Factor structure and age invariance of the Cardiff Anomalous Perceptions Scale (CAPS) in healthy older and younger adults

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Author Note

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Abstract

Whilst anomalous perceptual experiences are common in healthy older adults, they remain poorly characterised. In particular, it is unclear whether the phenomenology of these experiences differs between healthy older and younger adults. The current study examined similarities and differences in the factor structure of the Cardiff Anomalous Perceptions Scale (CAPS) in healthy, community-dwelling older (n = 194; M_{age} = 71.89 [SD = 7.74, range 52-91], 69.1% female) and younger adults (n = 421, M_{age} = 19.40 [SD = 2.44, range 17-34], 69.6% female; N = 615), using exploratory and confirmatory factor analysis, together with measurement invariance testing. The results found that a 2-factor correlated model comprising 23 of the original 32 CAPS items provided the best fit to the data. Further, scalar invariance was found between the two samples, indicating equivalence of the factor structure, factor loadings, and thresholds by age group. Compared to younger adults, the latent group means of older adults were also found to be equal on Factor 1, but significantly lower on Factor 2. Evidence of scalar age invariance on the CAPS suggests that this tool is valid for making comparisons between older and younger adults on two dimensions of anomalous perceptual experiences. Further, the results suggest that anomalous perceptions in the general community may be characterised by two components: anomalous body-centred self-experiences (e.g., alterations in body, touch, smell, and taste perception) and anomalous external experiences (e.g., auditory, visual, and sensed presence hallucinations); each of which may have different causes, correlates, and consequences for healthy ageing.

Key words: Healthy, ageing, older adults, anomalous perceptions, anomalous perceptual experiences, Cardiff Anomalous Perceptions Scale (CAPS), measurement invariance, age invariance, factor Analysis. *Public significance statement:* This study suggests that the Cardiff Anomalous Perceptions Scale (CAPS) is a questionnaire that can be used similarly for healthy older and younger adults to measure experiences such as hallucinations.

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Hallucinations may be defined as sensory experiences that occur in the absence of any external stimuli (David, 2004; American Psychiatric Association, 2013), and are one example of the broader category of anomalous perceptual experiences. Hallucinations most commonly include “hearing” voices and “seeing” things that other people cannot, but also occur in other sensory modalities. The term ‘perceptual anomalies’ encompasses a much wider range of changes in perceived shape, size, location, and intensity—as well as frank hallucinations—across all sensory modalities. Here, the term hallucination is therefore used as just one example of an anomalous perception that may be experienced. Indeed, there is considerable individual variability in the type of anomalous perceptions experienced, which appears to reflect the influence of multiple causal factors (Bell, Halligan, & Ellis, 2006; Ford et al., 2014; Rollins et al., 2019).

In previous psychological literature, hallucinations have typically been considered a sign of psychotic disorder (Larøi et al., 2012), but more recently have been recognised as occurring across diagnostic categories and in healthy individuals with no diagnosis at all (Bell, Halligan, Pugh, & Freeman, 2011; Unterrassner, Wyss, Wotruba, Haker, & Rössler, 2017; Waters & Fernyhough, 2016). Whilst anomalous perceptual experiences are known to occur in non-clinical samples across all age groups (García-Ptacek, García Azorín, Sanchez Salmador, Cuadrado, & Porta-Etessam, 2013; Maijer, Begemann, Palmen, Leucht, & Sommer, 2018; Ohayon, 2000; Unterrassner et al., 2017), research in this area has primarily focused on younger adults; consequently, much less is known about the nature of hallucinations in healthy older adults. This gap in the evidence base is potentially problematic, given the relatively common occurrence of hallucinatory experiences amongst community-dwelling older adults (Baumeister, Sedgwick, Howes, & Peters, 2017)—which is

estimated to be somewhere between 4.5 and 10.6% (reviewed in Badcock, Dehon, & Larøi, 2017)—and that the number of older adults is growing more quickly than in any other age group worldwide. Indeed, it has been projected that, by 2050, the number of adults aged 60 and over will have doubled since 2015 (United Nations, 2015). Furthermore, anomalous perceptual experiences in older age groups have been linked to an increased risk of future mental and neurodegenerative disorders (De Loore et al., 2011; Pagonabarraga et al., 2016), cognitive decline and difficulties in daily living (Cox & ffytche, 2014), and (when accompanied by high levels of distress) an increased need for care (Daalman, Diederen, Hoekema, van Lutterveld, & Sommer, 2016).

Parallel findings in younger adults show that higher levels of distress and intrusion relate to the persistence of hallucinations and the development of clinical disorders (De Loore et al., 2011; Debbané, Schneider, Eliez, & Van der Linden, 2011; van Os, Linscott, Myin-Germeys, Delespaul, & Krabbendam, 2009). However, there is a notable absence of direct comparisons between older and younger adults; therefore, it remains unclear if the nature of anomalous perceptual experiences is the same or different across age groups. Increasing this understanding has important theoretical and clinical implications, including helping to develop more accurate explanatory models of hallucinations (McCarthy-Jones et al., 2014) and age-sensitive treatments (Larøi, 2006). Therefore, the primary aim of this study was to examine the factor structure of anomalous perceptions—assessed with the Cardiff Anomalous Perceptions Scale (CAPS; Bell et al., 2006)—in healthy community-dwelling older adults and compare this with a sample of healthy younger adults. The CAPS is a self-report questionnaire designed to assess the experience of anomalous perceptions within the general population. The benefits of using the CAPS include: the neutral language used (e.g., experiences are not portrayed as being “strange”), the exclusion of items that assess other

features of psychosis (e.g., disorganised thoughts), and the range of experiences that are assessed across a number of different sensory modalities (e.g., hearing, vision, and taste).

Initial exploratory factor analysis of the CAPS in a general, non-clinical, younger to middle-aged adult sample (range 18-54) found a 3-factor structure of anomalous perceptual experiences, with the three factors labelled: “temporal lobe experience”, “chemosensation”, and “clinical psychosis” (Bell et al., 2006). Subsequent studies with predominately younger adults have also found both 2- and 3-factor structures (Debbané et al., 2011; Jaén-Moreno, Moreno-Díaz, Luque-Luque, & Bell, 2014; Tamayo-Agudelo, Jaén-Moreno, & Luque-Luque, 2015). Whilst the participants in these studies differed in a number of ways (e.g., gender, culture), one important factor that may also have contributed to the variation in these factor structures is age, leading Tamayo-Agudelo et al. (2019) to argue that an analysis of measurement invariance of age is required. Indeed, no studies have specifically examined the factor structure of the CAPS in older adults, and so it is unknown whether this measure is invariant across age groups. One reason for suspecting non-invariance of the CAPS is that it could be suspectible to bias from confounding variables associated with group membership. For example, decreased sensory functioning (e.g., hearing and vision loss)—that may contribute to the experience of anomalous perceptions—is more likely to occur in older than younger adults, and could therefore bias scores on the CAPS. As such, establishing measurement invariance is important because it indicates whether a measure is equivalent across groups; in particular, scalar (“strong”) measurement invariance is needed to make valid comparisons of group means. Importantly, in addition to the varying number of factors found in previous research, there is also evidence of inconsistency in the factor loadings for the indicators of similarly labelled factors (see Table S1). For example, whilst a “clinical psychosis” factor has frequently been found in previous research, it has considerable variation in item composition across studies, such as: Q3, 5, 7, 10, 11, 31 (Bell et al., 2006);

