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Childhood trauma, attachment and psychopathology: A correlation network approach

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Abstract

Consistent evidence supports the view that childhood trauma is linked with insecure attachment styles and psychopathology. However, it is a matter of debate how different forms of child maltreatment may relate with dimensions of anxiety and avoidance in attachment relationships and may foster specific configurations of clinical symptoms. Accordingly, examining the associations between childhood trauma, insecure attachment and psychopathology from a correlation network perspective may serve to fill a relevant gap in the literature. Three-hundred fifty-two adults aged between 18 and 73 years old (M= 32.70; SD = 11.72) completed measures on child maltreatment, attachment styles and psychopathology. A regularized partial correlation network was estimated to examine the relationships between the three constructs. The network showed 101 out of 190 nonzero correlations linking childhood traumatic experiences, anxious and avoidant attachment dimensions, and clinical symptoms. The analysis of the network showed that being exposed to emotional abuse and emotional neglect increased the risk of being exposed to other types of childhood trauma, such as physical abuse. Anxious attachment was more strongly linked to child maltreatment and psychopathology than avoidant attachment. Suicidal ideation and maladaptive personality functioning were the clinical symptoms most strongly connected with the other variables in the network. These findings might be relevant for the assessment and treatment of individuals who display clinical problems related to insecure attachment and early relational trauma.

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1. Introduction

There is convincing evidence that traumatic experiences represent a risk factor for psychopathology (Dworkin et al., 2017; Klonsky & Moyer, 2008; Mandelli, Petrelli, & Serretti, 2015; Schalinski et al., 2019; Schimmenti, 2018).

There is also consistent evidence that childhood trauma experienced in the context of attachment relationships can result in worst outcomes, in terms of severity and intensity of psychopathology (Green et al., 2010; Kendler & Gardner, 2011; Salokangas et al., 2019; Schimmenti & Bifulco, 2015; Slopen et al., 2010). This has been shown in relation to several symptoms and disorders, including anxiety (Fernandes & Osório, 2015), depression (Infurna et al., 2016), dissociation (Dalenberg et al., 2012), post-traumatic stress (Young et al., 2020), psychosis (Varese et al., 2012), substance use (Somer, 2019), eating disorders (Caslini et al., 2016), and personality disturbances (Johnson et al., 1999; Zhang et al., 2012), among others. The positive relationship between childhood trauma and psychopathology has also been observed in nonclinical samples (Granieri et al., 2018; Schimmenti et al., 2015; Schimmenti, 2017, 2018), suggesting that childhood experiences of neglect and abuse in the attachment relationships have a globally negative impact on the development of mental and behavioral functioning of individuals (Bifulco & Schimmenti, 2019).

According to a developmental model of psychopathology, this happens because the construction of the self is rooted in the interaction between the genetic endowment of the individuals and their early experiences with caregivers (for a review, see Golds, de Kruiff & MacBeth, 2020). Research has indeed shown that childhood trauma is associated with gene alterations in individuals (Jiang et al., 2019; Perroud et al., 2011; Tozzi et al., 2018) and with long-term derangements in the neurotransmission of dopamine and oxytocin that persists into adulthood (Dillon et al., 2009; Kim et al., 2017; Oswald et al., 2014). Also, altered hypothalamic-pituitary-adrenal (HPA) stress responses in humans seem to be linked to experiences of abuse and neglect in early-life stages (Cross et al., 2017; Heim et al., 2000; Jiang et al., 2019; McGowan et al., 2009; Robakis et al., 2020). This may reveal a critical mechanism for the development of psychopathology (Lutz et al., 2015), which especially increases the risk for stress-related disorders (Ramo-Fernández et al., 2015) and depression (Cross et al., 2017; Jaworska-Andryszewska & Rybakowski, 2019; Park et al., 2019).

From an attachment perspective, early experiences with caregivers shape the internal working models of attachment (Bowlby, 1973), that is, the cognitive and affective schemata that include the representation of self, the representation of the others, and the representation of the relationship between self and others. Following this theoretical framework, it can be postulated that childhood trauma negatively affects the development of the internal working models of attachment, leading to insecure attitudes toward oneself and/or toward other individuals.

In fact, the lack of security in childhood attachment relationships, as well as the unpredictability of the developmental context, might foster a sense of unworthiness and anxious attitudes toward close relationships or, on the contrary, an excessive self-reliance and a dismissive approach in the relationships with others (Bartholomew & Horowitz, 1991) in the child. Attachment insecurity may thus deviate the emotional development of the individual, leading to the onset of clinical symptoms that likely reflect a difficulty to adequately process and mentalize the internal states as a consequence of child maltreatment (Schimmenti, 2018). Notably, the anxious and avoidant attachment attitudes indicate a lack of trust toward the self (anxious attachment) or toward the other people (avoidant attachment). In any case, the lack of trust in interpersonal relationships limits the individual's possibility to properly reflect on internal and external events, to adequately regulate feelings, and ultimately to learn from experience (Schimmenti et al., 2014).

Furthermore, it has been shown that childhood traumatization at his extreme may lead to attachment disorganization (Cyr et al., 2010; Goldberg et al., 2003; Hesse & Main, 2006; Lyons-Ruth et al., 1999; Madigan et al., 2006; Schuengel et al., 1999; Spangler, 2013). Disorganized infants show inconsistent attachment strategies (Main & Solomon, 1986, 1990), with their internal working models being intrinsically multiple, inconsistent and unintegrated (Schimmenti & Caretti, 2016). In fact, it has been suggested that caregivers of disorganized infants are both frightening and frightened (Main & Hesse, 1990), engendering in their infants' contradictory internal representations of attachment that persist during time and strongly limit the possibility to trustfully relate with others and give meaning to internal and external experiences. Accordingly, childhood experiences of neglect and abuse in the attachment relationships may hinder the development of mentalizing abilities (Fonagy et al., 2007), thus impairing the integration of bodily and mental states (Bucci, 1997) and increasing the risk of subsequent psychopathology (Bifulco & Schimmenti, 2019; Kilpatrick et al., 2000; Ruchkin et al., 2007; Wasserman & McReynolds, 2011).

The current study was aimed to examine the relationships between childhood trauma, attachment attitudes and psychopathology within a correlation network perspective. Correlation network analysis is a statistical method for modelling and visualizing the relationships between each pair of variables in a network of associations.

To exclude the potential spurious associations from the network and to graphically represent it, it is possible to compute a sparse gaussian graphical model via a graphical LASSO (that is, a graphical least absolute shrinkage and selection operator, a sparse penalized maximum likelihood estimator for the precision matrix; see Epskamp & Fried, 2018; Friedman et al., 2008), using the Extended Bayesian Information Criterion (EBIC) for selecting an appropriate tuning parameter that may generate a simple and analyzable sparse model.

The graphical model of the correlation network consists of "nodes" and "edges": nodes represent the investigated variables, and edges represent the association between the pairs of variables. Three centrality metrics allow the researcher to examine how connected a node is within the network, and therefore its clinical relevance. Betweenness reveals how many times a node lies on the shortest path between any pair of other nodes; closeness indicates the average distance of a node from all other nodes; strength corresponds to the sum of the absolute value of the edge weights. This latter metric can be considered particularly relevant for the study of psychopathology, because it reflects the likelihood that a node activates other nodes in the network (McNally et al., 2017). A theoretical assumption of correlation network analysis is that the correlation network should be interpreted as a system consisting of interactions among the investigated variables. Variables into the network are mutually associated and reinforce each other (Borsboom & Cramer, 2013). In fact, when an event activates a node in a strongly connected network, the network may become a self-sustaining system, maintaining the state of activation in absence of the triggering event (Borsboom, 2017).

Thus, correlation network analysis may represent a novel approach to examine the pattern of associations between childhood trauma, attachment attitudes, and clinical symptoms, as it might help researchers to better understand how these constructs are associated among them, and how their relationships may result in pathological configurations.

The interactions between childhood trauma and psychopathology have been scarcely investigated through correlation network analysis. Isvoranu and colleagues (2017) examined the patterns of associations between different types of childhood trauma and psychotic symptoms. Glück, Knefel and Lueger-Schuster (2017) investigated the relationships between childhood traumatic experiences, anger, shame and post-traumatic stress symptoms. Furthermore, correlation network analysis has been frequently performed to examine the associations among specific clinical symptoms in individuals with a child sexual abuse history (Choi et al., 2017; Kratzeret et al., 2020; McBride et al., 2020; McNally et al., 2017). All of these studies pointed

out to the usefulness of a correlation network approach to better understand how clinical symptoms might be activated in relation to childhood trauma.

Accordingly, identifying the configurations of the patterns of associations among childhood trauma, attachment attitudes and psychopathological symptoms might improve the quality of psychological assessment, especially when there is clinical evidence that childhood trauma has exerted an important and negative effect on the development of mental and behavioral functioning of an individual.

Therefore, the aim of this study was to examine the network of associations between child maltreatment, insecure attachment attitudes, and clinical symptoms in a sample of adult individuals, and to explore if specific experiences of relational trauma in childhood were more strictly linked to insecure attachment and clinical symptoms in the network. This approach might serve to identify developmental pathways that potentially lead to psychopathology, so to inform preventative actions and clinical interventions.

