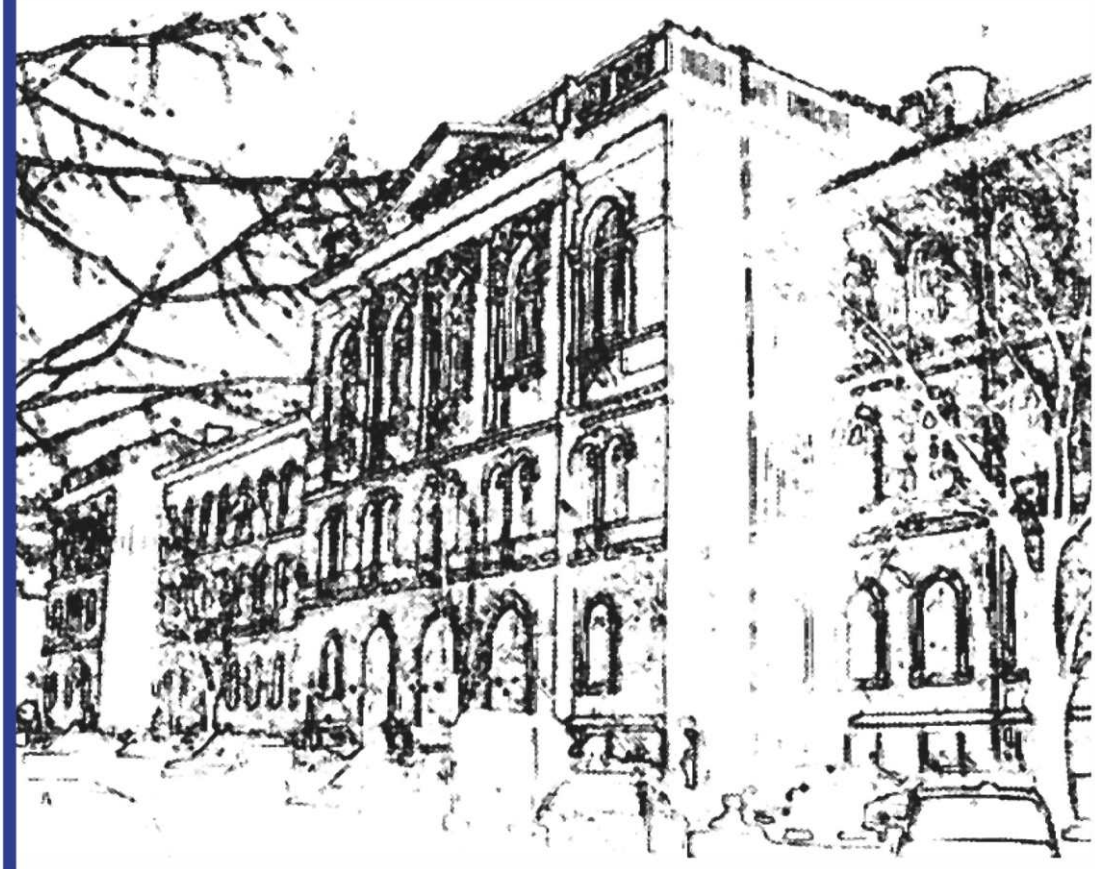
1

March 2022

Volume XXII, Number 1

JOURNAL OF EVIDENCE-BASED PSYCHOTHERAPIES

The Official Journal of the International Institute for the Advanced Studies of Psychotherapy and Applied Mental Health (IIAS of PAMH)



Presa Universitară Clujeană

Journal of Evidence-Based Psychotherapies is the successor of the Journal of Cognitive and Behavioral Psychotherapies (2001-2013) and is published biannually (in March and September) in one volume per year by the International Institute for the Advanced Studies of Psychotherapy and Applied Mental Health. The journal is devoted to the advancement of the clinical theory and practice of evidence-based psychotherapies (EBP) (e.g., evidence-based psychological assessments, evidence-based psychological treatments). The journal publishes original papers dealing with EBP and psychology, psychiatry, the medical and mental specialties, and allied areas of science. Submissions include (1) articles referring to clinical and experimental studies, discussions of theory, and systematic reviews for inclusion in Article Section, (2) articles referring to clinical discussions/developments for inclusion in the Clinical Forum Section, and (3) commentaries, letters to the editor, reviews and abstracts of books, tapes, and films, salient findings in EBP, and other information relevant to the journal's goal for inclusion in the Development and Resources Section. Finally, the journal seeks to publish special issues devoted to topics of particular interest, suggestions for which are welcomed by the Editor.

Indexed in: (1) Abstracted: Thomson ISI Web of Science/SSCI; SCOPUS; PsycINFO; and International Bibliography of Social Science; **(2) Full text**: EBSCO, ERIH+, and ProQuest

JOURNAL OF EVIDENCE-BASED PSYCHOTHERAPIES

VOLUME 22 MARCH 2022 NUMBER 1

CONTENTS

ARTICLES SECTION

The International Institute for the Advanced Studies of Psychotherapy and Applied Mental Health (IIAS of PAMH) is a research Institute of the Babes-Bolyai University (BBU), located in Cluj-Napoca, Romania. Babes-Bolyai University is one of the oldest, most prestigious, and influential academic settings in Romania and in the Eastern-Central Europe (http://www.ubbcluj.ro). It has been almost four centuries since the beginnings of this university of Cluj-Napoca. The first project to set up a higher education institution in Cluj-Napoca was recorded in 1565, and in 1581 it was set up an academic college, organized and run by Jesuits. Since then Babes-Bolyai University has become a modern institution which acquired a remarkable fame by its long-time achievements at national and international level. The Institute will invite as affiliates/partners prestigious organizations involved in the development of psychotherapy and applied mental health interventions. IIAS of PAMH aims to promote advanced study and scholarship in applied mental health by research.

Specific information and more detailed information about IIAS of PAMH may be obtained by visiting our website at: http://www.psychotherapy.ro or by emailing us to internationalinstitute@psychology.ro

ISSN: 2360 – **0853**
ISSN-L: 2360 – **0853**

Universitatea Babeş-Bolyai
Presa Universitară Clujeană
Director: Codruţa Săcelean
Str. Hașdeu nr. 51
400371 Cluj-Napoca, România
Tel./Fax: (+40)-264-597.401
E-mail: editura@editura.ubbcluj.ro
http://www.editura.ubbcluj.ro

Journal of Evidence-Based Psychotherapies,
Vol. 22, No. 1, March 2022, 1-20.

10.24193/jebp.2022.1.1

RELATIONSHIPS BETWEEN HOSTILITY, RESILIENCE AND INTOLERANCE OF UNCERTAINTY: A STRUCTURAL EQUATION MODELING

Simel Parlak[1], Emine Burcu Tunç[2], Derya Eryiğit[3], Müge Uluman[4]*

[1] Department of Guidance and Psychological Counseling, Istanbul Sabahattin Zaim University. https://orcid.org/0000-0002-8651-2693
[2] Department of Educational Measurement and Evaluation, Marmara University. https://orcid.org/0000-0002-8225-9299
[3] Department of Guidance and Psychological Counseling, Marmara University. https://orcid.org/0000-0002-3708-7176
[4] Department of Educational Measurement and Evaluation, Marmara University. https://orcid.org/0000-0003-4155-3114

Abstract

The aim of this study is to examine the relationship between hostility, resilience, and intolerance of uncertainty within the framework of structural equation modeling. In order to determine the relationship between the concepts, structural equation modeling was made, and the mediation role of resilience between hostility and intolerance of uncertainty was investigated. A total of 359 individuals participated in the study from different regions of Turkey. The short version of the intolerance of uncertainty scale, brief resilience scale, and hostility in pandemic scale were used as research instruments. The test of the measurement model resulted in an acceptable fit to the data, and all loadings of the measured variables on the latent constructs were statistically significant. The test of the direct relationship between hostility and intolerance of uncertainty model and mediation role of resilience between hostility and intolerance of uncertainty resulted in an acceptable fit to the data. The results of the Bootstrap analysis were used to determine whether the mediation role of resilience between hostility and intolerance of uncertainty was statistically significant. According to the results of the research, it is determined that psychological resilience is a partial mediator variable between hostility and intolerance to uncertainty. In order to control the feelings of intolerance and hostility toward uncertainty,

* Correspondence concerning this article should be addressed sent to Simel Parlak, Department of Guidance and Psychological Counseling, Faculty of Education Sciences, Istanbul Sabahattin Zaim University, Istanbul, Turkey, Associate Professor, PhD. ORCID: https://orcid.org/0000-0002-8651-2693. Address: İstanbul Sabahattin Zaim Üniversitesi Halkalı Merkez, Halkalı, 34303 Küçükçekmece/ İstanbul, Türkiye.
E-mail: simelparlak@gmail.com
Mobile phone number: +90 553 607 6055

which are risky for the psychological health of individuals during the Covid-19 pandemic, the protective intervention factors of improving psychological resilience and increasing the capacity to tolerate uncertainty should be addressed in terms of individual and social mental health.

