

Supplementary Online Content

Rouquette A, Pingault J-B, Fried EI, et al. Emotional and behavioral symptom network structure in elementary school girls and association with anxiety disorders and depression in adolescence and early adulthood: a network analysis. *JAMA Psychiatry*. Published online August 15, 2018. doi:10.1001/jamapsychiatry.2018.2119

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

eTable 1. Baseline Characteristics of Each Subsample Studied (observed differences due to attrition were found statistically significant on every baseline characteristic, p-value<0.05, chi-square test or t-test depending on variable type)

	Baseline N=1423	With SBQ at ages 6, 8 and 10 years N=932	With DSM assessment at follow-up N=783
Categorical variables – N (%)			
Intact family unit	890 (63)	697 (75)	606 (77)
Maternal employment	689 (48)	470 (50)	404 (52)
Paternal employment	1157 (81)	799 (86)	670 (86)
At least one parent speaks French	1379 (97)	917 (98)	770 (98)
Disruptive behaviour problems at inclusion	424 (30)	266 (29)	210 (27)
Continuous variables – Mean (SD)			
Maternal age at birth of first child (years)	24.3 (3.9)	24.7 (3.9)	24.7 (3.9)
Paternal age at birth of first child (years)	26.7 (4.2)	26.9 (4.2)	27.0 (4.2)
Maternal education (years of schooling)	11.8 (2.6)	12.0 (2.6)	12.2 (2.5)
Paternal education (years of schooling)	12.0 (3.5)	12.1 (3.5)	12.4 (3.5)

SBQ: Social Behavior Questionnaire, DSM: Diagnostic and Statistical Manual of Mental Disorders

eTable 2. Frequencies (%) for Each Response to the 38 Items at Each Collection Time for the 932 Girls With Social Behavior Questionnaire Scores at ages 6, 8, and 10 years.

Item	Age 6 years				Age 8 years				Age 10 years			
	Never	Sometimes	Often	Missing	Never	Sometimes	Often	Missing	Never	Sometimes	Often	Missing
At-Conc	550 (59)	304 (33)	78 (8)	0 (0)	465 (50)	368 (39)	96 (10)	3 (0.3)	548 (59)	313 (34)	64 (6)	7 (0.8)
At-Give	411 (44)	428 (46)	91 (10)	2 (0.2)	404 (43)	443 (48)	79 (8)	6 (0.6)	446 (48)	421 (45)	56 (6)	9 (1)
At-Inat	357 (38)	494 (53)	79 (8)	2 (0.2)	290 (31)	493 (53)	145 (16)	4 (0.4)	390 (42)	424 (45)	114 (12)	4 (0.4)
At-Star	552 (59)	339 (36)	36 (4)	5 (0.5)	429 (46)	432 (46)	65 (7)	6 (0.6)	489 (52)	384 (41)	55 (6)	4 (0.4)
Ac-Rest	242 (26)	428 (46)	262 (28)	0 (0)	299 (32)	441 (47)	191 (20)	1 (0.1)	405 (43)	394 (42)	125 (13)	8 (0.9)
Ac-Squi	453 (49)	313 (34)	165 (18)	1 (0.1)	470 (50)	307 (33)	151 (16)	4 (0.4)	559 (60)	264 (28)	106 (11)	3 (0.3)
D-Blam	273 (29)	546 (59)	111 (12)	2 (0.2)	295 (32)	529 (57)	103 (11)	5 (0.5)	407 (44)	461 (49)	60 (6)	4 (0.4)
D-Cons	776 (83)	136 (15)	17 (2)	3 (0.3)	764 (82)	154 (17)	8 (1)	6 (0.6)	802 (86)	117 (13)	5 (1)	8 (0.9)
D-Dest	727 (78)	184 (20)	20 (2)	1 (0.1)	766 (82)	146 (16)	15 (2)	5 (0.5)	813 (87)	106 (11)	9 (1)	4 (0.4)
D-Diso	215 (23)	652 (70)	63 (8)	2 (0.2)	264 (28)	590 (63)	69 (7)	9 (1)	456 (49)	435 (47)	35 (4)	6 (0.6)
D-Irri	305 (33)	457 (49)	169 (18)	1 (0.1)	277 (30)	470 (50)	182 (20)	3 (0.3)	290 (31)	479 (51)	159 (17)	4 (0.4)
D-Kick	623 (67)	285 (31)	22 (2)	2 (0.2)	659 (71)	247 (27)	20 (2)	6 (0.6)	712 (76)	206 (22)	9 (1)	5 (0.5)
D-Lies	306 (33)	562 (60)	63 (7)	1 (0.1)	304 (33)	566 (61)	56 (6)	6 (0.6)	365 (39)	524 (56)	36 (4)	7 (0.8)
D-Like	788 (85)	117 (13)	24 (3)	3 (0.3)	755 (81)	153 (16)	17 (2)	7 (0.8)	779 (84)	126 (14)	21 (2)	6 (0.6)
D-Shar	475 (51)	415 (45)	40 (4)	2 (0.2)	573 (61)	330 (35)	24 (3)	5 (0.5)	656 (70)	259 (28)	13 (1)	4 (0.4)
I-Crie	223 (24)	497 (53)	211 (23)	1 (0.1)	292 (31)	468 (50)	168 (18)	4 (0.4)	350 (38)	455 (49)	125 (13)	2 (0.2)
I-Fear	368 (39)	431 (46)	133 (14)	0 (0)	323 (35)	478 (51)	125 (13)	6 (0.6)	321 (34)	489 (52)	117 (13)	5 (0.5)
I-Meti	370 (40)	398 (43)	164 (18)	0 (0)	363 (39)	418 (45)	145 (16)	6 (0.6)	431 (46)	379 (41)	116 (12)	6 (0.6)
I-sad	650 (70)	265 (28)	14 (2)	3 (0.3)	577 (62)	327 (35)	23 (2)	5 (0.5)	623 (67)	281 (30)	23 (2)	5 (0.5)
I-Soli	463 (50)	382 (41)	86 (9)	1 (0.1)	464 (50)	405 (43)	60 (6)	3 (0.3)	568 (61)	308 (33)	51 (5)	5 (0.5)
I-Worr	298 (32)	487 (52)	147 (16)	0 (0)	225 (24)	552 (59)	152 (16)	3 (0.3)	242 (26)	526 (56)	158 (17)	6 (0.6)
N-Nail	717 (77)	155 (17)	57 (6)	3 (0.3)	625 (67)	222 (24)	80 (9)	5 (0.5)	619 (66)	207 (22)	103 (11)	3 (0.3)
N-Twit	818 (88)	93 (10)	18 (2)	3 (0.3)	772 (83)	129 (14)	27 (3)	4 (0.4)	767 (82)	135 (14)	26 (3)	4 (0.4)

