bereavement	28.6%	18.6%	25.5%	
Stress/Illness	Linked to period of stress/illness	27.0%	7.0%	12.8%	1>2: 1.57
Multiple - single context	Occurs multiple times in same/similar context	41.3%	25.6%	48.9%	3>2: 1.03
Multiple - varied contexts	Occurs multiple times in dissimilar contexts	34.9%	65.1%	17.0%	2>1: 1.27; 1>3: 0.94; 2>3: 2.21
Immersion	Occurs when fully absorbed in an activity	11.1%	34.4%	2.1%	2>1: 1.47; 2>3: 3.20
Interaction	Can be interacted with (spoken to, touched)	14.3%	27.9%	6.4%	2>3: 1.74
Spiritual	Experience or identity spiritual in nature	20.6%	60.5%	4.3%	2>1: 1.79; 1>3: 1.75; 2>3: 3.54
Sleep	Occurs around boundaries of sleep	36.5%	18.6%	27.7%	
Mundane	Experience described as overly familiar, everyday	25.4%	-	12.8%	
Inside*	Specifically linked to particular indoor space	46.0%	69.8%	21.3%	2>1: 1.02; 1>3: 1.12; 2>3: 2.14
Outside*	Specifically linked to particular outdoor space.	9.5%	14.0%	66.0%	3>1: 2.93; 3>2: 2.48

Study 2: Involuntary	Specifically noted as unexpected	-	72.10%	-
Study 2: Spiritualist Practice	Experienced part of work as medium	-	41.90%	-
Study 3: Physical tiredness	Occurrence explicitly linked to exhaustion	-	-	27.70%
Study 3: Sports Activity	FP linked to specific sports activity	-	-	57.40%
Study 3: Risk of death	FP occurs only when in serious danger	-	-	12.80%

Table 3 Questionnaire scores for studies 1-3

	Study 1 (Population)		Study 2 (Spiritual)		Study 3 (Sports)		Group difference	Pairwise differences
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Felt Presence Score	10.25	3.88	13.62	2.99	7.61	3.50	***	2 > 1 > 3
Hallucinations (LSHS)	15.15	5.39	13.09	3.36	11.68	3.41	***	1 > 3, 2 > 3
Paranoia (PC)	31.40	15.96	21.08	5.45	20.60	8.52	***	1 > 2, 1 > 3
Derealisation (DES)	1.80	2.12	0.61	1.07	0.14	0.88	***	1 > 2 > 3
Dialogic Inner Speech (VISQ-R)	15.55	7.20	12.75	6.31	12.04	6.40	**	1 > 3
Other People in Inner Speech (VISQ-R)	12.31	8.61	9.60	6.47	7.61	4.50	***	1 > 3
Sleep Quality (SCI)	16.94	8.15	21.32	5.43	22.67	6.98	***	1 > 2, 1 > 3

*** $p < 0.001$, ** $p < 0.01$. All reported pairwise comparisons significant at at least $P < 0.05$, Bonferroni corrected