2. Method

2.1 Participants

The study involved 352 participants (175 males; 49.7%), aged between 18 and 73 years old (M=32.70; DS=11.72). Participants had an average level of education of 15.56 years (DS=3.32). Females presented higher age ($t_{(350)}$=-5.52; p<.01) and higher educational level ($t_{(350)}$=-2.57; p=.01) than males.

2.2 Procedures

Participants from the community were recruited through advertisements published in social network platforms. Each advertisement contained a link to access to an anonymous online survey, in which a brief description about the nature of the study and an informed consent schedule were presented. People who agreed to participate completed a socio-demographic schedule and self-report instruments evaluating childhood traumatic experiences, attachment attitudes and clinical symptoms. No missing data were collected because all questions in the electronic survey had been set as mandatory. The study was approved by the Internal Review Board for Psychological Research of UKE-Kore University of Enna (ID: 16.02.18).

2.3 Measures

The *Childhood Trauma Questionnaire - Short Form* (CTQ-SF; Bernstein et al., 2003; Italian validation by Sacchi et al., 2018) is a 28-item self-report measure which assesses childhood traumatic

experiences. Each item is presented as first-person statement rated on 5-point Likert scale (1= "Never true"; 5= "Very often true").

CTQ-SF comprises five scales that assess different types of childhood trauma: emotional abuse (5 items); physical abuse (5 items); sexual abuse (5 items); emotional neglect (5 items); and physical neglect (5 items). Also, CTQ-SF allows researchers to calculate a minimization/denial scale (3 items), which was not considered in the present study because it was not relevant for the specific research purpose (since the minimization/denial scale does not address experiences of childhood maltreatment). An example item of CTQ-SF (concerning emotional abuse) is: "When I was growing up people in my family called me things like 'stupid', 'lazy' or 'ugly'". The score on each scale is obtained by summing the score of each item, and it ranges from 5 to 25. Higher scores indicate higher severity of trauma. CTQ-SF has been translated in many countries (e.g., Gerdner & Allgulander, 2009; He et al., 2019; Hernandez et al., 2013) and its Italian version demonstrated good psychometrics properties (Sacchi et al., 2018).

In the present study, the Cronbach's alpha for emotional abuse was .86 (AIC=.57); for physical abuse was .85 (AIC = .56); for sexual abuse was .93 (AIC=.72); for emotional neglect was .90 (AIC=.66); for physical neglect was .54 (AIC =.22).

The *Relationship Questionnaire* (RQ; Bartholomew & Horowitz, 1991; Italian translation by Carli, 1995) is a self-report measure that assess four prototypical adult attachment styles. Secure attachment involves a positive view of both self and others; dismissing attachment involves a positive view of the self and a negative view of others; preoccupied attachment involves a negative view of the self and a positive view of the others; and fearful attachment style involves a negative view of both self and the others. Accordingly, the RQ includes four first-person statement that represent each attachment style. Participants were asked how much each statement describes their attitudes toward close relationships on a 7-point Likert scale (1 = "Strongly disagree"; 7 = "Strongly agree"). An example statement of RQ (representing preoccupied attachment) is: "I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them". Following the predetermined criteria for calculating scores on the two principal domains of insecure attachment (Bartholomew & Horowitz 1991), we used the scores on the four styles to calculate the final scores for attachment anxiety [(fearful + preoccupied) - (secure + dismissing)] and attachment avoidance [(fearful + dismissing) - (secure + preoccupied)].

The *DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure—Adult* (CCSM; American Psychiatric Association, 2013; Italian translation by Fossati et al., 2015) is a 23-item self-report measure assessing several domains of clinical symptoms.

It consists of questions about the frequency of symptoms in the last two weeks. Each answer is rated on a 5-point Likert scale (0 = "Not at all"; 4 = "Nearly every day"). The CCSM comprises thirteen domains: depression (2 items), anger (1 item), mania (2 item), anxiety (3 item), somatic symptoms (2 item), suicidal ideation (1 item), psychosis (2 item), sleep problems (1 item), memory (1 item), repetitive thoughts and behaviors (2 item), dissociation (1 item), personality functioning (2 item), substance use (3 item). An example item (concerning anxiety) is: "Feeling nervous, anxious, frightened, worried, or on edge". The CCSM has demonstrated adequate psychometric properties in the DSM field trials (Narrow et al., 2013) and in other studies (Bastiaens & Galus, 2018). Internal consistency (Cronbach's alpha value) of the full scale, obtained by averaging all domain scores, was .86 (AIC=.33).

2.4 Statistical analysis

Descriptive statistics were calculated for all variables. Gender difference were examined through the *t*-test for independent samples. The associations in the network were calculated via EBICglasso, an algorithm that estimates the sparse inverse covariance from the observations. EBIC hyperparameter γ was set to .05 (Foygel & Drton, 2010), to estimate a network with high specificity (Epskamp & Fried, 2018). Centrality indexes were calculated as standardized z-scores, with higher z-scores indicating higher centrality in the network. Significant differences between nodes were also calculated, using a non-parametric bootstrap of 1000 samples to test the stability of centrality metrics. Correlation network analysis was performed using the statistical software JASP 0.10.2 (JASP Team, 2019).

3. Results

Descriptive statistics are presented in Table 1 for the full sample and differentiated by gender. The *t*-test revealed statistically significant sex differences, with females reporting higher somatic and sleep symptoms than males, and males reporting more obsessive-compulsive symptoms and substance use compared to females.

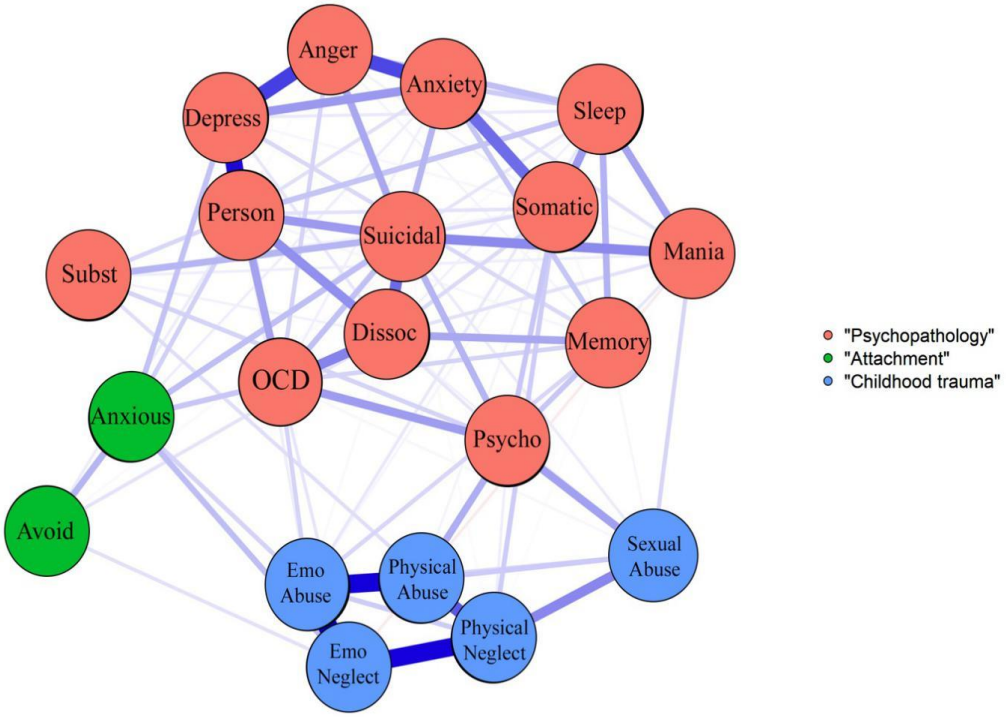
Table 1. Descriptive statistics and gender differences

	Full sample (N=352)			**Males (n=175)**		**Females (n=177)**			
	M	(SD)	Range	M	(SD)	M	SD	$t_{(350)}$	*p*
Age	32.70	(11.72)	18-73	29.37	(9.92)	36.00	(12.44)	-5.52	**<.01**
Years of education	15.56	(3.32)	5-21	15.11	(3.21)	16.01	(3.36)	-2.57	**.01**
Emotional abuse	7.89	(4.14)	5-25	7.77	(3.94)	8.02	(4.34)	-.57	.57
Physical abuse	6.01	(2.70)	5-25	6.06	(2.30)	5.96	(3.05)	.34	.74
Sexual abuse	5.93	(2.84)	5-25	6.00	(3.24)	5.87	(2.40)	.43	.67
Emotional neglect	10.48	(5.16)	5-25	10.17	(4.80)	10.79	(5.49)	-1.14	.26
Physical neglect	6.43	(2.25)	5-19	6.37	(2.06)	6.49	(2.42)	-.50	.62
Anxious attachment	-2.75	(4.88)	-12-12	-2.42	(4.94)	-3.08	(4.81)	1.28	.20
Avoidant attachment	.11	(4.08)	-11-11	.06	(4.05)	.15	(4.12)	-.21	.84
Depression	1.56	(1.00)	0-4	1.62	(1.01)	1.49	(.99)	1.15	.25
Anger	1.68	(1.12)	0-4	1.59	(1.09)	1.77	(1.15)	1.43	.12
Mania	1.47	(1.06)	0-4	1.55	(1.02)	1.39	(1.09)	-1.96	.15
Anxiety	1.38	(.97)	0-4	1.28	(.92)	1.48	(1.00)	-1.96	.05
Somatic symptoms	.96	(1.07)	0-4	.83	(.97)	1.08	(1.15)	-2.13	**.03**
Suicidal ideation	.32	(.82)	0-4	.39	(.93)	.25	(.69)	1.54	.12
Psychosis	.19	(.55)	0-4	.23	(.61)	.15	(.49)	1.39	.17
Sleep problems	1.33	(1.32)	0-4	1.17	(1.21)	1.50	(1.40)	-2.37	**.02**
Memory	.63	(.96)	0-4	.66	(.93)	.60	(.99)	.57	.57
Repetitive thoughts and behaviors	.76	(.99)	0-4	.87	(1.02)	.65	(.96)	2.10	**.04**
Dissociation	.41	(.82)	0-4	.45	(.82)	.37	(.82)	.90	.37
Personality functioning	1.23	(1.17)	0-4	1.35	(1.23)	1.11	(1.10)	1.88	.06
Substance use	.75	(.85)	0-3.67	.87	(.87)	.64	(.81)	2.66	**<.01**