eTable 2: continued

Item	Age 6 years				Age 8 years				Age 10 years			
	Never	Sometimes	Often	Missing	Never	Sometimes	Often	Missing	Never	Sometimes	Often	Missing
P-Byst	237 (25)	557 (60)	137 (15)	1 (0.1)	234 (25)	589 (63)	106 (1)	3 (0.3)	164 (18)	594 (64)	161 (17)	13 (1.4)
P-Comf	481 (52)	419 (45)	31 (3)	1 (0.1)	459 (49)	433 (46)	38 (4)	2 (0.2)	380 (41)	478 (51)	69 (7)	5 (0.5)
P-Diff	407 (44)	493 (53)	32 (3)	0 (0)	314 (34)	573 (61)	35 (4)	10 (1)	326 (35)	551 (59)	51 (5)	4 (0.4)
P-Hurt	673 (72)	225 (24)	31 (3)	3 (0.3)	661 (71)	250 (27)	20 (2)	1 (0.1)	599 (64)	298 (32)	31 (3)	4 (0.4)
P-Mess	159 (17)	570 (61)	203 (22)	0 (0)	147 (16)	572 (61)	211 (23)	2 (0.2)	137 (15)	588 (63)	204 (22)	3 (0.3)
P-Pick	274 (29)	553 (59)	105 (11)	0 (0)	262 (28)	579 (62)	88 (9)	3 (0.3)	285 (31)	554 (59)	90 (10)	3 (0.3)
P-Prai	137 (15)	533 (57)	261 (28)	1 (0.1)	175 (19)	576 (62)	177 (19)	4 (0.4)	195 (21)	550 (59)	177 (19)	10 (1.1)
P-Quar	148 (16)	525 (56)	258 (28)	1 (0.1)	150 (16)	598 (64)	176 (19)	8 (0.9)	188 (20)	582 (62)	158 (17)	4 (0.4)
P-Sick	452 (48)	424 (45)	55 (6)	1 (0.1)	441 (47)	464 (50)	25 (3)	2 (0.2)	430 (46)	451 (48)	43 (5)	8 (0.9)
P-Symp	176 (19)	593 (64)	162 (17)	1 (0.1)	196 (21)	615 (66)	118 (13)	3 (0.3)	159 (17)	600 (64)	165 (18)	8 (0.9)
Bull	773 (83)	143 (15)	13 (1)	3 (0.3)	805 (86)	114 (12)	9 (1)	4 (0.4)	858 (92)	66 (7)	2 (0)	6 (0.6)
Figh	660 (71)	254 (27)	16 (2)	2 (0.2)	712 (76)	206 (22)	9 (1)	5 (0.5)	784 (84)	141 (15)	2 (0)	5 (0.5)
Take	545 (58)	353 (38)	34 (4)	0 (0)	848 (91)	78 (8)	1 (1)	5 (0.5)	881 (95)	35 (4)	2 (0)	14 (1.5)
Spee	843 (90)	63 (7)	25 (3)	1 (0.1)	870 (93)	53 (6)	6 (1)	3 (0.3)	907 (97)	17 (2)	3 (0)	5 (0.5)
Stut	849 (91)	73 (8)	6 (1)	4 (0.4)	865 (93)	57 (6)	5 (1)	5 (0.5)	884 (95)	41 (4)	2 (0)	5 (0.5)

