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DATA DESCRIPTOR

Altered emotion perception in insomnia, anxiety, depression, mania, psychotic experiences and schizotypal symptoms: a dataset

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This data resource provides evidence concerning the prevalence of perceptual alterations of emotional faces amongst individuals experiencing symptoms of insomnia, anxiety, depression, mania, psychotic experiences, and schizotypal tendencies. More specifically, we explored the categorisation accuracy (whether the displayed emotion was correctly identified), misperception (which emotion an incorrect judgment was perceived to be), intensity (extent of the emotion signal strength) and emotional valence (the extent and direction of perceived affect) of six facial expressions of emotion from the Karolinska Directed Emotional Faces database. Complete data from N = 572 respondents are included. The dataset is available to other researchers and is provided on Figshare. Information concerning the data records, usage notes, code availability and technical validation are presented. Finally, we present demographic and correlational data concerning psychiatric symptoms and alterations in the perception of emotional faces.

Background and Summary

Social perceptual judgments facilitate the evaluation of another person, particularly when drawing upon emotionally salient information[1,2]. Individuals use facial, vocal, gestural, and postural cues to communicate emotions to others; whilst also reading such cues to determine another's' internal state[3,4]. Here, visual processing of the human face remains the most prevalent source of information[5]. Indeed, facial observations provide vital information pertaining to distinguishing characteristics, perceived attractiveness, intended behaviour, and emotional state, without use of language[6]. Accordingly, the nature of facial expressions serves as a primary source of information in social perception[7,8].

Accurate judgments of facially expressed emotion are vital for effective social interactions and non-verbal social judgments. Therefore, perceptual deficits associated with psychiatric symptoms may contribute to negative psychosocial consequences for those involved[9]. Perceptual alterations of emotional faces are widely established in psychiatric populations at both disorder and symptom level (e.g. insomnia, anxiety, depression, bipolar disorder, anorexia nervosa, schizophrenia)[10–15].

The present work sought to further examine the prevalence of perceptual alterations of emotional faces amongst individuals experiencing symptoms of insomnia, anxiety, depression, mania, psychotic experiences, and schizotypal tendencies. More specifically, we examined the categorisation accuracy (whether the displayed emotion was correctly identified), misperception (which emotion an incorrect judgment was perceived to be), intensity (the strength of the emotion signal strength) and emotional valence (the extent and direction of perceived affect in relation to intrinsic appeal or repulsion) of all six cross-culturally accepted facial expressions of emotion[16].

Methods

Sample and Design. The study was approved by the Sheffield Hallam University Research Ethics Committee (Protocol number: ER28407811), and all participants provided online informed consent. Students from two UK universities were recruited through institutional course participation schemes, social media groups and faculty emails. This resulted in a sample of N = 706 individuals who either began or clicked on a hyperlink to the survey

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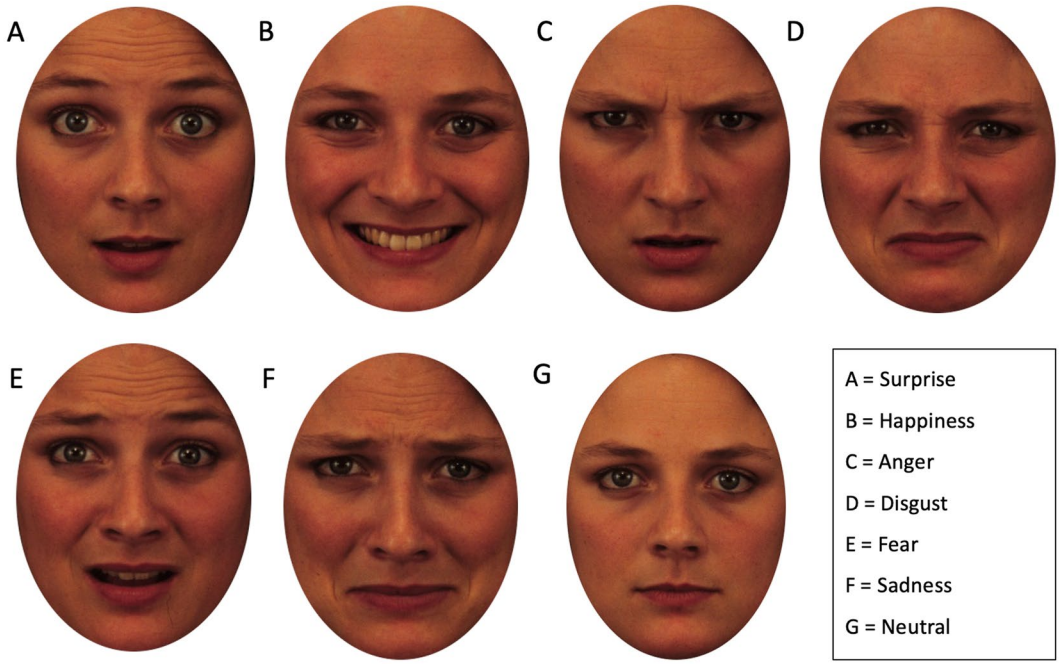

Fig. 1 Example set of facial expressions.

which was delivered using the Qualtrics platform (Qualtrics, Provo, UT). Only complete cases were used in the analysis due to the ethical right to withdraw from the survey at any time. The data were also examined for duplicate responses based on matching IP addresses, where none were found. To maintain participant anonymity, IP addresses were subsequently discarded. In addition, no personally identifying information or contact details were recorded. Rather, subjects provided a memorable keyword at the start of the survey which was to be cited in any request to withdraw data. Therefore, N = 572 respondents (mean age = 21.71 ± 7.30 years, range 18–65, 76% female; 89% student) providing complete data for the variables of interest. All participants reported: normal to corrected-to-normal vision, the absence of prosopagnosia, being ≥18 years old.

