**Supplementary Materials**

**Supplementary Table 1. Eligibility criteria**

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|  | **All participants** | **Functional neurological disorder (FND)** | **Healthy controls** |
| **Inclusion criteria** | **•**18-65 years old.  •Normal or corrected eyesight.  •Fluency in English language. | **•**A primary diagnosis of FND with either motor symptoms OR seizures.\*  \*Participants with functional seizures were required to experience at least two seizures per month, with premonitory symptoms. |  |
| **Exclusion criteria** | **•**Diagnosis of major cardiovascular disorder (e.g., heart disease).  **•**Diagnosis of major psychiatric disorder (e.g., psychosis, alcohol or substance dependence).  **•**Diagnosis of major neurological disorder (e.g., epilepsy, multiple sclerosis). | •Physical symptoms / disability impairing ability to perform tasks (e.g., severe/constant tremor, bilateral upper limb paralysis, seizure frequency > 10 per day).  •Medication that could significantly affect cardiovascular or cognitive functioning (e.g., beta-blockers, high-dose opiates). | **•**Current diagnosis of any major physical or mental health disorder.  •Lifetime diagnosis of functional neurological disorder. |

**Supplementary Table 2. Self-report questionnaire data**

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| --- | --- | --- | --- | --- |
| **Questionnaire** | **Description** | **Scores by group** | | **Comparison statistics** |
| **FND (Total n=14)** | **HC (Total n=14)** |
| **Functional Neurological Symptoms Questionnaire** | Assesses the presence, frequency, severity and impact of FNS over the previous week. Scores are calculated for: total number of FNS, average severity (1-7), average impact (1-7), with higher scores indicating more symptoms/greater severity/impact. | See Table 2 | - | - |
| **Patient Health Questionnaire – 15 (Kroenke et al., 2002):**  **M (SD)** | Fifteen items assess the frequency of common somatic symptoms over the previous four weeks. Scores range from 0-30 – higher scores indicate more somatic symptoms. | 13.1 (4.37) | 3.0 (2.32) | t(19.8)=7.68, p<.001, g=2.82 |
| **Patient Health Questionnaire – 9 (Kroenke et al., 2001):**  **Mdn (IQR)** | Nine items measure the frequency of depressive symptoms over the past two weeks. Scores range from 0-27 – higher scores indicate elevated depressive symptoms. | 11.5 (9.0) | 1.5 (3.5) | U=12.5, z=-3.95, p<.001, r=.747 |
| **Generalised Anxiety Disorder – 7 (Spitzer et al., 1999):**  **Mdn (IQR)** | Seven items assess the frequency of generalised anxiety symptoms in the past two weeks. Scores range from 0-21 – higher scores indicate more anxiety. | 7.5 (8.0) | 1.5 (4.5) | U=31.0, z=-3.10, p=.001, r=.586 |
| **Multiscale Dissociation Inventory (Briere, 2002): Mdn (IQR)** | A 30-item measure of the frequency of several forms of psychological dissociation over the preceding month. Raw scores are converted to T-scores (presented here). T-scores range from 0-170 – higher scores indicate greater dissociative symptomology. | **DENG**=60.0 (43.3)  **DEPR**=51.5 (48.3)  **DERL**=51.5 (30.3)  **ECON**=46.0 (10.5)  **MEMD**=55.0 (33.8)  **IDDIS**=47.0 (0.0) | **DENG**=50.0 (10.0)  **DEPR**=47.0 (0.0)  **DERL**=46.0 (0.0)  **ECON**=46.0 (4.0)  **MEMD**=48.5 (8.5)  **IDDIS**=47.0 (0.0) | **DENG**: U=57.5, z=-1.88, p=.062, r=.355  **DEPR**: U=49.0, z=-2.96, p=.024, r=.559  **DERL:** U=56.0, z=-2.33, p=.056, r=.44  **ECON:** U=92.5, z=-.296, p=.804, r=.056  **MEMD:** U=62.0, z=-1.72, p=.104, r=.325  **IDDIS:** U=84.0, z=-1.44, p=.541, r=.272 |
| **Somatoform Dissociation Questionnaire – 20 (Nijenhuis et al., 1996):**  **Mdn (IQR)** | Twenty items examining the extent of various somatoform symptoms in the last year (e.g., sensory disturbances, speech/swallowing difficulties, pain). Scores range from 20-100 – higher scores indicate greater somatoform dissociation. | 27.5 (9.25) | 20.0 (0.0) | U=11.0, z=-4.22, p<.001, r=.798 |
| **Toronto Alexithymia Scale – 20 (Bagby et al., 1994):**  **M (SD)** | A 20-item measure of difficulties in emotional processing (i.e., identification/description of emotions, external cognitive orientation). Scores range from 20-100 – higher scores indicate greater alexithymia. | 52.5 (11.0) | 41.9 (10.8) | t(26)=2.59, p=.008, g=.949 |
| **Traumatic Experiences Checklist (Nijenhuis et al., 2002):**  **Mdn (IQR)** | A 33-item measure of lifetime traumatic experiences and their impact (e.g., bullying, life threatening illness, childhood abuse and neglect). Due to ethical concerns, we used a 29-item version, omitting the final four items which probe further details of abuse/maltreatment disclosures. Total scores ranged from 0-29 and impact scores for individual events ranged from 1-5. Higher scores signify greater trauma burden and impact. | **Total** =3.5 (5.3)  **Impact=**12 (16.3) | **Total=**2.0 (3.5)  **Impact=**8.0 (12.0) | **Total:** U=67.0, z=-1.44, p=.164, r=.272  **Impact:** U=67.5, z=-1.41, p=.164, r=.267 |