The regularized partial correlation network is displayed in Figure 1. In Figure 1, higher thickness of the edges represents higher strength of the correlations. The network was constituted by 101 out of 190 nonzero correlation, with a sparsity of 0.47. This suggests that the three examined

constructs were strongly interrelated. As it can be observed in Figure 1, the experiences of childhood traumatization tended to cluster together; the same happened for the two insecure attachment attitudes and for the thirteen clinical symptoms.

Figure 1. Regularized partial correlation network of childhood trauma, insecure attachment styles and psychopathology.



Note: Avoid: Avoidant attachment; Anxious: Anxious attachment; Emo Abuse: Emotional abuse; Emo Neglect: Emotional neglect; Depress: Depression; Somatic: Somatic Symptoms; Suicidal: Suicidal Ideation; Psycho: Psychosis; Sleep: Sleep Problems; OCD: Repetitive Thoughts and Behaviors; Dissoc: Dissociation; Person: Personality Functioning; Subst: Substance Use.

It is noteworthy that the three examined constructs were interconnected in the network. In detail, the single strongest associations between childhood traumatic experiences and psychopathology were observed in the edges linking sexual and physical abuse to psychoticism. The strongest associations between childhood traumatic experiences and insecure attachment styles were observed in the edges linking emotional neglect with anxious and avoidant attachment. Finally, the strongest associations between insecure attachment styles and clinical symptoms were observed in the edges linking anxious attachment with depression, obsessive-compulsive symptoms, suicidal ideation and maladaptive personality functioning. Avoidant attachment, in contrast, was more strongly linked with dissociation and maladaptive personality functioning. The weights matrix of the regularized partial correlation network is displayed in Table 2.

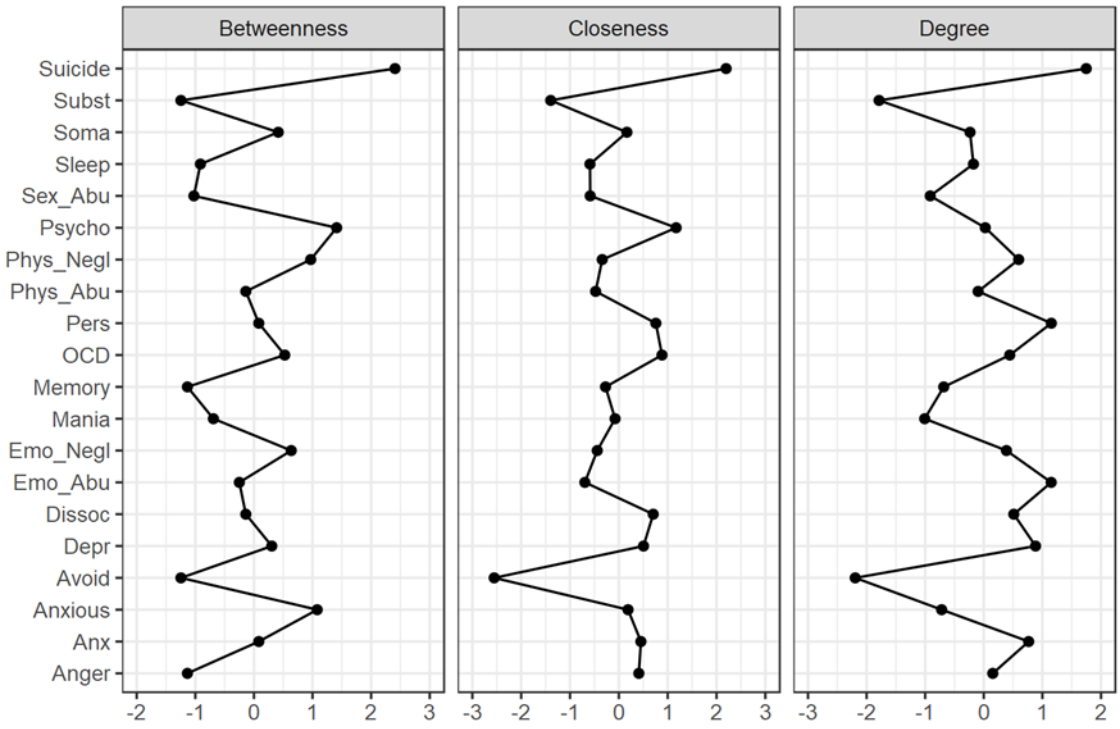
Table 2. Weights matrix of the regularized partial correlation network.

		2	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
1	*Anger*	.26	.01	.00	.27	.00	.00	.00	.00	.02	.06	.00	.00	.00	.00	.00	.09	.02	.00	.13
2	*Anxiety*	-	.02	.00	.15	.01	.00	.00	.04	.08	.02	.04	.00	.00	.00	.00	.07	.21	.00	.11
3	*Anxious*		-	.11	.09	.00	.06	.09	.00	.00	.08	.07	.00	.00	.00	.00	.00	.00	.00	.09
4.	*Avoidant*			-	.00	.04	.00	.04	.00	.00	.00	.03	.00	.00	.00	.00	.01	.00	.00	.00
5	*Depression*				-	.03	.02	.00	.00	.06	.05	.33	.00	.00	.00	.00	.03	.01	.00	.01
6	*Dissociation*					-	.01	.00	.04	.13	.18	.16	.00	.00	.04	.02	.02	.05	.02	.21
7	*Emotional Abuse*						-	.38	.00	.06	.06	.02	.34	.07	.00	.05	.03	.01	.00	.00
8	*Emotional Neglect*							-	-.03	.00	.08	.00	.00	.34	.00	.00	.00	.00	.00	.00
9	*Mania*								-	.00	.00	.00	.00	.00	.03	.06	.13	.01	.02	.17
10	*Memory*									-	.06	.01	.00	.00	.08	.01	.11	.01	.00	.00
11	*OCD*										-	.13	.00	.00	.14	.01	.00	.00	.00	.09
12	*Personality Functioning*											-	.00	.00	.00	.00	.09	.04	.06	.15
13	*Physical Abuse*												-	.24	.12	.08	.00	.01	.00	.00
14	*Physical Neglect*													-	.02	.17	.00	.07	.05	.01
15	*Psychosis*														-	.14	.00	.08	.06	.11
16	*Sexual Abuse*															-	.00	.00	.00	.03
17	*Sleep Problems*																-	.14	.00	.04
18	*Somatic Symptoms*																	-	.02	.05
19	*Substance Use*																		-	.11
20	*Suicidal Ideation*																			-

Note: Anger= CCSM Anger symptoms; Anxiety= CCSM Anxiety symptoms; Anxious= RQ Anxious attachment; Avoidant= RQ Avoidant attachment; Depression= CCSM Depression symptoms; Dissociation= CCSM Dissociation symptoms; Emotional Abuse= CTQ Emotional abuse; Emotional Neglet= CTQ Emotional neglet; Mania= CCSM Mania symptoms; Memory= CCSM Memory symptoms; OCD= CCSM Repetitive thoughts and behaviors symptoms; Personality functioning= CCSM Personality functioning symptoms; Physical Abuse= CTQ Physical abuse; Physical Neglet= CTQ Physical neglet; Psychosis= CCSM Psychosis symptoms; Sexual Abuse= CTQ Sexual abuse; Sleep Problems= CCSM Sleep problems symptoms; Somatic Symptoms= CCSM Somatic symptoms; Substance Use= CCSM Substance use symptoms; Suicidal Ideation= CCSM Suicidal ideation symptoms

The centrality indexes (see Figure 2) showed that suicidal ideation and maladaptive personality functioning had the highest strength (degree) in the network, thus these symptoms were more likely to activate further symptoms. Similarly, emotional abuse showed the highest strength among the childhood trauma variables, suggesting that this type of child maltreatment might foster other experiences of abuse and neglect.