Materials. *Facial stimuli.* Fifty-six facial photographs of eight individuals (50% female) displaying the emotional expressions of fear, anger, disgust, happiness, sadness, surprise, and neutrality were gathered from the Karolinska Directed Emotional Faces database[17]. In the present study, we chose to use all six cross-culturally accepted facial expressions of emotion[16]. These six expressions are commonly used to examine the perception of emotional faces in the context of psychiatric disorder. In line with previous studies controlling for potentially distracting and confounding factors, we cropped the hair and neckline from each image[18–21]. Thus, leaving a series of oval-shaped neutral facial images (see Fig. 1).

Psychometric measures. Insomnia. Insomnia symptoms were assessed using the Insomnia Severity Index (ISI)[22]. The ISI consists of seven items examining the severity of insomnia symptoms over the past 2 weeks including difficulty initiating and maintaining sleep and awakening too early. Items are scored on a 5-point likert-type scale, with total scores ranging from 0 to 28. Higher scores suggest greater insomnia severity. Total scores between 0 and 7 indicate no clinically significant insomnia, 8 and 14 subthreshold insomnia, 15 and 21 clinical insomnia (moderate severity), and 22 and 28 clinical insomnia (severe). Assessment of internal consistency Cronbach's alpha) yielded an alpha of $\alpha = 0.88$.

Anxiety. The 7-item Generalized Anxiety Disorder Scale (GAD-7) is a validated practical self-report anxiety questionnaire used in primary care[23]. The tool asks respondents how often, during the last 2 weeks, they have been bothered by each of the seven core symptoms of generalized anxiety disorder. Responses choice are 0 = "not at all"; 1 = "several days"; 2 = "more than half the days"; and 3 = "nearly every day". Total scores range between 0 and 21 with cut offs of ≥5, ≥10, and ≥15 indicating mild, moderate, and severe anxiety levels, respectively. The GAD-7 has been shown to exhibit good reliability, as well as criterion, construct, factorial, and procedural validity[23]. The Cronbach's alpha in the current study was $\alpha = 0.92$.

Depression. The 9-item patient health questionnaire (PHQ-9)[24] is a brief self-report depression scale used to assess depressive symptoms in the general population. Each of the nine depressive symptoms corresponds to the depression criteria of the DSM-V[25]. Respondents are required to indicate how much, during the previous 2 weeks, the symptom has bothered them on a scale of: 0 = "not at all", 1 = "several days", 2 = "more than half of the days" or 3 = "nearly every day". Total scores indicate depression severity and range from 0 to 27 with