*Notes.* ECON=emotional constriction;DENG=disengagement; DEPR=depersonalisation; DERL=derealisation;FND=functional neurological disorder; FNS=functional neurological symptoms; IDDIS=identity dissociation; IQR=interquartile range; M=mean; Mdn=median; MEMD=memory disturbance; SD=standard deviation

**Supplementary Table 3. Functional Neurological Symptoms Questionnaire**

Please look at the symptoms in the table below and tell us whether you have experienced these functional neurological symptoms in the **past week.** If you mark yes to indicate that the symptom was present in the past week, please complete the additional columns to tell us **how frequent** the symptoms were, **how severe** (intense) they were, and **how much impact** they had on you.

When rating the average **severity** of symptoms, please choose a number from 1 to 7, where **1=Symptom not present; 2=Minimal; 3=Mild; 4=Moderate; 5=Moderately severe; 6=Severe; 7=Very severe**. When rating the **impact** of symptoms, please choose a number from 1 to 7, where **1=No impact at all; 2=Minimal impact; 3=Mild impact; 4=Moderate impact; 5=Moderately severe impact; 6=Severe impact; 7=Very severe impact**.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **FND Symptom** | **Present?**  (circle or bold) | **Frequency**  (circle or bold) | **Average severity**  **(1-7)** | **Average impact**  **(1-7)** |
| Weakness | Yes / No | Constant / daily / weekly / less than weekly |  |  |
| Tremor | Yes / No | Constant / daily / weekly / less than weekly |  |  |
| Dystonia (muscle spasms / fixed postures) | Yes / No | Constant (1) / daily (2) / weekly (3) / less than weekly (4) |  |  |
| Walking / mobility difficulties | Yes / No | Constant / daily / weekly / less than weekly |  |  |
| Myoclonus (muscle jerks) | Yes / No | Constant / daily / weekly / less than weekly |  |  |
| Seizures\* | Yes / No | Number of seizures in the last week: |  |  |
| Numbness (loss of feeling) | Yes / No | Constant / daily / weekly / less than weekly |  |  |
| Visual disturbances | Yes / No | Constant / daily / weekly / less than weekly |  |  |
| Sensitivity to light/sound | Yes / No | Constant / daily / weekly / less than weekly |  |  |
| Dizziness | Yes / No | Constant / daily / weekly / less than weekly |  |  |
| Speech / swallowing difficulties | Yes / No | Constant / daily / weekly / less than weekly |  |  |
| Cognitive difficulties (e.g., brain fog, memory lapses) | Yes / No | Constant / daily / weekly / less than weekly |  |  |
| Other FND symptoms | Details: | Constant / daily / weekly / less than weekly |  |  |