Q2, 4, 6, 7, 8, 11, 12, 13, 14, 28, 31, and 32 (Bell et al., 2011); Q2, 3, 4, 8, 11, 12, 13, 22, 24, and 29 (Debbané et al., 2011); Q3, 7, 11, 13, and 31 (Kao, Wang, Lu, & Liu, 2013); Q2, 11, 12, 13, 28, 31, and 32 (Tamayo-Agudelo et al., 2019). Furthermore, there are a number of problems in previous factor analytical studies of the CAPS that prevent researchers from replicating these previous factor structures, such as not being able to confidently determine which items belong in which factor/s (see Table S2). These inconsistencies highlight that further exploration of the factor structure of the CAPS using exploratory factor analysis is also required.

The current study therefore aimed to (a) explore the factor structure of the CAPS in a sample of community-dwelling healthy older and younger adults, and (b) test the measurement invariance of the identified CAPS factor structure across the two age groups. To do this, an initial exploratory factor analysis on one random split-half of the overall sample was conducted. Based on the findings of this first analysis, the model with the best overall fit was then used to conduct a confirmatory factor analysis with the remaining half of the total sample. Finally, invariance testing of the CAPS in the older versus younger adult samples was conducted.

Method

Participants

Two separate cohorts of older (aged 50 and over) and younger (aged 17-35) healthy adults were recruited. Older adult participants were recruited through the Healthy Ageing Research Program (HARP)—a longitudinal study of community-dwelling older adults aged 50 years and over—investigating age-related changes in neuropsychological functioning and behaviour. Participants within the longitudinal study were initially recruited across a range of channels, including: local bulletin boards and newspapers, community presentations, online via social media, and through personal connections. Younger adult participants were all

undergraduate students, recruited via an online research participation system, who received course credit for their participation. Approval for the current study was provided by the Human Research Ethics Committee at the University of Western Australia.

Participants who reported a history of neurological (e.g., stroke, Parkinson's disease) and/or psychiatric conditions associated with the presence of hallucinations (e.g., schizophrenia, post-traumatic stress disorder) were excluded. Based on these criteria, 12 older adult participants (8-post-traumatic stress disorder; 2-stroke; 1-Alzheimer's disease; 1-schizoaffective disorder) and 16 younger adult participants were excluded (12-post-traumatic stress disorder; 2-psychotic disorder; 1-arachnoid cyst; 1-intraventricular haemorrhage). Older adult participants were screened and excluded if they scored below 18 on the telephone adapted version of the Montreal Cognitive Assessment (T-MoCA; Pendlebury et al., 2013, n = 15) or below 24 on the Folstein Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975; O'Bryant et al., 2008, n = 2). An additional 17 older adults did not consent to complete the cognitive screening and were, therefore, excluded. Younger adult participants were not cognitively screened, as the young age and education level of this sample would indicate the presence of little to no cognitive impairment. Participants who had experienced a loss of consciousness (LOC) for 30 minutes or more (older adults n = 4, younger adults n = 8), or did not report the length of their LOC (older adults n = 8), were also excluded. Lastly, two participants provided no CAPS data and were excluded. After all exclusions, a total of 194 older participants (range 52-91 years) and 421 younger participants (range 17-34 years) remained.

Materials

A customised questionnaire pack was designed to assess a range of demographic, social, medical (e.g., chronic medical conditions, alcohol and drug use), and mental health information. The key measure used in the current study was the CAPS.

Cardiff Anomalous Perceptions Scale (CAPS; Bell et al., 2006). The CAPS is a 32-item self-report questionnaire which assesses the tendency to experience a broad range of perceptual anomalies across the five sensory modalities, tapping changes in sensory intensity and distortion of perceptual input, as well as experiences more closely resembling clinical hallucinations. For example, "Do you ever hear noises or sounds when there is nothing about to explain them?". Participants answer each item "yes" or "no". The total CAPS score is the number of items endorsed "yes" (range 0 to 32), with higher scores indicating the presence of more anomalous perceptual experiences.

For each item endorsed as present, participants rate the level of associated distress, intrusiveness, and frequency on a 5-point scale, giving a subscale score range of 0 to 160, with higher scores indicating a greater level of distress, intrusiveness or frequency, respectively[1]. The CAPS total score has previously shown good internal reliability (Cronbach's $\alpha = .87$; Bell et al., 2006) and convergent validity with similar measures of hallucination proneness (Jaén-Moreno et al., 2014; Tamayo-Agudelo et al., 2019).

Telephone adapted version of the Montreal Cognitive Assessment (T-MoCA; Pendlebury et al., 2013). The T-MoCA is a brief, valid, and reliable instrument (10-15 mins) used to identify potential cognitive impairment, which is useful when it is not possible to test a participant face-to-face. The total score ranges from 0 to 22, and the recommended cut-off to detect mild cognitive impairment is 18 (Pendlebury et al., 2013).

Folstein Mini-Mental State Examination (MMSE; Folstein et al., 1975). The MMSE is a brief, well-established instrument (5-10 mins) that is commonly used to assess overall cognitive status (Folstein et al., 1975). The total score ranges from 0 to 30, and the recommended cut-off score to detect cognitive impairment is 24 (O'Bryant et al., 2008).

[1] Factor analysis is of the "yes/no" responses to all items in the CAPS; therefore, these three subscales were not analysed further in this study.

Procedure

Firstly, participants were sent the questionnaire pack via an online platform (Qualtrics) or by post. Participants were provided with an information sheet describing the purpose of the study, as well as the contact details of the researchers, and were told that completion and return of the questionnaire pack would be taken as evidence of their consent to participate. Completing the questionnaire pack took approximately one hour. Debriefing information was presented at the end of the questionnaire pack, including sources of help or information if needed. Within 4-6 weeks of completion of the questionnaire pack, older adults were contacted to complete the T-MoCA or MMSE by an assessor working within the longitudinal study that had been trained and assessed for competency by an endorsed clinical neuropsychologist.

Data Analysis

Descriptive analyses were conducted using SPSS version 25.0 for Windows (IBM Corp, Released 2017) and JASP (JASP Team, 2019). The internal reliability of the CAPS total score was calculated using McDonald's Omega total (ω_t) coefficient, and as a general guideline, values > .70 were considered adequate. The difference in observed means between samples on the CAPS were compared using nonparametric Mann-Whitney U tests (2-tailed). Exploratory and confirmatory factor analyses were conducted using Mplus version 8.0 (Muthén & Muthén, 1998-2017). Prior to all factor analyses, CAPS items with an endorsement rate of fewer than 5 "yes" responses were excluded from both the older and younger adult samples, as infrequently endorsed items may result in estimation problems. Specifically, items 11, 12, 13, 16, 19, 24, 26, and 28 were removed (Choi, Gibbons, & Crane, 2011; Dunn, Masyn, Jones, Subramanian, & Koenen, 2015; Scott & Reynolds, 2010).