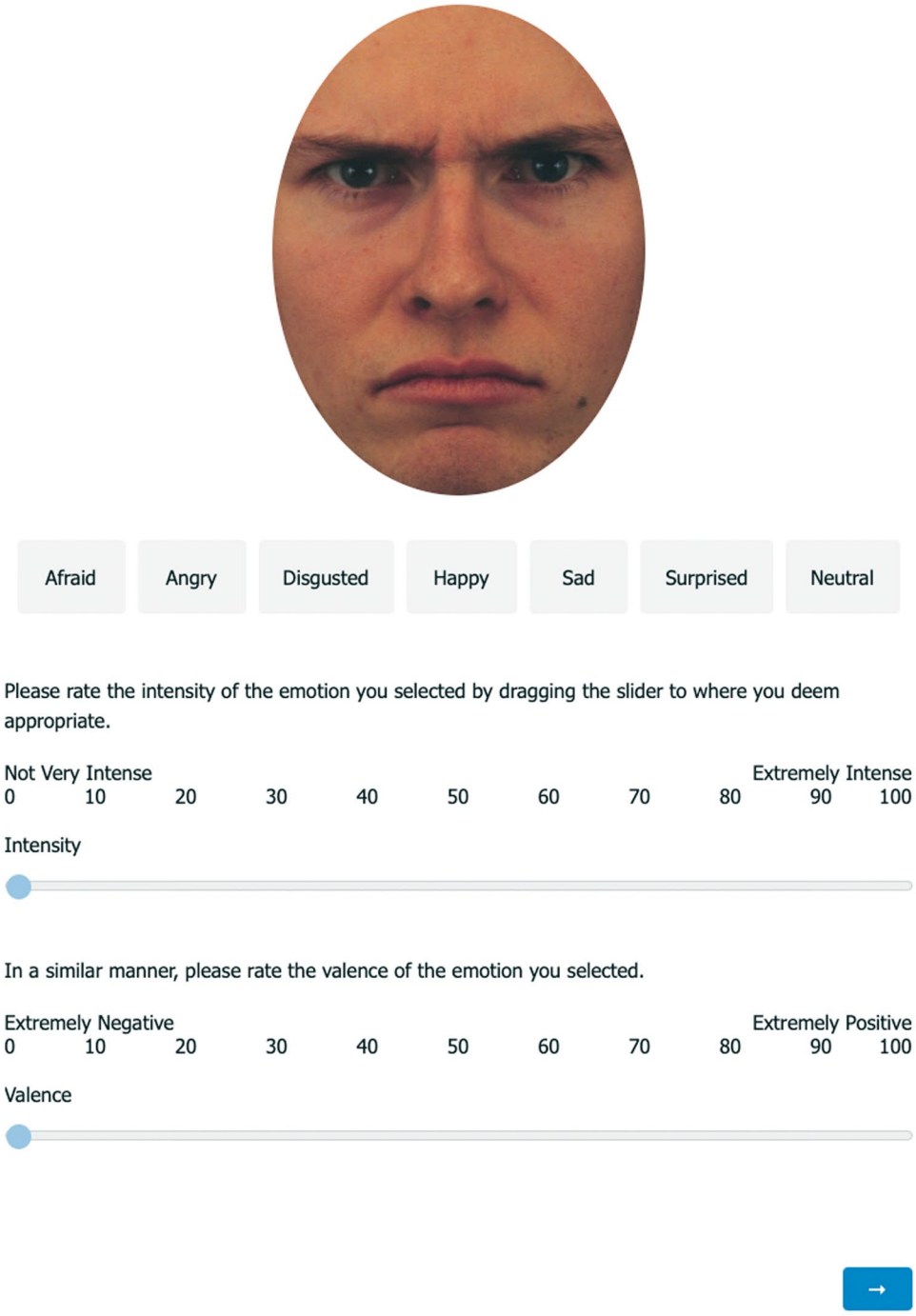

Fig. 2 Example trial.

higher scores indicating higher levels of depression. The scale has been shown to demonstrate good criterion and construct validity[23,24]. Cronbach's alpha in the current study was $\alpha = 0.91$.

Mania. The Mood Disorder Questionnaire (MDQ) was used to examine symptoms of mania (range 0–13)[25]. Participants provided a response of yes/no when presented with a series of prompting questions. For example, "Has there ever been a time when you were not your usual self and…". The summation of each item yields a total MDQ score where higher scores indicate increased levels of manic symptoms. The internal consistency of the scale in the present study was $\alpha = 0.85$. To screen positive for possible bipolar disorder, all three parts of the following criteria should be met based on the initial 13 items and two additional questions. More specifically, participants must answer yes to ≥ 7 of the thirteen items; indicate cooccurrence of ≥ 1 items within the same period; and report moderate to serious consequences of the possible episode (i.e., inability to work; family, monetary or legal difficulties; aggressive behaviour).

Demographic Variables	
Age	Participant age
Sex	Biological sex assigned at birth
Gender	Gender identity
Ethnicity – Ethnicity_5	Participant ethnicity
Student_Status	Whether or not the participant was currently enrolled as a student
Individual Psychometric Items	
ISI_1 – ISI_8	The seven individual items of the Insomnia Severity Index[21]
GAD7_1 – GAD7_7	The seven individual items of the Generalized Anxiety Disorder 7[22]
PHQ_1 – PHQ_9	The nine individual items of the Patient Health Questionnaire[23]
Mania_1 – Mania_13	The thirteen individual items of the Mood Disorder questionnaire[25]
Prodomal16_1 – Prodromal_16_16	The sixteen individual items of the Prodromal 16[32]
Prodromal_Severity_1 - Prodromal_Severity_16	The sixteen individual items of the Prodromal 16 severity subscale[32]
SCZ_UnusualExp1 - SCZ_UnusualExp12	The twelve individual items of the Short-Form Oxford-Liverpool Inventory of Feelings and Experiences – Unusual Experiences subscale[27]
SCZ_CogDis_1 - SCZ_CogDis_11	The eleven individual items of the Short-Form Oxford-Liverpool Inventory of Feelings and Experiences – Cognitive Disorganisation subscale[27]
SCZ_Anhed_1 - SCZ_Anhed_10	The ten individual items of the Short-Form Oxford-Liverpool Inventory of Feelings and Experiences – Introvertive Anhedonia subscale[27]
SCZ_Nonconformity_1 - SCZ_Nonconformity_10	The ten individual items of the Short-Form Oxford-Liverpool Inventory of Feelings and Experiences – Impulsive Nonconformity subscale[27]
Psychiatric Symptoms Scored	
GAD7_Anxiety	Summation of anxiety items
PHQ9_Depression	Summation of depressive items
MDQ_Mania	Summation of mania items
ISI_Insomnia	Summation of insomnia items
P16_Prodromal_Count	Summation of items assessing psychotic like experiences
P16_Prodromal_Severity	Summation of items assessing psychotic like experiences
Schizotypy_Unusual_Expereinces	Summation of items assessing unusual experiences
Schizotypy_Cognitive_Disorganisation	Summation of items assessing cognitive disorganisation
Schizotypy_Introvertive_Anhedonia	Summation of items assessing introvertive anhedonia
Schizotypy_Impulsive_Nonconformity	Summation of items assessing impulsive nonconformity
Perceptual Judgments	
F1AFC – F4AFC, M1AFC – M4AFC	Individual items for categorisation accuracy of female/male faces displaying fear
F1ANC – F4ANC, M1ANC – M4ANC	Individual items for categorisation accuracy of female/male faces displaying anger
F1DIC – F4DIC, M1DiC – M4DIC	Individual items for categorisation accuracy of female/male faces displaying disgust
F1HAC – F4HAC, M1HAC – M4HAC	Individual items for categorisation accuracy of female/male faces displaying happiness
F1SAC – F4SAC, M1SAC – M4SAC	Individual items for categorisation accuracy of female/male faces displaying sadness
F1SUC – F4SUC, M1SUC – M4SUC	Individual items for categorisation accuracy of female/male faces displaying surprise
F1NC – F4NC, M1NC – M4NC	Individual items for categorisation accuracy of neutral female/male faces
F1AFI_1 – F4AFI_1, M1AFI_1 – M4AFI_1	Individual items for intensity ratings of female/male faces displaying fear.
F1ANI_1 – F4ANI_1, M1ANI_1 – M4ANI_1	Individual items for intensity ratings of female/male faces displaying anger.
F1DII_1 – F4DII_1, M1DII_1 – M4DII_1	Individual items for intensity ratings of female/male faces displaying disgust
F1HAI_1 – F4HAI_1, M1HAI_1 – M4HA I_1	Individual items for intensity ratings of female/male faces displaying happiness
F1SAI_1 – F4SA I_1, M1SAI_1 – M4SAI_1	Individual items for intensity ratings of female/male faces displaying sadness
F1SUI_1 – F4SUI_1, M1SUI_1 – M4SUI_1	Individual items for intensity ratings of female/male faces displaying surprise
F1NI_1 – F4NI_1, M1NI_1 – M4NI_1	Individual items for intensity ratings of neutral female/male faces
F1AFV – F4AFV, M1AFV – M4AFV	Individual items for valance ratings of female/male faces displaying fear.
F1ANV – F4ANV, M1ANV – M4ANV	Individual items for valance ratings of female/male faces displaying anger.
F1DIV – F4DIV, M1DIV – M4DIV	Individual items for valance ratings of female/male faces displaying disgust
F1HAV – F4HAV, M1HAV – M4HAV	Individual items for valance ratings of female/male faces displaying happiness
F1SAV – F4SAV, M1SAV – M4SAV	Individual items for valance ratings of female/male faces displaying sadness
F1SUV – F4SUV, M1SUV – M4SUV	Individual items for valance ratings of female/male faces displaying surprise
F1NV – F4NV, M1NV – M4NV	Individual items for valance ratings of neutral female/male faces
Intensity_Fear, Intensity_Anger, Intensity_Disgust, Intensity_Happiness, Intensity_Sadness, Intensity_Surprise, Intensity_Neutral	Mean intensity ratings based on the emotional expression observed
Valance_Fear, Valance_Anger, Valance_Disgust, Valance_Happiness, Valance_Sadness, Valance_Surprise, Valance_Neutral	Mean emotional valence ratings based on the emotional expression observed