Please tell us which FND symptom(s) is most severe and has the most impact on you.

\*If you experience FND seizures, do you have warning symptoms? Yes / No

\*If you experience warning symptoms before an FND seizure, what is the earliest or most consistent symptom(s) that you experience?

**Supplementary Table 4. Standardised instructions – affective picture task**

|  |  |
| --- | --- |
| **Instructions 1** | In this task, you will be shown lots of different pictures on the screen, one at a time.  There will be 12 blocks of pictures, separated by brief breaks, when the word 'Rest' will be shown on screen.  During the breaks, please try to relax and stay focused on the screen.  Please press space to continue. |
| **Instructions 2** | Before some of the blocks of pictures, you will see the word 'Watch' on screen for a few seconds.  When you see this, please keep your eyes on the screen and just look at the subsequent pictures.  Please press space to continue. |
| **Instructions 3** | Before other blocks of pictures, you will see the word 'Distance' on screen.  When you see this, please try to minimise your reactions to the pictures by detaching yourself.  For example, you could imagine that you are an outside observer, distanced from your personal reactions to the pictures.  Please press space to continue. |
| **Instructions 4** | You will see a white fixation cross in the middle of the screen before every picture.  You will then see the word 'Watch' or 'Distance' to remind you whether to just look at the picture, or distance yourself from it.  You will then see the picture for a few seconds.  Some of the pictures may make you feel quite strong reactions; others may not affect you much at all.  Please keep your eyes focused on the screen throughout the task.  Please press space to continue. |
| **Instructions 5** | After every block of pictures, you will be asked several simple questions about how you feel, right then, in that moment.  First, you will be asked about your primary FND symptom, which was specified at enrolment to the study.\*  You will be asked about different aspects of your current experiences and physical states.  You can choose your answers using the number keys on the keyboard.  Please try to answer as quickly and accurately as possible.  Press space to continue. |
| **Instructions 6** | You will now see some example pictures, with 'Watch' or 'Distance' instructions, so that you can practice the task.  Please press space to begin. |
|  | **PRACTICE IMAGES x 6** |
| **Instructions 7** | You have now completed the practice items.  Please remember to look at the screen and stay as still as possible during this task.  Remember, when you see the word 'Watch', just look at the pictures.  When you see the word 'Distance', try to minimise your reactions by detaching yourself.  Feel free to ask any questions now.#  Please press space to begin. |

**\***Sentence omitted from healthy control version

#Experimenter answered questions in full and ensured the task was understood fully prior to participants commencing

