The Sensed Presence Questionnaire (SenPQ): Psychometric validation of a measure of the "Sensed Presence" experience

Joseph M Barnby [Corresp., 1] , **Vaughan Bell** [1]

[1] Department of Psychiatry, University College London, University of London, London, United Kingdom

Corresponding Author: Joseph M Barnby
Email address: joseph.barnby@ucl.ac.uk

Background. The experience of 'sensed presence' – a feeling or sense that another entity, individual or being is present despite no clear sensory or perceptual evidence – is known to occur in the general population, appears more frequently in religious or spiritual contexts, and seems to be prominent in certain psychiatric or neurological conditions and may reflect specific functions of social cognition or body-image representation systems in the brain. Previous research has relied on ad-hoc measures of the experience and no specific psychometric scale to measure the experiences exists to date.

Methods. Based on the phenomenological description in the literature, we created the 16-item Sensed Presence Questionnaire (SenPQ). We recruited participants from i) a general population sample, and; ii) a sample including specific selection for religious affiliation, to complete the SenPQ and additional measures of well-being, schizotypy, social anxiety, social imagery and spiritual experience. We completed an analysis to test internal reliability, the ability of the SenPQ to distinguish between religious and non-religious participants, and whether the SenPQ was specifically related to positive schizotypical experiences and social imagery. A factor analysis was also conducted to examine underlying latent variables.

Results. The SenPQ was found to be reliable and valid, with religious participants significantly endorsing more items than non-religious participants and the scale showing a selective relationship with construct relevant measures. Principal components analysis indicates two underlying factors interpreted as reflecting 'benign' and a 'malign' sensed presence experiences.

Discussion. The SenPQ appears to be a reliable and valid measure of sensed presence experience although further validation in neurological and psychiatric conditions in warranted.

1   Full Title:

2   **The Sensed Presence Questionnaire (SenPQ):**

3   **Initial Psychometric Validation of a Measure of the "Sensed Presence"**

4   **Experience**

6   Authors:

7   Joseph M Barnby[1*], Vaughan Bell[1]

9   1. Division of Psychiatry, University College London, 6th Floor, Maple House, 149

10   Tottenham Court Road, London, W1T 7NF, UK.

12   ***Corresponding author:**

13   Joseph M Barnby

14   Division of Psychiatry, University College London,

15   6th Floor, Maple House,

16   149 Tottenham Court Road,

17   London W1T 7NF

19   Email: Joseph.Barnby@ucl.ac.uk

20   Tel: +44 (0)20 7679 2000

23 **Abstract**

24 **Background.** The experience of 'sensed presence' – a feeling or sense that another entity,

25 individual or being is present despite no clear sensory or perceptual evidence – is known to

26 occur in the general population, appears more frequently in religious or spiritual contexts, and

27 seems to be prominent in certain psychiatric or neurological conditions and may reflect

28 specific functions of social cognition or body-image representation systems in the brain.

29 Previous research has relied on ad-hoc measures of the experience and no specific

30 psychometric scale to measure the experiences exists to date.

31 **Methods.** Based on phenomenological description in the literature, we created the 16-item

32 Sensed Presence Questionnaire (SenPQ). We recruited participants from i) a general

33 population sample, and; ii) a sample including specific selection for religious affiliation, to

34 complete the SenPQ and additional measures of well-being, schizotypy, social anxiety, social

35 imagery and spiritual experience. We completed an analysis to test internal reliability, the

36 ability of the SenPQ to distinguish between religious and non-religious participants, and

37 whether the SenPQ was specifically related to positive schizotypical experiences and social

38 imagery. A factor analysis was also conducted to examine underlying latent variables.

39 **Results.** The SenPQ was found to be reliable and valid, with religious participants

40 significantly endorsing more items than non-religious participants and the scale showing a

41 selective relationship with construct relevant measures. Principal components analysis

42 indicates two underlying factors interpreted as reflecting 'benign' and a 'malign' sensed

43 presence experiences.

44 **Discussion.** The SenPQ appears to be a reliable and valid measure of sensed presence

45 experience although further validation in neurological and psychiatric conditions in

46 warranted.

47

48   **Introduction**

49   William James (1902) first attempted to understand the sensed presence experience

50   psychologically, describing the experience "as if there were in the human consciousness a

51   sense of reality, a feeling of objective presence, a perception of what we may call 'something

52   there'". The philosopher and psychiatrist Karl Jaspers also discussed it in his influential book

53   on the phenomenology of psychiatry, *General Psychopathology*, defining it as where "we are

54   aware that something is present which at that moment is not based on any obvious sensory

55   sign" (Jaspers, 1913 / 1963).

56

57   Contemporary researchers define the experience of sensed presence, sometimes called

58   'feeling of presence' or 'felt presence,' as the subjective experience of the presence of an

59   external entity, being, or individual despite no clear sensory or perceptual evidence

60   (Thompson, 1982; Cheyne, 2001; Blom, 2010; Luhrmann, 2012, 2013; Alderson-Day, 2016).

61   This more recent research has reported that it is particularly prevalent in certain contexts and

62   psychological states.