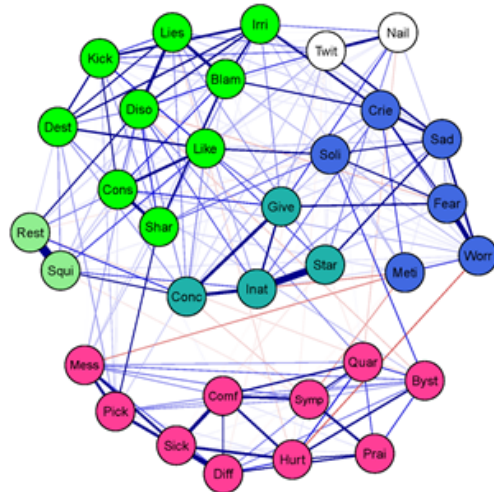
eTable 3. Standardized Loadings From the Longitudinal Exploratory Structural Equation Model on the 33 (Non-Skewed) Items in the Social Behavior Questionnaire (SBQ) With 5 Factors Extracted for the 932 Girls With SBQ Scores at Ages 6, 8 and 10 years*

	Age 6					Age 8					Age 10				
	Act	Att	Dis	Int	Pro	Act	Att	Dis	Int	Pro	Act	Att	Dis	Int	Pro
Ac-Rest	0.92					0.91					0.88				
Ac-Squi	0.86					0.86					0.79				
At-Conc	0.36	0.51				0.33	0.64					0.72			
At-Give		0.44					0.51					0.53			
At-Inat		0.80					0.75					0.86			
At-Star		0.68					0.63					0.66			
D-Blam			0.57					0.58					0.63		
D-Cons			0.40					0.39					0.49		
D-Dest			0.44					0.52			0.33		0.42		
D-Diso			0.54					0.58					0.55		
D-Irri			0.48	0.31				0.44					0.51		
D-Kick			0.59					0.59 0					0.55		
D-Lies		0.34	0.51					0.67					0.59		
D-Like								0.39							
D-Shar			0.45					0.41					0.45		
I-Crie			0.31	0.38					0.41					0.50	
I-Fear				0.62					0.67					0.70	
I-Meti				0.32					0.39					0.41	
I-sad				0.44					0.49					0.52	
I-Soli				0.50					0.37					0.50	
I-Worr				0.58					0.60					0.62	
N-Nail															
N-Twit															
P-Byst					0.54					0.53					0.56
P-Comf					0.73					0.78					0.80
P-Diff					0.72					0.80					0.78
P-Hurt					0.66					0.67					0.71
P-Mess					0.54					0.58					0.67
P-Pick					0.49					0.51					0.64
P-Prai					0.50					0.56					0.67
P-Quar					0.46					0.59					0.61
P-Sick					0.77					0.79					0.83
P-Symp					0.51					0.61					0.62

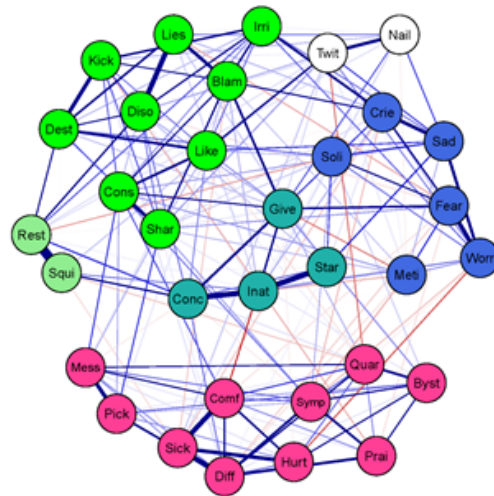
Only loadings above 0.3 are shown. Act: Hyperactivity, Att: Attention, Dis: Disruptive, Int: Internalizing, Pro: Pro-social