Continued

Accuracy_Fear, Accuracy _Anger, Accuracy _Disgust, I Accuracy_Happiness, Accuracy _Sadness, Accuracy _Surprise, Accuracy_Neutral	Total accuracy scores when categorising the observed emotional expressions.
Fear_TOTAL_MSP_Anger, Fear_TOTAL_MSP_ Disgust, Fear_TOTAL_MSP_Happiness, Fear_ TOTAL_MSP_Sadness, Fear_TOTAL_MSP_Suprise, Fear_TOTAL_MSP_Neutral	Misperception of facially expressed fear. Specifically, which emotion an incorrect judgment was perceived to be.
Anger_TOTAL_MSP_Fear, Anger_TOTAL_MSP_ Disgust, Anger_TOTAL_MSP_Happiness, Anger_ TOTAL_MSP_Sadness, Anger_TOTAL_MSP_ Suprise, Anger_TOTAL_MSP_Neutral	Misperception of facially expressed anger. Specifically, which emotion an incorrect judgment was perceived to be.
Disgust_TOTAL_MSP_Fear, Disgust_TOTAL_ MSP_Anger, Disgust_TOTAL_MSP_Happiness, Disgust_TOTAL_MSP_Sadness, Disgust_TOTAL_ MSP_Suprise, Disgust_TOTAL_MSP_Neutral	Misperception of facially expressed disgust. Specifically, which emotion an incorrect judgment was perceived to be.
Happiness_TOTAL_MSP_Fear, Happiness _TOTAL_ MSP_Anger, Happiness _TOTAL_MSP_Disgust, Happiness _TOTAL_MSP_Sadness, Happiness _TOTAL_MSP_Suprise, Happiness _TOTAL_MSP_ Neutral	Misperception of facially expressed happiness. Specifically, which emotion an incorrect judgment was perceived to be.
Sadness_TOTAL_MSP_Fear, Sadness_TOTAL_MSP_ Anger, Sadness_TOTAL_MSP_Disgust, Sadness_ TOTAL_MSP_Happiness, Sadness_TOTAL_MSP_ Suprise, Sadness _TOTAL_MSP_Neutral	Misperception of facially expressed sadness. Specifically, which emotion an incorrect judgment was perceived to be.
Surprise_TOTAL_MSP_Fear, Surprise _TOTAL_ MSP_Anger, Surprise _TOTAL_MSP_Disgust, Surprise_TOTAL_MSP_Sadness, Surprise_TOTAL_ MSP_Happiness, Surprise_TOTAL_MSP_Neutral	Misperception of facially expressed surprise. Specifically, which emotion an incorrect judgment was perceived to be.
Neutral_TOTAL_MSP_Fear, Neutral_TOTAL_MSP_ Anger, Neutral_TOTAL_MSP_Disgust, Neutral_ TOTAL_MSP_Sadness, Neutral_TOTAL_MSP_ Suprise, Neutral_TOTAL_MSP_Happiness	Misperception of neutral faces. Specifically, which emotion an incorrect judgment was perceived to be.