63

64   One area particularly associated with the sensed presence experience is spirituality and

65   religion. Luhrmann and Morgain (2012) described how participants in a prayer group

66   frequently described the experience of a 'near tangible presence', and Luhrmann's

67   ethnographic work (summarised in Luhrmann, 2012) has noted how this experience forms an

68   essential component of evangelical religious practice. Suedfeld and Mocellin (1987)

69   described the role of intense physiological states in 'spirit quests' common in many

70   traditional religious practices that specifically induce a sensed presence experience, and

71   Granqvist et al. (2005) and Granqvist and Larsson (2006) have demonstrated experimentally

72   that the experience can be induced by priming participants with religious concepts.

73

74   However, the experience has also been reported in a range of other, neurophysiological

75   contexts. These include sleep-related hallucinations and paralysis, where it is typically

76   associated with fear and anxiety (Cheyne et al., 1999), epileptic seizure (Landtblom, 2006)

77   and particularly temporal lobe epilepsy (Trimble & Freeman, 2006), psychoactive drug use

78   (Barbosa et al., 2005) and direct brain stimulation (Arzy & Schurr, 2016); and has been

79   associated with psychosis and auditory hallucinations (Woods et al., 2015), acquired brain

80   injury (Brugger et al., 1996), Parkinson's disease (Fenelon et al., 2011) and a range of intense

81   emotional or physiological states (Suedfeld & Mocellin, 1987) including bereavement

82   (Steffan & Coyle, 2011).

83

84   Previous theories have suggested the sensed presence phenomenon may be a result of a

85   projected internal body map (Brugger et al., 1996), partial activation of the threat system

86   (Cheyne & Girard, 2007), or a form of externalised social imagery (Nielsen, 2007;

87   Solomonova et al., 2008), or, perhaps more exotically, an external projection of autonomous

88   unconscious processes (Jaynes, 2000; Jung, 1969).

89

90   Notably, neuropsychological theories have been based on increasing numbers of studies

91   where the experience has been induced in the lab, or reported in observational or patient

92   studies, but it is noteworthy that no specific psychometric measure for the sensed presence

93   experience exists and current studies rely on scales which are not ideally suited to the task or

94   simple verbal description.

95

96   A seven item subscale of the Other Experiences Questionnaire (OEQ7) (Nielsen, cited in

97   Solomonova et al., 2008), has been used to measure experiences akin to sensed presence

98   experience in previous studies (Solomonova et al., 2008). However, the OEQ7 is actually

99   intended to measure 'social imagery', and includes items on imaginary companions, seeing

100 apparitions and the feeling of being followed, alongside items on the actual sensed presence

101 experience.

102

103 Trimble and Freeman (2006) measured sensed presence in religious and non-religious

104 individuals with epilepsy by using items from the Index of Core Spiritual Experiences

105 (INSPIRIT) questionnaire (Kass et al., 1991). However, as the study used selected items from

106 a specific spirituality questionnaire, this would not be suitable for measuring sensed presence

107 experiences in other contexts.

108

109 Other scales include the sensed presence experience but only as a single item – such as the

110 Tellegen Absorption Scale (Tellegen and Atkinson, 1974), the Magical Ideation Scale

111 (Eckblad and Chapman, 1983), and the Cardiff Anomalous Perceptions Scale (Bell et al.,

112 2006).

113

114 Alternatively some studies have simply asked people to affirm whether they have had a

115 sensed presence experience. For example, while Hay (1979) reported useful descriptive

116 themes of SP experiences from participants, Hay (1979) and Hay & Morisy (1978) did not

117 use comprehensive or validated measures to capture SP experiences and simply relied on a

118 single question.

119

120 Given the potential for sensed presence experiences to provide a window into

121 neuropsychological mechanisms for body representation or social cognition, clearly, a robust

122 and validated measure of the phenomena is needed.

123   With this in mind, we created and investigated the reliability and validity of a new scale,

124   called the 'Sensed Presence Questionnaire' (SenPQ), designed to capture the experience of

125   'sensed presence' in a psychometrically robust manner.

126

127   As religious practice has been traditionally associated with greater levels of sensed presence

128   experience, as part of the scale validation we predicted that individuals who have religious

129   practice / belief from the general population would score higher on the SenPQ as people

130   without. Based on previous research, we also predicted that the SenPQ would selectively

131   correlate with measures of unusual perceptual experiences but no other aspects of schizotypy,

132   as well as correlating with measures of social imagery and daily spiritual experience.

133

134   **Materials and Methods**

135   A cross-sectional observational design was used in the general population. Data was collected

136   in the form of an online survey using two distinct samples. The study was reviewed and

137   ethically approved by the UCL ethics review board (ref no.: 8587/001). Participants indicated

138   consent on the online form.

139

140   *Design of the Sensed Presence Questionnaire (SenPQ)*

141   The Sensed Presence Questionnaire (SenPQ) comprises of 16 questions. These were derived

142   from a literature review of the sensed presence phenomenon spanning studies from sleep

143   paralysis, epilepsy and other neurological disorders, psychosis, stress and anxiety, ritual, drug

144   induced experiences, and the general population. As well as covering a range of typical

145   sensed presence experiences from the scientific literature, the scale also includes items that

146   are positively and negatively valenced, as well as neutrally valenced in their presentation.