Keywords: Hostility, resilience, intolerance of uncertainty, COVID-19, mediation model.

Introduction

Pandemics trigger changes in the psychological and sociological structures of society (Trauer et al., 2011). The COVID-19 pandemic, which is a global health threat (Cao et al., 2020; Wang et al., 2020), was first detected in Turkey on March 11 (T.R. Ministry of Health, 2020) and has brought about changes in social life which later affected the psychological well-being of the whole society. For this reason, it is necessary to understand the epidemiology of the pandemic and to define the changes that have occurred in Turkey, which is going through the pandemic like the rest of the world, and to guide the public health responses in the upcoming pandemics (Trauer et al., 2011). In this context, it is important to examine the concepts of hostility, intolerance of uncertainty, and psychological resilience during the pandemic process.

Hostility is a complex set of tendencies that involves negative beliefs, angry emotions, and aggressive interactions (Spilberger et al., 1983). In a study conducted by Pérez-Fuentes, Molero Jurado, Martos Martínez, and Gázquez Linares (2020) with 1004 people, it is concluded that the perceived threat during the pandemic increases the levels of sadness-depression, anxiety, and anger-hostility. At the same time, it is concluded that anxiety and anger-hostility directly affect the perception of threat from the virus. A negative attitude, hostility often causes people to experience anger. An individual with a hostile attitude experiences a negative and pessimistic view of the world, distrust towards other people, and a desire to harm. These individuals generally have anxiety in the face of problems and cannot cope with uncertainty (Eckhardt, Bradley & Deffenbacher, 2004).

Pandemics cause compelling life events and increase the need for psychological resilience (Cao et al., 2020; Wang et al., 2020). It is known that pandemics also increase the stress level in individuals. Due to the process experienced, post-traumatic stress disorder (Lee et al., 2018), stress, anxiety, depressive symptoms, rejection, fear, and anger (Jones et al., 2017) may be observed in individuals. Kobasa (1979) states that each individual responds differently to high-stress situations. She also stated that some individuals get sick when they are highly stressed, while some others do not due to the difference in personality traits, and she calls this difference in personality psychological resilience. Psychological resilience can also be defined as the capacity to come out of difficulties and become stronger.

Psychological resilience provides the individual the opportunity to heal the pain s/he experienced, to take responsibility for his/her life, and to continue his/her life full of love (Walsh, 2006). Individuals with high psychological resilience have stated that the trauma they experienced helped them understand the value of life, increased their rapprochement with their family and friends, helped them understand the meaning of life, and brought a new mission to their lives (Southwick & Charney, 2012).

One of the characteristics of psychological resilience is that it enables withdrawal with flexible adaptability in intense threats and crisis situations encountered in life. Studies have shown that positive emotions lead to creative thoughts in the individual in times of stress (Onwukwe, 2010). Resilient people tend to be flexible. They do not keep to a single method in coping with the difficult situations they experience. They can move from one coping strategy to another depending on the circumstances. (Southwick & Charney, 2012).

Individuals with high psychological resilience have a higher ability to cope with unexpected events that may occur in the future (Tompkins & Adger, 2004). The obscurity or uncertainty in the pandemics creates anxiety. Each person's reaction to such worrisome situations of uncertainty can be different. Some individuals can easily identify solutions to these situations and continue their lives. It is seen that especially individuals with high psychological resilience can continue their lives in the face of intense threats and in crisis situations. However, while life is full of uncertainties that may emerge at any time, people intolerant to uncertainty can easily find many reasons to worry and they mostly focus on this worry and anxiety. Also, they have difficulty in making decisions and finding solutions to get rid of the uncertainty in question (Dugas, Buhr & Ladouceur, 2004). These individuals experience an intense threat perception, see uncertain situations in life as intolerable and challenging, and may experience various mental disorders (Carleton et al., 2012). Intolerance of uncertainty is defined as the individual's belief that uncertain situations will result in negativity and perceiving uncertainty as a threat (Carleton, 2012). Individuals who are intolerant of uncertainty use inappropriate coping skills due to negative emotions and may act impulsively (Robichaud, 2013; Pawluk & Koerner, 2016). This situation causes individuals to experience intense stress and impairs their functionality (Barahmand & Haji, 2014). The fact that the pandemic process is a compelling life event can increase the anxiety level of individuals with intolerance towards uncertainty (Asmundson & Taylor, 2020).

Some studies on the variables of hostility, psychological resilience, and intolerance of uncertainty have been conducted so far. In one such study, which was conducted during the latest pandemic by Becerra-García, Giménez Ballesta, Sánchez-Gutiérrez, Barbeito Resa, and Calvo Calvo (2020) with 151 participants aged 18-76, it is revealed that individuals aged 18-35 have higher hostility rates. In another research study, conducted by Bartos, Bauer, Cahlíková, and Chytilová, (2020) with 2186 people in the pandemic, it is revealed that hostility towards foreigners increased in the Czech Republic. In yet another study conducted during the pandemic by Becerra-García, Giménez Ballesta, Sánchez-Gutiérrez, Barbeito

Resa & Calvo Calvo (2020) with 151 people aged 18-76 years, it is seen that younger participants aged 18-35 have shown higher levels of hostility, depression, anxiety, and interpersonal sensitivity. One more study conducted during the pandemic by Achterberg, Dobbelaar, Boer, and Crone (2021) with 106 parents and 151 children shows that there is a significant increase in the negative emotions of parents, such as anxiety, depression, hostility, and interpersonal sensitivity.

World Health Organization (WHO) Europe director Kluge emphasizes that maintaining our optimism during the pandemic and trying to stay physically and mentally healthy has an important role in increasing psychological resilience. He states that the greatest strengths we have as human beings in managing stressful life events such as pandemics are psychological resilience and cooperation (Kluge, 2020). In a study conducted by Baykal (2020) with 191 people, it was found that high levels of anxiety reduce the level of psychological resilience and decrease life satisfaction. A research study conducted by Celebi (2020) with 499 people revealed that individuals with low psychological resilience during the pandemic are more negatively affected by the COVID-19 pandemic. In a study conducted by Kasapoglu (2020) with 565 adult individuals during the COVID-19 pandemic, it is seen that psychological resilience directly, significantly, and negatively affects intolerance to uncertainty. Yet another study conducted by Guduk, Guduk, and Vural (2021) with 284 healthcare professionals showed that individuals who have not stayed in quarantine, have worked flexible hours, and lived with their friends have lower intolerance of uncertainty. Social support network, which is one of the components of psychological resilience, seems to reduce intolerance of uncertainty. Duman (2020) revealed through 100 university students that the students are moderately intolerant to uncertainty and that there is a positive relationship between the fear of COVID-19 and intolerance of uncertainty.

Based on the above-mentioned literature, it is thought that an increase in the level of intolerance to uncertainty may cause the individual to experience difficulties in life and develop hostile feelings and actions. It is suggested that individuals with high psychological resilience may have a higher level of tolerance to uncertainty and a decrease in hostile emotions and actions. The aim of this study was to examine the relationship between hostility, resilience, and intolerance of uncertainty within the framework of structural equation modeling. In order to determine the relationship between the concepts, structural equation modeling was made, and the mediation role of resilience between hostility and intolerance of uncertainty was investigated.

Method

Research Model and Participants

The aim of this study was to examine the relationship between hostility, resilience, and intolerance of uncertainty within the framework of structural equation

modeling. The relationships between variables were investigated using the Structural Equation Model (SEM), which is a statistical analysis that integrates a number of statistical techniques and which investigates and tests the predictive relationships between variables in a multidimensional way (Şimşek, 2020).