Table 1. Variable codes for dataset. Note: Insomnia, ISI: Insomnia Severity Index; Anxiety, GAD7: Generalized Anxiety Disorder Scale; Depression, PHQ-9: Patient Health Questionnaire; Mania: MDQ, Mood Disorder Questionnaire; Psychotic Experiences: Prodromal-16; Unusual Experiences, Cognitive Disorganisation, Introvertive Anhedonia, Impulsive Nonconformity: SF-OLIFE, Short-Form Oxford-Liverpool Inventory of Feelings and Experiences Questionnaire.

Psychotic like experiencesThe Prodromal Questionnaire 16 (PQ-16) was administered to assess life-time symptoms of psychotic experiences[26]. It was developed as a brief version of the 92-item Prodromal Questionnaire[26] to enable the detection of ultra-high-risk (UHR) patients in routine adult mental health services. Sixteen items evaluate the occurrence of positive/negative symptoms and avolition on a two-point scale (yes/no). In addition, symptom distress is measures on a four-point scale between: 0 = no distress and 3 = severe distress. More specifically, the PQ-16 contains nine items relating to hallucinations; five items relating to delusions; and two negative symptom items. The summation of 'yes' item responses yield a total score between 0 and 16, where higher scores indicate an increased number of psychotic symptoms. In adults, a score of $\geq$6 predicts diagnosis of psychosis with high sensitivity (87%) and specificity (87%)[27]. Similarly, distress items are summated to create a total prodromal severity scale. The Cronbach's alpha in the current study was $\alpha = 0.85$ for total scores and $\alpha = 0.90$ for severity scores.

Schizotypal traitsThe Short-Form Oxford-Liverpool Inventory of Feelings and Experiences scale examined schizotypal personality traits (O-LIFE)[28]. The 43-item measure is comprised of four subscales: unusual experiences (12-Items), cognitive disorganisation (11-items), introverted anhedonia (10-items), and impulsive nonconformity (10-items). The unusual experiences subscale examines positive symptoms related to psychosis (i.e., perceptual aberrations, magical thinking, hallucinations). Cognitive disorganisation explores disorganised features of psychosis (i.e., concentration difficulties, impaired decision-making, social anxiety). The introverted anhedonia subscale examines negative schizotypy, primarily characterised by a lack of physical and social pleasure (i.e., intimacy, social activities). Impulsive nonconformity measures diminished self-control (i.e., impulsive, anti-social, eccentric behaviour). All items utilise a two-point scale (yes/no). The summation of 'yes' item responses yield a total score for each respective subscale. The Cronbach's alpha in the current study was $\alpha = 0.78$ for unusual experiences, $\alpha = 0.81$ for cognitive disorganisation, $\alpha = 0.70$ for introverted anhedonia, and $\alpha = 0.70$ for impulsive nonconformity.

Procedure. Participants completed an online questionnaire, in which they were presented with the series of fifty-six images in randomized order. For each face displayed, participants were asked to select (categorise) the corresponding emotional expression (fear, anger, disgust, happiness, sadness, surprise, and neutral). Subsequently, participants were asked to rate their perceived intensity and emotional valance on a 100-mm visual analogue scale. The intensity scale was anchored at *not very intense* and *extremely intense*. Whereas valence was anchored at *extremely negative* and *extremely positive*. Each face was displayed until a response was made. Following the completion of the face-task, participants completed the ISI, GAD-7, PHQ-9, MDQ PQ-16 and O-LIFE. The procedure lasted approximately thirty minutes. An example trial is presented in Fig. 2.