In all factor analyses, a robust weighted least squares mean and variance adjusted (WLSMV) estimator was used, based on the tetrachoric correlation matrix of the categorical

response variables. The default geomin (oblique) rotation was also used to allow the factors to correlate with each other. In a series of additional analyses, a maximum likelihood with robust standard errors (MLR) estimator was used to calculate the Akaike Information Criterion (AIC; Akaike, 1987), Bayesian Information Criterion (BIC; Schwarz, 1978) and sample-size adjusted BIC (SABIC; Sclove, 1987) values to compare model fit. When comparing these values between alternate models, lower AIC, BIC and SABIC values all indicate better model fit. The chi-square (χ^2) statistic is reported; however, it is sensitive to sample size and is often statistically significant (González-Blanch et al., 2018). Therefore, a number of other important fit statistics were also used to assess model fit. These include: the (1) standardized root mean square residual (SRMR; Jöreskog & Sörbom, 1998), (2) comparative fit index (CFI; Bentler, 1990), (3) Tucker-Lewis index (TLI; Tucker & Lewis, 1973), and (4) root mean square error of approximation (RMSEA; Steiger, 1990). Recommended cut-offs for identifying reasonable model fit to the data using these fit indices are: SRMR .06 - .08, CFI .90 - .95, TLI .90 - .95, and RMSEA .05 - .08 (Byrne, 2001; Hu & Bentler, 1999; Tabachnick & Fidell, 2001), while recommended cut-offs for identifying good model fit are: SRMR < .06, CFI ≥ .95, TLI ≥ .95, and RMSEA < .05 (Hu & Bentler, 1999; Tabachnick & Fidell, 2001; Yu, 2002).

Phase 1: Exploratory Factor Analysis. In Phase 1 (n = 307), exploratory factor analysis was conducted on a random split-half of the total sample (i.e., half of the older and half of the younger adults) to examine the factor structure of the CAPS. Previous research has found the most support for either a 2- or 3-factor correlated structure. Additionally, it could be that a single, general factor of anomalous perceptions exists, and so we compared the fits of 1-, 2-, and 3-factor models with one another.

Phase 2: Confirmatory Factor Analysis. In Phase 2 (n = 308), confirmatory factor analysis was conducted with the remaining half of the total sample to test the fit of the CAPS

to the model that provided the best fit in Phase 1. A cut-off value of > .40 for factor loadings was used to retain items from Phase 1 (Matsunaga, 2010). To maintain consistency, the same cut-off value for factor loadings was also used to assign items to factors (i.e., if an item loaded > .40 on a factor, it was then assigned to that factor for the confirmatory factor analysis in Phase 2).

Phase 3: Invariance Testing. Provided the model tested in Phase 2 demonstrated adequate fit, this model was then used to conduct a multigroup confirmatory factor analysis to test for measurement invariance across age groups (i.e., the older versus the younger adult samples; $N = 615$). Configural invariance tests whether the overall factor structure holds in different samples, and is a prerequisite for testing more stringent types of invariance (i.e., metric and scalar invariance; Campbell, Barry, Joe, & Finney, 2008). When using categorical data, Muthén and Muthén (2013) suggest that metric invariance testing—which examines whether the factor loadings are equivalent across samples (Putnick & Bornstein, 2016)—is not appropriate. Therefore, configural invariance was tested first, and, if this was established, a scalar invariance model was tested to examine whether the factor loadings and item thresholds were equivalent across samples (Putnick & Bornstein, 2016). To establish configural invariance, the proposed model needed to demonstrate adequate fit indices, as described above. When comparing configural to scalar invariance, decreases in CFI of ≤ .01, TLI ≤ .01, and RMSEA ≤ .015, were used as evidence of invariance (Chen, 2007; Cheung & Rensvold, 2002). After establishing scalar invariance, we sought to determine whether the two age groups had different latent mean values of the two factors (i.e., scalar plus mean invariance) by taking the scalar invariance model and further constraining the latent group means to be equal; if CFI decreased < .01, this was used as evidence that the groups differed on their latent factor means.

Results

Descriptive Statistics

Table 1 shows the demographic variables of both the older and younger adult samples. Mean, *SD*s, ranges, McDonald's ω_t, and the difference in observed means for each factor for both age groups were calculated (Table 2). The results in Table 2 show significant differences in observed CAPS scores between older and younger adults. In the combined sample, McDonald's ω_t for Factor 1 was .66, and .61 for Factor 2. In both the older and younger adult samples, the CAPS exhibited internal consistency just below the acceptable threshold (Nunnally & Bernstein, 1994).

Phase 1: Exploratory Factor Analysis. Fit statistics for the three alternate CAPS models tested in the first, random, split-half of the total sample are shown in Table 3. When comparing the 1-factor (1a) and 2-factor correlated (1b) models, the χ^2 value was lower in the 2-factor correlated model. Furthermore, the CFI and TLI values were above the recommended cut-off in the 2-factor correlated model but were inadequate in the 1-factor model. When comparing the 2-factor (1b) and 3-factor correlated (1c) models, the 3-factor model had higher CFI and TLI values, as well as a lower χ^2 value, than the 2-factor model; however, the AIC, BIC, and SABIC values were all lower in the 2-factor model, suggesting that it had greater parsimony. Accordingly, the 2-factor correlated model was carried through to the confirmatory factor analysis in Phase 2. The factor loadings for the 2-factor correlated model are presented in Table 4.

Phase 2: Confirmatory Factor Analysis. Prior to conducting the confirmatory factor analysis, item 10 ("Do you ever have the sensation that your limbs might not be your own or might not be properly connected to your body?") was removed as it did not meet the cut-off of > .40. Using the same cut-off, items were then assigned to either Factor 1 or 2 (the assignment of items is shown in bold text in Table 4). Fit statistics for the 2-factor correlated

CAPS model tested in the second, random, split-half of the total sample are shown in Table 3. The factor loadings and R^2 values for the 2-factor correlated model tested in Phase 2 are presented in Table 4 (also see Figure 1 for the path diagram of this model). As shown in Figure 1, Factor 1 comprised items 8, 9, 14, 17, 18, 20, 21, 25, 29, and 30, and encompassed items related to alterations in body, touch, smell and taste perception; therefore, this factor was labelled "anomalous body-centred self-experiences". Factor 2 comprised items 1, 2, 3, 4, 5, 6, 7, 15, 22, 23, 27, 21, and 32, and largely encompassed items describing auditory, visual, and sensed presence hallucinations; as such, this factor was labelled "anomalous external experiences". While not all of the model fit indices met ideal cut-off criteria, this model was considered adequate for the purposes of invariance testing and was, therefore, carried through to Phase 3.

