PTSD and Autism Spectrum Disorder: Co-morbidity and shared mechanisms

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5th International Trauma Informed Care Conference

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Trauma Science is WEIRD

Or: Who is being left out of our studies?

BEHAVIORAL AND BRAIN SCIENCES (2010) **33**, 61–135
doi:10.1017/S0140525X0999152X

The weirdest people in the world?

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636,120 Ways to Have Posttraumatic Stress Disorder

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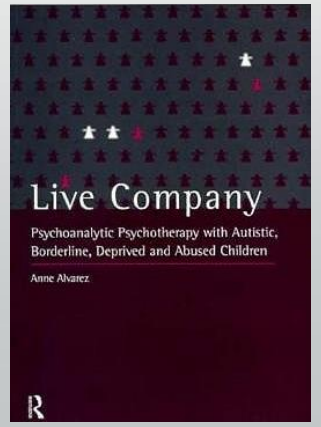
Trauma and autism : A historical perspective

Autism and trauma were often inter-related in the psychoanalytic literature:

- Autism as a developmental disorder caused by maltreatment.
- "Refrigerator mothers" (Bettelheim, 1967).
- Infants (and, sometimes, adults) seek shelter in their inner psychic cocoon when exposed to emotional threat or trauma (Allvarez, 1992; Mahler, 1958; Tustin, 1986).



Autism Spectrum Disorder (ASD)

According to DSM-5 (APA, 2013):

A. Persistent deficits in social communication and social interaction across multiple contexts.

B. Restricted, repetitive patterns of behavior, interests, or activities.

C. Symptoms must be present in the early developmental period.

- There are three severity levels of ASD. Severity of social communication difficulties and restricted, repetitive behaviors are separately rated.
- With or without accompanying intellectual impairment.
- With or without accompanying language impairment.

Prevalence & Comorbidity

- One in 68 children diagnosed by the age of 8 in the United States (Centers for Disease Control and Prevention, 2014).
- Male to female ratio varying from 3:1 (Loomes, Hull, & Mandy, 2017) to 16:1 (Ferri, Abel, & Brodkin, 2018).
- Individuals with ASD show high rates of psychiatric co-morbidity ranging from 65% to 94% (Rieffe, de Bruine, De Rooij & Stockmann, 2014).
- ADHD, anxiety disorders and depression are the most commonly diagnosed (de Bruin et al., 2007).

Autistic Traits (AT)

- AT are continuously distributed across the population (Constantino & Todd, 2003; Posserud et al., 2006).
- Individuals with an ASD diagnosis score at the extreme end of this distribution (Baron-Cohen, 2010).
- There is an increase in studies examining the relationship between AT and other co-morbid conditions.

Among the general population

Among non-ASD clinical populations

Among those with ASD and their families

Trauma Exposure and ASD

- Children with ASD were at higher risk for maltreatment, physical, sexual and verbal abuse (e.g., Kerns et al., 2015).
- Children with ASD were bullied more often than peers with other disabilities and more often than non-disabled peers (e.g., Bitsika & Sharpley, 2014).
- Valenti and colleagues (2012) reported a dramatic decline in adaptive functioning in youth with ASD who were exposed to a severe earthquake in Italy.

ASD-PTSD Comorbidity:
A Neglected Field

- de Bruin and colleagues (2007) examined rates of psychiatric co-morbidity among children with PDD-NOS and reported **no** comorbid PTSD.
- Mehtar and Mukaddes (2011) found a history of various traumas (such as accidents, natural disasters, violence and abuse) in 26% of youth attending an outpatient ASD clinic in Istanbul. They reported a PTSD prevalence of **17.4%**.
- Strunz and colleagues (2014) examined rates of psychiatric co-morbidity among adults with ASD and reported a PTSD prevalence of **7%**.

Unresolved Questions:

1. Are individuals with ASD/high autistic traits more exposed to trauma compared to TD individuals?
2. What is perceived as traumatic among individuals with ASD? Do individuals with ASD/high autistic traits perceive negative social interactions as more traumatic?
3. Are there differences in PTSD rates between those with and without ASD?
4. Is there a difference in the PTSD profile (the PTSD symptom composition and severity) of those with and without ASD?
5. Are there shared underlying mechanisms that play a role in ASD-PTSD co-morbidity?

Theoretical Foundation

Psychological Trauma: Theory, Research, Practice, and Policy
2018, Vol. 10, No. 3, 290–299

1942-9681/18/$12.00 http://dx.doi.org/10.1037/tra0000298

PTSD and Autism Spectrum Disorder: Co-Morbidity, Gaps in Research, and Potential Shared Mechanisms

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Potential Shared Mechanisms:

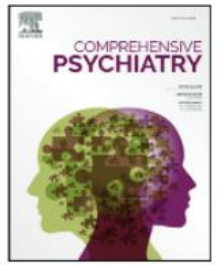
Vulnerability	ASD	PTSD
Alterations in the functional connectivity of the amygdala and prefrontal cortex	Mazefsky et al., 2013	Grant, Cannistraci, Hollon, Gore, & Shelton, 2011 Williams et al., 2006
Dysregulation of the LHPA axis	Corbett, Schupp, Levine, & Mendoza, 2009	Baumeister, Lightman, & Pariante, 2014
Hippocampus abnormality	Ben Shalom, 2003;2009	Lindauer, 2004 Wignall et al., 2004
Problems in emotion regulation	Mazefsky & White, 2014 Mazurek, Kanne, & Wodka, 2013	Orth & Wieland, 2006 Seligowski, Lee, Bardeen, & Orcutt, 2015
Reduced specificity of autobiographical memory	Brezis, 2015 Crane & Goddard, 2008; Crane, Goddard, & Pring, 2013 Goddard, Dritschel, Robinson, & Howlin, 2014 Maister, Simons, & Plaisted-Grant, 2013	Kleim & Ehlers, 2008 McNally, 2006 McNally, Litz, Prassas, Shin, & Weathers, 1994 Van Vreeswijk, & de Wilde, 2004
Cognitive rigidity	Leung & Zakzanis, 2014	Palm & Follette, 2011
Internal, stable, and global attribution style	Barnhill & Myles, 2001	Massad & Hulsey, 2006
Increased rumination	Hill, Berthoz, & Frith, 2004; Ozonoff et al., 2004 Crane, Goddard, & Pring, 2013	Razik, Ehring, & Emmelkamp, 2013 Wells & Sembi, 2004; Michael, Halligan, Clark, & Ehlers, 2007
Increased anger and aggression	Matson & Adams, 2014 Rieffe, Camodeca, Pouw, Lange, & Stockmann, 2012	Begic & Jokic-Begic, 2001 Orth & Wieland, 2006
A tendency for avoidance	Wood & Gadow, 2010	Hetzel-Riggin & Meads, 2016

Study 1: PTSD and Autistic traits

Contents lists available at ScienceDirect

Comprehensive Psychiatry

journal homepage: www.elsevier.com/locate/comppsych



Are PTSD and autistic traits related? An examination among typically developing Israeli adults

Nirit Haruvi-Lamdan [a,*], Shiri Lebendiger [a], Ofer Golan [a], Danny Horesh [a,b]

[a] Department of Psychology, Bar-Ilan University, Israel
[b] School of Medicine, New York University, United States of America

Participants

- N=103
- Mean age = 23.91 (3.46), range 18-34
- Several academic institutions.
- Participants represented three academic fields that were previously found to differ in AT.

	% (n)
Gender	
Male	46.6% (48)
Female	53.4% (55)
Discipline	
Psychology	36.9% (38)
Business administration	31.1% (32)
Exact sciences	32% (33)
Country of birth	
Israel	92.2% (95)
Other	7.8% (8)
Religion	
Jewish	92.2% (95)
Muslim	3.9% (4)
Christian	3.9% (4)
Family status	
Married	10.7% (11)
Single	80.6% (83)
In a relationship	8.7% (9)
Income	
Below average	21.4% (22)
Average	12.6% (13)
Above average	66.0% (68)

Measures

The Autism-Spectrum Quotient (Baron-Cohen et al., 2001)

- The AQ includes 5 domains of functioning: Social skills, communication, attention switching, imagination, and attention to details.
- Score of 26 or above is the cut-off for clinic-referred samples.