	Mean ± SD	Fear	Anger	Disgust	Happiness	Sadness	Surprise	Neutral
[Intensity Ratings]								
Mean ± SD		57.85 ± 13.87	60.88 ± 15.19	73.18 ± 13.77	62.16 ± 15.64	49.27 ± 15.03	59.72 ± 14.38	36.56 ± 21.92
Cronbach's α		0.82	0.85	0.86	0.89	0.82	0.84	0.92
Insomnia	10.10 ± 6.40	0.118**	0.079	0.112**	0.027	0.108*	0.057	0.025
Anxiety	7.66 ± 5.98	−0.030	−0.039	0.010	−0.057	−0.061	−0.076	−0.047
Depression	9.91 ± 6.81	0.012	−0.029	0.063	−0.043	−0.010	−0.054	−0.061
Mania	6.53 ± 3.82	−0.026	−0.087*	0.011	−0.052	−0.032	−0.050	−0.054
Psychotic Experiences	5.79 ± 4.09	0.008	−0.070	0.013	−0.057	−0.002	−0.032	−0.037
Prodromal Severity	8.54 ± 8.40	0.031	−0.045	−0.018	−0.078	0.028	−0.053	0.013
Unusual Experiences	4.33 ± 2.90	−0.008	−0.060	−0.001	−0.048	−0.023	−0.030	0.023
Cognitive Disorganisation	6.91 ± 3.05	−0.019	−0.023	0.094*	−0.044	−0.017	−0.047	−0.077
Introvertive Anhedonia	2.97 ± 2.26	−0.050	−0.100*	−0.096*	−0.088*	−0.017	−0.069	−0.030
Impulsive Nonconformity	3.92 ± 2.41	−0.105*	−0.132**	−0.043	−0.145**	−0.115**	−0.106*	−0.083*
[Emotional Valance Ratings]								
Mean ± SD		37.27 ± 9.70	25.90 ± 12.61	24.81 ± 13.62	66.50 ± 10.86	31.39 ± 10.74	45.96 ± 8.75	45.55 ± 8.45
Cronbach's α		0.81	0.88	0.86	0.84	0.82	0.68	0.78
Insomnia		0.013	−0.016	−0.018	−0.025	0.027	0.005	−0.068
Anxiety		0.006	−0.008	−0.037	−0.025	0.077	0.036	−0.039
Depression		−0.029	−0.031	−0.070	−0.040	0.048	0.048	−0.072
Mania		−0.017	−0.033	−0.055	−0.031	−0.018	0.030	−0.094*
Psychotic Experiences		0.053	0.065	0.015	−0.045	0.074	0.056	−0.028
Prodromal Severity		0.069	0.106*	0.066	−0.110**	0.114**	0.049	−0.004
Unusual Experiences		0.066	0.90*	0.086*	−0.077	0.111**	0.080	−0.029
Cognitive Disorganisation		−0.050	−0.091*	−0.101*	0.060	−0.039	0.040	−0.070
Introvertive Anhedonia		0.022	0.090*	0.089*	−0.140**	0.100*	0.026	−0.018
Impulsive Nonconformity		−0.013	0.013	0.003	−0.126**	0.021	0.012	−0.106*
[Categorisation Accuracy]								
Mean ± SD		2.44 ± 1.52	7.20 ± 1.19	7.05 ± 1.34	7.68 ± 0.86	5.30 ± 1.54	7.36 ± 1.00	6.52 ± 1.49
Cronbach's α^		0.48	0.57	0.62	0.67	0.46	0.49	0.59
Insomnia		−0.085*	−0.077	0.014	−0.051	−0.044	0.017	−0.001
Anxiety		−0.096*	−0.143**	−0.017	−0.092*	−0.079	−0.011	−0.067
Depression		−0.011	−0.151**	0.004	−0.112*	−0.031	−0.042	−0.065
Mania		−0.080	0.055	0.075	−0.034	−0.078	0.050	−0.034
Psychotic Experiences		−0.088	−0.123**	0.059	−0.086*	−0.035	−0.013	−0.019
Prodromal Severity		−0.103*	−0.220	−0.085*	−0.155**	−0.069	−0.059*	−0.075
Unusual Experiences		−0.104*	−0.138**	0.049	−0.081	−0.059	0.021	0.000
Cognitive Disorganisation		0.016	0.10	0.049	−0.019	−0.020	0.034	−0.009
Introvertive Anhedonia		0.16	−0.083*	−0.107**	−0.139**	−0.043	−0.067	−0.047
Impulsive Nonconformity		−0.57	−0.093*	0.011	−0.072	−0.092*	−0.048	−0.064

Table 2. Mean ratings and standard deviations (SD), and corelations between insomnia, anxiety, depression, mania, psychotic experiences and schizotypal tendencies with ratings of categorisation accuracy and intensity ratings for each emotional expression. Note: Insomnia, ISI: Insomnia Severity Index; Anxiety, GAD7: Generalized Anxiety Disorder Scale; Depression, PHQ-9: Patient Health Questionnaire; Mania: MDQ, Mood Disorder Questionnaire; Psychotic Experiences: Prodromal-16; Unusual Experiences, Cognitive Disorganisation, Introvertive Anhedonia, Impulsive Nonconformity: SF-OLIFE, Short-Form Oxford-Liverpool Inventory of Feelings and Experiences Questionnaire. ^After recoding into correct = 1, incorrect = 0. *Sig at $P < 0.05$; **Sig at $P < 0.01$.

Data Records

The dataset (demographics, psychiatric measures) has been anonymised and both individual datapoints for each psychometric measure and face rating are available in CSV and SAV formats on Figshare (https://doi.org/10.6084/m9.figshare.26397817)[29] and as part of the current supplemental information (see Appendix A). For copyright reasons, the original PDF files including scoring information for each measure are not included in the appendix. However, the key scoring information is provided in the aforementioned measures section, and each original measure can be individually examined where necessary. In the current dataset, reverse coding was applied where required. Finally, the total/mean or composite score for each psychiatric symptom and perceptual judgments of emotional faces displaying each expression (accuracy, and intensity) were calculated and included to simplify the usability of the dataset. Descriptions of calculated variables are provided in Table 1. Details of the data cleaning procedure are available in the following section.

Correct Expression	Fear	Anger	Disgust	Happiness	Sadness	Surprise	Neutral
Misperceived as:							
Fear	2.42 ± 1.51	0.03 ± 0.18	0.07 ± 0.28	0.04 ± 0.21	0.73 ± 0.92	0.32 ± 0.61	0.08 ± 0.31
Anger	0.28 ± 0.61	2.08 ± 1.14	0.48 ± 0.83	0.04 ± 0.39	0.19 ± 0.53	0.04 ± 0.38	0.42 ± 0.82
Disgust	1.45 ± 1.17	0.43 ± 0.80	7.05 ± 1.34	0.04 ± 0.24	0.57 ± 0.93	0.06 ± 0.29	0.15 ± 0.44
Happiness	0.02 ± 0.15	0.02 ± 0.14	0.02 ± 0.19	7.68 ± 0.86	0.02 ± 0.15	0.08 ± 0.29	0.07 ± 0.29
Sadness	1.04 ± 0.87	0.16 ± 0.47	0.30 ± 0.62	0.07 ± 0.29	5.89 ± 1.48	0.04 ± 0.27	0.73 ± 0.87
Surprise	2.66 ± 1.58	0.08 ± 0.33	0.05 ± 0.27	0.03 ± 0.18	0.58 ± 0.74	7.36 ± 1.00	0.03 ± 0.16
Neutral	0.11 ± 0.39	0.07 ± 0.35	0.04 ± 0.23	0.10 ± 0.41	0.61 ± 0.81	0.11 ± 0.36	6.52 ± 1.49

Table 3. Mean ratings and standard deviations (SD) for categorization accuracy and misperception for the whole sample.