Phase 3: Invariance Testing. Fit statistics for the invariance analyses are reported in Table 3. Configural invariance was found (i.e., there was *not* a difference in CAPS factor structure between older and younger adults). Likewise, strong fit statistics and decreases in CFI of ≤ .01, TLI ≤ .01, and RMSEA ≤ .015, between the configural (3a) and scalar (3b) models of indicated that there was also scalar invariance (i.e., that there was *not* a difference in the factor loadings and item thresholds between older and younger adults).

Adding further constraints (3c) on the means resulted in decreases in the CFI and TLI values of > .01, suggesting that the latent group means were not equivalent. Modification indices revealed that the likely reason for the decrease in model fit was due to differences in the latent group means of Factor 2. Therefore, we released the mean constraint on Factor 2 (3d), and found that model fit improved; this suggests that older and younger adults have equal latent means on Factor 1, but that older adults have lower latent means (Cohen's d = -1.25) than younger adults on Factor 2. The factor loadings for this final, and most stringent, test of age invariance are reported in Table 4. Whilst the SRMR is higher than ideal in all

analyses, inspection of the fit indices for the final invariance model (3d), which uses the full sample, takes account of age, and allows for differences in the latent means of Factor 2, revealed that the χ^2 of model fit was not significant, and CFI and TLI were good. According to Asparouhov and Muthén (2018), this indicates that the model fits well, and we need not be concerned with the SRMR value of > .08.

Discussion

The current study is the first to explore the factor structure of anomalous perceptual experiences (assessed with the CAPS) in community-dwelling healthy older and younger adults, and test the measurement invariance of this factor structure across age groups. The results of the exploratory factor analysis suggested a 2-factor structure, and the key finding here is that this factor structure demonstrated scalar invariance. Therefore, while the latent mean estimates of Factor 2 were significantly lower in older than younger adults, the overall factor structure, factor loadings, and thresholds of the CAPS did not differ between age groups. This finding suggests that this tool is valid for making comparisons between older and younger adults on two dimensions of anomalous perceptual experiences.

The current results reconfirm that anomalous perceptual experiences in healthy individuals are not a unitary phenomenon, as finding a multidimensional factor structure suggests that there may be multiple contributory factors underlying these experiences (Badcock et al., 2017; Maijer et al., 2018). Based on the previous literature, it might have been reasonable to suspect that the reported inconsistency in the number of factors and thematic content of the factors underlying observed CAPS scores could have been due to age differences in the samples from which prior results were derived. However, the current finding of scalar invariance by age group suggests that this explanation is unlikely. Our analyses showed that a 2-factor correlated model, comprising 23 of the original 32 CAPS items, provided the best fit to the data, and that this model's structure, factor loadings, and

thresholds were invariant to differences in age. As such, the current results suggest that it is more appropriate to interpret the CAPS according to its two subfactor scores, rather than a single total score. However, caution is advised when comparing observed test scores, because, unlike latent variables, they contain measurement error. Indeed, the presence of measurement error in the observed scores likely explains why the observed score means of Factor 1 (McDonald's ω_t for total sample = .66) differed by age group, but the latent variable means did not.

Examination of the content of the 2-factor structure showed that both factors comprised experiences involving multiple sensory modalities (i.e., both factors can be interpreted as reflecting multimodal anomalous perceptual experiences). Consistent with this, research suggests that multimodal hallucinations are common in both non-clinical and (some) clinical populations (e.g., Parkinson's disease, psychosis). Moreover, recent evidence indicates that multimodal hallucinations may increase the risk for developing clinically relevant symptoms in non-clinical samples, with co-occurring hallucinations likely sharing some common causal mechanisms (Laloyaux et al., 2019).

In the current study, Factor 1 comprised items predominately related to changes in the perception of smell, taste, body image, and touch perception (sometimes referred to as "body-centred senses"; Postmes et al., 2014; Riva, 2018). Previous analyses of the CAPS have frequently identified a "chemosensation" factor—comprising items assessing olfactory and gustatory experiences (Bell et al., 2006; Kao et al., 2013; Tamayo-Agudelo et al., 2019)—that clearly shares some similarities with our Factor 1. However, given the current factor analysis includes items beyond changes in the experience of smell and taste, one potential interpretation of this factor is that it more broadly captures anomalous body-centred self-experiences. Indeed, research suggests that disturbances in self-experience are an essential

element of schizophrenia spectrum disorders (Parnas & Handest, 2003), that also occur in the general population (Raballo & Parnas, 2011).

In contrast, Factor 2 comprised items predominately related to auditory and visual anomalous perceptions (sometimes termed the "spatial senses"; Spence, 2019), but also included sensed presence hallucinations (e.g., Q2 “Do you ever sense the presence of another being, despite being unable to see any evidence?”). Overall, the items within this factor capture more severe distortions in everyday perceptions and frank hallucinations, experienced in external space and/or involving other (non-self) agents. Previous factor analyses of the CAPS have identified a “clinical psychosis” factor—comprising items assessing experiences commonly linked to clinically diagnosable psychosis disorders (Bell et al., 2006; Bell et al., 2011; Debbané et al., 2011; Kao et al., 2013; Tamayo-Agudelo et al., 2019)—that also shares strong similarities with our Factor 2. However, the clinical significance of this factor is unclear, and labelling it in this way also implies that the anomalous self-experiences described in Factor 1 are not clinically significant (which also remains unknown). Instead, the commonality between anomalous perceptions of audition, vision, and sensed presence is that the object of perception in these experiences is related to both spatial location and person. Accordingly, Factor 2 was labelled as “anomalous external experience” (i.e., of space and identity).

It is important to note that, whilst the two dimensions of anomalous perceptual experiences described above are separable, they are not entirely independent since the results show that these factors are well correlated. Indeed, this correlated factor structure is consistent with the proposal that there are some social, cognitive, and neural processes shared by all anomalous perceptual experiences, whilst others also play a unique role in the experience of hallucinations in specific modalities (Fernyhough, 2019). Therefore, the

descriptions of these factors emphasise the most prominent functional attributes of each factor, which may in turn be related to their different underlying causal mechanisms.

In relation to the measurement invariance analyses, the results reveal support for scalar invariance, which indicates that the overall factor structure, factor loadings, and item thresholds did not differ significantly between older and younger adults (Milfont & Fischer, 2010). However, the factor structure and scalar invariance established in the current study only pertains to the absence or presence of these experiences; therefore, future research examining measurement invariance of the three CAPS subscales (i.e., distress, intrusiveness, and frequency) is also needed. In line with this, previous research has emphasised the importance of factors, such as distress, in predicting future need for care (Daalman et al., 2016). Given the rapidly ageing population, more attention needs to be given to the role of distress, frequency, and intrusiveness in predicting outcomes for older adults with anomalous perceptions.