Stressful and traumatic life events list

Participants asked to note:

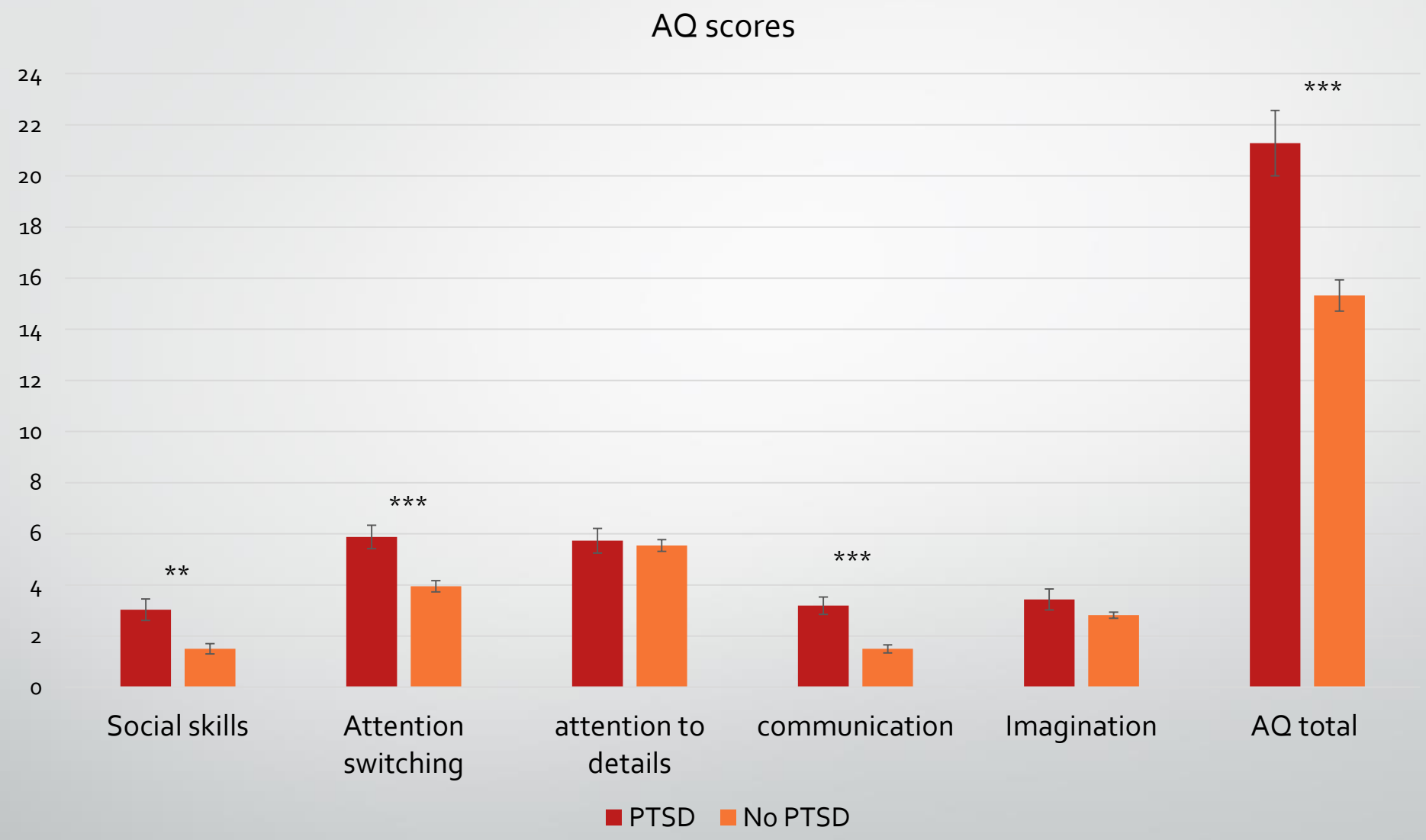
1) Life events ⟶ 2) Which event caused the most significant distress.

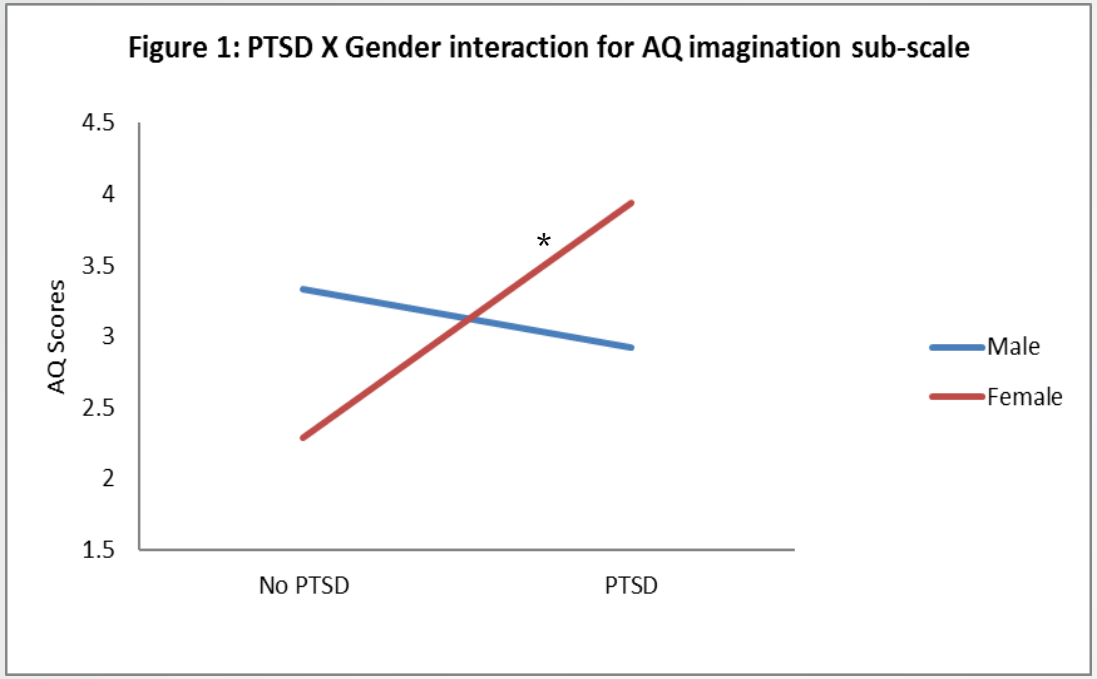
PTSD Checklist for DSM-5 (Weathers et al., 2013)

- The PCL-5 items correspond directly with the 20 PTSD symptoms appearing in DSM-5.
- Score of 38 or above is the cut-off for probable diagnosis.

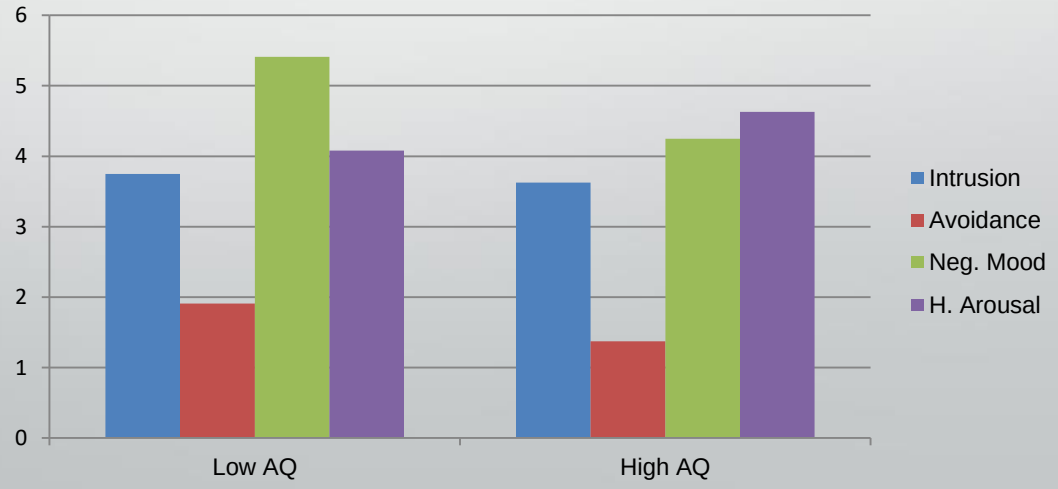
Results

PCL / AQ	Re-experiencing	Avoidance	Negative alteration in cognition and mood	Hyperarousal	Total
Social skill	**.251***	.121	**.424****	**.279****	**.339****
Attention switching	.058	.005	**.240***	**.259****	.191
Attention to details	**.258****	.128	.098	.132	.169
Communication	.168	.147	**.362****	**.328****	**.310****
Imagination	.188	.044	.187	.140	.175
Total	**.291****	.137	**.406****	**.356****	**.369****