	MSP Fear	MSP Anger	MSP Disgust	MSP Happiness	MSP Sadness	MSP Surprise	MSP Neutral
[Insomnia]							
Fear	—	−0.110*	0.088*	0.036	−0.006	0.047	0.048
Anger	0.046	—	0.051	0.022	−0.006	0.047	0.074
Disgust	−0.032	−0.017	—	0.066	−0.042	−0.044	0.137**
Happiness	0.011	−0.047	−0.006	—	0.034	0.073	0.091*
Sadness	0.010	−0.046	0.042	0.007	—	−0.026	0.076
Surprise	−0.025	−0.034	0.023	0.011	−0.047	—	0.036
Neutral	0.002	0.009	−0.010	0.038	−0.018	0.016	—
[Anxiety]							
Fear	—	−0.090*	0.076	0.052	0.001	0.048	0.073
Anger	0.113*	—	0.086*	0.087*	0.033	0.076	0.078
Disgust	0.010	−0.013	—	0.073	0.008	−0.022	0.080
Happiness	0.086*	−0.026	0.098*	—	0.011	0.033	0.091*
Sadness	−0.018	0.008	0.068	−0.021	—	−0.016	0.105*
Surprise	−0.022	−0.040	0.058	0.030	0.006	—	0.036
Neutral	0.101*	−0.011	0.046	0.053	0.039	0.061	—
[Depression]							
Fear	—	−0.116**	0.096*	0.034	0.017	−0.036	0.032
Anger	0.101*	—	0.089*	0.061	0.025	0.115**	0.087*
Disgust	−0.017	−0.020	—	0.065	−0.017	−0.018	0.087*
Happiness	0.090*	−0.001	0.072	—	0.054	0.030	0.093*
Sadness	−0.002	−0.021	0.056	−0.015	—	−0.022	0.105*
Surprise	0.014	−0.052	0.063	0.071	−0.014	—	0.048
Neutral	0.081	−0.008	−0.049	0.063	0.039	0.031	—
[Mania]							
Fear	—	−0.068	0.092*	−0.030	−0.032	0.079	0.009
Anger	0.043	—	0.086*	−0.039	0.038	0.027	0.026
Disgust	−0.074	−0.050	—	−0.028	−0.055	−0.008	0.022
Happiness	0.023	−0.062	0.042	—	0.005	0.043	0.044
Sadness	0.010	−0.037	0.101*	−0.034	—	0.006	0.034
Surprise	−0.053	−0.054	0.011	0.016	−0.061	—	0.033
Neutral	0.040	0.005	0.011	−0.028	−0.045	0.020	—
[Psychotic Experiences]							
Fear	—	−0.113	0.043	0.047	0.020	0.080	0.004
Anger	0.079	—	0.070	0.001	0.088*	0.074	0.027
Disgust	−0.021	−0.062	—	0.023	−0.034	−0.031	0.017
Happiness	0.057	0.004	0.042	—	0.105*	0.060	0.019
Sadness	0.043	−0.025	0.004	0.002	—	0.008	0.035
Surprise	0.017	−0.061	−0.002	0.008	0.011	—	0.056
Neutral	0.050	0.044	−0.010	−0.001	−0.025	0.014	—
[Prodromal Severity]							
Fear	—	−0.063	0.0480.	0.198**	0.008	0.031	0.135**
Anger	0.116**	—	0.091*	0.149**	0.137**	0.121**	0.119**

Continued

	MSP Fear	MSP Anger	MSP Disgust	MSP Happiness	MSP Sadness	MSP Surprise	MSP Neutral
Disgust	0.067	−0.010	—	0.135**	0.049	0.010	0.196**
Happiness	0.066	0.035	0.076	—	0.066	0.068	0.133**
Sadness	0.065	−0.014	0.008	−0.059	—	−0.013	0.059
Surprise	0.014	−0.037	0.067	0.042	0.102*	—	0.085*
Neutral	0.043	0.013	0.055	0.076	0.026	0.123**	—
[Unusual Experiences]							
Fear	—	−0.111**	0.094*	0.062	−0.020	0.071	0.028
Anger	0.112**	—	0.134**	−0.052	0.019	0.056	0.045
Disgust	−0.015	−0.052	—	0.004	−0.040	−0.008	0.036
Happiness	0.031	−0.013	0.033	—	0.069	0.086*	0.058
Sadness	0.029	−0.037	0.010	0.044	—	0.040	0.049
Surprise	−0.021	−0.049	−0.059	−0.042	−0.064	—	−0.004
Neutral	0.004	0.060	−0.003	0.061	−0.084*	0.038	—
[Cognitive Disorganisation]							
Fear	—	−0.142**	0.106*	−0.050	−0.033	−0.011	−0.019
Anger	0.021	—	−0.026	−0.059	0.008	0.022	0.006
Disgust	0.006	−0.053	—	−0.018	0.004	−0.045	−0.046
Happiness	0.044	−0.086*	0.023	—	0.052	0.080	0.013
Sadness	0.064	−0.039	−0.002	−0.038	—	−0.006	0.005
Surprise	0.011	−0.093*	0.002	0.028	−0.048	—	−0.002
Neutral	0.061	0.021	−0.035	−0.052	0.018	−0.042	—
[Introvertive Anhedonia]							
Fear	—	0.030	−0.011	0.121**	0.017	−0.045	0.023
Anger	0.061	—	0.007	0.069	0.019	0.072	0.111**
Disgust	0.097*	0.057	—	0.087*	0.060	−0.003	0.067
Happiness	0.046	0.069	0.062	—	0.111*	0.027	0.072
Sadness	−0.001	0.005	0.062	0.033	—	−0.044	0.044
Surprise	0.040	0.036	0.019	0.004	0.031	—	0.038
Neutral	−0.007	0.025	0.003	0.108**	0.010	0.065	—
[Impulsive Nonconformity]							
Fear	—	−0.107*	0.077	0.058	−0.062	0.054	0.055
Anger	0.072	—	0.024	0.067	0.043	0.068	0.071
Disgust	0.013	−0.049	—	0.053	0.001	−0.007	0.063
Happiness	0.051	0.005	0.043	—	0.034	0.025	0.058
Sadness	0.025	0.029	0.082	−0.015	—	−0.025	0.059
Surprise	−0.012	−0.007	0.026	0.050	−0.014	—	0.107*
Neutral	0.034	0.077	0.016	0.056	−0.006	0.028	—