The findings of the current study need to be considered in light of a number of limitations. Firstly, the younger adult sample consisted entirely of undergraduate students, and may, therefore, not be representative of the wider population. Secondly, the participants in the current study were predominately female (69.4%) and Anglo-Australian (78.9%), but the potential effects of gender and/or culture on anomalous perceptual experiences could not be examined. Indeed, Tamayo-Agudelo et al. (2019) noted that the influence of cultural factors needs to be tested in future research using measurement invariance, and—given the mixed evidence of gender effects on the CAPS (Bell et al., 2006; Bell et al., 2011)—we also propose that measurement invariance should be tested in relation to gender. In the current study, we did not examine the extent to which other sample characteristics that may differ between age groups (e.g., education, IQ) could have influenced the findings, and so we suggest that further study will be needed to systematically assess the impact of these

variables. The current sample also included only healthy older adults, and so it could be that the factor structure also differs in clinical samples. We also note that having participants self-report their physical and mental health history may be a limitation, because the concordance between self-reported and actual diagnosis may be low (Wu, Lai, Gau, Wang, & Tsai, 2014). Thirdly, the current age invariance testing was not conducted using an entirely independent sample from the one that was used to derive its factor structure, indicating that the findings of the current study need replicating in an independent sample. That said, this is the first study to establish age invariance of a CAPS factor solution. Future research is also needed to examine the reliability, and convergent and divergent validity of the brief, 23-item version of the CAPS found in the current study, as well as its potential clinical utility (e.g., ability to predict course and outcome, and identify biological and/or social correlates). Further, the sample size and inclusion of an older non-clinical population (with lower prevalence rates of anomalous perceptions) may have influenced the frequency of participant responses and, therefore, model estimation may also have been affected. Steps were taken to overcome this issue (i.e., removing infrequently endorsed items); however, testing a larger number of participants could potentially have increased the CAPS endorsement rates and allowed for inclusion of all 32 items. Nonetheless, the evidence of measurement invariance suggests that the CAPS is a useful tool regardless of age group, and the reduced number of items may also be more practical for use in future studies where time constraints apply.

Lastly, this study offers another factor structure of the CAPS to a growing stable of alternatives (see Tables S1 and S2), each with different factors and different items loading onto those factors. It is entirely plausible that the CAPS factor structure varies by study population and that an age, gender, and population invariant solution cannot be found. One possible approach to this challenge is to encourage researchers in the field to share their item-

level data to combine into a single, large data set to allow the factor structure of the CAPS to be examined more definitively[2].

In summary, the current study showed that a 2-factor correlated model of the CAPS had good model fit and possessed scalar invariance to age in a sample of healthy older and younger adults. Further, it revealed that older adults had lower latent mean levels of the Factor 2 trait (i.e., “anomalous external experiences”) compared to healthy younger adults. This observation is somewhat surprising given that the social, cognitive, and sensory risk factors for hallucinatory experiences increase with age (Badcock et al., 2017), and therefore merits further examination. Future research could also use meta-analytic structural equation modelling to test the 2-factor correlated model found in the current study using data from previous factor analyses of the CAPS (Jak, 2015). Overall, these findings suggest that the CAPS is valid for making comparisons between older and younger adults on two dimensions of anomalous perceptual experiences.

[2] We invite interested readers with CAPS data to share to contact us.

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Table 1

Demographics of the younger (aged 17-35) and older (aged 50 and over) samples.

	Younger sample (n = 421)	Older sample (n = 194)
Age years ($M \pm SD$, range)	19.40 ± 2.44, 17-34	71.89 ± 7.75, 52-91
Gender [n (%)]		
Females	293 (69.6)	134 (69.1)
Males	128 (30.4)	60 (30.9)
Years of education ($M \pm SD$, range)[a]	12.08 ± .56, 10-17	13.31 ± 2.51, 7-19
Ethnicity [n (%)][b]		
Caucasian	274 (65.1)	183 (94.3)
Asian	97 (23)	7 (3.6)
African	10 (2.4)	
Aboriginal/Torres Strait Islander	1 (.2)	
Hispanic	3 (.7)	
Other	35 (8.3)	2 (1.0)
T-MoCA ($M \pm SD$)	N/A	19.67 ± 1.34
MMSE ($M \pm SD$)	N/A	28.29 ± 1.42

Note. [a]One older adult did not report years of education; [b]One younger adult and two older adults did not report ethnicity. T-MoCA = telephone adapted version of the Montreal Cognitive Assessment (Pendlebury et al., 2013; max. 22); MMSE = Mini-Mental State Examination (Folstein et al., 1975; max. 30). Higher scores on both measures indicate better general cognition.

Table 2

Characteristics of the CAPS for the younger (aged 17-35) and older (aged 50 and over) samples.

CAPS scores	Younger sample (n = 421)				Older sample (n = 194)				Difference in observed means between samples[b]
	M	*SD*	Range	ωt	*M*	*SD*	Range	ωt	
Factor 1	.62	1.08	0-7	.60	.97	1.55	0-8	.69	p = .006
Factor 2	1.64	2.00	0-11	.68	.90	1.50	0-8	.65	p < .001

Note. CAPS = Cardiff Anomalous Perceptions Scale; ωt = McDonald's Omega total. [b]Mann-Whitney U test (2-tailed). Factor 1 comprises items 8, 9, 14, 17, 18, 20, 21, 25, 29, and 30, and Factor 2 comprises items 1, 2, 3, 4, 5, 6, 7, 15, 22, 23, 27, 31, and 32.

Table 3

Exploratory, confirmatory factor and measurement invariance analyses of the CAPS, with fit statistics.

Model	*df*	χ^2	*p*	SRMR	CFI	TLI	RMSEA (90% CI)	AIC	BIC	SABIC
PHASE 1: EXPLORATORY FACTOR ANALYSIS (first, random, split-half combined older and younger sample, *n* = 307)										
1a. 1-factor model	252	321.01	.002	.174	.888	.877	.030 (.019-.039)	4307.04	4485.93	4333.69
1b. 2-factor correlated model	229	244.97	.224	.131	.974	.969	.015 (.000-.029)	4265.57	4530.18	4305.00
1c. 3-factor correlated model	207	214.06	.354	.118	.989	.985	.011 (.000-.027)	4273.30	4619.89	4324.94
PHASE 2: CONFIRMATORY FACTOR ANALYSIS (second, random, split-half combined older and younger sample, *n* = 308)										
2. 2-factor correlated model	229	295.56	.002	.154	.876	.863	.031 (.019-.040)			
PHASE 3: INVARIANCE TESTING (older and younger adult samples combined, *N* = 615)								Δ CFI	Δ TLI	Δ RMSEA
3a. Configural invariance	458	536.44	.007	.140	.935	.928	.024 (.013-.032)			
3b. Scalar invariance	477	548.32	.013	.145	.941	.937	.022 (.011-.030)	-.006	-.009	.002
3c. Scalar plus mean invariance (both factors)	501	648.81	< .001	.147	.877	.876	.031 (.024-.038)	.064	.061	-.009
3d. Scalar plus mean invariance (Factor 2 means freed)	500	551.79	.054	.144	.957	.956	.018 (.000-.027)	-.080	-.080	.013

Note. CI = confidence interval; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; SABIC = sample-size adjusted BIC. Recommended cut-offs for identifying reasonable model fit: SRMR .06 - .08, CFI .90 - .95, TLI .90 - .95, and RMSEA .05 - .08 (Byrne, 2001; Hu & Bentler, 1999; Tabachnick & Fidell, 2001). Recommended cut-offs for identifying good model fit: SRMR < .06, CFI ≥ .95, TLI ≥ .95, and RMSEA < .05 (Hu & Bentler, 1999; Tabachnick & Fidell, 2001; Yu, 2002). Lower AIC, BIC and SABIC values all indicate better model fit.

