

Supplementary Online Content

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eTable 2. Transformation of Grades From Old Scale (Used Until 2007) to New Scale

eTable 3. Standardized Mean Grade Difference at the Final 9th Grade Exam in Danish During 2002-2016, in Individuals Who Sat the Exam (274,332 girls and 268,168 boys) for Individuals With Mental Disorders as Compared to Individuals Without Mental Disorders, Stratified on Sex and With 95% Confidence Intervals

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This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. Diagnostic Classification of Mental Disorders According to the ICD-10 and Corresponding ICD-8 Diagnoses			
Diagnosis	ICD-10 codes	Equivalent ICD-8 codes	Earliest age
Any mental disorder	F00-F99	290-315	1
Organic mental disorder	F00-F09	290.09, 290.10, 290.11, 290.18, 290.19, 292.x9, 293.x9, 294.x9, 309.x9	1
Substance use disorder	F10-F19	291.x9, 294.39, 303.x, 304.x	10
- Disorder due to alcohol use	F10	291.x9, 303.x	10
- Disorder due to cannabis use	F12	304.59	10
Schizophrenia spectrum disorder	F20-F29	295.x, 296.89, 297.x9, 298.29-298.99, 299.04, 299.05, 299.09, 301.83	10
- Schizophrenia	F20	295.x9 (excl. 295.79)	10
Mood disorder	F30-F39	296.x9 (excl. 296.89), 298.09, 298.19, 300.49, 301.19	10
- Bipolar disorder	F30-F31	296.19, 296.39, 298.19	10
- Unipolar depression	F32-F33	296.09, 296.29, 298.09, 300.49	10
Anxiety disorder	F40-F48	300.x9 (excl. 300.49), 305.x9 305.68, 307.99	5
- Obsessive compulsive disorder	F42	300.39	5
Eating disorder	F50	306.50, 306.58, 306.59	5
- Anorexia nervosa	F50.0 F50.1	306.50	5
- Bulimia	F50.2 F50.3	-	5
- EDNOS	F50.9	306.58 306.59	5
Personality disorder	F60	301.x9 (excl 301.19), 301.80, 301.81, 301.82, 301.84	14
Intellectual disability	F70-F79	311.xx, 312.xx, 313.xx, 314.xx, 315.xx	1
Other developmental disorders	F80-F83	306.0x, 306.1x, 306.3x	1
- Disorder of language	F80	306.0x	1
- Disorder of scholastic skills	F81	306.1x	1
- Disorder of motoric skills	F82	306.3x	1
Autism spectrum disorder	F84 (excl 84.2-3)	299.00, 299.01, 299.02, 299.03	1
- Childhood autism	F84.0	299.00	1
- Asperger's syndrome	F84.5	-	1
ADHD - All subtypes	F90+F98.8	308.01	1
- ADHD Combined Subtype	F90.0	-	1
ODD/CD	F91	308.03, 308.04, 308.05, 308.06	1
Attachment disorder	F94 (excl. F94.0)	308.07	1
Tic disorder	F95	306.29	1

Abbreviations: EDNOS - Eating Disorder not otherwise specified; ADHD - Attention Deficit Hyperactivity Disorder; ODD/CD - Oppositional defiant disorder/conduct disorder.

eTable 2. Transformation of Grades From Old Scale (Used Until 2007) to New Scale

Old scale	New scale
0	-3
3 and 5	00
6	02
7	4
8 and 9	7
10	10
11 and 13	12

eTable 3. Standardized Mean Grade Difference[§] at the Final 9th Grade Exam in Danish During 2002-2016, in Individuals Who Sat the Exam (274,332 girls and 268,168 boys) for Individuals With Mental Disorders as Compared to Individuals Without Mental Disorders, Stratified on Sex and With 95% Confidence Intervals[#]