The study was carried out through an online data collection platform. The individuals participating in the study were over the age of 18, could understand Turkish, and volunteered to participate in the research. Ethics committee approval for the study was received from the ethical committee of Okan University, Turkey, on 10.03.2021. The privacy of all the participants was protected, and confidentiality requirements for data collection and analysis were strictly followed. It was guaranteed that the data obtained would be stored in encrypted files and would not be shared with anyone or any organization other than scientific research. Informed consent was obtained from the participants who agreed to participate in the research. Thus, this research study complies with research publishing ethics. The authors declare no conflicts of interest.

Before proceeding to the answering phase of the scale items, information on demographic variables of age and gender was collected in order to describe the participants. A total of 359 individuals participated in the study in Turkey. The mean age of the sample was 29.08 (SD=9.52) ranging from 18 to 67 years. Of the participants, 292 were female (81.3%) and 67 were male (18.7%).

Research Instruments

The Short version of the intolerance of uncertainty scale (ius-12) (Sarıçam, Erguvan, Akın, Akça, 2014):

The validity and reliability of the scale were investigated by test-retest, Cronbach alpha, exploratory and confirmatory factor analysis, and criterion-related validity methods. Coping Flexibility Scale and Educational Stress Scale were used for criterion-related validity. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was found as .85. A significant result on Bartlett's test of Sphericity $\chi 2= 5052,53$ ($p< .001$, $df= 66$) was also found. Results confirmatory factor analyses demonstrated that 12 items yielded two factors as original form and that the two-dimensional model was well fit ($\chi^2= 147.20$, $df= 48$, RMSEA=.073, CFI=.95, IFI=.95, GFI=.94, and SRMR=.046). Factor loadings ranged from .55 to .87. Cronbach alpha internal consistency coefficient was found as .88 for overall scale, .84 for prospective anxiety subscale, and .77 for inhibitory anxiety subscale. In the concurrent validity, significant relationships were found between the Intolerance of Uncertainty Scale (IUS-12) and Coping Flexibility Scale, Educational Stress Scale ($r= -.43, .41$ respectively). The test-retest reliability coefficient was .74. Corrected item-total correlations ranged from .42 to .68.

Brief Resilience Scale (Doğan, 2015):
The Brief Resilience Scale (BRS) was developed to measure the level of individual resilience. The psychometric properties of the scale were examined by internal consistency, exploratory and confirmatory factor analysis methods, and criterion-related validity. After the exploratory and confirmatory factor analysis, it comes to the view that the scale has a structure with only one factor. Related to the BRS, the internal consistency coefficient was found .83. In the context of the criterion-related validity, positive correlations were found between BRS and Oxford Happiness Questionnaire, Ego Strength Scale, and Connor Davidson Resilience Scale. It is concluded that the BRS is a valid and reliable instrument to measure the resilience levels of individuals.

Hostility in Pandemic Scale (HPS) (Tunç, Parlak, Uluman & Eryiğit, 2021):
Hostility in Pandemic Scale (HPS) was developed to measure the hostility levels of individuals, which is a factor affecting the mental well-being of society during the pandemic. The study group consists of 855 individuals between the ages of 18-65 from different genders, socioeconomic levels, who have experienced the pandemic process. For the construct validity of the scale results, exploratory factor analysis was made and a one-dimensional structure consisting of 22 items was presented. It was determined that the variance explained by the scale showing a one-dimensional structure was 42.2. As a result of the confirmatory factor analysis performed through a separate study group, it was revealed that all the items have significant t values, and the model established according to model fit indexes has meaningful and acceptable fit values. Buss-Perry Aggression Scale was applied with HPS for criterion validity. As a result of the criterion validity analysis, a significant relationship was found between the scale results. The internal consistency of the scale results was calculated with Cronbach Alpha, and a reliability level of 0.93 was obtained. Test-retest reliability results were found to be 0.89. Item statistics also revealed that 22 items are discriminant.

The strategy of analysis

The aim of this study was to examine the relationship between hostility, resilience, and intolerance of uncertainty within the framework of structural equation modeling. To determine the relationship between the concepts, structural equation modeling was made, and the mediation role of resilience between hostility and intolerance of uncertainty was investigated.

First, the measurement model was estimated prior to the structural model. For measurement and structural model, the hostility and resilience construct was defined using item-parceling, since hostility and resilience have only one factor. Item parceling is a method that normalizes the distribution of observed variables and increases the reliability of these indicators (Şimşek, 2020). If the main purpose of the study is to examine the structural relationships among multiple constructs, parceling greatly helps to eliminate theoretically unimportant noises, and thus, to unveil the latent structure that otherwise may be eclipsed by measurement and sampling error debris (Matsunaga, 2008). The aim of this study was to examine the structural relationships among multiple constructs, so indicators as parcels were created for hostility and resilience latent variables by rank-ordering the items by the size of the item-total correlation and summing up the sets of items to obtain equivalent indicators for those constructs. Thus, four parcels for hostility and two parcels for resilience were created.

After the descriptive statistics and correlation analysis, the measurement model was tested before the structural model. The Maximum Likelihood estimation method was preferred because its fit values are less likely to be influenced by sample size and distribution than other methods are (Hu & Bentler, 1998; Anderson & Gerbing, 1988). There are different goodness-of-fit indices used in the evaluation of the model fit, and these indices limit values for accepting the model. Chi-Square Goodness of Fit is the most commonly used goodness-of-fit index among the suggested indexes. Due to the sensitivity of the Chi-Square statistic regarding sample size, researchers developed alternative goodness-of-fit measures, such as RMSEA, GFI, CFI, SRMR, IFI, NNFI, and RMR (Kline, 2005; Şimşek, 2020).

To analyze the mediation role of resilience between hostility and intolerance of uncertainty, Bootstrap analysis was applied. This analysis was carried out at a 95% confidence interval, and the number of Bootstrap samples was adjusted to 5000. The absence of the "0" value between lower (BootLLCI) and upper (BootULCI) Bootstrap values have been interpreted as the effect of the mediator variable is significant (Hayes, 2018).

The distribution of the variables was analyzed by using skewness and kurtosis value. All the values were between -1.00 and +1.00. Skewness for hostility scales ranged from -0.23 and 0.68; kurtosis ranged from -0.60 and 0.03., skewness for resilience scales ranged from -0.21 and 0,27; kurtosis ranged from to -0.37 and -0.16. Skewness for intolerance of uncertainty scales ranged from -0.26 and -0.05; and finally, kurtosis ranged from -0.91 and -0.11. These results indicate that there was no problem with normal distribution for any variables and that all the variables were normally distributed in the sample. In addition to the skewness and kurtosis analyses, the Kolmogorov-Smirnov test was used, and the results ($p > .05$) supported the normality.

Results

Test of the measurement model

First of all, the descriptive statistics and correlation values of the observed variables were examined. Means, standard deviations, and correlations of observed variables are shown in Table 1.

Table 1. Means, standard deviations, and correlations of observed variables.

Observed variables	M	SD	1	2	3	4	5	6	7	8
Hostility										
1 H1PARCEL	11.39	4.38	1.00							
2 H2PARCEL	12.73	4.89	.81**	1.00						
3 H3PARCEL	15.25	5.24	.84**	.80**	1.00					
4 H4PARCEL	13.28	5.12	.82**	.79**	.77**	1.00				
Intolerance of Uncertainty										
5 IU1	23.65	5.73	.44**	.49**	.51**	.44**	1.00			
6 IU2	15.72	5.63	.43**	.43**	.43**	.40**	.75**	1.00		
Resilience										
7 R1PARCEL	9.61	3.00	-.26**	-.28**	-.25**	-.24**	-.47**	-.51**	1.00	
8 R2PARCEL	9.47	2.77	-.19**	-.17**	-.17**	-.11*	-.37**	-.44**	.79**	1.00

Notes: N=359. **p <0.01 *p <0.05
H1PARCEL-H4PARCEL= parcels created for Hostility; R1PARCEL-R2PARCEL= parcels created for Resilience; IU1: prospective anxiety subscale IU2: inhibitory anxiety subscale.

Before the measurement model was tested, the correlations between all the latent variables in the model were checked and all of them were found statistically significant (p <.01, see Table 2).

Table 2. Correlations among the latent variables

Latent variables	1	2	3
1 Hostility	1.00	0.58**	-0.31**
2 Intolerance of Uncertainty	-	1.00	-0.57**
3 Resilience			1.00

Notes: N= 359, **p<.01.