Table 4

Factor loadings for the 2-factor correlated model of the CAPS in Phases 1, 2, and 3.

	Phase 1: EFA (n = 307)		Phase 2: CFA (n = 308)			Phase 3: Scalar plus mean invariance (F2 means freed, N = 615)					
CAPS item: Do you ever…	F1	F2	F1	F2	R^2	F1 (OA)	F2 (OA)	R^2	F1 (YA)	F2 (YA)	R^2
Q1: Notice that sounds are much louder than they normally would be?	.33*	**.42***		.63**	.40**		.67**	.31**		.67**	.45**
Q2: Sense the presence of another being, despite being unable to see any evidence?	-.38*	**.77***		.40**	.16*		.38**	.45**		.38**	.15**
Q3: Hear your own thoughts repeated or echoed?	.21	**.46***		.57**	.33*		.55**	.45**		.55**	.30**
Q4: See shapes, lights or colours even though there is nothing really there?	.03	**.49***		.60**	.37*		.50**	.41**		.50**	.25**
Q5: Experience unusual burning sensations or other strange feelings in or on your body?	.07	**.45***		.36**	.13*		.44**	.15*		.44**	.20*
Q6: Hear noises or sounds when there is nothing about to explain them?	.01	**.69***		.61**	.37*		.65**	.47**		.65**	.43**
Q7: Hear your own thoughts spoken aloud in your head, so that someone near might be able to hear them?	.14	**.61***		.28	.08		.55**	.31**		.55**	.31**
Q8: Detect smells which don't seem to come from your surroundings?	**.54***	-.06	.81**		.66**	.54**		.56**	.54**		.29**
Q9: Have the sensation that your body, or a part of it, is changing or has changed shape?	**.40***	-.05	.53**		.28	.41**		.16*	.41**		.17*
Q10: Have the sensation that your limbs might not be your own or might not be properly connected to your body?	.36*	.33*									
Q14: Experience unexplained tastes in your mouth?	**.43***	.02	.43**		.18	.37**		.19*	.37**		.14*
Q15: Find that sensations happen all at once and flood you with information?	.14	**.41***		.78**	.62**		.58**	.64**		.58**	.33**
Q17: Have difficulty distinguishing one sensation from another?	**.50***	.16	.75**		.57*	.60**		.36*	.60**		.36*
Q18: Smell everyday odours and think they are unusually strong?	**.70***	.17	.68**		.47**	.69**		.76**	.69**		.48**
Q20: Find that your skin is more sensitive to touch, heat or cold than usual?	**.49***	.34*	.74**		.55**	.69**		.61**	.69**		.47**

Q21: Think that food or drink tastes much stronger than it normally would?	**.73***	.04	.71**		.51*	.58**		.96**	.58**		.34**
Q22: Look in the mirror and think that your face seems different from usual?	.32*	**.41***		.68**	.47**		.61**	.65**		.61**	.37**
Q23: Have days where lights or colours seem brighter or more intense than usual?	.17	**.54***		.66**	.43**		.60**	.50**		.60**	.36**
Q25: Find that common smells sometimes seem unusually different?	**.80***	-.01	.60**		.36*	.67**		.70**	.67**		.45**
Q27: Find that your experience of time changes dramatically?	.29*	**.54***		.78**	.61**		.74**	.53**		.74**	.54**
Q29: Notice smells or odours that people next to you seem unaware of?	**.51***	.06	.65**		.42*	.59**		.41**	.59**		.35**
Q30: Notice that food or drink seems to have an unusual taste?	**.87***	-.04	.69**		.47*	.70**		.51**	.70**		.49**
Q31: See things that other people cannot?	-.20	**.99***		.70**	.49*		.81**	.47**		.81**	.65**
Q32: Hear sounds or music that people near you don't hear?	-.02	**.75***		.64**	.41*		.68**	.35**		.68**	.46**

Note. EFA = Exploratory Factor Analysis; CFA = Confirmatory Factor Analysis; F1 = Factor 1; F2 = Factor 2; OA = Older Adults; YA = Younger Adults. Unstandardised estimates reported for Phases 2 and 3. For Phase 3, the correlation between the two factors was $r = .80$ in the younger adult sample, and $r = .66$ in the older adult sample, both $p < .001$. * $p < .05$, ** $p < .001$.

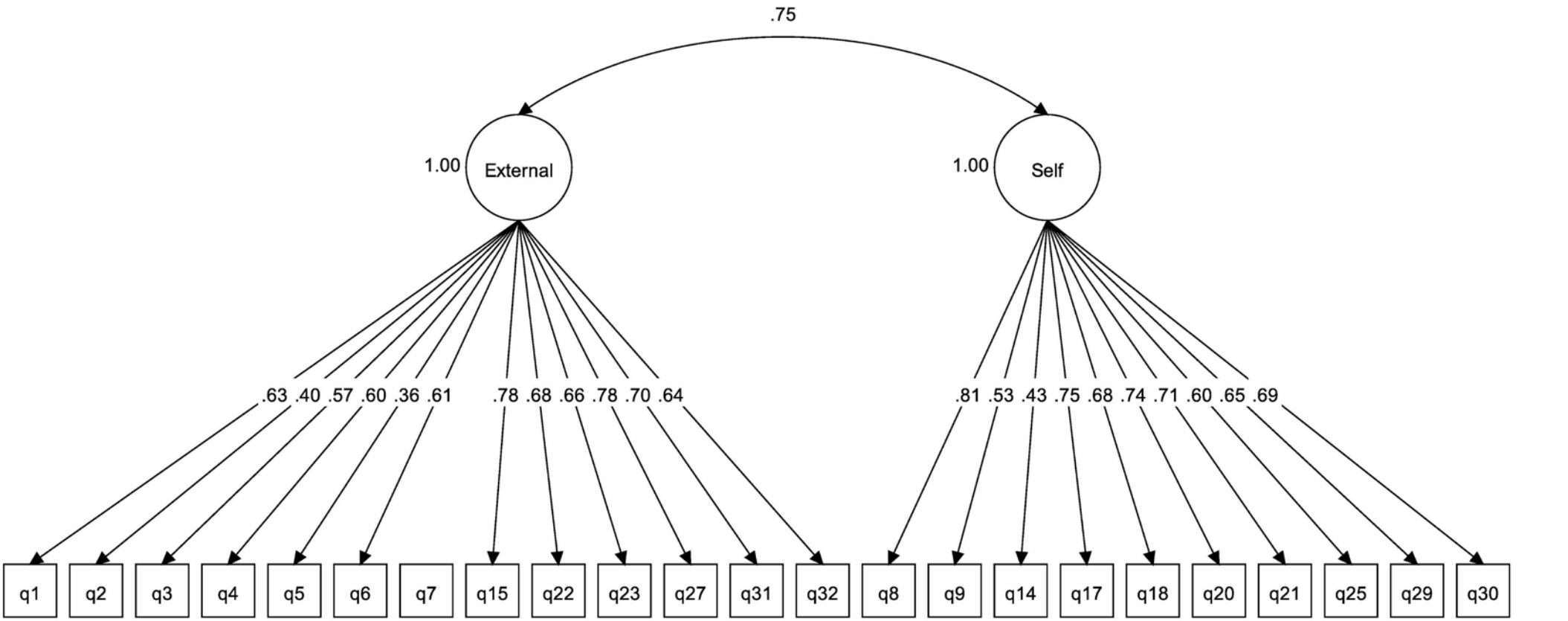

Figure 1. Phase 2: Confirmatory factor analysis of the 2-factor correlated model of the CAPS in the second random split-half of the total sample (*n* = 308).