147

148 The questionnaire requests that respondents refer to experiences from the last month only

149 when rating the items, and not to record any experiences associated with drug-induced

150 experiences. Respondents are asked to indicate the frequency with which the experience has

151 occurred using a Likert-like scale: 'Never', 'Occasionally', 'Sometimes', 'Very Often',

152 'Always'. The questionnaire is freely available online and has been released under a Creative

153 Commons license at the following link: https://osf.io/fecgz/

154

155 *Participants*

156 Participants were recruited via two methods: i) online via the http://proflic.ac online study

157 recruitment platform that has diverse participant base and where we received 101 completed

158 responses from separate individuals (Sample S1) from 135 responses in total including

159 incomplete data sets. In addition, social media advertisements were sent from the authors'

160 personal accounts and accounts associated with the authors' university department (with

161 notices that did not refer to anything spiritual or religious) and emails were sent to religious

162 groups including university religious societies (Hindu society, Islamic Society, Christian

163 Union, Sikh Society, Buddhist Society, and the Jewish Society) and local churches requesting

164 participants (Sample S2). Recruitment for both samples was started in parallel. The

165 questionnaire took approximately 25 minutes to complete. Participants recruited via the

166 online recruitment service were paid £4 upon questionnaire completion. All participants were

167 directed to the same online questionnaires.

168

169 Individuals who clicked on the link to the survey and began to fill in the survey were

170 considered to have been recruited into the study, regardless of whether the scales were fully

171 completed although only complete questionnaire sets were entered into the analysis.

172   Questionnaires were preceded by a page requesting demographic data that required age,

173   gender, religious belief, average meditation practice, ethnic group, and education level.

174

175   Both samples were combined for the final analysis which consisted of a total of 191

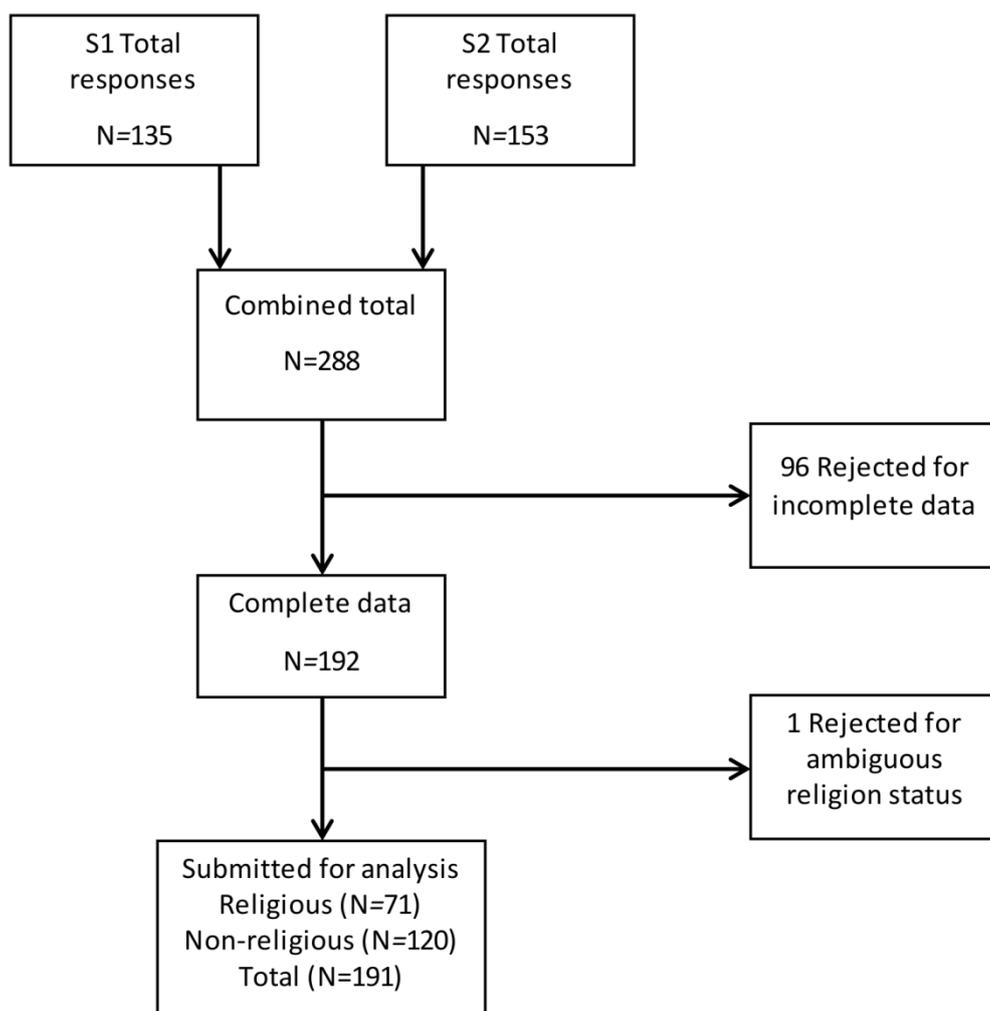
176   participants included (see Figure 1). Analysis scripts that conduct a separate analysis for each

177   sample (minus the principal components analysis which is underpowered when not conducted

178   on the whole sample) are available on the Open Science Framework page for this study

179   (https://osf.io/fecgz/), which demonstrate the same pattern of results in each sample,

180   supporting the reliability and validity of the scale.

181

182

183   **Figure 1 - Recruitment diagram**

184

185   *Additional Measures*

186   Other Experiences Questionnaire (OEQ7) (Solomonova et al., 2008): a validated measure

187   demonstrated to capture social imagery, and has previously been tested in context of sleep

188   paralysis and anxiety.

189

190   WHO-5 (World Health Organisation, 1998): a short form, validated well-being questionnaire,

191   demonstrated to capture well-being as accurately as its extended version.