AQ scores
24
22
20
18
16
14
12
10
8
6
4
2
0
**
***
***
***
Social skills
Attention switching
attention to details
communication
Imagination
AQ total
PTSD
No PTSD



PTSD Composition: Among those with high AT a different clinical picture appeared, dominated by hyper-arousal symptoms (among TDs – Neg. mood and cognition)



Study 2: PTSD and ASD (clinical group)

Mental Health Across the Lifespan

autism

Autism
2020, Vol. 24(4) 884–898

DOI: 10.1177/1362361320912143
journals.sagepub.com/home/aut
SAGE

Autism Spectrum Disorder and Post-Traumatic Stress Disorder: An unexplored co-occurrence of conditions

Nirit Haruvi-Lamdan[1], Danny Horesh[1,2,3], Shani Zohar[1], Meital Kraus[1] and Ofer Golan[1,3,4]

Participants

- **25 with ASD vs. 25 TD.**
  Groups matched on age and gender.
- Inclusion criteria for both groups were age of 18 and above, and Hebrew as a native language.
- Inclusion criteria for the ASD group was a formal diagnosis of ASD with no intellectual impairment from a clinical psychologist or psychiatrist, and recognition of the diagnosis by the Ministry of Welfare and the National Insurance Service.
- Only two participants (8%) with ASD had a legal guardian.

	ASD	TD
Age	M=22.88 (SD=3.7)	M=22.76 (SD=3.4)
Gender	60% Male (n=15) 40% Female (n=10)	60% Male (n=15) 40% Female (n=10)
Country of birth	96% Israel (n=24) 4% Other (n=1)	88% Israel (n=22) 12% Other (n=3)
Family status	84% Single (n=21) 16% In relationship (n=4)	96% Single (n=24) 4% In relationship (n=1)
***Education**	72% High school (n=18) 16% Students (n=4) 12% Academic (n=3)	20% High school (n=5) 76% Students (n=19) 4% Academic (n=1)
Religion	96% Jewish (n=24) 4% Other (n=1)	88% Jewish (n=22) 12% Other (n=3)
Income	8% Below average (n=2) 40% Average (n=10) 52% Above average (n=13)	20% Below average (n=5) 20% Average (n=5) 60% Above average (n=15)
Employment	20% Full time (n=5) 36% Part time (n=9) 44% No (n=11)	16% Full time (n=4) 48% Part time (n=12) 36% No (n=9)

Measures

The Autism-Spectrum Quotient (Baron-Cohen et al., 2001)

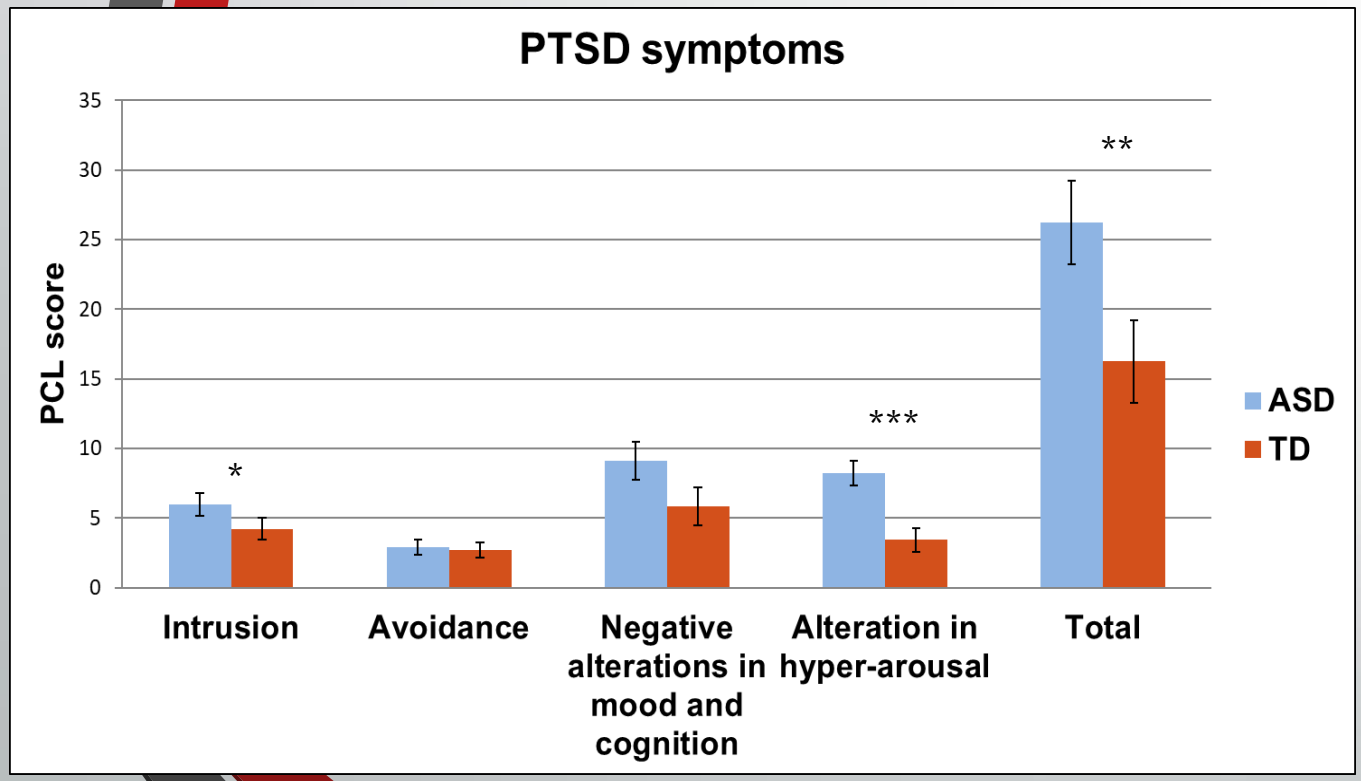
Stressful and traumatic life events list

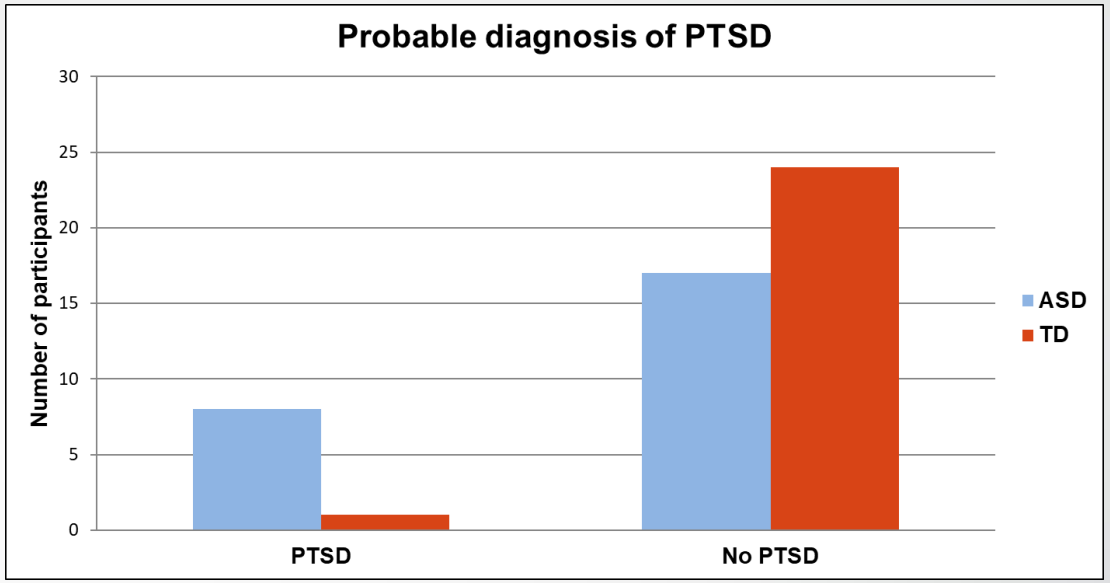
Comprehensive list of potentially traumatic life events that included both :

1. PTSD criterion A events (e.g., war, sexual abuse), based on the Life Events Checklist for DSM-5 (LEC-5).
2. **Wide range of negative social events**, such as bullying, social exclusion, and ostracism (based on the Bullying Questionnaire).