Note. External = Anomalous external experiences (Factor 2); Self = Anomalous body-centred self-experiences (Factor 1). Factor loadings are standardised and only significant paths are presented.

Supplementary Material

Table S1

Factor loadings from research examining the CAPS, published 2006 to 2019.

CAPS item	Bell et al. (2006)			Bell et al. (2011)			Debbané et al. (2011)			Jaén-Moreno et al. (2014)			Kao et al. (2013)			Tamayo-Agudelo et al. (2015)		Tamayo-Agudelo et al. (2019)		
	F1 (“temporal lobe”)	F2 (“chemosensation”)	F3 (“clinical psychosis”)	F1 (“non-clinical”)	F2 (“clinical psychosis”)	F3 ("temporal lobe")	F1 ("perceptual distortions")	F2 ("clinical psychosis")	F3 ("anomalous olfactory experience")	F1 ("changes in quality of perception")	F2 ("depersonalization, derealisation experiences")	F3 ("temporal lobe associated experiences")	F1 ("temporal lobe experience")	F2 ("chemosensation")	F3 ("clinical psychosis")	F1 ("multimodal perceptual alterations")	F2 ("temporal lobe")	F1 ("non-clinical hallucinatory experience")	F2 (“clinical psychosis”)	F3 ("chemosensation")
Q1	.44			.57			.59				.39		✓			.56		.35		
Q2	.45				.44			.62				.42	✓				.64		.50	
Q3			.61	.38				.52			.5				✓			.52		
Q4	.65				.47		.36	.35				.56	✓					.40		
Q5			.37	.35			.42				.47							.52		
Q6	.40				.33		.44					.55	✓				.66	.31	.33	
Q7			.67		.54	-.37									✓					
Q8		-.46		.45	.30	-.31		.47		.42				✓						-.51
Q9				.50							.55					.55		.38		
Q10	.55		-.31			.48							✓					.41		
Q11			.64		.51	.40		.93							✓				.57	
Q12	.53				.62			.49	.64			.40	✓				.62		.31	
Q13					.57			.76				.61			✓		.71		.62	
Q14		-.61		.47	.33		.71			.36				✓						-.39
Q15		-.33		.46							.58							.60		
Q16	.44			.54						.32	.35		✓				.42			
Q17		-.31		.49							.44					.50		.46		
Q18		-.71		.67					.67	.61				✓		.54				-.68
Q19						.37														-.38
Q20		-.49		.59			.55			.52				✓		.44				-.41
Q21		-.64		.60						.65				✓		.88				-.73
Q22		-.32		.40		.33	.39	.37			.47							.56		
Q23	.39	-.31		.67							.45		✓					.43		
Q24	.50					.63		.46				.42	✓				.44	.31		
Q25		-.49		.61						.58				✓		.49				-.62
Q26	.67			.45					.47		.56		✓					.48		

Q27	.43			.57			.62				.45		✓			.40				
Q28					.67														.68	
Q29		-.64		.58				-.34	.81	.53				✓						-.49
Q30		-.72		.62			.59			.58				✓		.91				-.62
Q31	.38		.44		.32	.31									✓		.87		.60	
Q32	.57				.42		.45			.34		.43	✓				.77		.39	

Note. Reported to 2 decimal places. F = factor. Factor loadings < .30 were not reported in all of the above studies unless stated otherwise, and therefore are not shown here. For Kao et al. (2013) and Tamayo-Agudelo et al. (2015), factor loadings < .40 were not reported. For Debbané et al. (2011), factor loadings < .33 were not reported. [1]The authors noted that this third factor was previously labelled “temporal lobe” in Bell et al. (2006), but that the content of this factor in the current study did not directly match this.[2]The original factor loading table reported by Kao et al. (2013) did not provide numerical factor loadings, but did report which items comprised each factor, indicated by ticks.

Table S2

Summary of inconsistencies in previous research examining the CAPS, published 2006 to 2019.

Key	
	Item removed prior to analyses
	Item not reported in factor loadings table
	Item reported in factor loadings table, but no factor loadings shown
	Item cross-loading between factors, and unclear which factor it belongs in

Bell et al. (2006). 3-factor model comprising temporal lobe; chemosensation; and clinical psychosis		
F1	Temporal lobe	Q1, Q2, Q4, Q6, Q10, Q12, Q16, Q23, Q24, Q26, Q27, Q32
F2	Chemosensation	Q8, Q14, Q15, Q17, Q18, Q20, Q21, Q22, Q25, Q29, Q30
F3	Clinical psychosis	Q3, Q5, Q7, Q11, Q31

Notes: Items 13, 19, and 28 (n = 3) were removed prior to the PCA due to lack of variance; although they remained in the final published scale, it is unclear which factor they belong in. Item 9 appears in Table 5 of the publication, although has no loadings assigned to it (due to being < .3), and is not referenced later in text; again, it is unclear which factor this item belongs in.

Bell et al. (2011). 3-factor model comprising non-clinical; clinical psychosis; and temporal lobe		
F1	Non-clinical	Q1, Q3, Q5, Q9, Q15, Q16, Q17, Q18, Q20, Q21, Q23, Q25, Q26, Q27, Q29, Q30
F2	Clinical psychosis	Q2, Q4, Q6, Q12, Q13, Q28, Q32
F3	Temporal lobe	Q10, Q19, Q24

Notes: Items 7, (F2 and F3), 8 (F1 and F2), Q11 (F2 and F3), Q14 (F1 and F2), Q22 (F1 and F3), and Q31 (F2 and F3, n = 6) are each reported in Table 5 of the publication; however, they cross-load across factors, and it is not explicitly stated how, or if, these items were then assigned to factors.

Debbané et al. (2011). 3-factor model comprising perceptual distortions; clinical psychosis; and anomalous olfactory experience		
F1	Perceptual distortions	Q1, Q14, Q20, Q27, Q30
F2	Clinical psychosis	Q2, Q3, Q11, Q13
F3	Anomalous olfactory experience	Q12, Q18, Q29

Notes: Items 10, 16, 19, 21, 25, 28, and 3 (n = 7) were removed prior to analyses due to lack of variance. Table 2 on page 10 of the publication shows that items 4, 12, 22, and 29 cross-loaded (n = 4). On page 9 of the manuscript, the authors then describe that they used a factor loading threshold of > .50 to group items onto factors (this resolved the issue of cross-loading items). They also noted that 13 items did not load onto any factor; using Table 2, these items are: 4, 5, 6, 7, 8, 9, 15, 17, 22, 23, 24, 26, and 32.