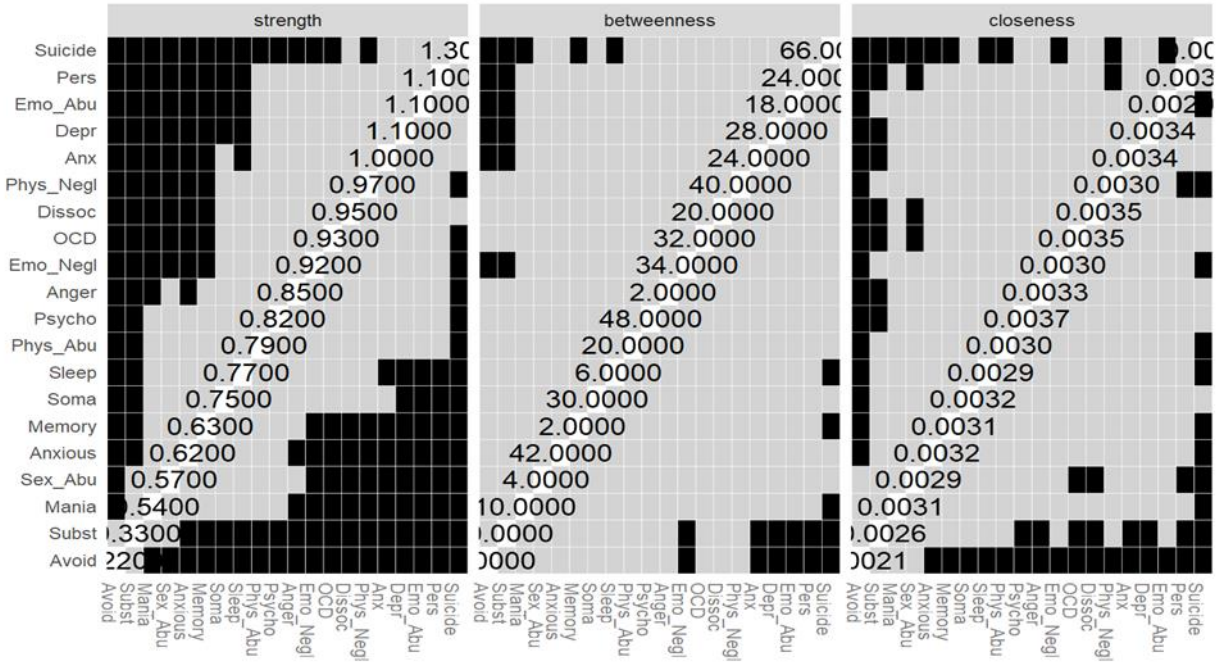
Figure 2. Centrality indexes of the network



Note: Anger= CCSM Anger symptoms; Anx=CCSM Anxiety symptoms; Anxious=RQ Anxious attachment; Avoid= RQ Avoidant attachment; Depr= CCSM Depression symptoms; Dissoc= CCSM Dissociation symptoms; Emo_Abu=CTQ Emotional abuse; Emo_Negl= CTQ Emotional neglet; Mania= CCSM Mania symptoms; Memory= CCSM Memory symptoms; OCD= CCSM Repetitive thoughts and behaviors symptoms; Pers= CCSM Personality Functioning symptoms; Phys_Abu= CTQ Physical abuse; Phys_Negl= CTQ Physical neglet; Psycho= CCSM Psychosis symptoms; Sex_Abu= CTQ Sexual abuse; Sleep= CCSM Sleep problems symptoms; Soma= CCSM Somatic symptoms; Subst= CCSM Substance use symptoms; Suicide= CCSM Suicidal ideation symptoms.

Suicidal ideation was also the variable with the highest betweenness and highest closeness in the network. However, the examination of differences between nodes and the bootstrap analyses (see Figure 3) showed that the strength metrics were relevant for the network and quite stable, whereas the closeness index and the betweenness index were not particularly informative or stable, thus suggesting that distance between nodes and network pathways might differ in other samples.

Figure 3. Bootstrapped difference tests for nodes



Note: Anger=CCSM Anger symptoms; Anx=CCSM Anxiety symptoms; Anxious=RQ Anxious attachment; Avoid= RQ Avoidant attachment; Depr= CCSM Depression symptoms; Dissoc= CCSM Dissociation symptoms; Emo_Abu=CTQ Emotional abuse; Emo_Negl= CTQ Emotional neglet; Mania= CCSM Mania symptoms; Memory= CCSM Memory symptoms; OCD= CCSM Repetitive thoughts and behaviors symptoms; Pers= CCSM Personality Functioning symptoms; Phys_Abu= CTQ Physical abuse; Phys_Negl= CTQ Physical neglet; Psycho= CCSM Psychosis symptoms; Sex_Abu= CTQ Sexual abuse; Sleep= CCSM Sleep problems symptoms; Soma= CCSM Somatic symptoms; Subst= CCSM Substance use symptoms; Suicide= CCSM Suicidal ideation symptoms.

Bootstrapped estimates are given in the diagonal. Black boxes mean significant differences at the .05 level.

4. Discussion

The current study examined the relationship between childhood trauma, insecure attachment attitudes and clinical symptoms within a correlation network analysis framework. In our community sample, experiences of child maltreatment and insecure attachment attitudes were not prominent, as expected. Yet, many participants reported mild levels of clinical symptoms. Especially, females reported higher levels of somatic and sleep symptoms than males, whereas males reported higher levels of substance use and obsessive-compulsive symptoms. These findings are consistent with previous research showing that females are more prone to develop internalizing symptoms, such as anxiety (Gao et al., 2020) and depression (Liu et al., 2019; Sun

et al., 2017; Tung et al., 2018), whereas males tend to display more externalizing symptoms, such as alcohol abuse and antisocial behaviors (Kramer et al., 2008); moreover, there is evidence that a comorbidity between obsessive-compulsive symptoms and substance use is relatively common among males (for a review, see Mathis et al., 2011).

In line with previous research, the correlation network analysis showed that different types of childhood trauma tend to cluster together, thus suggesting that different forms of traumatic experiences during childhood are likely to co-occur (Armour et al., 2014; Bifulco & Schimmenti, 2019; Schimmenti, 2018). Concerning the childhood trauma variables, the centrality metrics revealed that emotional abuse was the variable with the strongest associations in the network. This result is consistent with previous research showing that parents' hostile and rejecting attitudes toward the child increase the risk for other forms of coercive and abusive parenting (Bifulco & Schimmenti, 2019; Brown et al., 2019; Cecil et al., 2017; Denholm et al., 2013).

It can also be observed that the domains of insecure attachment tend to cluster together, as it happens for the indicators of clinical symptoms. This latter finding is consistent with the view that symptoms of different disorders may interact among them, determining a comorbidity between two or more diagnostic categories. Within a correlation network approach, comorbidity might be conceptualized as the result of the activation of a symptom that act as a "bridge" for symptoms related to different disorders. Accordingly, an event that activates a bridge symptom may trigger the activation of other symptoms (Cramer et al., 2010; Fried et al., 2017).

The correlation network analysis highlighted the strong interrelations among the domains of childhood traumatic experiences, attachment attitudes and clinical symptoms.

As it can be observed in Figure 1, emotional neglect and emotional abuse are closely related to clinical symptoms. Emotional neglect and abuse are two of the most common form of child maltreatment (Ney, 1994; Taillieu et al., 2016). They are characterized by patterns of harmful intentions not expressed through physical contact, although emotional neglect and abuse may co-occur with other forms of abuses and failures of care (Glaser, 2002).

Also, our results are consistent with research highlighting that experiences of emotional neglect and abuse in the attachment relationships might constitute traumatic experiences for the child, as they testify of the failures in the relational field involving the child and his or her caregiver (Schimmenti, 2017).

Strikingly, these types of child maltreatment might generate a developmental cascade of further episodes of maltreatment and distressing events in the family and in the social context (Bifulco & Schimmenti, 2019), which have a globally negative impact on the development of mental and behavioral functioning, thus increasing the risk of psychopathology (Schimmenti, 2018). This is also reflected in systematic reviews and meta-analytic studies, which show that emotional neglect and abuse are critical variables to take into account for understanding the development of mental disorders, such as schizophrenia (Sideli et al., 2020) and depression (Infurna et al., 2016).

Examining the correlations among childhood trauma and clinical symptoms, strong associations between psychoticism and sexual and physical abuse were observed. This is consistent with previous research showing that the risk for psychotic symptoms is increased in those individuals exposed to early trauma (Morgan & Fisher, 2007; Sideli et al., 2020; Varese et al., 2012). Moreover, research has shown that child abuse might increase the distress of those who develop a psychotic disorder in adulthood, thus leading to worse outcomes (Bendall et al., 2008).

It can also be observed that emotional neglect and emotional abuse were linked to insecure attachment attitudes in the network. This result is in line with literature suggesting that children with emotionally abusing, intrusive or neglecting caregivers are more prone to develop severely insecure attachment attitudes in adulthood (Schimmenti & Bifulco, 2015; Unger & De Luca, 2014). In fact, inadequate attachment contexts may shape negative representations of self and others, thus disrupting the sense of security in close relationships (Bartholomew & Horowitz, 1991; Bowlby, 1969). However, the configuration of the associations in the network suggests that the anxious and the avoidant attachment dimensions are connected to different domains of clinical symptoms.