PTSD Checklist for DSM-5 (Weathers et al., 2013)

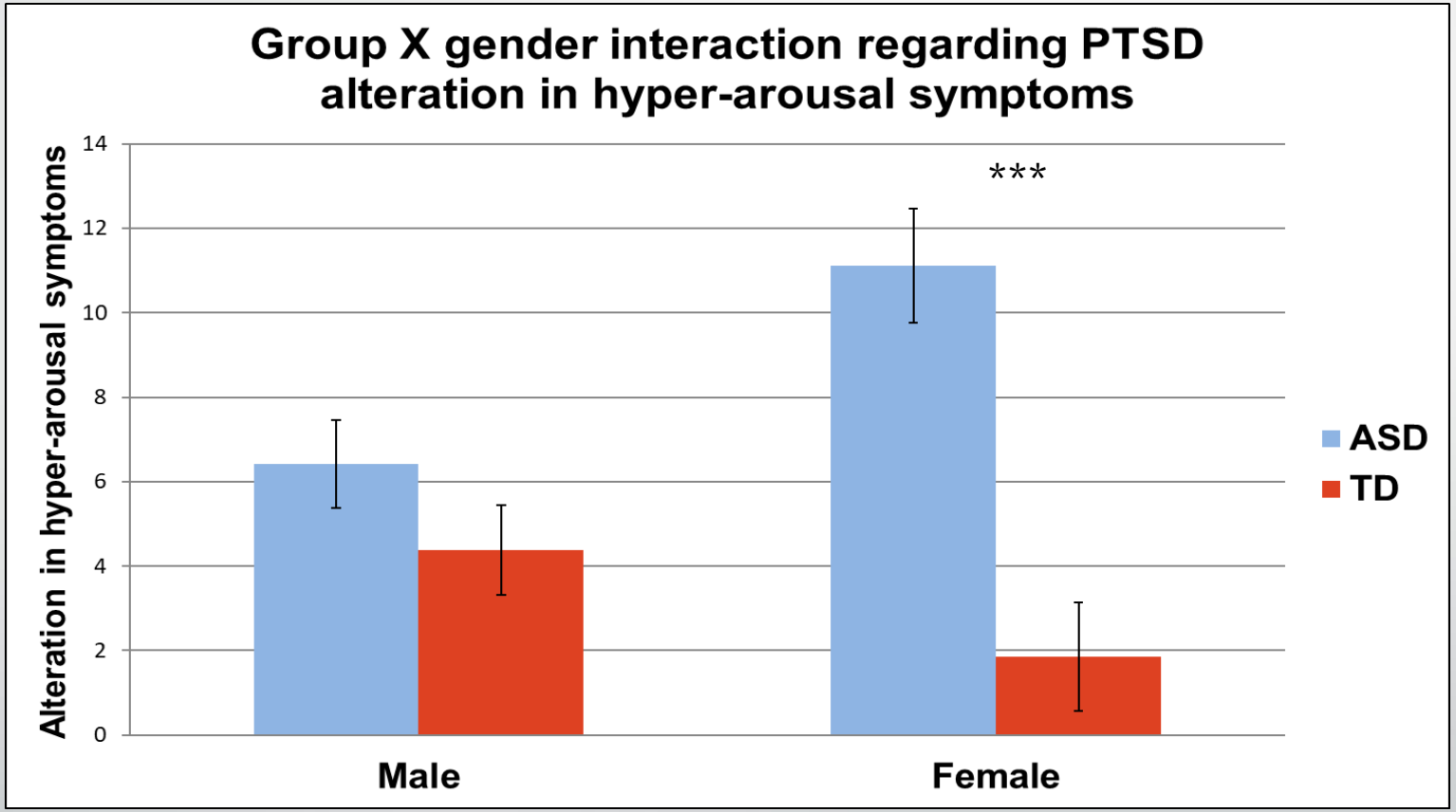
Results





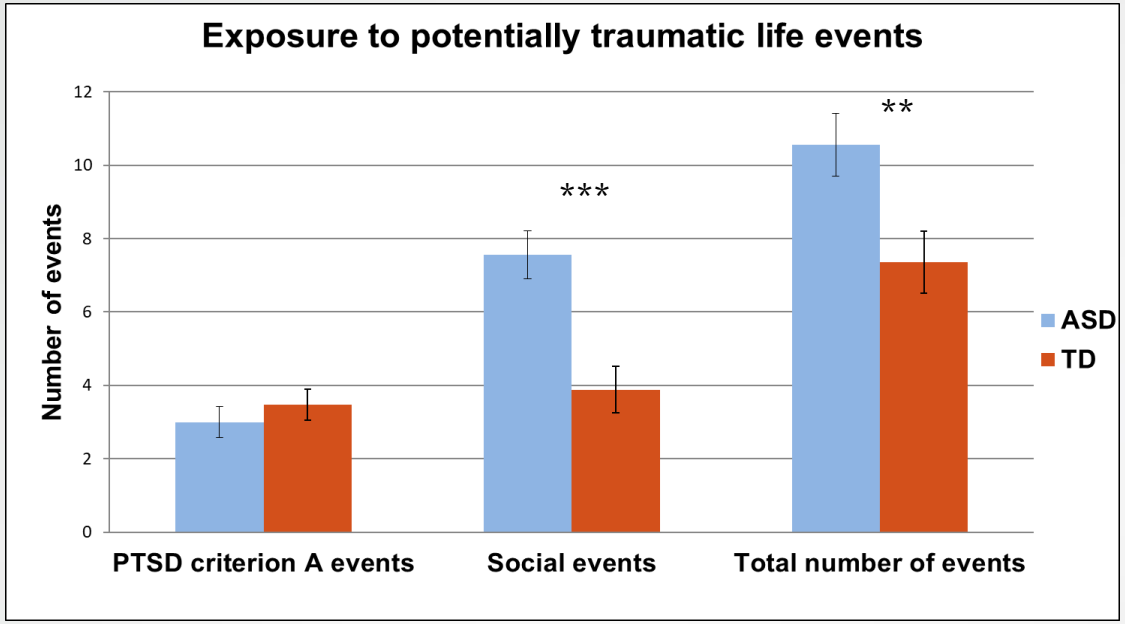
32% of the ASD group met the PCL cutoff for a probable PTSD diagnosis, compared to only **4%** in the TD group ($p<.05$).

Haruvi-Lamdan, Horesh, Zohar, Kraus, & Golan; *2020*.

