**SUPPLEMENTARY MATERIALS**

**Supplementary Materials 1. Demographic and clinical characteristics of 99 adults with 22q11DS, with and without psychotic illness**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Total  N = 99 (100%) | | Psychotic  N = 43 (43.4%) I | | Non-Psychotic  N = 56 (56.6%) II | |  |
| **n** | **%** | **n** | **%** | **n** | **%** | ***Pa*** |
| Sex (Male) | 43 | 43.4 | 21 | 48.8 | 22 | 39.2 | 0.34 |
| Ethnicity  European  Other | 89  10 | 89.9  10.1 | 35  8 | 81.4  18.6 | 54  2 | 96.4  3.60 | 0.02\* |
| Handedness (Right) | 84 | 84.9 | 36 | 83.7 | 48 | 85.7 | 0.78 |
| Deletion Origin  De novob  Inherited  Unknownc | 83  9  7 | 83.8  9.10  7.10 | 37  3  3 | 86.1  7.00  7.00 | 46  6  4 | 82.1  10.7  7.20 | 0.92 |
| Deletion Extent  Typicald  Atypical  Unknowne | 96  3  1 | 96.0  0.03  0.01 | 41  2  0 | 95.3  0.05  0.00 | 55  1  1 | 96.5  0.02  0.02 | 0.99 |
| Congenital Heart Defect (CHD)  None  Simple  Complex *(requiring surgery)* | 41  16  42 | 41.4  16.2  42.4 | 28  6  9 | 65.1  14.0  20.9 | 13  10  33 | 23.2  17.9  58.9 | <0.0001\* f |
|  | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | ***P*** |
| Age at onset psychosis | - | - | 21.1 | 5.2 | - | - | - |
| Age at neurocognitive testing (y) | 26.6 | 8.6 | 28.2 | 6.6 | 25.5 | 9.6 | 0.111 |
| FSIQ | 71.7 | 8.6 | 68.7 | 6.5 | 74.2 | 9.3 | 0.001\* |
| VIQ | 73.6 | 8.5 | 70.3 | 6.6 | 76.2 | 9.0 | 0.001\* |
| PIQ | 72.8 | 8.7 | 69.6 | 6.1 | 75.5 | 9.7 | 0.001\* |
| Age at Vineland assessment (y) | 27.5 | 8.3 | 29.8 | 6.9 | 25.5 | 8.8 | 0.016\* |
| Interval time neurocognitive <> Vineland (y) | 1.6 | 2.2 | 1.9 | 2.8 | 1.2 | 1.6 | .145 |

\* Indicates significance (*p*<0.05)*,* a Χ2 for sex, CHD, and handedness variables; Fisher’s Exact Test for ethnicity and deletion origin variables; simple ANOVA’s for Age at assessment, interval time, FSIQ (Full-scale IQ), VIQ (Verbal IQ), PIQ (Performance IQ)*,* b includes probable de-novo, c Parental 22q11.2 deletion status and/or testing results unavailable, d deletion overlaps the A-B region, e neither typical nor atypical*,* f Difference due to ascertainment differences, e.g., non-psychotic patients ascertained through adult congenital cardiac clinics, I All 43 individuals in this group (100%) were receiving antipsychotic medication, II 27 individuals (48.2%) in the non-psychotic group were diagnosed with a mood- (25%) , or anxiety (37.5%) disorder; consistent with expectations of previous studies ([Schneider *et al.*, 2014](#_ENREF_47))