**Supplementary Table 5. IAPS images**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Image** | **Description** | **Category** | **Mean Arousal** | **SD Arousal** | **Mean Valence** | **SD Valence** |
| 1300 | PitBull | NHA | 6.79 | 1.84 | 3.55 | 1.78 |
| 7380 | RoachPizza | NHA | 5.88 | 2.44 | 2.46 | 1.42 |
| 2811 | Gun | NHA | 6.9 | 2.22 | 2.17 | 1.38 |
| 3064 | Mutilation | NHA | 6.41 | 2.62 | 1.45 | 0.97 |
| 9921 | Fire | NHA | 6.52 | 1.94 | 2.04 | 1.47 |
| 3030 | Mutilation | NHA | 6.76 | 2.1 | 1.91 | 1.56 |
| 9622 | Jet | NHA | 6.26 | 1.98 | 3.1 | 1.9 |
| 2683 | War | NHA | 6.21 | 2.15 | 2.62 | 1.78 |
| 2730 | NativeBoy | NHA | 6.8 | 2.21 | 2.45 | 2.25 |
| 6530 | Attack | NHA | 6.18 | 2.02 | 2.76 | 1.86 |
| 1525 | Attack dog | NHA | 6.51 | 2.25 | 3.09 | 1.72 |
| 2661 | Baby | NHA | 5.76 | 2.13 | 3.9 | 2.49 |
| 1050 | Snake | NHA | 6.87 | 1.68 | 3.46 | 2.15 |
| 3022 | Scream | NHA | 5.88 | 2.08 | 3.7 | 1.91 |
| 3400 | Severed Hand | NHA | 6.91 | 2.22 | 2.35 | 1.9 |
| 6022 | Assault | NHA | 6.09 | 2.47 | 2.14 | 1.55 |
| 9910 | CarAccident | NHA | 6.2 | 2.16 | 2.06 | 1.26 |
| 3102 | BurnVictim | NHA | 6.58 | 2.69 | 1.4 | 1.14 |
| 6415 | DeadTiger | NHA | 6.2 | 2.31 | 2.21 | 1.51 |
| 9620 | Shipwreck | NHA | 6.11 | 2.1 | 2.7 | 1.64 |
| 6312 | Abduction | NHA | 6.37 | 2.3 | 2.48 | 1.52 |
| 1201 | Spider | NHA | 6.36 | 2.11 | 3.55 | 1.88 |
| 2981 | DeerHead | NHA | 5.97 | 2.12 | 2.76 | 1.94 |
| 6212 | Soldier | NHA | 6.01 | 2.44 | 2.19 | 1.49 |
| 9300 | Dirty | NHA | 6 | 2.41 | 2.26 | 1.76 |
| 9500 | Porpoises | NHA | 5.82 | 2.29 | 2.42 | 1.73 |
| 9254 | Assault | NHA | 6.04 | 2.35 | 2.03 | 1.35 |
| 9405 | SlicedHand | NHA | 6.08 | 2.4 | 1.83 | 1.17 |
| 9902 | CarAccident | NHA | 6 | 2.15 | 2.33 | 1.38 |
| 6370 | Attack | NHA | 6.44 | 2.19 | 2.7 | 1.52 |
| 1932 | Shark | NHA | 6.47 | 2.2 | 3.85 | 2.11 |
| 3100 | BurnVictim | NHA | 6.49 | 2.23 | 1.6 | 1.07 |
| 1301 | Dog | NHA | 5.77 | 2.18 | 3.7 | 1.66 |
| 9252 | DeadBody | NHA | 6.64 | 2.33 | 1.98 | 1.59 |
| 3250 | OpenChest | NHA | 6.29 | 1.63 | 3.78 | 1.72 |
| 3150 | Mutilation | NHA | 6.55 | 2.2 | 2.26 | 1.57 |
| 9810 | KKKRally | NHA | 6.62 | 2.26 | 2.09 | 1.78 |
| 6570 | Suicide | NHA | 6.24 | 2.16 | 2.19 | 1.72 |
| 6315 | BeatenFem | NHA | 6.38 | 2.39 | 2.31 | 1.69 |