After descriptive statistics and correlation values, the measurement model was tested. Factor loadings, standard errors, and t-values for the measurement model

are shown in Table 3, and standardized parameter estimates for the measurement model are shown in Figure 1.

Table 3. Factor loadings, standard errors, and t-values for the measurement model.

Measure and variable	Unstandardized factor loading	SE	t	Standardized factor loading
Hostility				
H1PARCEL	4.07	0.31	23.04	0.93
H2PARCEL	4.28	0.52	20.74	0.87
H3PARCEL	4.75	0.51	21.93	0.90
H4PARCEL	4.52	0.54	21.10	0.88
Intolerance of Uncertainty				
IU1	4.94	1.33	18.42	0.86
IU2	4.92	1.29	18.78	0.87
Resilience				
R1PARCEL	2.96	0.57	19.79	0.98
R2PARCEL	2.23	0.38	15.85	0.81

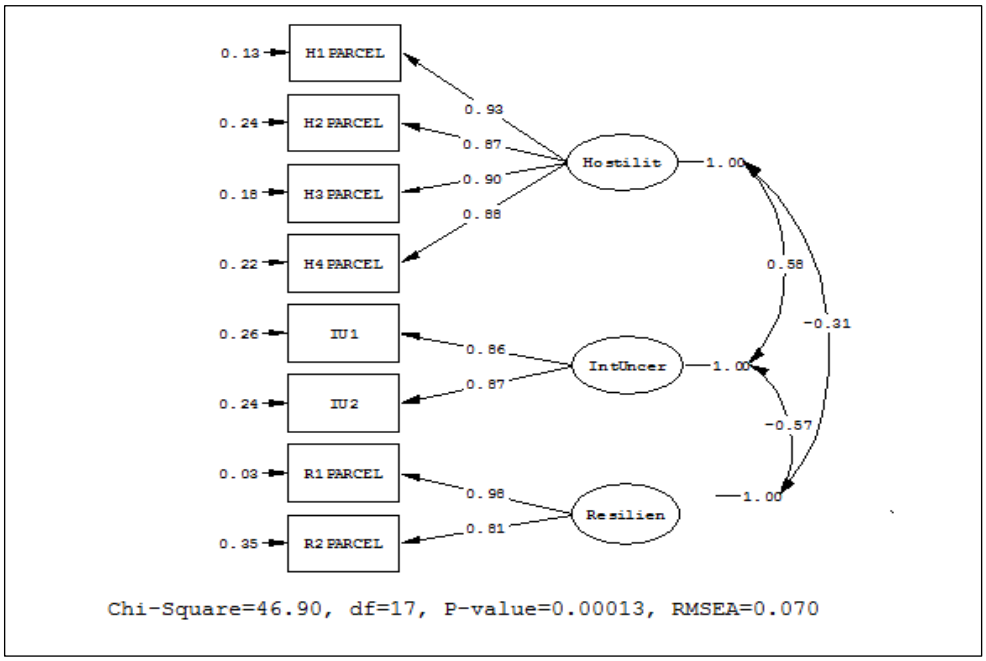


Figure 1. Standardized parameter estimates for measurement model.

The test of the measurement model resulted in an acceptable fit to the data, as indicated by the following goodness of fit statistics: $\chi 2$ (17, N=359) = 46.90; Root Mean Square Error of Approximation (RMSEA) = 0.070 (90 Percent Confidence Interval for RMSEA = (0.047;0.094); Goodness of Fit Index (GFI) = 0.97; Comparative Fit Index (CFI) = 0.99; Standardized Root Mean Square Residual (SRMR)= 0.028; Incremental Fit Index (IFI) = 0.99; Non-Normed Fit Index (NNFI) = 0.98; Root Mean Square Residual (RMR) = 0.59. As Table 3 demonstrates, all loadings of the measured variables on the latent constructs were statistically significant.

Test of the structural models

Within the aim of the research, firstly the direct relationship between hostility and intolerance of uncertainty was tested and shown in Figure 2.

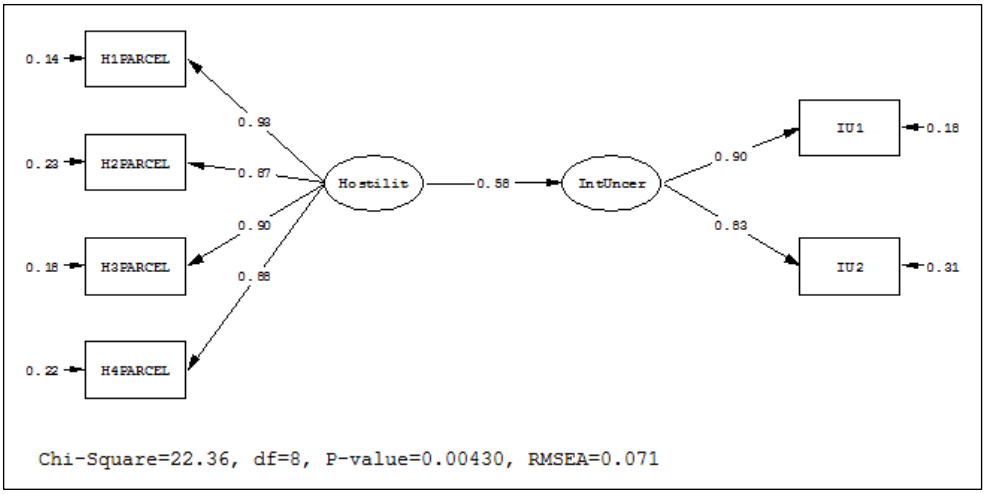


Figure 2. Standardized parameter estimates for the direct relationship between hostility and intolerance of uncertainty

The test of the direct relationship between hostility and intolerance of uncertainty model resulted in an acceptable fit to the data, as indicated by the following goodness of fit statistics: $\chi 2$ (8, N=359) = 22.36; Root Mean Square Error of Approximation (RMSEA) = 0.071 (90 Percent Confidence Interval for RMSEA= (0.037 ; 0.11); Goodness of Fit Index (GFI) = 0.98; Comparative Fit Index (CFI)= 0.99; Standardized Root Mean Square Residual (SRMR) = 0.017; Incremental Fit Index (IFI) = 0.99; Non-Normed Fit Index (NNFI) = 0.99; Root Mean Square Residual (RMR) = 0.48.

Then, the direct relationship between hostility and intolerance of uncertainty, and the mediation role of resilience between hostility and intolerance of uncertainty were investigated and shown in Figure 3.

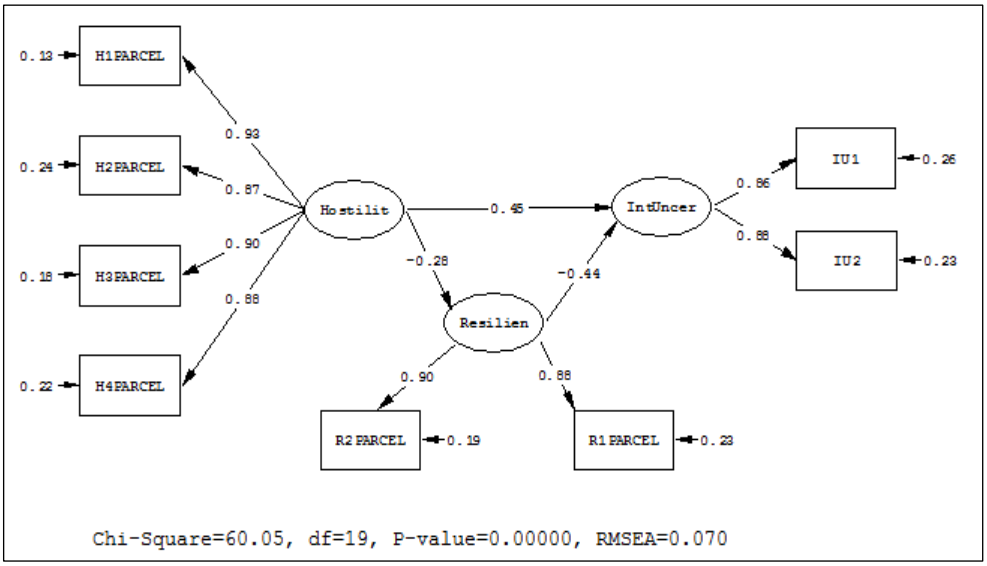


Figure 3. Standardized parameter estimates for the mediation role of resilience between hostility and intolerance of uncertainty

The test of the mediation role of resilience between hostility and intolerance of uncertainty model resulted in an acceptable fit to the data, as indicated by the following goodness of fit statistics: $\chi 2$ (19, N=359) = 60.05; Root Mean Square Error of Approximation (RMSEA) = 0.07 (90 Percent Confidence Interval for RMSEA = (0.056 ; 0.10); Goodness of Fit Index (GFI) = 0.96; Comparative Fit Index (CFI) = 0.98; Standardized Root Mean Square Residual (SRMR) = 0.044; Incremental Fit Index (IFI) = 0.98; Non-Normed Fit Index (NNFI) = 0.97; Root Mean Square Residual (RMR) = 0.77.