192   Brief Oxford-Liverpool Inventory of Feeling and Experiences (O-LIFE) (Mason et al., 2005):

193   a short form validated scale to measure schizotypal personality traits, developed from a larger

194   version (Claridge et al., 1996), including subscales for unusual experiences (UE), cognitive

195   disorganisation (CD), introvertive anhedonia (IA), and impulsive non-conformity (IN).

196

197   Daily Spiritual Experience Scale (DSES) (Underwood & Teresi, 2002): a validated scale

198   designed to assess ordinary and daily connection with the transcendent in daily life. Question

199   16 was omitted in our version as the rest of the 15 items all coded in the same format, and has

200   been omitted and validated in absence in previous studies (Ellison & Fan, 2008).

201

202   The Social Interaction Anxiety Scale (SIAS) (Mattick & Clarke, 1998): a validated scale

203   designed to capture social interaction anxiety.

204

205   Participants were also given the option of a free text box at the end of the questionnaire series

206   to describe a sensed presence experience, if they indicated they had experienced one.

207

208   *Analysis*

209   Internal reliability of the SenPQ was tested with Cronbach's Alpha (Cronbach, 1951).

210   Validity was determined firstly by whether SenPQ score distinguished between religious and

211   non-religious groups by using an independent samples t-test, predicting a significant

212   difference between SenPQ in religious and non-religious groups. Secondly we examined the

213   association between SenPQ score and additional measures, predicting that the SenPQ would

214   selectively correlate with the O-LIFE unusual experiences subscale, the OEQ7 measure of

215   social imagery and the DSES measure of spiritual experience.

216

217   In addition, we completed a principal components analysis of the SenPQ items on the entire

218   sample using direct oblimin rotation based on the assumption that underlying factors would

219   not be independent. The mean item scores for each individual factor loading were used for all

220   subsequent analysis. Parallel analysis for principle components (95% confidence interval,

221   1000 random correlation matrices) (Horn, 1965; O'Connor, 2000) and observation of the

222   scree plot (Cattell, 1966) were used to select retained factors.

223

224   We also completed a receiver operating characteristic (ROC) analysis to examine how scale

225   specific scale scores distinguished between religious and non-religious groups.

226

227   **Results**

228   *Demographics*

229   The total sample consisted of 89 males, 99 females, 2 who selected 'Other' and 1 who

230   selected 'Prefer not to say'. The mean age of the sample was 36.23 (SD = 13.4; Range 17 –

231   73). Religious affiliation, ethnicity and level of education are reported in Table 1. For the

232   purposes of classifying people into religious and non-religious groups for further analysis,

233   people who selected 'No Religion' or 'Agnostic' were considered non-religious, as were

234   individuals who recorded themselves as 'Atheist' under the 'Other' option. All others were

235   considered religious.

236

237

	Frequency (%)
Religious Affiliation	
No Religion	99 (51.83)
Agnostic	16 (8.37)
Christian	45 (23.56)
Buddhist	4 (2.09)
Hindu	2 (1.04)
Jewish	3 (1.57)
Muslim	3 (1.57)
Sikh	3 (1.57)
Other	16 (8.37)
Highest Level of Education	
GCSE	10 (5.23)
A Level	29 (15.18)
University Undergraduate	93 (48.69)
University Postgraduate	59 (30.89)

238

239 **Table 1 - Religion and education of sample**

240

241 20 participants reported daily meditation practice, 10 weekly practice, 23 monthly practice,

242 and 138 no practice. Self-reported ethnicity of the sample was "English / Welsh / Scottish /

243 Northern Irish / British" (N=131), "White other" (N=25), "Indian" (N=8), "White and Asian"

244 (N=5), "Chinese" (N=4), "White and Black African" (N=3), "Pakistani" (N=2), "Other"

245 (N=2), "Irish" (N=2), "White and Black Caribbean" (N=2), "Other Mixed / Multiple ethnic

246 background" (N=2), "Bangladeshi" (N=1), "African" (N=1), "Caribbean" (N=1), "Arab"

247 (N=1), "Gypsy or Irish Traveller" (N=1).

248

249 *Statistical analysis*

250 Due to the sampling distribution of mean scores on the SenPQ violating the assumption of

251 normal distribution, all analyses were conducting using a simple bootstrap re-sampling

252 method (1000 samples, 95% CI) (Bland & Altman, 2015). All data analysis used SPSS v.22

253   (SPSS Inc). The raw data and analysis scripts for this study are freely available online at the

254   Open Science Framework at the following link: https://osf.io/fecgz/

255

256   *Internal reliability*

257   All SenPQ items where entered into internal reliability analysis and the scale demonstrated

258   very high internal consistency (Cronbach's alpha = 0.951).

259

260   *Validity*

261   Means and standard deviations for the scale scores are displayed in Table 2. Discriminant

262   validity of the SenPQ was demonstrated by conducting an independent samples t-test (two-

263   tailed) between mean scores from religious (N = 71) and non-religious groups (N = 120). The

264   religious group had a higher mean score than the non-religious group (see Table 2), a

265   difference which was significant when tested with an independent samples t-test (t = -3.592,

266   p = 0.002, mean difference = -5.208, 95% CI: -8.098 - -2.156; Cohen's d = 0.51), indicating

267   good discriminant validity.