Anxious attachment was linked to depression, obsessive-compulsive symptoms, suicidal ideation and maladaptive personality functioning, consistent with previous research showing that feelings of unworthiness (which are crucial features of anxiously attached individuals, see Bartholomew & Horowitz, 1991) may foster internalizing symptoms (Bajaj et al., 2016; Lee & Hankin, 2009; Sowislo & Orth, 2013). In contrast, avoidant attachment was strongly connected with emotional neglect on the one hand, and with dissociation and maladaptive personality functioning on the other hand. This is in line with some literature suggesting that a negative representation of the others might lead individuals to a defensive exclusion of their attachment needs (Mikulincer & Shaver, 2016). In fact, the exclusion of attachment needs, which can be observed in the excessive self-reliance and withdrawal from close relationships of avoidant

individuals (Bartholomew & Horowitz, 1991), could increase the risk to rely on dissociative processes to regulate the negative feelings (Schimmenti, 2017). This might compromise the sense of relatedness to others and, ultimately, the quality of life of individuals (Schimmenti & Caretti, 2016). Therefore, individuals who show high levels of avoidant attachment could display experiences of detachment from their body and from the others as a result of the neglecting childhood relationships. In other words, the effects of childhood trauma in individuals with avoidant attachment could result in increased dissociative symptoms (Schimmenti, 2017) and impairments in personality functioning (Granieri et al., 2018).

Finally, suicidal ideation was the symptom with the highest strength in the network, and thus with the strongest associations with the other examined variables. This finding is consistent with the literature showing that suicidal ideation constitutes a common symptom in several disorders, such as anxiety disorder (Norton et al., 2008), depressive disorder (Wang et al., 2015), bipolar disorder (Simon et al., 2007) and obsessive-compulsive disorder (Balci & Sevincok, 2010). Moreover, in line with previous findings (Bahk et al., 2017), we found that suicidal ideation is connected with childhood trauma, and especially with sexual abuse and physical neglect. In fact, the lack of adequate emotion regulation strategies deriving from child abuse and neglect may generate a sense of hopelessness (Brausch & Woods, 2019; Rajappa et al., 2012), which in turn could lead some individuals to think about suicide as a strategy to cope with overwhelming feelings (Baryshnikov et. al, 2020; Flores-Kanter et al., 2019).

Some limitations of this study should be highlighted. First, the cross-sectional nature of the study does not allow us to ascertain the causal interactions among the variables. Longitudinal studies could provide strongest evidence about the role of childhood trauma in the development of insecure attachment styles and clinical symptoms. Also, the use of self-report measures could limit the clinical validity of the findings, and other instrument such as structured and semi-structured interviews (Bifulco & Schimmenti, 2019) may result more effective to identify the relationship between childhood trauma, attachment styles and psychopathology. Finally, the study recruited community-dwelling individuals, which limits the generalizability of the findings. Therefore, future studies could explore how the examined variables interact in clinical samples, possibly within a longitudinal framework, so to examine if the current network replicate in the context of mental disorders. Also, future research in this field could take into account further psychological variables that are strictly related to childhood trauma, such as emotion dysregulation and failures in mentalizing, to generate a more comprehensive understanding of

the dysfunctional processes that emerge from childhood trauma and may result in psychopathology.

5. Conclusions

Its limitations notwithstanding, the current study provides new insights on the relationship between child maltreatment, insecure attachment styles and clinical symptoms, by showing the interactions within and among these constructs. Examining the network of associations between the investigated constructs represents indeed a possibility for clinicians and researchers to better understand the developmental processes that could be involved in the onset of psychopathology, furnishing a simple yet comprehensive framework to better conceptualize the dynamics of symptoms and their origins, and thus to provide a tailored and effective treatment.

Actually, our findings show that an exposure to various types of child maltreatment could lead to attachment vulnerabilities and may concur to the development of psychopathology, with clinical symptoms potentially reinforcing, in a vicious cycle, the attachment insecurity and the negative feelings related to an abusing and neglecting childhood history. Therefore, when traumatic experiences occur within the attachment relationships during childhood, these experiences can deviate the affective development of the child by altering the representations of the interpersonal experience and by impairing the affect regulation abilities. Hence, a clear implication for clinicians is that they should promote adequate strategies of self-regulation and interpersonal regulation of emotions in their traumatized clients, by fostering feelings of safety and trust toward relationships (Bowlby, 1988). This could represent a prerequisite for effectively treating the underlying traumatic memories and the unbearable states of mind that often lie behind the doors of emotion dysregulation and failures in mentalizing.

References

1. American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). American Psychiatric Association.
2. Armour, C., Elklit, A., & Christoffersen, M. N. (2014). A latent class analysis of childhood maltreatment: Identifying abuse typologies. *Journal of Loss and Trauma*, *19*(1), 23-39. https://doi.org/10.1080/15325024.2012.734205.
3. Bahk, Y. C., Jang, S. K., Choi, K. H., & Lee, S. H. (2017). The Relationship between Childhood Trauma and Suicidal Ideation: Role of Maltreatment and Potential Mediators. *Psychiatry Investigation*, *14*(1), 37–43. https://doi.org/10.4306/pi.2017.14.1.37.
4. Bajaj, B., Robins, R. W., & Pande, N. (2016). Mediating role of self-esteem on the relationship between mindfulness, anxiety, and depression. *Personality and Individual Differences*, *96*, 127-131. https://doi.org/10.1016/j.paid.2016.02.085.
5. Balci, V., & Sevincok, L. (2010). Suicidal ideation in patients with obsessive–compulsive disorder. *Psychiatry Research*, *175*(1-2), 104-108. https://doi.org/10.1016/j.psychres.2009.03.012.
6. Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults: a test of a four-category model. *Journal of Personality and Social Psychology*, *61*(2), 226. https://doi.org/10.1037/0022-3514.61.2.226.
7. Baryshnikov, I., Rosenstrom, T., Jylha, P., Vuorilehto, M., Holma, M., Holma I., Riihimäki, K., Brown G. K., Oquendo, M. A., & Isometsa, E. T. (2020). The role of hopelessness in suicidal ideation among patients with depressive disorders. *The Journal of Clinical Psychiatric*, *81*(2). https://doi.org/10.4088/JCP.19m12866.
8. Bastiaens, L., & Galus, J. (2018). The DSM-5 self-rated level 1 cross-cutting symptom measure as a screening tool. *Psychiatric Quarterly*, *89*(1), 111-115. https://doi.org/10.1007/s11126-017-9518-7
9. Bendall, S., Jackson, H. J., Hulbert, C. A., & McGorry, P. D. (2008). Childhood trauma and psychotic disorders: A systematic, critical review of the evidence. *Schizophrenia Bulletin*, *34*, 568–579. https://doi.org/10.1093/schbul/sbm121.
10. Bernstein, D. P., Stein, J. A., Newcomb, M. D., Walker, E., Pogge, D., Ahluvalia, T., Stokes, J., Handelsman, L., Medrano, M., Desmond, D., & Zule, W. (2003). Development and validation of a brief screening version of the Childhood Trauma Questionnaire. *Child Abuse & Neglect*, *27*(2), 169-190. https://doi.org/10.1016/S0145-2134(02)00541-0.
11. Bifulco, A., & Schimmenti, A. (2019). Assessing child abuse: "We need to talk!". *Child Abuse & Neglect*, *98*, 104236. https://doi.org/10.1016/j.chiabu.2019.104236.
12. Borsboom, D. (2017), A network theory of mental disorders. *World Psychiatry*, *16*(1), 5-13. https://doi.org/10.1002/wps.20375.
13. Borsboom, D., & Cramer, A. O. (2013). Network analysis: An integrative approach to the structure of psychopathology. *Annual Review of Clinical Psychology*, *9*, 91-121. https://doi.org/10.1146/annurev-clinpsy-050212-185608.
14. Bowlby, J. (1969). *Attachment and Loss: Vol. 1. Attachment*. New York: Basic Books.