The path coefficient between hostility and intolerance of uncertainty in the basic model decreases from 0.58 to 0.45 in the mediation model. The relationship between hostility and intolerance of uncertainty decreases in this way in the mediation model but still indicates a significant relationship, which points out the partial mediating effect of resilience between these two variables (Baron & Kenny, 1986).

Bootstrap Analysis

Although the structural model resulted in a good fit to the data, bootstrap confidence intervals were calculated for mediation. The bootstrapping procedure is used to determine whether or not the indirect pathways were significantly different

from zero (Shrout & Bolger, 2002). This method is based on testing the significance of the indirect paths from the independent variable (hostility) to the mediator (resilience) and from the mediator to the dependent variable (intolerance of uncertainty). Bootstrapping produces a large number of samples from the dataset and uses them to obtain estimates of the standard errors. In the present study, 5.000 bootstrap samples were drawn. The interval confidence of these standard errors is considered when testing the significance of indirect effects. These standard errors were used to calculate the 95% confidence interval (CI) for each indirect effect. Significant mediation is indicated when the upper and the lower limits of the 95% CI do not include zero.

The results of the Bootstrap analysis, used to determine whether the mediation role of resilience between hostility and intolerance of uncertainty is statistically significant, are given in Table 4.

Table 4. Bootstrap analysis results regarding the indirect effect of resilience.

Standardized indirect effect	Boot standard error	BootLLCI (Lower value)	BootULCI (Upper value)
0.057	0.013	0.031	0.085

Standardized values for lower value is: 0.031 and upper value is: 0,085. Significant mediation is indicated when the upper and the lower limits of the 95% CI do not include zero.”0” is not between these two values, so it can be said that the mediation role of resilience between hostility and intolerance of uncertainty is statistically significant.

Discussion

It is claimed that situations such as social distance, isolation, losing a close person, being infected, and the uncertainty of the course of the COVID-19 pandemic cause negative psychological effects on some individuals (Bhuiyan et al., 2020). It is stated that the challenging life situations caused by COVID-19 result in various psychosocial problems, such as depression, anxiety, and somatization (Arslan et al., 2020; Satici, Kayis, Satici, Griffiths & Can, 2020). For this reason, the mediation of psychological resilience between hostility and intolerance to uncertainty has been investigated in this study. According to the results of the research, it is determined that psychological resilience is a partial mediator variable between hostility and intolerance to uncertainty. The relationship between hostility and intolerance to uncertainty changes when resilience enters the model. Psychological resilience is determined as a variable that reduces the strength of the relationship between the two variables.

In the research carried out in the period of March-May 2021, when the Covid-19 pandemic continued to affect individuals, it is seen that hostility increases as the intolerance of uncertainty increases. Supporting the results of the research, the finding in the literature that individuals who are intolerant of uncertainty tend to resort to maladaptive coping behavior to get rid of negative emotions (Robichaud, 2013) and that they can turn to impulsive behavior (Pawluk & Koerner, 2013; Pawluk & Koerner, 2016). In a study conducted by Celik et al. (2021) with 714 people during the COVID-19 period, it is concluded that as the intolerance of uncertainty increases, there is an increase in hostile behaviors, similar to the results of the current research. In a study conducted by Rona, et al., (2007), it is stated that uncertainty causes feelings of intolerance and tension in people. Aytac and Aydın's study (2021), conducted with 283 healthcare professionals, found that COVID-19 has increased the burnout and hostility levels of individuals, in support of the research results. In a study conducted with 256 participants in Morocco, it is concluded that psychological problems resulting from suspicion, hostility, and fear of losing autonomy, and feelings of inadequacy, restlessness, and discomfort during interpersonal interactions are experienced during the COVID-19 pandemic (Sfendla & Hadrya, 2020). The coronavirus pandemic can lead to mental anger, intolerance, feelings of tension, unhappiness, feelings of helplessness, burnout, guilt, loneliness, aimlessness, and pessimism in individuals. In this case, it can cause anxiety disorders, depressive disorders, acute stress response, sleep disorders, post-traumatic stress disorder, and alcohol-substance use disorders (Aslan & Turkili, 2021).

In the study conducted, it has been concluded that as psychological resilience increases, intolerance to uncertainty decreases. Supporting the result of the research, a study conducted with 565 adult individuals during the COVID-19 pandemic shows that psychological resilience has a direct, significant, and negative effect on intolerance against uncertainty (Kasapoglu, 2020). In studies conducted with different sample groups, it is seen that intolerance of uncertainty during the COVID-19 pandemic reduces the psychological resilience of individuals (Karatas & Tagay, 2021; Di Blasi, et al., 2021). In a study conducted by Bozdag (2020) with 237 adult individuals, it is determined that the participants with higher levels of psychological resilience have lower levels of depression and anxiety. Altundag (2021), in a study examining 841 people through regression analysis, found a negative significant relationship between fear of COVID-19 and resilience.

In the research that tested the mediation of psychological resilience between hostility and intolerance to uncertainty, it is concluded that as psychological resilience increases, intolerance to uncertainty decreases, and this also decreases hostility. In a study conducted by Cevizci (2019) with 106 healthcare professionals, it was found that employees with low psychological resilience have higher anger/aggression levels than employees with high psychological resilience. With the examination of user correspondence on the social media platform Weibo in China, the expressions of anxiety, depression, anger, and happiness were detected in the data obtained in the study conducted during the COVID-19 pandemic, and it was

determined that while anger, anxiety, and depression increases, happiness decreases (Li, et al., 2020). In a study conducted by Bilge & Bilge (2020), it is stated that individuals with low psychological resilience and who use a dysfunctional coping style with stress feel the need for psychological help more. A decrease in the level of resilience may lead to a decrease in the self-control capacity of the individual, which can lead to hostile behavior (Soysal, 2016). In the reports of the WHO, it is stated that psychological resilience is an important tool in coping with the psychological effects of COVID-19 (Kluge, 2020). These studies, which support the research results, show that psychological resilience reduces intolerance to uncertainty and thus reduces hostility. The obscurity or uncertainty in the pandemic creates anxiety. It seems likely that individuals with a low tolerance to uncertainty may experience failure in maintaining their life and functionality and may develop hostile feelings and actions. Psychological resilience is thought to have an important role in overcoming this process in a healthy way.

Resilience is vital for effectively coping with adversity, uncertainty, and change. It is stated that the psychological resilience levels of individuals have decreased during the pandemic (Killgore et al., 2020). It is important to examine the effects of the changes experienced on the mental well-being of the individual in order to improve the resilience necessary for the well-being of the individual and the protection of mental health during the pandemic. The process experienced in determining the strategies of mental health services and creating intervention steps should be understood. The ability of the individual to manage the internal anger caused by uncertainty, perceiving the other as a threat, and developing hostility both directly affect the mental health of the individual and negatively affect the dynamics of social solidarity and the fight against the pandemic. Identifying the mental dynamics experienced through this study is important in terms of community mental health. In order to control the feelings of intolerance and hostility toward uncertainty, which are risky for the psychological health of individuals during the COVID-19 pandemic, the protective intervention factors of improving psychological resilience and increasing the capacity to tolerate uncertainty should be addressed for the good of individual and social mental health.

Although advanced statistical procedures have been used in this study to examine the mediation of resilience between hostility and intolerance to uncertainty, some limitations should be noted. In the present study, data have been obtained using self-report measures, so only the psychological resilience variable has been included in the model as a mediator variable. However, in future research, the model can be tested by using different mediating variables between hostility and intolerance to uncertainty. The current research is carried out in the screening model, but experimental studies can also be carried out by applying a program to increase the psychological resilience levels of individuals. Furthermore, the participants were mostly women, and thus gender-based differences could not be mentioned in this research. In future studies, examining these variables through gender-based

differences could contribute a lot to the literature. Despite its limitations, the findings of this study could help mental health professionals to treat mental health problems caused by the COVID-19 pandemic.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Acknowledgements

We would like to thank all of the participants who participated in this study for their support.