**Supplementary Materials 2. 15 Neurocognitive Tests**

|  |  |  |
| --- | --- | --- |
| **Neurocognitive test** | **Abbreviation used** | **Description** |
| Purdue pegboard – bilateral([Tiffen, 1968](#_ENREF_56)) | Purdue - Bilateral | Measures how fast metal pegs can be placed in the holes along the board within a 30-second time period.  *Using both hands.* |
| Purdue pegboard – dominant([Tiffen, 1968](#_ENREF_56)) | Purdue - Dom | Same as for Purdue – Bilateral, except only  *Using the dominant hand* |
| Purdue pegboard – Non dominant([Tiffen, 1968](#_ENREF_56)) | Purdue – Non Dom | Same as for Purdue – Bilateral, except only  *Using the non-dominant hand* |
| Stroop Task  (color-word)([Golden, 1978](#_ENREF_24)) | Stroop (c-w) | Measures relative speed of reading the colour names that are printed in another colour. Involves cognitive interference, requiring inhibition of a reading response. |
| Rey Auditory Verbal Learning Test - Recall([Rey, 1958](#_ENREF_45)) | RAVLT - Recall | Measures immediate memory recall, learning curve, susceptibility of interference, retention ability and recognition memory.  Fifteen words are read aloud for five consecutive trials (List A). A new list of unrelated words (List B) is read aloud which tests for interference effects.  *Asked to recall words from List A after all five trials* |
| Rey Auditory Verbal Learning Test - Recognition([Rey, 1958](#_ENREF_45)) | RAVLT - Recog | Same as RAVLT – Recall, but  *Asked to identify words (from List A) from a list of filler words and words from List B and List A* |
| Rey Auditory Verbal Learning Test - Retention([Rey, 1958](#_ENREF_45)) | RAVLT - Retention | Same as RAVLT – Recall, but  *Asked to recall words from List A after learning interference List B* |
| Wechsler’s Memory Scale- Revised, Logical Memory I([Wechsler, 1987](#_ENREF_63)) | WMS-R LM I | Measures the ability to recall concepts in two orally presented stories.  *Immediate recall of events* |
| Wechsler’s Memory Scale- Revised, Logical Memory II([Wechsler, 1987](#_ENREF_63)) | WMS-R LM II | Same as WMS-R LM I, but with  *Delayed recall of events* |
| Wechsler’s Memory Scale- Revised, Visual Reproduction I([Wechsler, 1987](#_ENREF_63)) | WMS-R VR I | Measures the ability to reproduce and draw the geometric designs that were showed briefly.  *Immediate recall and drawing of shapes* |
| Wechsler’s Memory Scale- Revised, Visual Reproduction II([Wechsler, 1987](#_ENREF_63)) | WMS-R VR II | Same as WMS-R VR I, but with  *Delayed-recall and drawing of shapes* |
| Animals([Spreen and Benton, 1969](#_ENREF_52)) | Animals | Measures how many items belonging to a semantic category (e.g. animals) can be recalled within 60 seconds. |
| Judgment of Line Orientation([Benton *et al.*, 1994](#_ENREF_5)) | JLO | Measures the ability to evaluate angles of line segments by matching line pairs. |
| Trails B([Reitan and Wolfson, 1985](#_ENREF_44)) | Trails B | Measures how fast 25 encircled numbers and letters can be connected in an alternating and progressive order. |
| Wisconsin Card Sorting Task - Categories([Heaton *et al.*, 1993](#_ENREF_30)) | WCST (cat) | Measures the ability to form abstract concepts and to process feedback to shift or maintain mental processes. Four stimulus cards with different shapes and colours are placed in front, asked to match every card (from a given deck) to one of the four stimulus cards. Feedback is given to every move. |

**Supplementary Materials 3. Mean Z-scores on the 15 neurocognitive tests for 99 adults with 22q11DS, with (n = 43) and without psychotic illness (n = 56).**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Neurocognitive  test | Total sample | | Psychotic | | Non-psychotic | |  | | | |
| **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | **t** | **p** | | **Effect size** |
| *Visual and Logical Memory* | | | | | | | | | | |
| WMS-R Logical Memory I | -1.50 | 0.91 | -1.87 | 0.83 | -1.23 | 0.87 | 3.70 | **0.0004** | | 0.75 |
| WMS-R Visual Reproduction II | -1.04 | 1.13 | -1.44 | 0.95 | -0.74 | 1.19 | 3.17 | **0.002** | | 0.64 |
| WMS-R Logical Memory II | -1.32 | 0.92 | -1.75 | 0.80 | -1.00 | 0.88 | 4.35 | **<0.0001\*** | | 0.89a |
| Animals | -1.20 | 1.06 | -1.71 | 1.09 | -0.82 | 0.88 | 4.51 | **<0.0001\*** | | 0.91a |
| *Verbal Memory* |  |  |  |  |  |  |  |  | |  |
| RAVLT - Retention | -1.53 | 1.52 | -2.08 | 1.40 | -1.10 | 1.50 | 3.31 | 0.001 | | 0.67 |
| RAVLT – Recognitionb | -0.19 | 1.37 | -0.78 | 1.73 | 0.28 | 0.75 | 3.76 | **0.0004\*** | | 0.83a |
| RAVLT Recall (Trials I – V) | -1.94 | 1.60 | -2.76 | 1.31 | -1.30 | 1.53 | 4.99 | **<0.0001\*** | | 1.01a |
| *Motor Performance* |  |  |  |  |  |  |  |  | |  |
| Purdue Pegboard – Non Dominant | -2.96 | 1.31 | -3.50 | 1.10 | -2.59 | 1.30 | 3.69 | **0.0004\*** | | 0.75 |
| Purdue Pegboard - Dominant | -2.71 | 1.31 | -3.33 | 1.35 | -2.22 | 1.07 | 4.54 | **<0.0001\*** | | 0.93a |
| Purdue Pegboard – Bilateralb | -3.35 | 1.30 | -4.02 | 1.18 | -2.84 | 1.17 | 4.99 | **<0.0001\*** | | 1.00a |
| *Executive Performance* | | | | | | | | | | |
| Judgement of Line Orientation | -1.58 | 0.94 | -1.81 | 0.77 | -1.44 | 1.00 | 2.00 | 0.048 | 0.41 | |
| Trails B | -1.96 | 1.01 | -2.18 | 0.82 | -1.80 | 1.12 | 1.94 | 0.05 | 0.38 | |
| WCST (Categories) | -1.56 | 0.88 | -1.80 | 0.93 | -1.38 | 0.81 | 2.43 | 0.02 | 0.49 | |
| WMS-R Visual Reproduction I | -1.05 | 1.14 | -1.34 | 1.07 | -0.85 | 1.15 | 2.20 | 0.03 | 0.44 | |
| Stroop task (Colour-word) | -1.43 | 0.98 | -1.78 | 0.76 | -1.17 | 1.06 | 3.37 | **0.001\*** | 0.65 | |