| 3063 | Mutilation | NHA | 6.35 | 2.6 | 1.49 | 0.96 |
| 8178 | Cliffdiver | PHA | 6.82 | 2.33 | 6.5 | 2 |
| 7270 | Icecream | PHA | 5.76 | 2.21 | 7.53 | 1.73 |
| 8080 | Sailing | PHA | 6.65 | 2.2 | 7.73 | 1.34 |
| 4689 | EroticCouple | PHA | 6.21 | 1.74 | 6.9 | 1.55 |
| 8341 | WingWalker | PHA | 6.4 | 2.27 | 6.25 | 1.86 |
| 4311 | EroticFemale | PHA | 6.67 | 2.19 | 6.66 | 1.76 |
| 8034 | Skier | PHA | 6.3 | 2.16 | 7.06 | 1.53 |
| 8370 | Rafting | PHA | 6.73 | 2.24 | 7.77 | 1.29 |
| 8186 | SkySurfer | PHA | 6.84 | 2.01 | 7.01 | 1.57 |
| 4677 | EroticCouple | PHA | 6.19 | 2.08 | 6.58 | 1.65 |
| 1650 | Jaguar | PHA | 6.23 | 1.99 | 6.65 | 2.25 |
| 2216 | Children | PHA | 5.83 | 2.2 | 6.41 | 1.9 |
| 8179 | Bungee | PHA | 6.99 | 2.35 | 6.48 | 2.18 |
| 4653 | EroticCouple | PHA | 5.83 | 2.07 | 6.56 | 1.65 |
| 8501 | Money | PHA | 6.44 | 2.29 | 7.91 | 1.66 |
| 8470 | Gymnast | PHA | 6.14 | 2.19 | 7.74 | 1.53 |
| 5621 | Skydivers | PHA | 6.99 | 1.95 | 7.57 | 1.42 |
| 4608 | EroticCouple | PHA | 6.47 | 1.96 | 7.07 | 1.66 |
| 5470 | Astronaut | PHA | 6.02 | 2.26 | 7.35 | 1.62 |
| 8170 | Sailboat | PHA | 6.12 | 2.3 | 7.63 | 1.34 |
| 4695 | EroticCouple | PHA | 6.61 | 1.88 | 6.84 | 1.53 |
| 5626 | Hanglider | PHA | 6.1 | 2.19 | 6.71 | 2.06 |
| 8499 | Rollercoaster | PHA | 6.07 | 2.31 | 7.63 | 1.41 |
| 4664 | EroticCouple | PHA | 6.72 | 2.08 | 6.61 | 2.23 |
| 8190 | Skier | PHA | 6.28 | 2.57 | 8.1 | 1.39 |
| 5450 | Liftoff | PHA | 5.84 | 2.4 | 7.01 | 1.6 |
| 8496 | Waterslide | PHA | 5.79 | 2.26 | 7.58 | 1.63 |
| 7230 | Turkey | PHA | 5.52 | 2.32 | 7.38 | 1.65 |
| 8200 | Waterskier | PHA | 6.35 | 1.98 | 7.54 | 1.37 |
| 4607 | EroticCouple | PHA | 6.34 | 2.16 | 7.03 | 1.84 |
| 8400 | Rafters | PHA | 6.61 | 1.86 | 7.09 | 1.52 |
| 8490 | Rollercoaster | PHA | 6.68 | 1.97 | 7.2 | 2.35 |
| 7502 | Castle | PHA | 5.91 | 2.31 | 7.75 | 1.4 |
| 5629 | Hiker | PHA | 6.55 | 2.11 | 7.03 | 1.55 |
| 4611 | EroticCouple | PHA | 6.04 | 2.11 | 6.62 | 1.82 |
| 8300 | Pilot | PHA | 6.14 | 2.21 | 7.02 | 1.6 |
| 4652 | EroticCouple | PHA | 6.62 | 2.04 | 6.79 | 2.02 |
| 8191 | IceClimber | PHA | 6.19 | 2.17 | 6.07 | 1.73 |
| 8180 | CliffDivers | PHA | 6.59 | 2.12 | 7.12 | 1.88 |
| 4643 | EroticCouple | PHA | 6.01 | 2 | 6.84 | 1.54 |
| 5531 | Mushroom | Neutral | 3.69 | 2.11 | 5.15 | 1.45 |