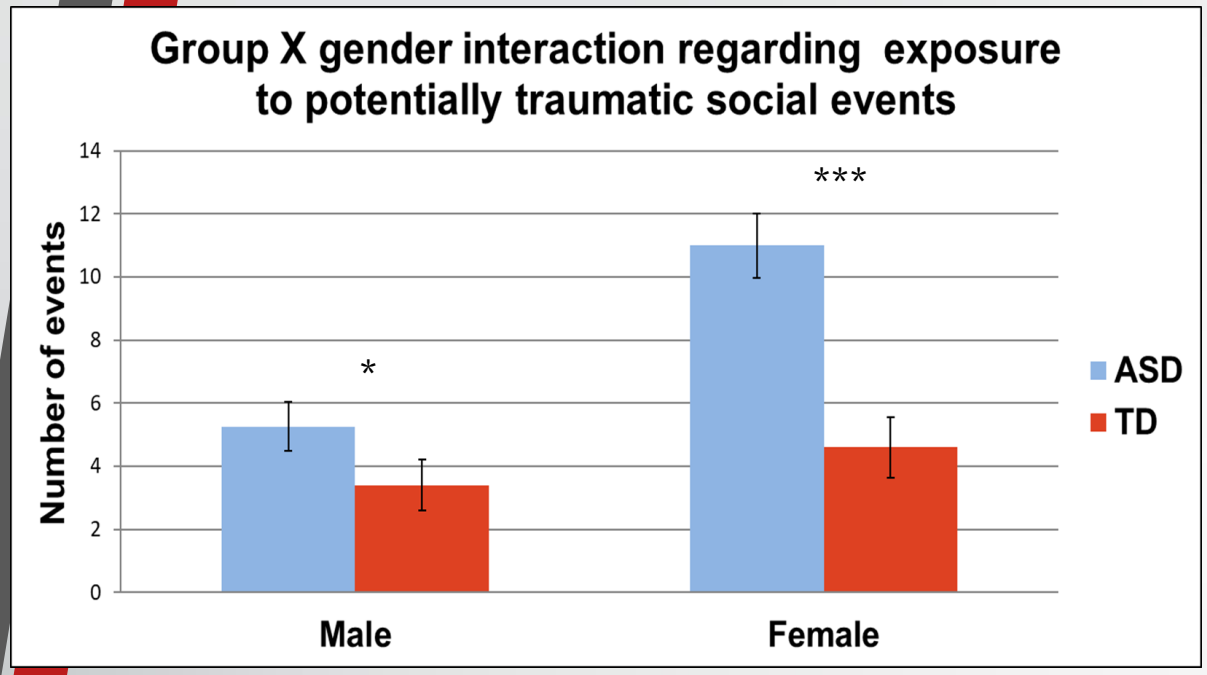

Group X gender interaction regarding PTSD alteration in hyper-arousal symptoms
Alteration in hyper-arousal symptoms
14
12
10
8
6
4
2
0
***
Male
Female
ASD
TD

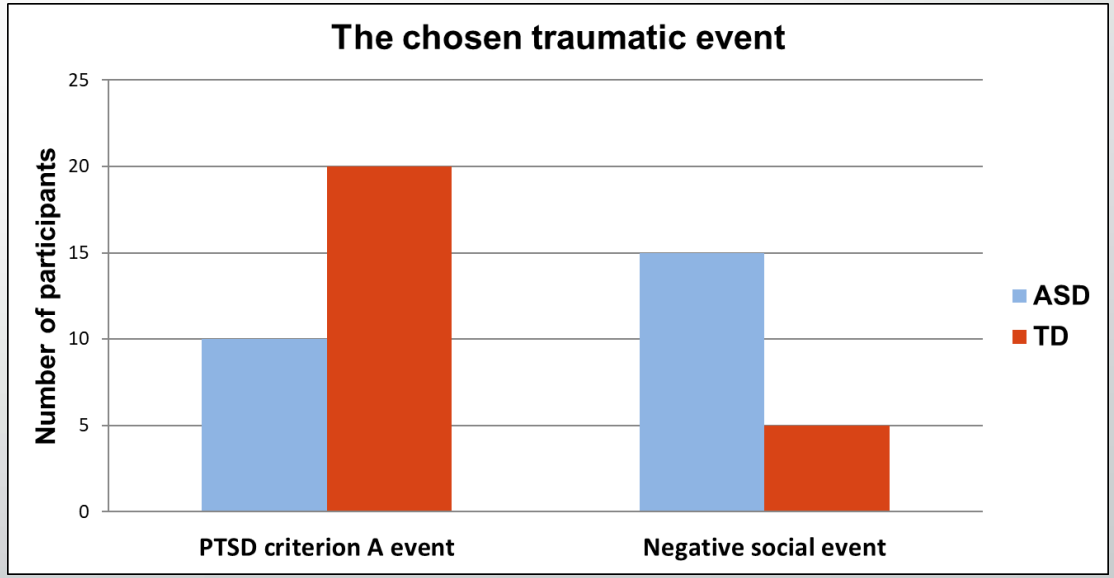
CPTSD?

Multiple social stressors were reported



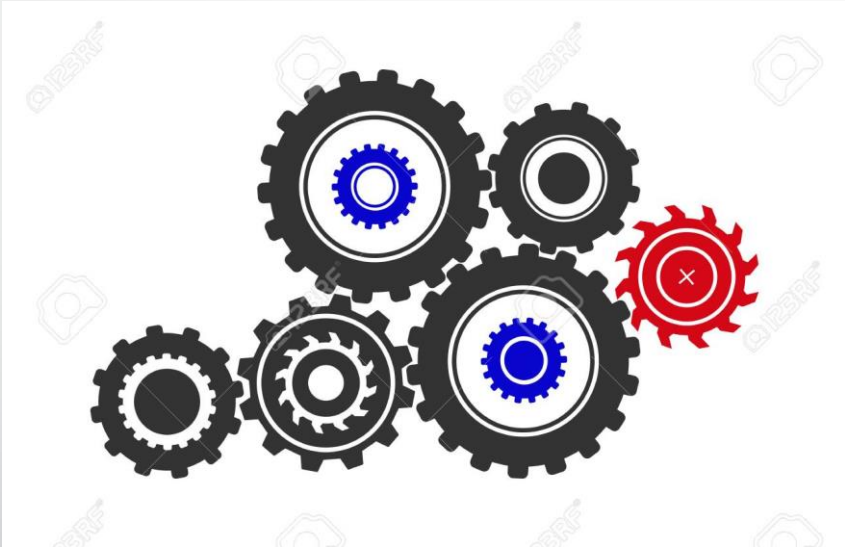
	Total score		Intrusion		Avoidance		Negative alterations in mood and cognition		Hyper-arousal	
	ASD	TD	ASD	TD	ASD	TD	ASD	TD	ASD	TD
Negative social events	**.407****	.310	.328	.228	-.085	.067	.352	.301	**.533****	.378
PTSD criterion A events	.153	**.608***	-.047	**.417***	.199	**.456***	.044	**.600***	.344	**.518****
Total number	.392	**.561****	.262	**.396***	-.010	.298	.311	**.550****	**.557****	**.562***





In the ASD group, **60%** chose a negative social event as the worse traumatic event, compared to only **20%** of the TD group ($\chi^2(1)=8.33$, $p<.01$).