15. Bowlby, J. (1973). Attachment and loss: Volume II: Separation, anxiety and anger. In *Attachment and Loss: Volume II: Separation, Anxiety and Anger* (pp. 1-429). London: The Hogarth Press and the Institute of Psycho-Analysis.
16. Bowlby, J. (1988). A Secure base: Clinical applications of attachment theory. London: Routledge.
17. Brausch, A. M., & Woods, S. E. (2019). Emotion regulation deficits and nonsuicidal self-injury prospectively predict suicide ideation in adolescents. *Suicide and Life-Threatening Behavior*, *49*(3), 868-880. https://doi.org/10.1111/sltb.12478.
18. Brown, S. M., Rienks, S., McCrae, J. S., & Watamura, S. E. (2019). The co-occurrence of adverse childhood experiences among children investigated for child maltreatment: A latent class analysis. *Child Abuse & Neglect*, *87*, 18-27. https://doi.org/10.1016/j.chiabu.2017.11.010.
19. Bucci, W. (1997). Psychoanalysis and Cognitive Science: A multiple code theory. NY: Guilford Press.
20. Carli, L. (Ed.). (1995). *Attaccamento e rapporto di coppia: Il modello di Bowlby nell'interpretazione del ciclo di vita*. Milano: Raffaello Cortina.
21. Caslini, M., Bartoli, F., Crocamo, C., Dakanalis, A., Clerici, M., & Carrà, G. (2016). Disentangling the association between child abuse and eating disorders: a systematic review and meta-analysis. *Psychosomatic Medicine*, *78*(1), 79-90. https://doi.org/10.1097/PSY.0000000000000233
22. Cecil, C. A., Viding, E., Fearon, P., Glaser, D., & McCrory, E. J. (2017). Disentangling the mental health impact of childhood abuse and neglect. *Child Abuse & Neglect*, *63*, 106-119. https://doi.org/10.1016/j.chiabu.2016.11.024.
23. Choi, K. W., Batchelder, A. W., Ehlinger, P. P., Safren, S. A., & O'Cleirigh, C. (2017). Applying network analysis to psychological comorbidity and health behavior: Depression, PTSD, and sexual risk in sexual minority men with trauma histories. *Journal of Consulting and Clinical Psychology, 85*(12), 1158-1170. https://doi.org/10.1037/ccp0000241.
24. Cramer, A. O., Waldorp, L. J., Van Der Maas, H. L., & Borsboom, D. (2010). Comorbidity: A network perspective. *Behavioral and Brain Sciences*, *33*(2-3), 137-150. https://doi.org/10.1017/S0140525X09991567.
25. Cross, D., Fani, N., Powers, A., & Bradley, B. (2017). Neurobiological development in the context of childhood trauma. *Science and Practice*, *24*(2), 111-124. https://doi.org/10.1111/cpsp.12198.
26. Cyr, C., Euser, E. M., Bakermans-Kranenburg, M. J., & Van Ijzendoorn, M. H. (2010). Attachment security and disorganization in maltreating and high-risk families: A series of meta-analyses. *Development and Psychopathology*, *22*(1), 87-108. https://doi.org/10.1017/S0954579409990289.
27. Dalenberg, C. J., Brand, B. L., Gleaves, D. H., Dorahy, M. J., Loewenstein, R. J., Cardena, E., Frewen, P. A., Carlson, E. B., & Spiegel, D. (2012). Evaluation of the evidence for the trauma and fantasy models of dissociation. *Psychological Bulletin*, *138*(3), 550-588. https://doi.org/10.1037/a0027447.
28. Denholm, R., Power, C., Thomas, C., & Li, L. (2013). Child maltreatment and household dysfunction in a British birth cohort. *Child Abuse Review*, *22*(5), 340-353. https://doi.org/10.1002/car.2235.
29. Dillon, D. G., Holmes, A. J., Birk, J. L., Brooks, N., Lyons-Ruth, K., & Pizzagalli, D. A. (2009). Childhood adversity is associated with left basal ganglia dysfunction during reward anticipation in adulthood. *Biological psychiatry*, *66*(3), 206-213. https://doi.org/10.1016/j.biopsych.2009.02.019.

30. Dworkin, E. R., Menon, S. V., Bystrynski, J., & Allen, N. E. (2017). Sexual assault victimization and psychopathology: A review and meta-analysis. *Clinical Psychology Review*, *56*, 65-81. https://doi.org/10.1016/j.cpr.2017.06.002.
31. Epskamp, S., & Fried, E. I. (2018). A tutorial on regularized partial correlation networks. *Psychological Methods, 23*(4), 617–634. https://doi.org/10.1037/met0000167.
32. Fernandes, V., & Osório, F. L. (2015). Are there associations between early emotional trauma and anxiety disorders? Evidence from a systematic literature review and meta-analysis. *European Psychiatry*, *30*(6), 756-764. https://doi.org/10.1016/j.eurpsy.2015.06.004.
33. Flores-Kanter, P. E., García-Batista, Z. E., Moretti, L. S., & Medrano, L. A. (2019). Towards an explanatory model of suicidal ideation: the effects of cognitive emotional regulation strategies, affectivity and hopelessness. *The Spanish Journal of Psychology*, *22*, E43. https://doi.org/10.1017/sjp.2019.45.
34. Fonagy, P., Gergely, G., & Target, M. (2007). The parent–infant dyad and the construction of the subjective self. *Journal of child psychology and psychiatry*, *48*(3-4), 288-328. https://doi.org/10.1111/j.1469-7610.2007.01727.x.
35. Fossati, A., Borroni, S., & Del Corno, F. (2015). *Scala di valutazione dei sintomi trasversali di livello 1 autosomministrata – Adulto*. Milano: Raffaello Cortina.
36. Foygel, R., & Drton, M. (2010). Extended Bayesian information criteria for Gaussian graphical models. *Advances in neural information processing systems*, 23, 2020-2028.
37. Fried, E. I., van Borkulo, C. D., Cramer, A. O., Boschloo, L., Schoevers, R. A., & Borsboom, D. (2017). Mental disorders as networks of problems: a review of recent insights. *Social Psychiatry and Psychiatric Epidemiology*, *52*(1), 1-10. 10.1007/s00127-016-1319-z.
38. Friedman, J., Hastie, T., & Tibshirani, R. (2008). Sparse inverse covariance estimation with the graphical lasso. *Biostatistics*, *9*(3), 432-441. https://doi.org/10.1093/biostatistics/kxm045.
39. Gao, W., Ping, S., & Liu, X. (2020). Gender differences in depression, anxiety, and stress among college students: a longitudinal study from China. *Journal of Affective Disorders*, *263*, 292-300. https://doi.org/10.1016/j.jad.2019.11.121.
40. Gerdner, A., & Allgulander, C. (2009). Psychometric properties of the swedish version of the childhood trauma Questionnaire-Short form (CTQ-SF). *Nordic Journal of Psychiatry*, *63*(2), 160-170. https://doi.org/10.1080/08039480802514366.
41. Glaser, D. (2002). Emotional abuse and neglect (psychological maltreatment): A conceptual framework. *Child Abuse & Neglect*, *26*(6), 697–714. https://doi.org/10.1016/S0145-2134(02)00342-3.
42. Glück, T. M., Knefel, M., & Lueger-Schuster, B. (2017). A network analysis of anger, shame, proposed ICD-11 post-traumatic stress disorder, and different types of childhood trauma in foster care settings in a sample of adult survivors. *European Journal of Psychotraumatology, 8*(Suppl. 3). https://doi.org/10.1080/20008198.2017.1372543.
43. Goldberg, S., Benoit, D., Blokland, K., & Madigan, S. (2003). Atypical maternal behavior, maternal representations, and infant disorganized attachment. *Development and Psychopathology, 15*(2), 239–257. https://doi.org/10.1017/S0954579403000130

44. Golds, L., de Kruiff, K., & MacBeth, A. (2020). Disentangling genes, attachment, and environment: A systematic review of the developmental psychopathology literature on gene–environment interactions and attachment. *Development and Psychopathology*, *32*(1), 357-381. https://doi.org/10.1017/S0954579419000142.
45. Granieri, A., Guglielmucci, F., Costanzo, A., Caretti, V., & Schimmenti, A. (2018). Trauma-related dissociation is linked with maladaptive personality functioning. *Frontiers in psychiatry*, *9*, 206. https://doi.org/10.3389/fpsyt.2018.00206.
46. Green, J.G., McLaughlin, K.A., Berglund, P.A., Gruber, M.J., Sampson, N.A., Zaslavsky, A.M., & Kessler, R.C. (2010). Childhood adversities and adult psychiatric disorders in the national comorbidity survey replication I: Associations with first onset of DSM-IV disorders. *Archives of General Psychiatry*, *67*(2), 113–123. https://doi.org./10.1001/archgenpsychiatry.2009.186.
47. He, J., Zhong, X., Gao, Y., Xiong, G., & Yao, S. (2019). Psychometric properties of the Chinese version of the Childhood Trauma Questionnaire-Short Form (CTQ-SF) among undergraduates and depressive patients. *Child Abuse & Neglect*, *91*, 102-108. https://doi.org/10.1016/j.chiabu.2019.03.009.
48. Heim, C., Newport, D. J., Heit, S., Graham, Y. P., Wilcox, M., Bonsall, R., Miller, A. H., & Nemeroff, C. B. (2000). Pituitary-adrenal and autonomic responses to stress in women after sexual and physical abuse in childhood. *JAMA*, *284*(5), 592-597. https://doi.org/10.1001/jama.284.5.592.
49. Hernandez, A., Gallardo-Pujol, D., Pereda, N., Arntz, A., Bernstein, D. P., Gaviria, A. M., Labad, A., Valero, J., & Gutiérrez-Zotes, J. A. (2013). Initial validation of the Spanish Childhood Trauma Questionnaire-Short Form: factor structure, reliability and association with parenting. *Journal of Interpersonal Violence*, *28*(7), 1498-1518. https://doi.org/10.1177/0886260512468240.
50. Hesse, E., & Main, M. (2006). Frightened, threatening, and dissociative parental behavior in low-risk samples: Description, discussion, and interpretations. *Development and psychopathology*, *18*(2), 309-343. https://doi.org/10.1017/S0954579406060172.
51. Infurna, M. R., Reichl, C., Parzer, P., Schimmenti, A., Bifulco, A., & Kaess, M. (2016). Associations between depression and specific childhood experiences of abuse and neglect: A meta-analysis. *Journal of Affective Disorders*, *190*, 47-55. https://doi.org/10.1016/j.jad.2015.09.006.
52. Isvoranu, A. M., van Borkulo, C. D., Boyette, L. L., Wigman, J. T. W., Vinkers, C. H., Borsboom, D., & Group Investigators. (2017). A Network approach to psychosis: Pathways between childhood trauma and psychotic symptoms. *Schizophrenia Bulletin*, *43*(1), 2017, 187-196. https://doi.org/10.1093/schbul/sbw055.
53. JASP Team (2019). *JASP (Version 0.10.2)* [Computer software].
54. Jaworska-Andryszewska, P., & Rybakowski, J. K. (2019). Childhood trauma in mood disorders: neurobiological mechanisms and implications for treatment. *Pharmacological Reports*, *71*(1), 112-120. https://doi.org/10.1016/j.pharep.2018.10.004.
55. Jiang, S., Postovit, L., Cattaneo, A., Binder, E. B., & Aitchison, K. J. (2019). Epigenetic modifications in stress response genes associated with childhood trauma. *Frontiers in psychiatry*, *10*, 808. https://doi.org/10.3389/fpsyt.2019.00808.
56. Johnson, J. G., Cohen, P., Brown, J., Smailes, E. M., & Bernstein, D. P. (1999). Childhood maltreatment increases risk for personality disorders during early adulthood. *Archives of General Psychiatry*, *56*(7), 600-606. 10.1001/archpsyc.56.7.600.