268

269   As can be seen in Table 3, the SenPQ demonstrated a strong significant correlation with the

270   OEQ-7 social imagery scale and a moderate significant correlation with the DSES daily

271   spiritual experiences scale. There was a strong significant correlation with the unusual

272   experiences subscale of the O-LIFE schizotypy scale, a weak correlation with the impulsive

273   non-conformity subscale, and no significant correlation with the cognitive disorganisation or

274   introvertive anhedonia subscales, indicating a good convergent and divergent validity.

275

276

			Gender			O-LIFE							
Group	N	Age	(M:F:O)	SenPQ	OEQ7	Total	UE	CD	IA	IN	DSES	WHO-5	SIAS
Religious	71	36.20 (13.04)	35:35:1	26.55 (11.86)	10.85 (2.94)	14.42 (7.73)	4.14 (3.20)	4.24 (2.83)	2.80 (1.98)	3.24 (2.08)	44.93 (15.60)	19.97 (4.29)	46.13 (14.22)
Non-Religious	120	36.25 (13.66)	54:64:2	21.34 (8.14)	9.34 (2.65)	14.47 (7.47)	3.12 (2.77)	4.62 (2.96)	3.22 (2.39)	3.51 (2.33)	30.28 (11.48)	19.34 (4.58)	49.59 (17.83)
Total	191	36.23 (13.40)	89:99:3	23.28 (9.98)	9.90 (2.84)	14.45 (7.55)	3.50 (2.97)	4.48 (2.91)	3.07 (2.25)	3.41 (2.24)	35.72 (14.92)	19.58 (4.48)	48.30 (16.62)

277

Table 2 - Descriptive statistics for the religious, non-religious, and total samples.

279

Legend: SenPQ=Sensed Presence Questionnaire, O-LIFE = brief Oxford-Liverpool Inventory of Feelings and Experiences, UE = Unusual Experiences subset, CD = Cognitive Disorganisation subset, IA = Introvertive Anhedonia subset, IN = Impulsive Non-Conformity subset, OEQ-7 = Other Experiences Questionnaire, WHO-5 =World Health Organisation 5-item well-being questionnaire, DSES = Daily Spiritual Experience Scale, SIAS = Social Interaction Anxiety Scale.

284

	O-LIFE								
	UE	*CD*	*IA*	*IN*	*Total*	*OEQ-7*	*WHO-5*	*DSES*	*SIAS*
SenPQ	0.641***	0.110	0.068	0.308***	0.406***	0.673***	0.056	0.407***	0.025

285

286 **Table 3 - Pearson correlations between SenPQ and other scales in the total sample.**

287

288 Legend: SenPQ=Sensed Presence Questionnaire, O-LIFE = brief Oxford-Liverpool Inventory of Feelings and Experiences, UE = O-LIFE Unusual

289 Experiences subscale, CD = O-LIFE Cognitive Disorganisation subscale, IA = O-LIFE Introvertive Anhedonia subscale, O-LIFE IN = Impulsive Non-

290 Conformity subscale, OEQ-7 = Other Experiences Questionnaire, WHO-5 =World Health Organisation 5-item well-being questionnaire, DSES = Daily

291 Spiritual Experience Scale, SIAS = Social Interaction Anxiety Scale. ***p<0.001.

292

293 *Measures of anxiety and well-being*

294 No significant associations were found between the SenPQ and WHO-5 score (r = .56, p =

295 .443) and between the SenPQ and SIAS score (r = .025, p = .773).

296

297 *Factor analysis of the SenPQ*

298 To investigate the factor loadings of the Sensed Presence Questionnaire, a factor analysis was

299 run on all 16 items.

300

301 To test all assumptions, a Kaiser–Meyer–Olkin measure of sampling adequacy (0.925) and

302 Bartlett's test of sphericity [$\chi 2$ (120) = 2467.009, p < 0.001] were run and considered

303 adequate, with all items significantly correlating by at least 0.3 (p < 0.001).

304

305 A two factor solution was selected based on parallel analysis for principal components (Horn,

306 1965; O'Connor, 2000) and inspection of the scree plot (Cattell, 1966). The first component

307 explained 52.28% of the variance, and the second component explained an additional 7.66%

308 of the variance in the sample.

309

310 The pattern matrix can be found in Table 4. Factor one was interpreted as 'Benign Presence'

311 and factor two was interpreted as 'Malign Presence'.

312

313

314

	Item	Factor 1	Factor 2
13	I have felt the presence of a protective being around me that I couldn't see	0.990	
6	I have felt I was being watched over by caring being that I couldn't see	0.981	
3	When I was under a lot of pressure, I felt someone or something was accompanying me	0.823	
8	I have felt when an unseen presence has arrived	0.707	
5	During times of stress I have had the feeling that I was being accompanied by an unseen presence	0.604	
11	I have visited certain places where I can feel the presence of distinct but unseen beings	0.581	
12	I can feel the presence of people that I know are physically distant from me	0.559	
15	Even though I knew the person had died, I felt them accompanying me	0.550	
7	When I have visited specific locations, I felt I was in the presence of an unseen being or beings	0.494	0.432
1	I have felt another being or beings near me when I couldn't see anyone around me that could explain it		0.544
10	I have felt as if someone or something is near me, even though I know it is not really the case		0.578
2	When half asleep I have thought someone else was with me, only to find out when I woke up that they couldn't have been		0.693
16	Even though I knew it was my imagination, I still felt as if someone or something was with me		0.701
9	I have woken up during the night with the feeling that an unseen presence was in the room with me		0.702
14	I have felt a sinister or threatening presence around me, despite not being able to see any evidence for it		0.822
4	I have had the feeling that a negative or hurtful presence was around me that I couldn't see		0.896

315

316 **Table 4 - Pattern matrix factor loadings from two-component exploratory factor**

317 **analysis of item scores from 191 samples.**

318

319 Legend: All loadings less than 0.4 are not displayed.

320 *ROC Analysis*

321 Data from the psychometric measures was entered into a ROC analysis to show they

322 discriminated religious from non-religious groups over the extent of their score range. Results

323 are displayed in Table 5 and Figure 2.