Underlying mechanisms of PTSD-ASD comorbidity



Rumination

Short Report

autism

Autism
1–7
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DOI: 10.1177/13623613211035240
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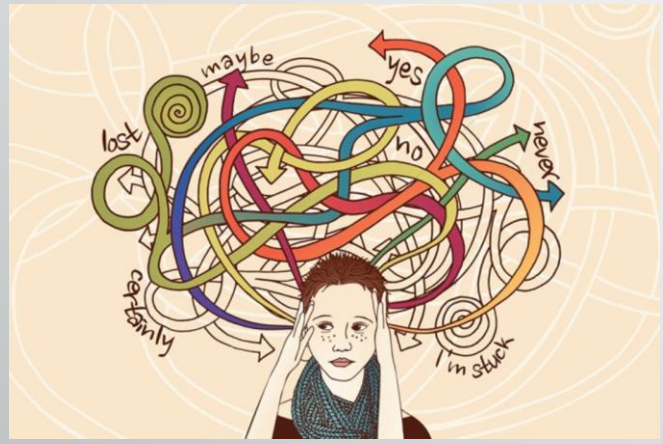
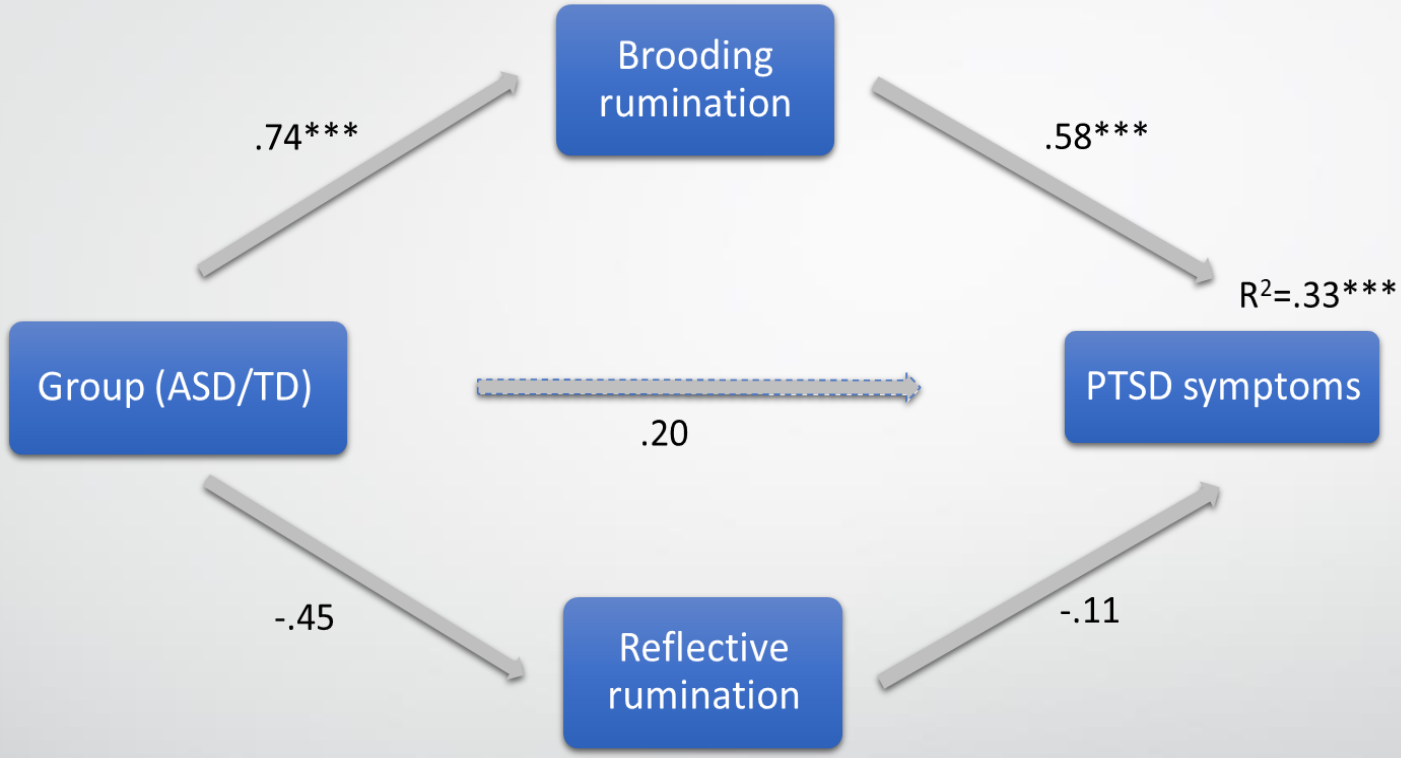
The comorbidity between autism spectrum disorder and post-traumatic stress disorder is mediated by brooding rumination

Ofer Golan[1,2,3], Nirit Haruvi-Lamdan[1], Nathaniel Laor[2,4] and Danny Horesh[1,2,5]

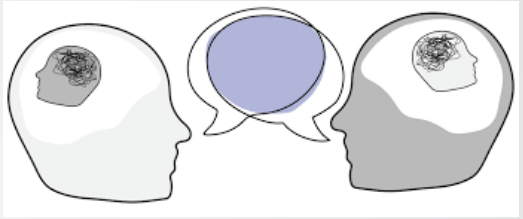
- Focusing one's attention on one's negative emotional state and inhibiting any actions that might distract the individual from his/her state (Nolen-Hoeksema, 1991) .
- Rumination is considered an ER strategy; however, it is likely to be an independent cognitive processing style
- **Brooding rumination** - continuously comparing one's current condition to one's desired condition
- **Reflection rumination** - an introspective effort to cognitively solve one's problems



	ASD (n=34)	TD (n=66)	F
PTSD symptoms Total	28.26 (15.31)	17.89 (15.58)	6.81*
PTSD intrusion	6.14 (4.37)	4.34 (3.97)	~3.20
PTSD avoidance	3.17 (2.7)	2.51 (2.38)	1.00
PTSD negative alterations in mood and cognition	10.46 (7.13)	6.54 (6.45)	5.57*
PTSD hyper-arousal	8.29 (4.54)	4.48 (5.03)	8.98**
Brooding rumination	2.61 (0.77)	1.89 (0.67)	13.00*
Reflection rumination	2.13 (0.61)	1.91 (0.77)	.853~


Brooding rumination
.74***
.58***
R^2=.33***
Group (ASD/TD)
.20
PTSD symptoms
-.45
Reflective rumination
-.11

Social cognition



- The relationship between individuals and their social environment is determined by two main factors: first, the quality of one's social environment and second, one's perception and understanding of information conveyed by others (Stevens & Jovanovic, 2019).

- The term "social cognition" refers to various psychological processes that allow individuals to be part of a social group (Frith, 2008). It denotes cognitive abilities involved in the processing and interpretation of socio-emotional information in oneself and others (Newman, 2001). These processes link the perception of social information and the individual's behavioral response, including perception, attention, decision-making, memory, and emotions (Adolphs, 2003).

- Of particular relevance to social cognition are the various social signals through which we perceive others, including facial expressions or eye-gaze direction (Frith, 2008).

Social Cognition in ASD

- Deficits in social cognition are central to the social impairment that is the hallmark of ASD (Baron-Cohen, 1989).
- Persistent impairment in social communication and social interaction that manifests in multiple contexts (APA, 2013).
- Individuals with ASD find it difficult to relate to others and recognize their emotions and will usually fail to express normal empathic reactions to displays of fear, pleasure, or pain in others (Hobson, 1993).
- Impairments in Theory of Mind (ToM) – difficulty in understanding intentions and beliefs of others and in predicting their behaviors (e.g., Baron-Cohen, 1989; Bishop-Fitzpatrick et al., 2017).

Social Cognition in PTSD

- Heightened suspicion towards others and feelings of alienation and social detachment (APA, 2013).
- Janoff-Bulman's Shattered Assumptions Theory – no longer believing in the benevolence of the world and the good in others.
- PTSD patients consistently show deficits in social cognitive task performance, particularly tasks involving emotion recognition and mentalizing (Stevens & Jovanovic, 2019).
- It was suggested that affective and cognitive aspects of ToM are deeply impaired in individuals with PTSD, creating significant difficulty in their ability to predict others' feelings, thoughts, or beliefs (Couette et al., 2020).

METHODS

Participants

101 adults over the age of 18: (1) 51 diagnosed with ASD (age: M = 23.97, SD = 5.48); and (2) 50 TD participants (age: M = 23.59, SD = 4.38).

Inclusion criterion for participation in the ASD group was an official ASD diagnosis by a clinical psychologist or a psychiatrist, according to DSM-5 criteria, but **without intellectual impairment**. Intellectual functioning was assessed by WAIS vocabulary and similarities subtests to rule out intellectual impairment. TD participants were also screened-out for ASD using the AQ. Participants with psychosis and/or drug abuse were **excluded** from the study.