57. Kendler, K.S., & Gardner, C.O. (2011). A longitudinal etiologic model for symptoms of anxiety and depression in women. *Psychological Medicine*, *41*(10), 2035–2045. https://doi.org/10.1017/S0033291711000225.
58. Kilpatrick, D. G., Acierno, R., Saunders, B., Resnick, H. S., Best, C. L., & Schnurr, P. P. (2000). Risk factors for adolescent substance abuse and dependence: Data from a national sample. *Journal of Consulting and Clinical Psychology, 68*(1), 19–30. https://doi.org/10.1037/0022-006X.68.1.19.
59. Kim, S., Kwok, S., Mayes, L. C., Potenza, M. N., Rutherford, H. J., & Strathearn, L. (2017). Early adverse experience and substance addiction: dopamine, oxytocin, and glucocorticoid pathways. *Annals of the New York Academy of Sciences*, *1394*(1), 74-91. https://doi.org/10.1111/nyas.13140.
60. Klonsky, E. D., & Moyer, A. (2008). Childhood sexual abuse and non-suicidal self-injury: meta-analysis. *The British Journal of Psychiatry*, *192*(3), 166-170. https://doi.org/10.1192/bjp.bp.106.030650.
61. Kramer, M. D., Krueger, R. F., & Hicks, B. M. (2008). The role of internalizing and externalizing liability factors in accounting for gender differences in the prevalence of common psychopathological syndromes. *Psychological Medicine*, *38*(1), 51-61. https://doi.org/10.1017/S0033291707001572.
62. Kratzer, L., Heinz, P., Schennach, R., Knefel, M., Schiepek, G., Biedermann, S., & Büttner, M. (2020). Sexual symptoms in post-traumatic stress disorder following childhood sexual abuse: A network analysis. *Psychological Medicine,* 1-12. https://doi.org/10.1017/S0033291720001750.
63. Lee, A., & Hankin, B. L. (2009). Insecure attachment, dysfunctional attitudes, and low self-esteem predicting prospective symptoms of depression and anxiety during adolescence. *Journal of clinical child & Adolescent Psychology*, *38*(2), 219-231. https://doi.org/10.1080/15374410802698396.
64. Liu, Y., Zhang, N., Bao, G., Huang, Y., Ji, B., Wu, Y., Liu, C., & Li, G. (2019). Predictors of depressive symptoms in college students: A systematic review and meta-analysis of cohort studies. *Journal of Affective Disorders*, *244*, 196-208. https://doi.org/10.1016/j.jad.2018.10.084.
65. Lutz, P. E., Almeida, D., M Fiori, L., & Turecki, G. (2015). Childhood maltreatment and stress-related psychopathology: the epigenetic memory hypothesis. *Current Pharmaceutical Design*, *21*(11), 1413-1417. 10.2174/1381612821666150105124928.
66. Lyons-Ruth, K., Bronfman, E., & Parsons, E. (1999). Maternal frightened, frightening, or atypical behavior and disorganized infant attachment patterns. *Monographs of the Society for Research in Child Development*, 67-96. https://doi.org/10.1111/1540-5834.00034.
67. Main, M., & Hesse, E. (1990). *Parents' unresolved traumatic experiences are related to infant disorganized attachment status: Is frightened and/or frightening parental behavior the linking mechanism?* In M. T. Greenberg, D. Cicchetti, & E. M. Cummings (Eds.), *The John D. and Catherine T. MacArthur Foundation series on mental health and development. Attachment in the preschool years: Theory, research, and intervention* (p. 161–182). University of Chicago Press.
68. Main, M., & Solomon, J. (1986). *Discovery of an insecure-disorganized/disoriented attachment pattern.* In T. B. Brazelton & M. W. Yogman (Eds.), *Affective development in infancy* (p. 95–124). Ablex Publishing.

69. Main, M., & Solomon, J. (1990). *Procedures for identifying infants as disorganized/ disoriented during the Ainsworth Strange Situation.* In M. T. Greenberg, D. Cicchetti, & E. M. Cummings (Eds.), *The John D. and Catherine T. MacArthur Foundation series on mental health and development. Attachment in the preschool years: Theory, research, and intervention* (p. 121–160). University of Chicago Press.

70. Madigan, S., Moran, G., & Pederson, D. R. (2006). Unresolved states of mind, disorganized attachment relationships, and disrupted interactions of adolescent mothers and their infants. *Developmental Psychology, 42*(2), 293–304. https://doi.org/10.1037/0012-1649.42.2.293.

71. Mandelli, L., Petrelli, C., & Serretti, A. (2015). The role of specific early trauma in adult depression: a meta-analysis of published literature. Childhood trauma and adult depression. *European Psychiatry*, *30*(6), 665-680. https://doi.org/10.1016/j.eurpsy.2015.04.007.

72. Mathis, M. A. D., Alvarenga, P. D., Funaro, G., Torresan, R. C., Moraes, I., Torres, A. R., Zilberman, M. L., & Hounie, A. G. (2011). Gender differences in obsessive-compulsive disorder: a literature review. *Brazilian Journal of Psychiatry*, *33*(4), 390-399. http://dx.doi.org/10.1590/S1516-44462011000400014.

73. McBride, O., Hyland, P., Murphy, J., & Elklit, A. (2020). Network analysis of posttraumatic stress experiences of adults seeking psychological treatment for childhood sexual abuse. *Journal of Traumatic Stress*, *33*(1), 10-18. https://doi.org/10.1002/jts.22381.

74. McGowan, P. O., Sasaki, A., D'alessio, A. C., Dymov, S., Labonté, B., Szyf, M., Turecki, G., & Meaney, M. J. (2009). Epigenetic regulation of the glucocorticoid receptor in human brain associates with childhood abuse. *Nature Neuroscience*, *12*(3), 342-348. https://doi.org/10.1038/nn.2270.

75. McNally, R. J., Heeren, A., & Robinaugh, D. J. (2017). A Bayesian network analysis of posttraumatic stress disorder symptoms in adults reporting childhood sexual abuse. *European Journal of Psychotraumatology*, *8*(sup.3), 1341276. https://doi.org/10.1080/20008198.2017.1341276.

76. Mikulincer, M. & Shaver, P. R. (2016). *Attachment in adulthood. Structure, Dynamics and Change.* New York: The Guilford Press.

77. Morgan, C., & Fisher, H. (2007). Environment and schizophrenia: environmental factors in schizophrenia: childhood trauma—a critical review. *Schizophrenia Bulletin*, *33*(1), 3-10. https://doi.org/10.1093/schbul/sbl053.

78. Narrow, W. E., Clarke, D. E., Kuramoto, S. J., Kraemer, H. C., Kupfer, D. J., Greiner, L., & Regier, D. A. (2013). DSM-5 field trials in the United States and Canada, Part III: development and reliability testing of a cross-cutting symptom assessment for DSM-5. *American Journal of Psychiatry, 170*(1), 71-82. https://doi.org/10.1176/appi.ajp.2012.12071000

79. Ney, P. G., Fung, T., & Wickett, A. R. (1994). The worst combinations of child abuse and neglect. *Child Abuse & Neglect*, *18*(9), 705-714. https://doi.org/10.1016/0145-2134(94)00037-9.

80. Oswald, L. M., Wand, G. S., Kuwabara, H., Wong, D. F., Zhu, S., & Brasic, J. R. (2014). History of childhood adversity is positively associated with ventral striatal dopamine responses to amphetamine. *Psychopharmacology*, *231*(12), 2417-2433. https://doi.org/10.1007/s00213-013-3407-z.

81. Park, C., Rosenblat, J. D., Brietzke, E., Pan, Z., Lee, Y., Cao, B., Zuckerman, H., Kalantarova, A., & McIntyre, R. S. (2019). Stress, epigenetics and depression: a systematic review. *Neuroscience & Biobehavioral Reviews*, *102*, 139-152. https://doi.org/10.1016/j.neubiorev.2019.04.010.

82. Perroud, N., Paoloni-Giacobino, A., Prada, P., Olié, E., Salzmann, A., Nicastro, R., Guillaume, S., Mouthon, D., Stouder, C., Dieben, K., Huguelet, P., Courtet, P., & Malafosse, A. (2011). Increased methylation of glucocorticoid receptor gene (*NR3C1*) in adults with a history of childhood maltreatment: a link with the severity and type of trauma. *Translational Psychiatry*, *1*(12), 59. https://doi.org/10.1038/tp.2011.60.

83. Rajappa, K., Gallagher, M., & Miranda, R. (2012). Emotion dysregulation and vulnerability to suicidal ideation and attempts. *Cognitive Therapy and Research*, *36*(6), 833-839. https://doi.org/10.1007/s10608-011-9419-2.