324

Measure	Area Under the Curve	Std. Error	95% CIs	
SenPQ	.655***	.041	.575	.735
UE	.592*	.042	.509	.675
CD	.462	.043	.379	.546
IA	.458	.042	.376	.540
IN	.473	.043	.390	.556
O-LIFE	.490	.043	.406	.574
DSES	.811***	.034	.745	.878
OEQ7	.656***	.041	.576	.735
WHO-5	.547	.043	.464	.630
SIAS	.459	.042	.377	.541

325

326 **Table 5 - Receiver Operator Characteristic analysis of all measures predicting religious**

327 **(positive) or non-religious (negative) identification.**

328

329 Legend: SenPQ=Sensed Presence Questionnaire, O-LIFE = brief Oxford-Liverpool Inventory of

330 Feelings and Experiences, UE = Unusual Experiences O-LIFE subscale, CD = Cognitive

331 Disorganisation O-LIFE subscale, IA = Introvertive Anhedonia O-LIFE subscale, IN = Impulsive

332 Non-Conformity O-LIFE subscale, OEQ-7 = Other Experiences Questionnaire, WHO-5 = World

333 Health Organisation 5-item well-being questionnaire, DSES = Daily Spiritual Experience Scale, SIAS

334 = Social Interaction Anxiety Scale. Asymptotic significance: *p<0.05, ***p<0.001.

335

336

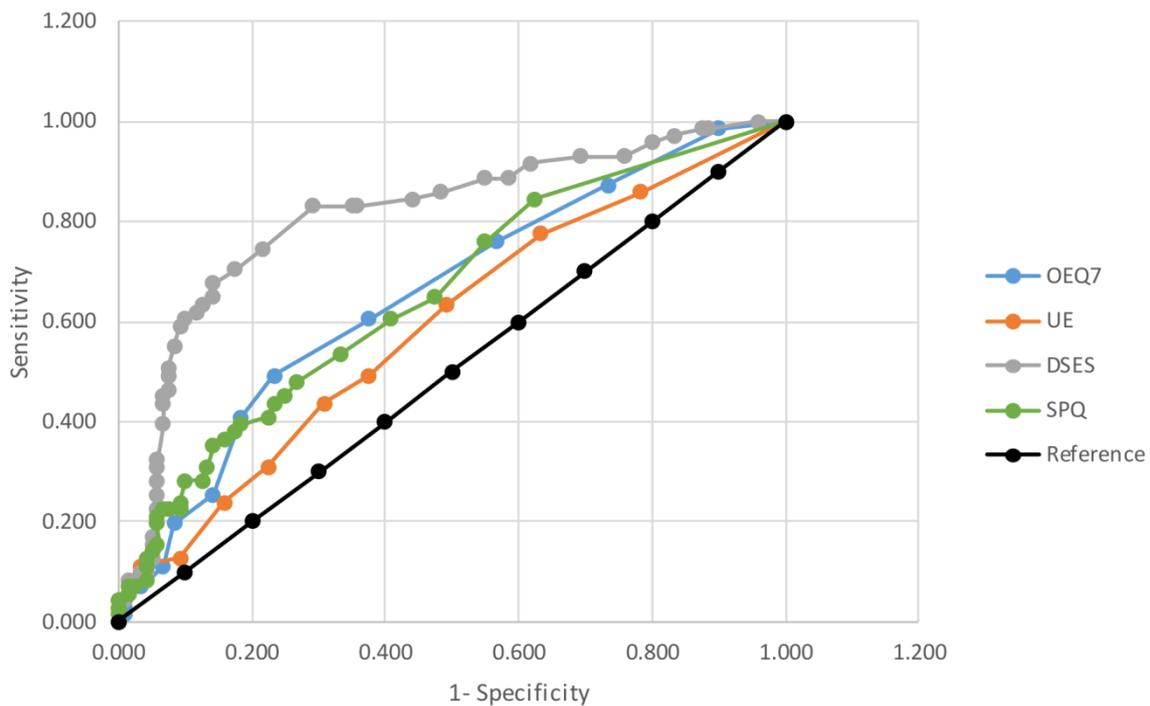



Figure 2 - Graph of receiver operating charactistic (ROC) curve for DSES, OEQ7, UE,

337

and SenPQ compared to the null reference in classifying religious and non-religious

338

participants.

339

340

341 Legend: SenPQ=Sensed Presence Questionnaire, DSES = Daily Spiritual Experience Scale, OEQ-7 =

342 Other Experiences Questionnaire, UE = Unusual Experiences O-LIFE subscale.

343

344 The most efficient total discriminator of religious and non-religious groups was the DSES

345 daily spiritual experience scale. The SenPQ and OEQ-7 Other Experiences Questionnaire

346 were highly discriminant and perform almost identically. The Unusual Experiences subscale

347 of the O-LIFE schizotypy scale discriminates between groups to a lesser extent and all other

348 scale show no significant discriminant ability.