| 7009 | Mug | Neutral | 3.01 | 1.97 | 4.93 | 1 |
| 7037 | Trains | Neutral | 3.71 | 2.08 | 4.81 | 1.12 |
| 2396 | Couple | Neutral | 3.34 | 1.83 | 4.91 | 1.05 |
| 2880 | Shadow | Neutral | 2.96 | 1.94 | 5.18 | 1.44 |
| 2516 | Elderly woman | Neutral | 3.5 | 1.88 | 4.9 | 1.43 |
| 2493 | NeutralMale | Neutral | 3.34 | 2.1 | 4.82 | 1.27 |
| 2890 | Twins | Neutral | 2.95 | 1.87 | 4.95 | 1.09 |
| 7207 | Beads | Neutral | 3.57 | 2.25 | 5.15 | 1.46 |
| 7217 | ClothesRack | Neutral | 2.55 | 1.65 | 5 | 0.78 |
| 5510 | Mushroom | Neutral | 2.82 | 2.18 | 5.15 | 1.43 |
| 2102 | NeuMan | Neutral | 3.03 | 1.87 | 5.16 | 0.96 |
| 7059 | KeyRing | Neutral | 2.73 | 1.88 | 4.93 | 0.81 |
| 2514 | Woman | Neutral | 3.5 | 1.81 | 5.19 | 1.09 |
| 7000 | RollingPin | Neutral | 2.42 | 1.79 | 5 | 0.84 |
| 2393 | FactoryWorker | Neutral | 2.93 | 1.88 | 4.87 | 1.06 |
| 7036 | Shipyard | Neutral | 3.32 | 2.04 | 4.88 | 1.08 |
| 2595 | Women | Neutral | 3.71 | 1.88 | 4.88 | 1.24 |
| 7010 | Basket | Neutral | 1.55 | 1.36 | 4.95 | 1.43 |
| 7491 | Building | Neutral | 2.6 | 1.95 | 4.87 | 0.94 |
| 2840 | Chess | Neutral | 2.43 | 1.82 | 4.91 | 1.52 |
| 7235 | Chair | Neutral | 2.68 | 1.9 | 4.85 | 1.13 |
| 7038 | Shoes | Neutral | 3.01 | 1.96 | 4.82 | 1.2 |
| 7055 | LightBulb | Neutral | 3.02 | 1.83 | 4.9 | 0.64 |
| 7160 | Fabric | Neutral | 3.07 | 2.07 | 5.02 | 1.1 |
| 5534 | Mushrooms | Neutral | 3.14 | 2.03 | 4.84 | 1.44 |
| 2385 | Girl | Neutral | 3.64 | 1.81 | 5.2 | 1.32 |
| 7034 | Hammer | Neutral | 3.06 | 1.95 | 4.95 | 0.87 |
| 7950 | Tissue | Neutral | 2.28 | 1.81 | 4.94 | 1.21 |
| 7187 | AbstractArt | Neutral | 2.3 | 1.75 | 5.07 | 1.02 |
| 7179 | Rug | Neutral | 2.88 | 1.97 | 5.06 | 1.05 |
| 9070 | Boy | Neutral | 3.63 | 2.03 | 5.01 | 1.89 |
| 7041 | Baskets | Neutral | 2.6 | 1.78 | 4.99 | 1.12 |
| 2512 | Man | Neutral | 3.46 | 1.75 | 4.86 | 0.84 |
| 5532 | Mushrooms | Neutral | 3.79 | 2.2 | 5.19 | 1.69 |
| 7006 | Bowl | Neutral | 2.33 | 1.67 | 4.88 | 0.99 |
| 7090 | Book | Neutral | 2.61 | 2.03 | 5.19 | 1.46 |
| 6150 | Outlet | Neutral | 3.22 | 2.02 | 5.08 | 1.17 |
| 2038 | NeuWoman | Neutral | 2.94 | 1.93 | 5.09 | 1.35 |
| 7002 | Towel | Neutral | 3.16 | 2 | 4.97 | 0.97 |

***Notes.*** NHA=negative high arousal; PHA=positive high arousal; SD=standard deviation