* The number of factors to extract was based on a parallel analysis. The Root Mean Square Error Approximation (RMSEA=0.016, acceptable fit if <0.06) and the Comparative and Tucker Fit Index (CFI=0.974 and TLI=0.970, acceptable fit if >0.95, poor fit if <0.90, marginal in between) served to evaluate model fit (Hu & Bentler, 1999). The weighted least squares means and variance adjusted estimator was used to take account of ordinal data and a Geomin oblique rotation was performed. The full information maximum likelihood was used to handle missing data and residuals of each item across time were allowed to be correlated.

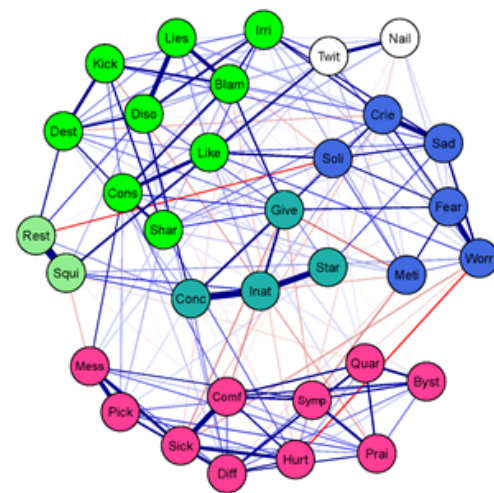
eFigure 1. Corresponds to Figure 2 With All Edges Shown Including Those With a Weight Over |0.03|.



Age 6 years



Age 8 years

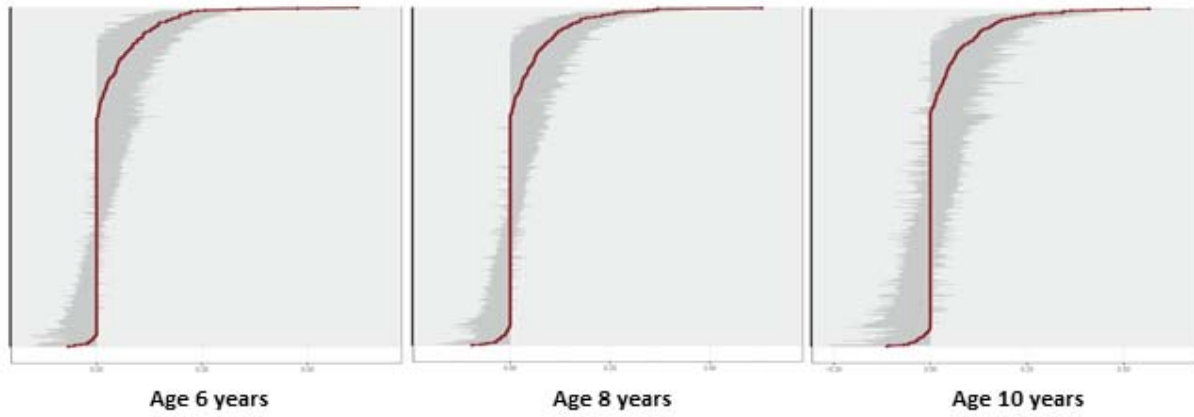


Age 10 years

Legend: Networks of the 33 items for the social behavior questionnaire at ages 6, 8 and 10 years. Positive edges are shown in blue, negative ones in red, and stronger and saturated edges represent strong regularized partial correlations. Edges were scaled using the value of the highest edge weight across all time points (0.65). Items are colored according to community (in the online version), i.e. in light green for Hyperactivity, sea-green