349

Discussion

350

351 This study involved the creation and initial validation of a 16-item sensed presence

352 questionnaire and in a general population sample we demonstrated that the SenPQ is a

353 reliable and valid measure for measure the experience of 'sensed presence'.

354

355 One of the clearest findings is that the experience of 'sensed presence' is quite common in the

356 general population, even among those who profess no religious belief. The experience was

357 more commonly reported in people who either classify themselves as having a specific

358 religion or who score more highly on a measure of daily spiritual experience, as was

359 predicted from previous research (Luhrmann and Morgain, 2012; Luhrmann, 2012; Granqvist

360 et al., 2005; Granqvist and Larsson, 2006).

361

362 However, considering that the experience of sensed presence has been reported in the context

363 of various states and conditions outside of a religious framework, including sleep disorders,

364 neurological conditions, drug use, and intense physiological and emotional stress, we would

365 expect that the Sensed Presence Questionnaire to be useful across a range of presentations

366 and this needs to be a focus for future validation studies.

367

368 A particularly notable finding from the principal components analysis was the emergence of

369 distinct factors for 'benign' and 'malign' sensed presence experiences, echoing reports from

370 the literature on differing emotional valence of sensed presence experiences (Alderson-Day,

371 2016). However, as this study specifically invited people with religious or spiritual beliefs to

372 participate, and didn't specifically seek to include people with medical conditions associated

373 with sensed presence experiences, it is likely that benign experiences may be more common

374 in this sample and therefore potentially more likely to present as a distinct factor within the

375   population. Future work will need to examine how well the benign / malign distinction holds

376   up in other populations and samples.

377

378   In terms of limitations, as an initial validation study, additional data is needed to test whether

379   the scale remains reliable and valid in further samples and more diverse populations. We used

380   two sampling methods; one that drew participants from an online service that specifically

381   recruits a diverse participant base to participate in online studies, the second was a

382   combination of non-targeted recruitment using social media and specific invitations to

383   religious groups. Although our sample was broadly representative of the religious, ethnic and

384   age groups in the general population of the UK, it over-sampled people with higher levels of

385   education. Considering this, further validation needs to be conducted using additional formats

386   and a more representative general population sample.

387

388   *Conclusions*

389   From the data presented here, the Sensed Presence Questionnaire (SenPQ) appears a reliable

390   and valid measure of the 'sensed presence' experience. A principal components analysis

391   suggests that the SenPQ may comprise of two factors, malign and benign presence. We hope

392   the scale will be subject to further validation studies and will allow the 'sensed presence'

393   experience to be investigated in a range of conditions.

394

395   **References**

396   Alderson-Day B. 2016. The silent companions. *The Psychologist*, 29: 272–275.

397   Arzy S, Schurr R. 2016. "God has sent me to you": Right temporal epilepsy, left

398   prefrontal psychosis. *Epilepsy & Behavior*, 60: 7–10.

399   Barbosa PCR, Giglio JS, Dalgalarrondo P. 2005. Altered states of consciousness and

400   short-term psychological after-effects induced by the first time ritual use of

401   ayahuasca in an urban context in Brazil. Journal of Psychoactive Drugs, 37: 193–

402   201.

403   Bell V, Halligan PW, Ellis HD. 2006. The Cardiff Anomalous Perceptions Scale

404   (CAPS): A new validated measure of anomalous perceptual experience.

405   *Schizophrenia Bulletin*, 32: 366-77.

406   Bland JM, Altman DG. 2015. Statistics notes: bootstrap resampling methods. *BMJ*, 350:

407   h2622.

408   Blom JD. 2010. *A Dictionary of Hallucinations*. London: Springer.

409   Brugger P, Regard M, Landis T. 1996. Unilaterally felt ''presences'': the

410   neuropsychiatry of one's invisible doppelganger. *Neuropsychiatry,*

411   *Neuropsychology, and Behavioral Neurology*, 9: 114–122.

412   Cattell RB. 1966. The scree test for the number of factors. *Multivariate Behavioral*

413   *Research*, 1: 245–276.

414   Cheyne JA. 2001. The Ominous Numinous. Sensed Presence and 'Other' Hallucinations.

415   *Journal of Consciousness Studies*, 8:133-150.

416   Cheyne JA, Newby-Clark IR, Rueffer SD. 1999. Relations among hypnagogic and

417   hypnopompic experiences associated with sleep paralysis. *Journal of Sleep*

418   *Research*, 8: 313–317.

419 Cheyne JA, Girard TA. 2007. Paranoid delusions and threatening hallucinations: a

420 prospective study of sleep paralysis experiences. *Consciousness and Cognition*,

421 16: 959–974.

422 Claridge G, McCreery C, Mason O, Bentall R, Boyle G, Slade P, Popplewell, D. 1996.

423 The factor structure of 'schizotypal 'traits: a large replication study. *British*

424 *Journal of Clinical Psychology*, 35: 103–115.

425 Cronbach LJ. 1951. Coefficient alpha and the internal structure of tests. *Psychometrika*,

426 16: 297–334.

427 Eckblad M, Chapman LJ. 1983. Magical ideation as an indicator of schizotypy. *Journal*

428 *of Consulting and Clinical Psychology*, 51, 215–225.