Table 4. Corelations between insomnia, anxiety, depression, mania, psychotic experiences and schizotypal tendencies with misperception scores for each emotional expression. Note: Insomnia, ISI: Insomnia Severity Index; Anxiety, GAD7: Generalized Anxiety Disorder Scale; Depression, PHQ-9: Patient Health Questionnaire; Mania: MDQ, Mood Disorder Questionnaire; Psychotic Experiences: Prodromal-16; Unusual Experiences, Cognitive Disorganisation, Introvertive Anhedonia, Impulsive Nonconformity: SF-OLIFE, Short-Form Oxford-Liverpool Inventory of Feelings and Experiences Questionnaire. *Sig at $P < 0.05$; **Sig at $P < 0.01$.

Technical Validation

For the current purpose, the SAV file was exported from the Qualtrics online survey platform (Qualtrics, Provo, UT) where the data was cleaned using SPSS v. 29.0 (IBM Corp., Armonk, NT, USA). Total ratings of accuracy were summated for each expression. For each trial, correct responses yielded a score of 1 whereas incorrect responses were scored as 0. Therefore, accuracy scores ranged between 0 to 8, with higher scores indicating greater categorisation accuracy of the assessed expression. Next, mean expression intensity ratings were calculated, and ranged between a possible 0 to 100 score, with higher scores indicating greater intensity ratings. Finally, mean emotional valence ratings were calculated, and ranged between a possible 0 to 100 score, with higher scores indicating more positively valanced ratings. Descriptive statistics for all calculated variables were inspected to ensure that results fell within an expected range. Whilst normality was assessed using histograms, it is vital to consider the inherent skew observed when examining psychiatric symptoms, where a traditional disruption would not be expected. As noted, reliability analysis was performed for each psychometric measure. Here, the internal consistency (Cronbach's α) of each scale remained acceptable. Examination of internal consistency for the intensity of each expression yielded α values between 0.82–0.92. Examination of internal consistency for the emotional valence of each expression yielded α values between 0.68–0.88. Examination

of internal consistency for the categorisation before recoding was $\alpha = 0.46–0.67$ after recoding. Therefore, the facial stimuli reliably depicted their corresponding expression with a degree of confidence (see Table 2 for each α value). The dataset was carefully inspected for abnormal response patterns and completion times before any formal analyses was conducted. Neither were observed. To facilitate the potential usability and consideration of further analysis of the current data set, the descriptive statistics (means and standard deviations), and Pearson's bivariate correlations (two-tailed) between expression intensity, emotional valance, categorization accuracy and misperception scores with symptoms of insomnia, anxiety, depression, mania, psychotic experiences, and schizotypal traits are presented in Tables 2, 3 and 4 respectively. Significance was considered at the $p < 0.05$ level.

Several strengths and limitations of the current data should be noted. The cross-sectional nature limits the ability to draw any definitive explanation when concerning causal relationships. Next, the sample was not homogeneous, including a disproportionate amount of data from young white female respondents. Finally, potential users of the current data should consider limitations associated with subjective assessments which rely on self-reported information. That said, all six cross-culturally accepted facial expressions of emotion were examined[16,30], with the inclusion of data concerning the emotional valance and misperception of emotional expressions above the typical inclusion of only accuracy and intensity. Whilst similar studies typically focus on a smaller set of related symptoms, the present data provides perceptual judgments across a large domain of psychiatric symptoms. Often with large scale data collection, studies may employ scales single-item or bespoke in-house scales, which fail to capture symptom severity and specificity[31]. Accordingly, the current data provides a comprehensive assessment of psychiatric symptoms by using well validated scales with robust psychometric properties.

Usage Notes

Data have been deidentified and are presented in the same manner across data files, which can be imported into most compatible statistical software packages. As noted, the dataset includes all individual datapoints for each de-identifiable psychometric measure and perceptual judgment. For each validated questionnaire, the initial authors scoring instructions were followed to calculate the relevant total, composite, and subscale variables which may be of interest.

Data availability

Data is available on Figshare: https://doi.org/10.6084/m9.figshare.26397817.

Code availability

No custom code was used during the compilation of the dataset.

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Author contributions

The experiment was designed and conceived by U.A. and J.S. Data was collected by U.A. and J.S. An initial version of the manuscript was written by U.A. Following, input was sought from J.S.

Competing interests

The authors declare no competing interests.

Additional information

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