Diagnosis	N, females	N, males	Standardized mean grade difference (95% CI)	Standardized mean grade difference (95% CI)	Sex difference, P value [€]
			Females	Males	
Any mental disorder	9,923	9,924	-0.15 (-0.17 to -0.14)	-0.06 (-0.08 to -0.05)	<0.001
Organic mental disorder	13	45	-0.37 (-0.76 to 0.01)	-0.04 (-0.25 to 0.17)	0.140
Substance use disorder	107	90	-0.59 (-0.73 to -0.46)	-0.14 (-0.29 to 0.01)	<0.001
- Disorder due to alcohol use	14	14	-0.85 (-1.22 to -0.47)	-0.29 (-0.67 to 0.10)	0.041
- Disorder due to cannabis use	63	61	-0.56 (-0.74 to -0.38)	-0.15 (-0.33 to 0.03)	0.002
Schizophrenia spectrum disorder	324	194	-0.22 (-0.30 to -0.14)	-0.02 (-0.13 to 0.08)	0.003
- Schizophrenia	56	37	-0.20 (-0.39 to 0.00)	0.08 (-0.15 to 0.31)	0.074
Mood disorder	1,526	613	-0.01 (-0.04 to 0.03)	0.00 (-0.06 to 0.05)	0.926
- Bipolar disorder	27	15	-0.01 (-0.28 to 0.26)	0.07 (-0.29 to 0.43)	0.736
- Unipolar depression	1,450	545	0.00 (-0.04 to 0.04)	0.00 (-0.06 to 0.06)	0.984
Anxiety disorders	4,705	2,540	-0.12 (-0.14 to -0.10)	-0.01(-0.03 to 0.02)	<0.001
- Obsessive compulsive disorder	985	763	0.12 (0.07 to 0.16)	0.05 (0.00 to 0.10)	0.047
Eating disorders	1,866	169	0.28 (0.24 to 0.31)	0.07 (-0.03 to 0.18)	0.001
- Anorexia nervosa	904	76	0.45 (0.40 to 0.50)	0.10 (-0.06 to 0.26)	<0.001
- Bulimia	117	<4	0.22 (0.09 to 0.35)	-	-
- EDNOS	616	62	0.09 (0.04 to 0.15)	0.02 (-0.17 to 0.20)	0.429
Personality disorder	412	79	-0.21 (-0.29 to -0.14)	-0.07 (-0.23 to 0.09)	0.112
Intellectual disability	129	171	-0.95 (-1.07 to -0.82)	-0.25 (-0.36 to -0.14)	<0.001
Other developmental disorders	649	1,541	-0.64 (-0.70 to -0.59)	-0.16 (-0.20 to -0.13)	<0.001
- Disorder of language	131	328	-0.75 (-0.87 to -0.63)	-0.20 (-0.27 to -0.12)	<0.001
- Learning disorder	177	333	-0.90 (-1.01 to -0.79)	-0.28 (-0.36 to -0.20)	<0.001
- Disorder of motoric skills	34	159	-0.43 (-0.68 to -0.18)	-0.01 (-0.12 to 0.10)	0.002
Autism spectrum disorder	738	2,301	-0.08 (-0.14 to -0.03)	-0.04 (-0.07 to -0.01)	0.169
- Childhood autism	80	310	-0.28 (-0.44 to -0.12)	-0.13 (-0.21 to -0.05)	0.087
- Asperger's syndrome	312	1,071	0.03 (-0.05 to 0.11)	0.01 (-0.03 to 0.05)	0.595
ADHD - All subtypes	1,338	3,310	-0.55 (-0.59 to -0.51)	-0.12 (-0.15 to -0.10)	<0.001
- ADHD Combined Subtype	739	2,199	-0.56 (-0.61 to -0.51)	-0.12 (-0.15 to -0.09)	<0.001
ODD/CD	183	474	-0.45 (-0.56 to -0.35)	-0.09 (-0.16 to -0.03)	<0.001
Attachment disorder	287	461	-0.54 (-0.63 to -0.45)	0.01 (-0.05 to 0.08)	<0.001
Tic disorder	142	643	-0.05 (-0.17 to 0.07)	0.01 (-0.04 to 0.07)	0.347

Abbreviations: EDNOS - Eating Disorder not otherwise specified; ADHD - Attention Deficit Hyperactivity Disorder; ODD/CD - Oppositional defiant disorder/conduct disorder.