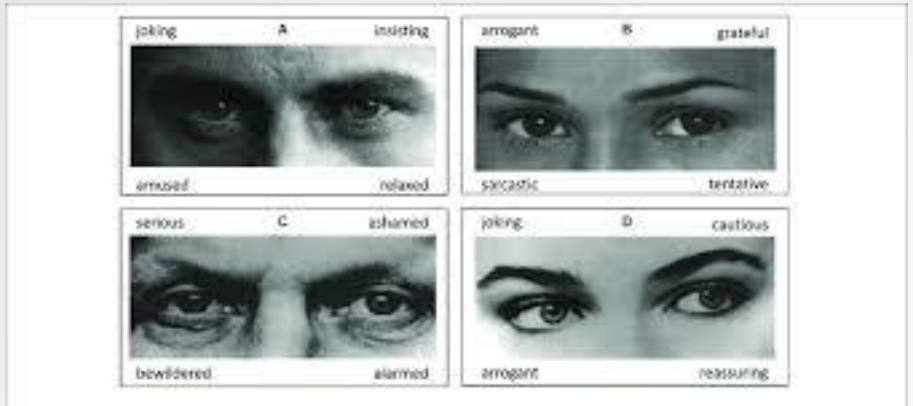
Table 1 - *Sociodemographic characteristics of the groups*

Variable	ASD (N=51)	TD (N=50)	Significance t/ χ^2
Gender %			$\chi^2(1)=5.25^*$ ($p<0.05$)
Female	33.3 (17)	56.0 (28)	
Male	66.7 (34)	44.0 (22)	
Age			$t(95.12) = 0.38$ ($p=0.7$)
M	23.9	23.5	
SD	5.48	4.32	
Education %			$\chi^2(1)=6.22^*$ ($p<0.05$)
1. Pre-high school	68.6 (35)	44.0 (22)	
2. Post-high school	31.4 (16)	56.0 (28)	
Family Status %			$\chi2(1)=0.003$, ($p=0.95$)
1. In a relationship	23.5 (12)	12 (24.0)	
2. Not in a relationship	76.5 (39)	38 (76.0)	
AQ Score			$t(99)=5.25^{***}$ ($p<0.001$)
M	25.76	18.14	
SD	7.83	6.68	

Note: $^*p<0.05$; $^{***}p<0.001$

Measures

- *Socio-demographic Background*
- *The Autism-Spectrum Quotient (AQ)* (Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001)
- *Stressful and traumatic life events* - Life Events Checklist for DSM-5 (LEC-5; Weathers, Blake, Schnurr, Kaloupek, Marx, & Keane, 2013) + a list of negative inter-personal situations that are based on a bullying questionnaire (Sourander et al., 2010). These include exposure to various forms of bullying and cyberbullying, including physical (e.g., hitting, pushing), verbal (e.g., name-calling, threats), or psychological (e.g., social exclusion, ostracism) events.
- *PTSD Checklist for DSM-5 (PCL-5)* (Weathers, Litz, Keane, Palimeri, Marx, 2013)

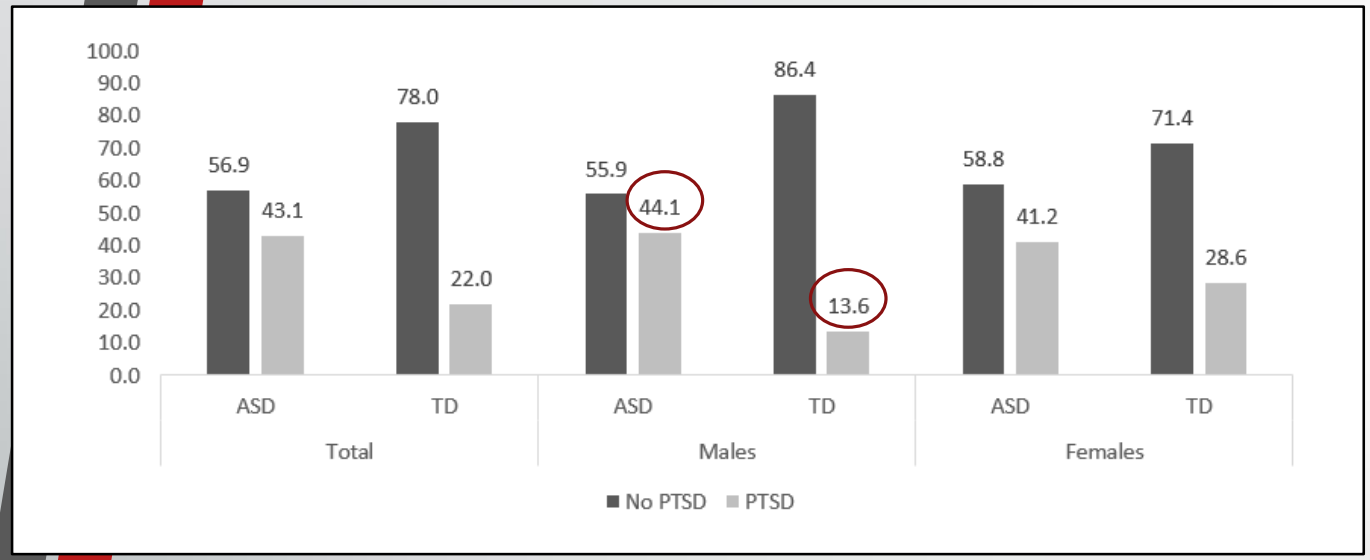


The 'Reading the Mind in the Eyes' Test (RMET; Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001) is a social cognition task that examines a participant's ability to identify complex emotions and mental states. Participants were presented with 36 images of human eyes and were asked to choose out of 4 words the one that best describes the emotion the person in the image is experiencing.

Social cognition was measured by the number of overall correct answers in the RMET, as well as the average response time for correct answers.

Results – PTSD and ASD

Among males – ASD reported 4 times more PTSD



Positive associations between PTSD and AQ domains

Table 3 - *Bivariate correlations between PTSD symptoms and AQ domains*

Variable	1	2	3	4	5	6	7	8	9	10	11
1. PTSD symptoms total											
2. PTSD re-experiencing	0.82**										
3. PTSD avoidance	0.71**	0.56**									
4. PTSD negative alterations in mood and cognition	0.93**	0.66**	0.57**								
5. PTSD hyperarousal	0.89**	0.61**	0.53**	0.79**							
6. AQ total	0.27**	0.23*	0.18	0.25*	0.23*						
7. AQ social skills	0.36**	0.23*	0.20*	0.37**	0.35*	0.84**					
8. AQ attention switching	0.22*	0.25*	0.14	0.20*	0.16	0.74**	0.58**				
9. AQ attention to details	-0.03	0.01	0.02	-0.05	-0.04	0.41**	0.05	0.28**			
10. AQ communication	0.21*	0.17	0.17	0.20*	0.16	0.89**	0.77**	0.60**	0.22*		
11. AQ imagination	0.16	0.13	0.09	0.13	0.18	0.63**	0.49**	0.17	0.04	0.49**	

Social cognition effects

ASD-PTSD performed the worst of RMET

Group and PTSD differences in social cognition task

Table 4 - *Group and PTSD differences in social cognition*

	Group		M (SD)	F	η^2
Social cognition total correct answers	ASD	PTSD	24.59 (4.39)		
		No PTSD	21.89 (4.62)		
		Total	23.05 (4.67)		
	TD	PTSD	26.90 (3.36)		
		No PTSD	25.69 (3.34)		
		Total	25.96 (3.35)		
				5.19*	0.05
Social cognition average response time	ASD	PTSD	14.03 (9.06)		
		No PTSD	12.91 (8.03)		
		Total	13.39 (8.42)		
	TD	PTSD	6.14 (2.10)		
		No PTSD	6.99 (3.62)		
		Total	6.80 (3.34)		
				17.75**	0.15