429 Ellison CG, Fan D. 2008. Daily spiritual experiences and psychological well-being

430 among US adults. *Social Indicators Research*, 88: 247–271.

431 Fénelon G, Soulas T, De Langavant LC, Trinkler I, Bachoud-Lévi AC. 2011. Feeling of

432 presence in Parkinson's disease. *Journal of Neurology, Neurosurgery &*

433 *Psychiatry*, 82:1219–24.

434 Granqvist P, Fredrikson M, Unge P, Hagenfeldt A, Valind S, Larhammar D. 2005.

435 Sensed presence and mystical experiences are predicted by suggestibility, not by

436 the application of weak complex transcranial magnetic fields. *Neuroscience*

437 *Letters*, 379: 1–6.

438 Granqvist P, Larsson M. 2006. Contribution of religiousness in the prediction and

439 interpretation of mystical experiences–activation of religious schemas. *Journal of*

440 *Psychology*, 140: 319–327.

441 Hay D. 1979. Religious experience amongst a group of post-graduate students: A

442 qualitative study. *Journal for the Scientific Study of Religion*, 18:164–182.

443   Hay D, Morisy A. 1978. Reports of ecstatic, paranormal, or religious experience in Great

444   Britain and the United States: A comparison of trends. *Journal for the Scientific*

445   *Study of Religion*, 17:255–268.

446   Horn JL. 1965. A rationale and test for the number of factors in factor analysis.

447   *Psychometrika*, 30: 179–185.

448   James W. 1902. *The Varieties of Religious Experience*. United States: Harvard

449   University Press.

450   Jaspers K. 1913 / 1963. *General Psychopathology*. Manchester University Press.

451   Jaynes J. 2000. *The Origin of Consciousness in the Breakdown of the Bicameral Mind*.

452   London: Houghton Mifflin Harcourt.

453   Jung CG. 1969. The Archetypes and the Collective Unconscious. Princeton: Princeton

454   University Press.

455   Kass JD, Friedman R, Leserman J, Zuttermeister, PC, Benson H. 1991. Health outcomes

456   and a new index of spiritual experience. *Journal for the Scientific Study of*

457   *Religion*, 30: 203–211.

458   Landtblom AM. 2006. The "sensed presence": an epileptic aura with religious overtones.

459   *Epilepsy & Behavior*, 9: 186–188.

460   Luhrmann TM, Morgain R. 2012. Prayer as inner sense cultivation: An attentional

461   learning theory of spiritual experience. *Ethos*, 40:359-389.

462   Luhrmann TM. 2012. *When God Talks Back: Understanding the American Evangelical*

463   *Relationship with God*. London: Random House.

464   Luhrmann TM. 2013. Talking back about When God talks back. *HAU*, 3: 389–98.

465   Mason O, Linney Y, Claridge G. 2005. Short scales for measuring schizotypy.

466   *Schizophrenia Research*, 78: 293–6.

467   Mattick RP, Clarke JC. 1998. Development and validation of measures of social phobia

468   scrutiny fear and social interaction anxiety. *Behaviour Research and Therapy*, 36:

469   455–470.

470   Nielsen T. 2007. Felt presence: Paranoid delusion or hallucinatory social imagery?

471   *Conscious and Cognition*, 16: 975–983.

472   O'Connor BP. 2000. SPSS and SAS programs for determining the number of

473   components using parallel analysis and Velicer's MAP test. *Behavior Research*

474   *Methods, Instruments & Computers*, 32: 396–402.

475   Solomonova E, Nielsen T, Stenstrom P, Simard V, Frantova E, Donderi D. 2008. Sensed

476   presence as a correlate of sleep paralysis distress, social anxiety and waking state

477   social imagery. *Consciousness and Cognition*, 17: 49–63

478   Steffen E, Coyle A. 2011. Sense of Presence Experiences and Meaning-Making in

479   Bereavement: A Qualitative Analysis. *Death Studies*, 35: 579–609

480   Suedfeld P, Mocellin JS. 1987. The "Sensed Presence" in Unusual Environments.

481   *Environment and Behavior*, 19: 33–52.

482   Tellegen A, Atkinson G. 1974. Openness to absorbing and self-altering experiences

483   (''absorption''), a trait related to hypnotic susceptibility. *Journal of Abnormal*

484   *Psychology*, 83: 268.

485   Thompson, C. 1982. Anwesenheit: Psychopathology and clinical associations. *British*

486   *Journal of Psychiatry*, 141: 628–630.

487   Trimble M, Freeman A. 2006. An investigation of religiosity and the Gastaut–Geschwind

488   syndrome in patients with temporal lobe epilepsy. *Epilepsy & Behavior*, 9: 407–

489   414.

490   Underwood LG, Teresi JA. 2002. The daily spiritual experience scale: development,

491   theoretical description, reliability, exploratory factor analysis, and preliminary

492   construct validity using health-related data. Annals of Behavioral Medicine, 24:

493   22–33.

494   World Health Organization. 1998. *Well-Being Measures in Primary Health Care. The*

495   *DEPCAR Project*. Copenhagen: WHO Regional Office for Europe.

496   Woods A, Jones N, Alderson-Day B, Callard F, Fernyhough. 2015. Experiences of

497   hearing voices: analysis of a novel phenomenological survey. *Lancet Psychiatry*,

498   2: 323–331.