[§] Differences are measured in standard deviations (SD), standardized as Z-scores by subtracting the mean and dividing by the SD.

Analyses adjusted for year of examination, parental age, parental education, birth order, singleton vs. twins, preterm birth, and small for gestational age.

€ p-value for relative sex differences in standardized mean grade in Danish, in individuals with that mental disorder, when compared to same-sex individuals without that mental disorder

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			Females	Males	
Any mental disorder	9,923	9,924	-0.33 (-0.35 to -0.31)	-0.35 (-0.37 to -0.33)	0.071
Organic mental disorder	13	45	-0.39 (-0.90 to 0.11)	-0.37 (-0.64 to -0.09)	0.927
Substance use disorder	107	90	-0.78 (-0.96 to -0.60)	-0.83 (-1.03 to -0.63)	0.734
- Disorder due to alcohol use	14	14	-1.04 (-1.52 to -0.55)	-0.72 (-1.22 to -0.21)	0.374
- Disorder due to cannabis use	63	61	-0.70 (-0.93 to -0.46)	-0.86 (-1.10 to -0.63)	0.324
Schizophrenia spectrum disorder	324	194	-0.48 (-0.59 to -0.38)	-0.43 (-0.56 to -0.29)	0.520
- Schizophrenia	56	37	-0.27 (-0.52 to -0.02)	-0.29 (-0.59 to 0.01)	0.907
Mood disorder	1,526	613	-0.23 (-0.28 to -0.19)	-0.25 (-0.33 to -0.18)	0.724
- Bipolar disorder	27	15	-0.23 (-0.58 to 0.12)	-0.17 (-0.64 to 0.30)	0.840
- Unipolar depression	1,450	545	-0.23 (-0.28 to -0.18)	-0.25 (-0.33 to -0.17)	0.724
Anxiety disorders	4,705	2,540	-0.32 (-0.35 to -0.30)	-0.27 (-0.31 to -0.24)	0.027
- Obsessive compulsive disorder	985	763	-0.13 (-0.19 to -0.07)	-0.10 (-0.16 to -0.03)	0.457
Eating disorders	1,866	169	0.07 (0.02 to 0.11)	-0.03 (-0.18 to 0.11)	0.192
- Anorexia nervosa	904	76	0.25 (0.19 to 0.31)	0.14 (-0.07 to 0.35)	0.349
- Bulimia	117	<4	-0.13 (-0.30 to 0.04)	-	-
- EDNOS	616	62	-0.17 (-0.25 to -0.10)	-0.15 (-0.39 to 0.09)	0.896
Personality disorder	412	79	-0.55 (-0.64 to -0.46)	-0.45 (-0.66 to -0.23)	0.376
Intellectual disability	129	171	-1.10 (-1.27 to -0.94)	-1.17 (-1.31 to -1.02)	0.575
Other developmental disorders	649	1,541	-0.70 (-0.78 to -0.63)	-0.53 (-0.57 to -0.48)	<0.001
- Disorder of language	131	328	-0.68 (-0.84 to -0.52)	-0.45 (-0.55 to -0.35)	0.020
- Learning disorder	177	333	-0.94 (-1.08 to -0.79)	-0.69 (-0.79 to -0.59)	0.006
- Disorder of motoric skills	34	159	-0.58 (-0.90 to -0.25)	-0.26 (-0.41 to -0.12)	0.087
Autism spectrum disorder	738	2,301	-0.16 (-0.22 to -0.09)	-0.16 (-0.20 to -0.12)	0.961
- Childhood autism	80	310	-0.23 (-0.44 to -0.02)	-0.33 (-0.43 to -0.22)	0.413
- Asperger's syndrome	312	1,071	-0.03 (-0.14 to 0.07)	-0.04 (-0.09 to 0.02)	0.934
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ODD/CD	183	474	-0.65 (-0.78 to -0.51)	-0.43 (-0.51 to -0.34)	0.008
Attachment disorder	287	461	-0.60 (-0.71 to -0.48)	-0.29 (-0.37 to -0.20)	<0.001
Tic disorder	142	643	-0.29 (-0.44 to -0.14)	-0.31 (-0.39 to -0.24)	0.783

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