Funding Information

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical Consideration

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Ethics committee approval for the study was received from the ethical committee of Okan University, Turkey, on 10/03/2021. The privacy of all participants was protected, and confidentiality requirements for data collection and analysis were strictly followed. Thus, this research study complies with research publishing ethics. The authors declare no conflicts of interest.

References

Achterberg, M., Dobbelaar, S., Boer, O. D., & Crone, E. A. (2021). Perceived stress as mediator for longitudinal effects of the COVID-19 lockdown on wellbeing of parents and children. *Scientific reports, 11*(1), 1-14.

Altundağ, Y. (2021). Erken dönem covid-19 pandemisinde covid-19 korkusu ve psikolojik dayanıklılık. *EKEV Akademi Dergisi, (85)*, 499-516.

Anderson, J. C., & D. W. Gerbing. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103*(3), 411-23.

Arslan, G., Yıldırım, M., Tanhan, A., Buluş, M., & Allen, K. A. (2020). Coronavirus stress, optimism-pessimism, psychological inflexibility, and psychological health: Psychometric properties of the Coronavirus Stress Measure. *International Journal of Mental Health and Addiction*, 1-17. https://doi.org/10.1007/s11469-020-00337-6.

Aslan, E., & Türkili, S. (2021). İzolasyon ve karantinanın ruh sağlığı üzerine etkileri. *Mersin Üniversitesi Sağlık Bilimleri Dergisi, 14*(1), 133-145. doi:10.26559/mersinsbd.868398.

Asmundson, G. J., & Taylor, S. (2020). Coronaphobia: Fear and the 2019-nCoV outbreak. *Journal of Anxiety Disorders, 70*, 1-2.

Aytaç, S., & Aydın, G. Ç. (2021). *Psikolojik sağlik, tükenmişlik ve işten ayrilma niyeti ilişkisi: sağlik çalişanlari üzerine bir araştirma. sosyo-ekonomik boyutuyla sağlik.* Uluslararası Farklı Boyutlarıyla Sağlık Konferansı (ICDAH2020) 12-14 Kasım 2020 Seçme Bildiriler-1, 79.

Barahmand, U.,& Haji, A. (2014). The impact of intolerance of uncertainty, worry and irritability on quality of life in persons with epilepsy: Irritability as mediator. *Epilepsy research, 108*(8), 1335-1344.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, *51*(6), 1173.

Bartos, V., Bauer, M., Cahlíková, J., & Chytilová, J. (2020). Covid-19 crisis fuels hostility against foreigners. Available at SSRN 3593411.

Baykal, E. (2020). COVID-19 bağlamında psikolojik dayanıklılık, kaygı ve yaşam doyum ilişkisi. *International Journal of Social and Economic Sciences, 10*(2), 68-80.

Becerra-García, J. A., Giménez Ballesta, G., Sánchez-Gutiérrez, T., Barbeito Resa, S., & Calvo Calvo, A. (2020). Psychopathological symptoms during Covid-19 quarantine in spanish general population: a preliminary analysis based on sociodemographic and occupational-contextual factors. *Revista espanola de salud publica; 94*. ID: covidwho-593636.

Bhuiyan, A. I., Sakib, N., Pakpour, A. H., Griffiths, M. D., ve Mamun, M. A. (2020). COVID-19-related suicides in Bangladesh due to lockdown and economic factors: case study evidence from media reports. *International Journal of Mental Health and Addiction*, (Online First). https://doi.org/10.1007/s11469-020-00307-y.

Bilge, Y., & Bilge, Y. (2020). Koronavirüs salgını ve sosyal izolasyonun psikolojik semptomlar üzerindeki etkilerinin psikolojik sağlamlık ve stresle baş etme tarzları açısından incelenmesi. *Klinik Psikiyatri Dergisi, 23*. (1): 38-51. DOI: 10.5505/kpd.2020.66934.

Bozdağ, F. (2020). Pandemi sürecinde psikolojik sağlamlık. *Turkish Studies, 15*(6), 247-257.https://dx.doi.org/10.7827/TurkishStudies.44890.

Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Research,* 112934. https://doi.org/10.1016/j.psychres.2020.112934.

Carleton R.N. (2012). The intolerance of uncertainty construct in the context of anxiety disorders: theoretical and practical perspectives. *Expert Review of Neurotherapeutics, 12* (8), 937-947.

Carleton R.N., Mulvogue M.K., Thibodeau M.A., McCabe R.E., Antony M.M & Asmundson G.J.G. (2012). Increasingly certain about uncertainty: Intolerance of uncertainty across anxiety and depression. *Journal of Anxiety Disorders, 26* (3), 468-479.

Çelebi, G. Y. (2020). Covid 19 Salgınına İlişkin Tepkilerin Psikolojik Sağlamlık Açısından İncelenmesi. *IBAD Sosyal Bilimler Dergisi, 8*, 471-483.

Celik, D., Alpay, E. H., Celebi, B., & Turkeli, A. (2021). Intolerance of uncertainty, rumination, post-traumatic stress symptoms and aggression during COVID-19: a serial mediation model. *European journal of psychotraumatology*, *12*(1), 1953790. Doi:10.1080/20008198.2021.1953790.

Cevizci, O. (2019). *Sağlık Çalışanlarında Psikolojik Dayanıklılık ile Psikolojik Belirtilerin İlişkinin İncelenmesi*. Yayınlanmamış Yüksek Lisans Tezi. Sosyal Bilimler Enstitüsü, Lefkoşa: Yakın Doğu Üniversitesi. Kıbrıs.

Di Blasi, M., Gullo, S., Mancinelli, E., Freda, M. F., Esposito, G., Gelo, O. C. G., ... & Coco, G. L. (2021). Psychological distress associated with the COVID-19 lockdown: A two-wave network analysis. *Journal of affective disorders, 284*, 18-26.

Doğan, T. (2015). Adaptation of the Brief Resilience Scale into Turkish: A validity and reliability study. *The Journal of Happiness & Well-Being*, *3*(1), 93-102.

Dugas, M. J., Buhr, K. & Ladouceur, R. (2004). The role of intolerance of uncertainty in etiology and maintenance. In R. G. Heimberg, C. L. Turk, & D. S. Mennin (Eds.), *Generalized anxiety disorder: Advances in research and practice* (pp. 143-163). New York: Guilford Press.

Duman, N. (2020). Üniversite öğrencilerinde COVID-19 korkusu ve belirsizliğe tahammülsüzlük. *The Journal of Social Science, 4*(8), 426-437.

Eckhardt, C. Norlander, B. & Deffenbacher, J. (2004). The assessment of anger and hostility: A critical review. *Aggression and Violent Behavior, 9*(1), 17-43.

Güdük, Ö., Güdük, Ö., & Vural, A. (2021). COVID-19 küresel salgınında sağlık çalışanlarının belirsizliğe tahammülsüzlüğünün değerlendirilmesi. *Hacettepe Sağlık İdaresi Dergisi, 24*(1), 139-150.

Hayes, A. F. (2018). Partial, conditional, and moderated mediation: Quantification, inference, and interpretation. *Communication monographs*, *85*(1), 4-40.

Hu, L. T., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods, 3*(4), 424-453.

J. J. (2020). Threat of COVID-19 and emotional state during quarantine: Positive and negative affect as mediators in a cross-sectional study of the Spanish population. *Plos one, Public Library of Science 15*(6), 1-11. https://doi.org/10.1371/journal.pone.0235305.

Jones, N. M., Thompson, R. R., Schetter, C. D., & Silver, R. C. (2017). Distress and rumor exposure on social media during a campus lockdown. *Proceedings of the National Academy of Sciences, 114*(44), 11663-11668.

Karataş, Z., & Tagay, Ö. (2021). The relationships between resilience of the adults affected by the covid pandemic in Turkey and Covid-19 fear, meaning in life, life satisfaction, intolerance of uncertainty and hope. *Personality and Individual Differences, 172*, 110592.