Note: *p < 0.05; **p < 0.001

Females did better on RMET, especially in the ASD group

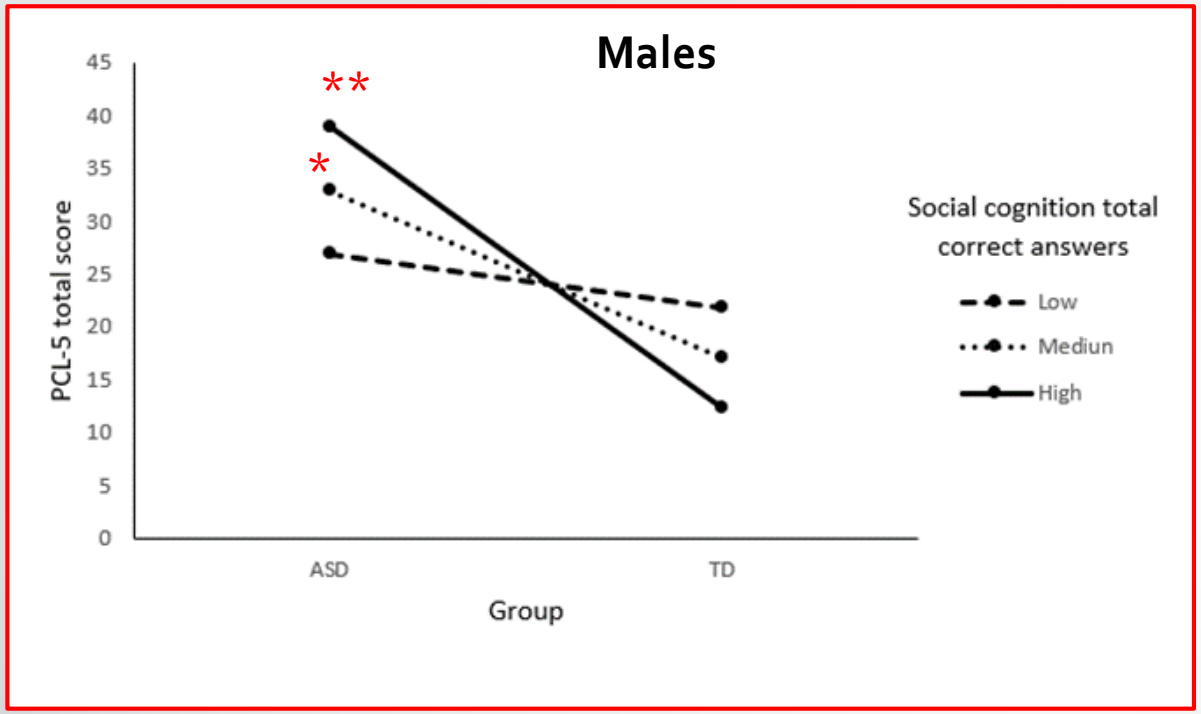
Group and gender differences in social cognition task

Table 6 - *Group and gender differences in social cognition*

	Group		M (SD)	F	η^2
Social cognition total correct answers	ASD	Females	24.88 (4.44)		
		Males	22.14 (4.58)		
	TD	Females	26.32 (3.76)		
		Males	25.50 (2.77)		
	Group X Gender			7.33*	0.07

Note: *p < 0.01

The moderating role of SC by Gender



Males	b	p	95% CI
Group	48.83	0.15	[-18.75, 116,42]
Social cognition total correct answers	4.19	0.01	[0.80, 7.59]
Group * Social cognition total correct answers	-2.69	0.04	[-5.38, -0.00]
Model summary	R^2=0.27, F(4, 51)=4.93, p<0.01		

Females: non-significant interaction
(b=−0.97, t(40)=−0.79, n.s)

Blissful ignorance?

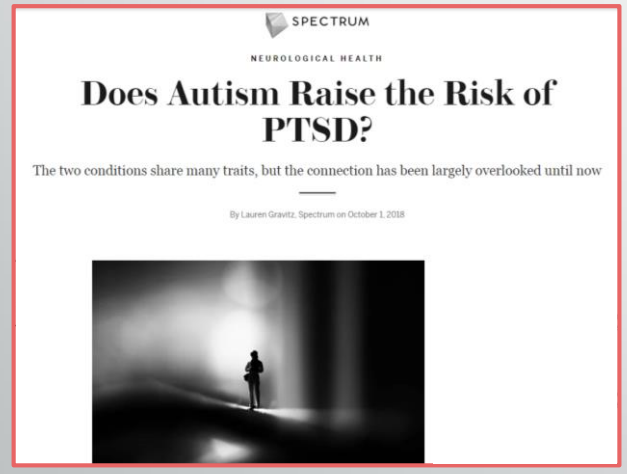
Table 5 - *Bivariate correlations between PTSD symptoms and social cognition in ASD group*

Variable	1	2	3	4	5	6	7
1. PTSD symptoms total							
2. PTSD re-experiencing	0.83**						
3. PTSD avoidance	0.64**	0.44**					
4. PTSD negative alterations in mood and cognition	0.93**	0.71**	0.51**				
5. PTSD hyperarousal	0.85**	0.59**	0.45**	0.72**			
6. Social cognition total correct answers	0.32*	0.32*	0.16	0.24	0.33*		
7. Social cognition average response time	-0.01	-0.10	0.14	0.00	0.04	0.78	

Note: *p < 0.05; **p < 0.01

Conclusions

- Individuals with ASD face an increased risk for both trauma exposure and PTSD.
- One's pre-existing vulnerability plays a crucial role in one's reaction to trauma. We know very little about the role of neurodevelopmental vulnerabilities in PTSD.
- Social stressors are highly common and chronic and seem to be particularly traumatic for individuals with ASD, most notably females.
- ASD may be associated with a unique symptomatic profile of PTSD.
- What about treatment? How can develop new interventions and/or adaptations to evidence-based treatments such as PE, CPT, and narrative therapy? (Personalized treatment)


SPECTRUM

NEUROLOGICAL HEALTH

Does Autism Raise the Risk of PTSD?

The two conditions share many traits, but the connection has been largely overlooked until now

By Lauren Gravitz, Spectrum on October 1, 2018

BMJ 2019;365:l2372 doi: 10.1136/bmj.l2372 (Published 10 June 2019)

EDITORIALS

Check for updates

Neglected causes of post-traumatic stress disorder

Patients with psychosis, other delusional states, or autism are also at risk

Chris R Brewin *emeritus professor in clinical psychology*[1], Freya Rumball *clinical psychologist*[2], Francesca Happé *professor of cognitive neuroscience*[2]

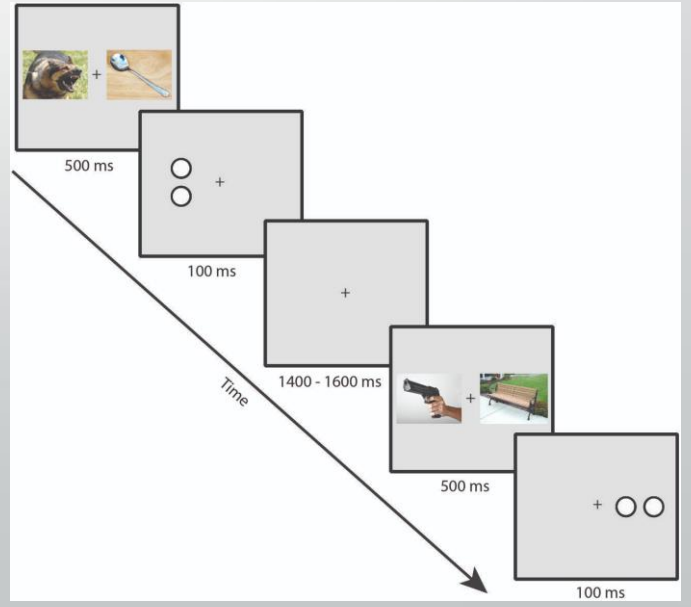
[1]Clinical, Educational and Health Psychology, University College London, Gower Street, London WC1E 6BT, UK; [2]Institute of Psychiatry, Psychology, and Neuroscience, King's College London, UK

What is trauma? – the Criterion A debate

What’s next?

Paving the way to TF-psychotherapy for ASD

Cognitive bias study (w/Dr. Shimrit Daches)



The subjective experience of trauma in ASD

Qualitative interviews

- What was traumatic for you?
- How did you cope?
- How do you remember the trauma today?

30.9.18
Hi,
I just saw your work … Unfortunately, I qualify for your research, and as you can imagine, my treatment is stuck, since my case doesn't look like what doctors are expecting.

9.10.18
Dear Danny and Ofer,
… I am getting in touch from The UK, having found your research cited …Essentially I am getting in touch to find out whether you have reached any conclusions yet about treating the two conditions together. Here is my story…

19.11.18
Dear Professor Golan,

I recently read … your work with Dr. Danny Horesh on expanding the understanding of PTSD in autistic people. I found it very interesting and wanted to write to tell you, briefly, of one of my own experiences in this respect.

Thank you for listening!

Danny.Horesh@biu.ac.il