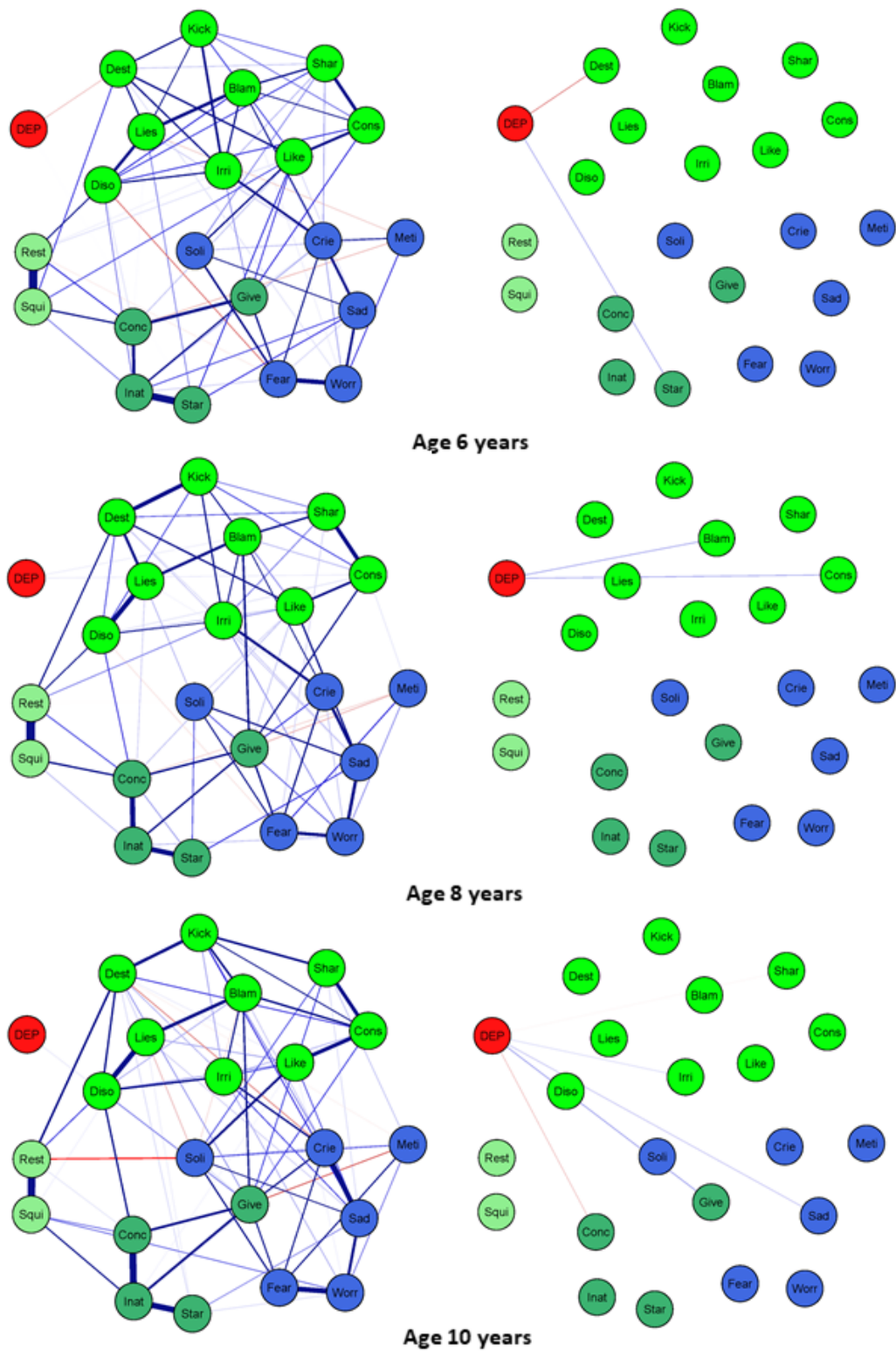
for Attention, green for Disruptive, blue for Internalizing, violet-red for Pro-sociality and white for items that do not belong to any community. For item labels, see Table 1).

eFigure 2. Bootstrapped 95% Confidence Intervals of the Edge Weights for the Figure 2 Networks.



Legend: The red dots represent the value (X-axis) of the 528 edge weights (Y-axis) and the grey lines their bootstrapped 95% confidence interval.
SBQ: Social Behavior Questionnaire

eFigure 3. Links Between SBQ Item Network During Childhood and Occurrence of Major Depression at Follow-up.



Legend: Left panel: Networks of the 21 items of the Hyperactivity (light green), Attention (sea green), Disruptive (green) and Internalizing (blue) communities (nodes colored in the online version) in the Social Behavior Questionnaire (SBQ) at ages 6, 8 and 10 years. The DEP node (red) represents the occurrence of major depression at follow-up. Each edge corresponds to a partial correlation (positive in blue, negative in red, with an absolute magnitude greater than 0.03) between 2 items, and its thickness corresponds to the absolute magnitude of the correlation. For instance, an edge between DEP and Sad in the age 10 network implies that endorsing the Sad item at age 10 was predictive of major depression diagnosis

at follow-up (age 15 or 22). Right panel: All edges are removed except relevant edges involving the DEP node (with no minimum absolute weight magnitude appearing in the graph). For item labels, see Table 1.