Kasapoğlu, F. (2020). COVID-19 salgını sürecinde kaygı ile maneviyat, psikolojik sağlamlık ve belirsizliğe tahammülsüzlük arasındaki ilişkilerin incelenmesi. *Turkish Studies, 15*(4), 599-614. https://dx.doi.org/10.7827/TurkishStudies.44284.

Killgore, W. D. S., Taylor, E. C., & Cloonan, S. A. (2020). Psychological resilience during the COVID-19 lockdown. *Psychiatry Research, 291*, 113216. https://doi.org/10.1016/j.psychres.2020.113216.

Kluge, H. H. P. (2020). *Statement – Physical and mental health key to resilience during COVID-19 pandemic. 26 March 2020, Copenhagen, Denmark*. http://www.euro.who.int/en/mediacentre/sections/statements/2020/statement-physical-and-mental-health-key-to-resilienceduring-covid-19-pandemic.

Kline, R.B. (2005). *Principles and practice of structural equation modeling.* New York: The Guilford Press.

Kobasa, S. C. (1979). Stressful life events, personality, and health: an ınquiry into hardiness. *Journal of Personality and Social Psychology*: *37*(1). 1-17.

Lee, S. M., Kang, W. S., Cho, A. R., Kim, T., & Park, J. K. (2018). Psychological impact of the 2015 MERS outbreak on hospital workers and quarantined hemodialysis patients. *Comprehensive psychiatry, 87*, 123-127.

Li, S., Wang, Y., Xue, J., Zhao, N., & Zhu, T. (2020). The impact of COVID-19 epidemic declaration on psychological consequences: a study on active Weibo users. *International journal of environmental research and public health, 17*(6), 2032.

Matsunaga, M. (2008). Item parceling in structural equation modeling: A primer. *Communication methods and measures*, *2*(4), 260-293.

Onwukwe, Y. U. (2010). *The relatıonshıp between posıtıve emotıons and psychological resılıence in persons experıencıng traumatıc crisis: a quantitative approach*. The Degree Doctor of Philosophy, Capella University, United States.

Pawluk, E. J., & Koerner, N. (2016). The relationship between negative urgency and generalized anxiety disorder symptoms: The role of intolerance of negative emotions and intolerance of uncertainty. *Anxiety, Stress, & Coping, 29*(6), 606-615.

Pawluk, E. J.,& Koerner, N. (2013). A preliminary investigation of impulsivity in generalized anxiety disorder. *Personality and Individual Differences, 54*(6), 732-737. Pawluk, E. J.,& Koerner, N. (2016). The relationship between negative urgency and generalized anxiety disorder symptoms: The role of intolerance of negative emotions and intolerance of uncertainty. *Anxiety, Stress, & Coping, 29*(6), 606-615.

Pérez-Fuentes, M. D. C., Molero Jurado, M. D. M., Martos Martínez, Á. & Gázquez Linares, J. J. (2020). Threat of COVID-19 and emotional state during quarantine: Positive and negative affect as mediators in a cross-sectional study of the Spanish population. *PloS one, 15*(6), e0235305.

Robichaud, M. (2013). Cognitive behavior therapy targeting intolerance of uncertainty: Application to a clinical case of generalized anxiety disorder. *Cognitive and Behavioral Practice, 20*(3), 251-263.

Robichaud, M. (2013). Cognitive behavior therapy targeting intolerance of uncertainty: Application to a clinical case of generalized anxiety disorder. *Cognitive and Behavioral Practice, 20*(3), 251-263.

Rona, R. J., Fear, N. T., Hull, L., Greenberg, N., Earnshaw, M., Hotopf, M., & Wessely, S. (2007). Mental health consequences of overstretch in the UK armed forces: first phase of a cohort study. *Bmj, 335*(7620), 603.

Sarıçam, H., Erguvan, F. M., Akın, A., & Akça, M. Ş. (2014). The Turkish short version of the intolerance of uncertainty (IUS-12) scale: The study of validity and reliability. *Route Educational and Social Science Journal*, *1*(3), 148-157.

Satici, S. A., Kayis, A. R., Satici, B., Griffiths, M. D., ve Can, G. (2020). Resilience, hope, and subjective happiness among the Turkish population: fear of Covıd-19 as a mediator. *International Journal of Mental Health and Addiction,* (Online First) 1-16. https://doi.org/10.1007/s11469-020-00443-5.

Sfendla, A., & Hadrya, F. (2020). Factors associated with psychological distress and physical activity during the COVID-19 pandemic. *Health security*, *18*(6), 444-453. doi.org/10.1089/hs.2020.0062.

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: new procedures and recommendations. *Psychological methods*, *7*(4), 422.

Şimşek, Ö. F. (2020). *Yapısal eşitlik modellemesine giriş: temel ilkeler ve LISREL uygulamaları.* Ankara: Ekinoks Yayıncılık.

Southwick, S. M. & Charney, D. S. (2012). *Resilience: the science of mastering life's greatest challenges.* New York: Cambridge University Press.

Soysal, M. N. (2016). *Facebook Bağımlılığı ve Psikolojik Dayanıklılık*. Yayınlanmamış Yüksek Lisans Tezi, İstanbul Gelişim Üniversitesi Sosyal Bilimler Enstitüsü, İstanbul.

Spielberger, C. D., Jacobs, G., Russell, S., & Crane, R. S. (1983). Assessment of anger: The state-trait anger scale. *Advances in personality assessment, 2*, 161-189.

T. C. Sağlık Bakanlığı. (2020). *COVID-19 (Yeni Koronavirüs Hastalığı) Nedir?* https://covid19bilgi.saglik.gov.tr/tr/covid-19-yeni-koronavirus-hastaligi-nedir.

Tompkins, E., & Adger, W. N. (2004). Does adaptive management of natural resources enhance resilience to climate change?. *Ecology and society, 9*(2). 1-14.

Trauer, J. M., Laurie, K. L., McDonnell, J., Kelso, A., & Markey, P. G. (2011). Differential effects of pandemic (H1N1) 2009 on remote and indigenous groups, Northern Territory, Australia, 2009. *Emerging infectious diseases, 17*(9), 1615.

Tunç, E. B., Parlak, S., Uluman, M., & Eryigit, D. (2021). Development of the hostility in pandemic scale (HPS): A validity and reliability study. *International Journal of Assessment Tools in Education*, *8*(3), 475-486.

Walsh, F. (2006). *Strengthening family resilience*. New York: The Guilford Press.

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health, 17*(5), 1729. https://doi.org/10.3390/ijerph17051729.

Journal of Evidence-Based Psychotherapies,
Vol. 22, No. 1, March 2022, 21-38.

10.24193/jebp.2022.1.2

MENTAL HEALTH PROBLEMS IN ABUSED INSTITUTIONALISED SERBIAN ADOLESCENTS AND THEIR USE OF SOCIAL AND MENTAL HEALTH SERVICES

Svetlana Ivanović Kovačević[1,3], Valentina Šobot[2,3], Ana Marija Vejnović[1,3], Vladimir Knežević[1,3], Jovan Milatović[1,3] & Darja Šegan[1,3]*

[1] University of Novi Sad, Faculty of Medicine Novi Sad, Department of Psychiatry and Psychological Medicine.
2 University of Novi Sad, Faculty of Medicine Novi Sad, Department of Psychology.
3 Clinic of psychiatry, Clinical center of Vojvodina, Novi Sad, Serbia.

Abstract
The aim of the study was to determine the frequency of various forms of maltreatment in adolescents without parental care, their mental health problems and treatment needs. Sixty examinees of both genders, aged 12-18, were divided in two groups: abused group (adolescent without parental care in an institutional setting) and control group (general population). The presence/absence of registered abuse/neglect by official social services were the criterion for classifying respondents into groups. The general questionnaire, Childhood Trauma Questionnaire and Youth Self Report were used. 46.67% of adolescents were neglected, 40% of them suffered several types of abuse, 10% were physically abused, 3.33% were emotionally abused, and no adolescent was sexually abused. 16.6% of cases of sexual abuse in the abused group as well as milder forms of maltreatment in the control group were registered by self-reported retrospective measures, which are not part of official registers. Delinquency, aggressive behavior and somatic complaints are significantly more prominent in the abused group compared to the control group. 86% of adolescents used some form of support and counseling from professionals, 56.6% were included in psychiatric treatment, and only 36.6% in psychotherapy. Mental health problems in abused adolescents without parental care indicates the specific needs for psychotherapy and psychiatric treatment.