Jaén-Moreno et al. (2014). 3-factor model comprising changes in quality of perception; depersonalisation, derealisation experiences; and temporal lobe associated experiences		
F1	Changes in quality of perception	Q18, Q20, Q21, Q25, Q30
F2	Depersonalisation, derealisation	Q3, Q5, Q9, Q15, Q23, Q26, Q27
F3	Temporal lobe associated	Q2, Q4, Q6, Q12, Q13, Q24, Q32

Notes: Items 7, 10, 11, 19, 28, and 31 (n = 6) were removed prior to analyses due to lack of variance. Items 1, 14, and 16 (n = 3) had factor loadings < .40 and were removed.

After the first set of analyses, items 8, 17, 22, and 29 (*n* = 4) were eliminated from the model (the residuals of the covariance were too high).

Kao et al. (2013). 3-factor model comprising temporal lobe experience; chemosensation; and clinical psychosis		
F1	Temporal lobe experience	Q1, Q2, Q4, Q6, Q10, Q12, Q16, Q23, Q24, Q26, Q27, Q32
F2	Chemosensation	Q8, Q14, Q18, Q20, Q21, Q25, Q29, Q30
F3	Clinical psychosis	Q3, Q7, Q11, Q13, Q31

Notes: The authors do not report that any items were removed prior to analyses due to lack of variance. Table 4 shows which items comprise each of the factors; however, factor loadings < .40 are not reported, and so it is unclear whether the authors propose that these items remain in the scale, and further, which factors they belong in. These items are: Q5, Q9, Q15, Q17, Q19, Q22, Q28 (*n* = 7).

Tamayo-Agudelo et al. (2015). 2-factor model comprising multimodal perceptual alterations and temporal lobe		
F1	Multimodal perceptual alterations	Q1, Q9, Q17, Q18, Q20, Q21, Q25, Q27, Q30
F2	Temporal lobe	Q2, Q6, Q12, Q13, Q16, Q24, Q31, Q32

Notes: Items 7, 10, 11, and 28 (*n* = 4) were removed prior to analyses due to lack of variance. Table 4 shows which items comprise each of the factors; however, factor loadings < .40 are not reported, and so it is unclear whether the authors propose that these items remain in the scale, and further, which factors they belong in. These items are: Q3, Q4, Q5, Q8, Q14, Q15, Q19, Q22, Q23, Q26, Q29 (*n* = 11).

Tamayo-Agudelo et al. (2019). 3-factor model comprising non-clinical hallucinatory experience; clinical psychosis; and chemosensation		
F1	Non-clinical hallucinatory experience	Q1, Q3, Q4, Q5, Q9, Q10, Q15, Q17, Q22, Q23, Q24, Q26
F2	Clinical psychosis	Q2, Q11, Q12, Q13, Q28, Q31, Q32
F3	Chemosensation	Q8, Q14, Q18, Q19, Q20, Q21, Q25, Q29, Q30

Notes: The authors do not explicitly state which factor represents which component in Table 2 (i.e., we have assumed that Factor 2 represents the "Clinical psychosis" factor they describe, simply from the experiences listed in this factor). Items 7, 16, and 27 (*n* = 3) appear in Table 2 of the publication, although have no loadings assigned to them (due to being < .30), and are not referenced later in text; therefore, it is unclear which factors these items might belong to. Item 6 is also reported in Table 2; however, this cross-loads across Factors 1 and 2, and it is not explicitly stated how, or if, this item was then assigned to either Factor 1 or 2.

Table S3

CAPS 23-item tetrachoric correlation matrix, thresholds, and endorsement rates in the combined sample.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q14	Q15	Q17	Q18	Q20	Q21	Q22	Q23	Q25	Q27	Q29	Q30	Q31	Q32
Q1	1.000																						
Q2	.180	1.000																					
Q3	.293	.160	1.000																				
Q4	.283	.377	.302	1.000																			
Q5	.193	.066	.180	.373	1.000																		
Q6	.437	.552	.420	.290	.038	1.000																	
Q7	.434	.397	.539	.346	.180	.319	1.000																
Q8	.365	.245	.124	.191	.285	.253	.154	1.000															
Q9	.346	-.039	.006	-.054	-.055	.146	.206	.216	1.000														
Q14	.091	-.061	.050	.111	.350	-.164	-.131	.247	.243	1.000													
Q15	.328	.282	.551	.363	.392	.295	.344	.340	.082	.247	1.000												
Q17	.399	.175	.297	.171	-.286	.472	.333	.289	.155	.231	.289	1.000											
Q18	.427	.045	.443	.168	.161	.213	.347	.410	.275	.218	.330	.390	1.000										
Q20	.336	.182	.291	.251	.393	.294	.281	.355	.271	.316	.356	.472	.445	1.000									
Q21	.336	.123	.169	.327	.252	.207	.257	.380	.199	.349	.327	.572	.492	.536	1.000								
Q22	.355	.299	.510	.373	.225	.284	.273	.285	.303	.212	.424	.290	.380	.393	.208	1.000							
Q23	.527	.241	.324	.399	.283	.426	.142	.148	.072	.013	.347	.403	.451	.364	.390	.430	1.000						
Q25	.220	-.207	.192	.152	.091	.129	.020	.368	.378	.337	.271	.199	.674	.381	.615	.409	.300	1.000					
Q27	.393	.320	.323	.326	.434	.356	.313	.307	.323	.228	.372	.369	.393	.543	.396	.472	.392	.526	1.000				
Q29	.243	-.047	.076	-.003	.100	.413	-.012	.556	.276	.253	.158	.325	.506	.312	.250	.278	.151	.618	.350	1.000			
Q30	.383	-.064	.188	.157	.179	.227	.160	.448	.239	.488	.181	.482	.533	.530	.569	.303	.220	.705	.425	.420	1.000		
Q31	.481	.487	.321	.516	.263	.633	.526	.473	-.002	.191	.466	.385	.199	.328	.049	.210	.444	.068	.410	.299	.307	1.000	
Q32	.306	.301	.312	.380	.264	.552	.358	.181	.288	-.010	.245	.399	.302	.305	.283	.264	.319	.162	.541	.307	.318	.724	1.000
Thresholds	1.171	1.024	1.111	1.232	1.096	1.182	1.580	1.488	1.463	1.625	1.489	1.971	1.315	1.031	1.553	1.096	1.344	1.942	.944	1.172	1.513	1.688	1.513
Proportion "No"	.879	.847	.867	.891	.863	.881	.943	.932	.928	.948	.932	.976	.906	.849	.940	.863	.911	.974	.827	.879	.935	.954	.935
Proportion "Yes"	.121	.153	.133	.109	.137	.119	.057	.068	.072	.052	.068	.024	.094	.151	.060	.137	.089	.026	.173	.121	.065	.046	.065

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