Bolded values indicate significance with Bonferroni adjustment *(p* < 0.0028*)*

\*Indicates significance (*p* < 0.05) after analysis of covariance (ANCOVA) with ethnicity, CHD and FSIQ

a Large effect size (*d* 0.8) (Cohen, 1988) for the comparison between psychotic and non-psychotic subgroups of 22q11DS

b Best (RAVLT-Recognition) and worst (Purdue Pegboard-bilateral) average neurocognitive test results for the sample overall, as for all of these results, would not necessarily reflect expectations for any individual, given substantial variability (high SD) of all tests. The relative strength on RAVLT-Recognition is consistent with the effort these individuals with 22q11DS were making and the fact that this subtest requires little verbal expressive abilities and relies on immediate recognition of simple auditory stimuli, reflecting perhaps the benefit of prompts.

**Supplementary Materials 4. Adaptive functioning for 84 adults with 22q11DS, with and without psychotic illness**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Total sample | | Psychotic  (n=38 (45,2%)) | | Non-psychotic (n=46 (54,8%)) | |  |
| Vineland Domains | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | **Pa** |
| Adaptive Behaviour Composite *(overall functioning)* | 63.0 | 19.6 | 54.1 | 14.8 | 70.3 | 20.2 | 0.000 |
| Daily Living Skills | 78.0 | 23.5 | 68.8 | 22.9 | 85.6 | 21.4 | 0.001 |
| Socialization | 64.8 | 18.2 | 57.1 | 14.0 | 71.2 | 18.9 | 0.000 |
| Communication | 58.6 | 22.8 | 51.2 | 16.9 | 64.6 | 25.2 | 0.006 |

a ANOVA

**References**

**Benton A, Sivan AB, Hamsher KD, Varney N and Spreen O** (1994). *Contributions to Neuropsychological Assessment: A Clinical Manual*, 2nd edn. New York, NY: Oxford University Press.

Golden CJ (1978) *Stroop Color and Word Test: A Manual for Clinical and Experimental Uses*. Chicago, Illinois: Skoelting.

Heaton RK, Chelune GJ, Talley J, Kay GG and Curtiss G (1993) *Wisconsin Card Sorting Test Manual, Revised and Expanded*. Odessa, FL: Psychological Assessment Resources.

Reitan R and Wolfson D (1985) *Neuropyschological Test Battery*. Tuscon, AZ: Neuropsychology press.

Rey A (1958) *L’examen Clinique en Psychologie*. Paris, France: Presse Universitaire de France.

Schneider M, Debbane M, Bassett AS, Chow EW, Fung WL, van den Bree M, Owen M, Murphy KC, Niarchou M, Kates WR, Antshel KM, Fremont W, McDonald-McGinn DM, Gur RE, Zackai EH, Vorstman J, Duijff SN, Klaassen PW, Swillen A, Gothelf D, Green T, Weizman A, Van Amelsvoort T, Evers L, Boot E, Shashi V, Hooper SR,

Bearden CE, Jalbrzikowski M, Armando M, Vicari S, Murphy DG, Ousley O, Campbell LE, Simon TJ, Eliez S and International Consortium on, B. & Behavior in 22q11.2 Deletion, S (2014) Psychiatric disorders from childhood to adulthood in 22q11.2 deletion syndrome: results from the International Consortium on Brain and Behavior in 22q11.2 Deletion Syndrome. *American Journal of Psychiatry* **171**, 627–639.

Spreen D and Benton AL (1969) *Neurosensory Center Comprehensive Examination for Aphasia*. Victoria, BC: Neuropsychology Laboratory.

Tiffen J (1968) *Purdue Pegboard Examiner Manual*. Chicago, IL: Scientific Research Associates.

Wechsler D (1987) *Wechsler Memory Scale – Revised*. San Antonio, TX: The Psychological Corporation.