84. Ramo-Fernández, L., Schneider, A., Wilker, S., & Kolassa, I. T. (2015). Epigenetic alterations associated with war trauma and childhood maltreatment. *Behavioral Sciences & the Law*, *33*(5), 701-721. https://doi.org/10.1002/bsl.2200.

85. Robakis, T. K., Zhang, S., Rasgon, N. L., Li, T., Wang, T., Roth, M. C., Humphreys, K. L., Gotlib, I. H., Ho, M., Khechaduri, A., Watson, K., Roat-Shumway, S., Budhan, V. V., Davis, K. N., Crowe, S. D., Williams, K. E., & Urban, A. E. (2020). Epigenetic signatures of attachment insecurity and childhood adversity provide evidence for role transition in the pathogenesis of perinatal depression. *Translational Psychiatry*, *10*(1), 1-14. https://doi.org/10.1038/s41398-020-0703-3.

86. Ruchkin, V., Henrich, C. C., Jones, S. M., Vermeiren, R., & Schwab-Stone, M. (2007). Violence exposure and psychopathology in urban youth: The mediating role of posttraumatic stress. *Journal of abnormal child psychology*, *35*(4), 578-593. http://doi.org/10.1007/s10802-007-9114-7.

87. Sacchi, C., Vieno, A., & Simonelli, A. (2018). Italian validation of the Childhood Trauma Questionnaire-Short Form on a college group. *Psychological Trauma: Theory, Research, Practice, and Policy*, *10*(5), 563. https://doi.org/10.1037/tra0000333.

88. Salokangas, R. K., Schultze-Lutter, F., Schmidt, S. J., Pesonen, H., Luutonen, S., Patterson, P., von Reventlow, H. G., Heinimaa, M., From, T. & Hietala, J. (2019). Childhood physical abuse and emotional neglect are specifically associated with adult mental disorders. *Journal of Mental Health*, 1-9. https://doi.org/10.1080/09638237.2018.1521940.

89. Schalinski, I., Breinlinger, S., Hirt, V., Teicher, M. H., Odenwald, M., & Rockstroh, B. (2019). Environmental adversities and psychotic symptoms: The impact of timing of trauma, abuse, and neglect. *Schizophrenia Research*, *205*, 4-9. https://doi.org/10.1016/j.schres.2017.10.034.

90. Schimmenti, A. (2017). The developmental roots of dissociation: A multiple mediation analysis. *Psychoanalytic Psychology*, *34*(1), 96. https://doi.org/10.1037/pap0000084.

91. Schimmenti, A. (2018). The trauma factor: Examining the relationships among different types of trauma, dissociation, and psychopathology. *Journal of Trauma & Dissociation*, *19*(5), 552-571. https://doi.org/10.1080/15299732.2017.1402400.

92. Schimmenti, A., & Bifulco, A. (2015). Linking lack of care in childhood to anxiety disorders in emerging adulthood: the role of attachment styles. *Child and Adolescent Mental Health*, *20*(1), 41-48. https://doi.org/10.1111/camh.12051.

93. Schimmenti, A., & Caretti, V. (2016). Linking the overwhelming with the unbearable: Developmental trauma, dissociation, and the disconnected self. *Psychoanalytic Psychology, 33*(1), 106–128. https://doi.org/10.1037/a0038019.

94. Schimmenti, A., Maganuco, N. R., La Marca, L., Di Dio, N., Gelsomino, E., & Gervasi, A. M. (2015). "Why Do I Feel So Bad?" Childhood Experiences of Emotional Neglect, Negative Affectivity, and Adult Psychiatric Symptoms. *Mediterranean Journal of Social Sciences*, *6*(6:S1), 259. 10.5901/mjss.2015.v6n6s1p259.

95. Schimmenti, A., Passanisi, A., Pace, U., Manzella, S., Di Carlo, G., & Caretti, V. (2014). The relationship between attachment and psychopathy: A study with a sample of violent offenders. *Current Psychology*, *33*(3), 256-270. https://doi.org/10.1007/s12144-014-9211-z.

96. Schuengel, C., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (1999). Frightening maternal behavior linking unresolved loss and disorganized infant attachment. *Journal of Consulting and Clinical Psychology, 67*(1), 54–63. https://doi.org/10.1037/0022-006X.67.1.54

97. Sideli, L., Murray, R.M., Schimmenti, A, Corso, M., La Barbera, D., Trotta, A., & Fisher, H. L. (2020). Childhood adversity and psychosis: a systematic review of bio-psychosocial mediators and moderators. *Psychological Medicine*. https://doi.org/10.1017/S0033291720002172

98. Simon, N. M., Zalta, A. K., Otto, M. W., Ostacher, M. J., Fischmann, D., Chow, C. W., Thompson, E. H., Stevens, J. C., Demopulos, C. M., Nierenberg, A. A., & Pollack, M. H. (2007). The association of comorbid anxiety disorders with suicide attempts and suicidal ideation in outpatients with bipolar disorder. *Journal of psychiatric research*, *41*(3-4), 255-264. https://doi.org/10.1016/j.jpsychires.2006.08.004.

99. Slopen, N., Williams, D. R., Seedat, S., Moomal, H., Herman, A., & Stein, D.J. (2010). Adversities in childhood and adult psychopathology in the South Africa Stress and Health Study: Associations with first-onset DSM-IV disorders. *Social Science & Medicine*, *71*(10), 1847–1854. https://doi.org/10.1016/j.socscimed.2010.08.015.

100. Somer, E. (2019). Trauma, Dissociation, and Opiate Use Disorder. *Current Addiction Reports*, *6*(1), 15-20. https://doi.org/10.1007/s40429-019-0236-0.

101. Sowislo, J. F., & Orth, U. (2013). Does low self-esteem predict depression and anxiety? A meta-analysis of longitudinal studies. *Psychological Bulletin*, *139*(1), 213–240. https://doi.org/10.1037/a0028931.

102. Spangler, G. (2013). Individual dispositions as precursors of differences in attachment quality: Why maternal sensitivity is nevertheless important. *Attachment & Human Development*, *15*(5-6), 657-672. https://doi.org/10.1080/14616734.2013.842065.

103. Sun, X. J., Niu, G. F., You, Z. Q., Zhou, Z. K., & Tang, Y. (2017). Gender, negative life events and coping on different stages of depression severity: A cross-sectional study among Chinese university students. *Journal of Affective Disorders*, *209*, 177-181. https://doi.org/10.1016/j.jad.2016.11.025.

104. Taillieu, T. L., Brownridge, D. A., Sareen, J., & Afifi, T. O. (2016). Childhood emotional maltreatment and mental disorders: Results from a nationally representative adult sample from the United States. *Child Abuse & Neglect*, *59*, 1-12. https://doi.org/10.1016/j.chiabu.2016.07.005.

105. Tozzi, L., Farrell, C., Booij, L., Doolin, K., Nemoda, Z., Szyf, M., Pomares, F. B., Chiarella, J., O'Keane, V., & Frodl, T. (2018). Epigenetic changes of FKBP5 as a link connecting genetic and environmental risk factors with structural and functional brain changes in major depression. *Neuropsychopharmacology*, *43*(5), 1138-1145. https://doi.org/10.1038/npp.2017.290.

106. Tung, Y. J., Lo, K. K., Ho, R. C., & Tam, W. S. W. (2018). Prevalence of depression among nursing students: A systematic review and meta-analysis. *Nurse Education Today*, *63*, 119-129. https://doi.org/10.1016/j.nedt.2018.01.009.

107. Unger, J. A. M., & De Luca, R. V. (2014). The relationship between childhood physical abuse and adult attachment styles. *Journal of Family Violence*, *29*(3), 223-234. https://doi.org/10.1007/s10896-014-9588-3.

108. Varese, F., Smeets, F., Drukker, M., Lieverse, R., Lataster, T., Viechtbauer, W., Read, J., van Os, J., & Bentall, R. P. (2012). Childhood adversities increase the risk of psychosis: a meta-analysis of patient-control, prospective-and cross-sectional cohort studies. *Schizophrenia Bulletin*, *38*(4), 661-671. https://doi.org/10.1093/schbul/sbs050.

109. Wang Y.-Y., Jiang N.-Z., Cheung E. F. C., Sun H.-W., Chan R. C. K. (2015). Role of depression severity and impulsivity in the relationship between hopelessness and suicidal ideation in patients with major depressive disorder. *Journal of Affective Disorders*, *183*, 83–89. https://doi.org/10.1016/j.jad.2015.05.001.

110. Wasserman, G. A., & McReynolds, L. S. (2011). Contributors to traumatic exposure and posttraumatic stress disorder in juvenile justice youths. *Journal of Traumatic Stress*, *24*(4), 422-429. https://doi.org/10.1002/jts.20664.

111. Young, L. B., Timko, C., Pulido, R. D., Tyler, K. A., Beaumont, C., & Grant, K. M. (2020). Traumatic childhood experiences and posttraumatic stress disorder among veterans in substance use disorder treatment. *Journal of Interpersonal Violence*. https://doi.org/10.1177/0886260519900937.

112. Zhang, T., Chow, A., Wang, L., Dai, Y., & Xiao, Z. (2012). Role of childhood traumatic experience in personality disorders in China. *Comprehensive Psychiatry*, *53*(6), 829-836. https://doi.org/10.1016/j.comppsych.2011.10.004.

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