Keywords: maltreatment, adolescence, self-reported measures, psychotherapy, child welfare system.

* Correspondence concerning this article should be addressed to Svetlana Ivanović Kovačević, University of Novi Sad, Faculty of Medicine Novi Sad, Hajduk Veljkova 3, 21 000 Novi Sad, Serbia. E-mail: svetlana.ivanovic-kovacevic@mf.uns.ac.rs

Introduction

The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) identify child maltreatment as a global social and public health problem and emphasize the importance of early identification and registration of child maltreatment cases to protect children and alleviate physical, psychological and social dysfunctions which can cause serious consequences in adult life.

Prevalence rates of child neglect and abuse differ substantially by maltreatment category, gender and by country and continent (Moody et al., 2018). The number of child maltreatment cases registered by official institutions (social services, policies) is only a fraction of the actual numbers, due to many cases of child abuse and neglect that are not detected, reported nor registered (Harker et al., 2013; Mathews, 2019). The number of registered cases depends on the number of residents that use human service as well as on the representation of human service, professionals and institutions in a particular environment (Colin-Vezina et al., 2015; Seithi et al., 2018). Also, social services are less successful in detecting abuse of children from middle – and upper – income families, because these families are usually not users of child welfare services (Cancian et al., 2010; Kelley, 2017).

Due to the lack of data and many undetected cases of child maltreatment by official institutions (Jacobs et al., 2008; World Health Organization, 2016), many studies have been conducted based on the application of self-reporting methods in determining the prevalence of child maltreatment (Laurin et al., 2018). Self-report measures of maltreatment tend to indicate higher prevalence (Finkelhorn et al., 2013; Negriff et al., 2017).

A recent systematic review study finds that the median rate of prevalence of sexual abuse is 20.4% in North American girls and 28.8% in Australian girls, while in boys are lower rates, according to retrospective self-reported measures. The rates of physical abuse in Europe were 12.0% and 27.0% for girls and boys respectively, and very high in some continents, such as Africa. Average rates of emotional abuse were almost double for girls compared to boys in North America (28.4% and 13.8%) and Europe (12.9% and 6.2% respectively). Average rates of neglect were most represented in Africa (for girls 41.8%, for boys 39.1%) and South America (girls 54.8%, boys 56.7%) whereas average rates were different between girls (40.5%) and boys (16.6%) in North America, but they were similar in Asia (girls 26.3%, boys 23.8%) (Moody et al., 2018).

The accumulation of various risk factors during child development significantly increases the likelihood of mental problems in childhood, adolescence and adulthood. There are several risk factors for the occurrence of neglect and abuse, such as: individual factors (child's age, unwanted child, prematurely born, special health care needs or disabilities), parental factors (young or single parent, parent with mental health, drug or alcohol issues, undereducated parents), and socio-cultural factors (social isolation, low income, unemployment, neighborhood crime and violence, gender inequality, economic policies) (Austin et al., 2020; Kim et al., 2017;

Klevens & Ports, 2017; McLaughlin, 2017; World Health Organization, 2014). Multiple adverse childhood experiences can disrupt adequate development of self-regulation skills (Kavanaugh et al., 2016; Marusak et al., 2015) or lead to disruption of attachment patterns (Doyle & Cicchetti, 2017; Özcan et al., 2016). Consequently, it could lower self-esteem and social competency skills (Greene & Jones, 2015), which increases the risk for development of psychopathological symptoms later in life, including anxiety, depression, suicidality, posttraumatic stress disorder (Child Welfare Information Gateway, 2019; Kobulsky at al., 2021), and antisocial behavior and delinquency (Greene & Jones, 2015; Herrenkohl et al., 2017; Kobulsky at al., 2021). Children who experience maltreatment are at risk of the development of substance use problems and disorder in adolescence and adulthood (Cicchetti & Handley, 2019).The psychosocial and psychopathological consequences of abuse can hinder the proper development of these children for many years (World Health Organization, 2014) and could lead to transgenerational transmission of abusive behavior (Yang et al., 2018).

Children without parental care are particularly vulnerable group. Compared to children living with both parents or one parent, children without parental care are exposed to many aversive circumstances (Rus et al., 2017). They are at increased risk of neglect, poverty and maltreatment and have poorer indicators in terms of mental and physical health and access to healthcare (Beal & Grenier, 2016).There are a lot of shortcomings in the current knowledge about children without parental care and the reasons that may affect child well-being. The data on the availability and need for services and support of these children and adolescents are insufficient (Vandivere et al., 2012). The most common reasons why children are placed in institutions and other types of non-parental care are: exposure to parental danger (child abuse, parent substance abuse and mental illness, parental cognitive deficit), unavailable parent (parent deceased, physical illness/injury, incarceration), lack of parental resources (financial problems, very young or single parent, parent-child conflict, special needs of the child that the parent can not meet). The negative effects of being placed in a residential institution on children's development and well-being have been comprehensively documented (Nsabimana et al., 2019; UNICEF, 2021). However, more recent data on children and adolescents without parental care placed in institutions are scarce in relation to their trauma, mental health problems and the need for mental health services and treatment, which is the subject of this study (Tordon et al., 2018). The majority of children without parental care in developed countries are placed in kinship care or family-based alternative care (Beal & Grenier, 2016; UNICEF, 2021).

The aim of this study was to examine the frequency of various forms of abuse and neglect in the sample of adolescents without parental care in an institutional setting, based on official data from social services, but also on self-reported measures for retrospective assessment of abuse, considering data from the literature where the actual prevalence of maltreatment exceeds the number of registered cases by official social services. We were interested in differences in self-reported measures of abuse and differences in mental health characteristics between

the group of abused adolescents and the group of adolescents from general population, as well as the availability of social services, psychiatric and psychotherapeutic interventions on the adolescents from both groups.

Methods

Samples

The study was conducted as a case control study. Sixty adolescents of both genders, aged 12 to 18, were examined. The participants were divided in two groups of 30 adolescents: a group of adolescents with the experience of abuse/neglect (A group) and a control group of adolescents without the experience of abuse/neglect (C group) according to the register of the social protection system. The sample for A group was collected in the institution for children and adolescents without parental care and the sample for C group was collected from school population. Groups were equalized in the gender and age structure. Both groups consisted of 66.67% of males and 33.33% of females. The average age of male adolescents in A group was 15.15 and in C group was 15.65 years, respectively, while the average age of female adolescents in A group and C group was 16.4 and 16.8 years, respectively. An average score on a verbal subscale of intelligence was based on Wechsler criteria for the participation in this research. The test was carried out anonymously. Participants in this research signed the informed consent.

Measures

Three following questionnaires were used:

Semi-structured General Questionnaire, made for the purpose of this research, which processed data on sociodemographic characteristics and medical history of participants;

Childhood Trauma Questionnaire (CTQ, Bernstein & Fink, 1998), a self-reported questionnaire for the retrospective assessment of the presence and intensity of emotional, physical and sexual abuse/neglect in the period up to the age of 18 (Bernstein & Fink, 1997). All items are rated on a 5-point scale ranging from 1 to 5, with higher scores indicating more severe maltreatment. A categorial classification of the intensity of the abuse and neglect was also offered for each scale. The lower limit of the low intensity interval was taken as a criterion for presence/absence of abuse or neglect, and

Youth Self Report (Achenbach, 1991), a self-assessment of emotional-behavioral symptoms of adolescents, grouped into eight subscales (delinquent behaviors, aggressive behavior, attention problems, thought problems, social problems, anxiety and depression, somatic complaints and withdrawn).

Based on the reports from the social services, the data related to the types of abuse/neglect of adolescents were obtained, while the data on mental health problems were collected based on medical records.

Statistical analysis

For the purpose of statistical analysis, JASP (version 0.14.1.0) were used. Results were statistically analyzed by Student's t-test as parametric method of testing with Cohen's d for measuring the effect size, chi-squared test as non-parametric method of testing and by Pearson's correlation for analyzing the correlation between intensity of different forms of maltreatment and the severity of the symptoms on the Achenbach's subscales. A p-value less than 0.05 was considered statistically significant.

The procedure was conducted according to the ethical standards of the Helsinki Declaration, for which the appropriate consent of the competent ethics committee was obtained.

Results

Based on the official reports from the social services of maltreatment in the A group, it was found that 46.67% of the participants were neglected, 40% suffered several forms of abuse (most often combined physical abuse and neglect, and physical and emotional abuse), 10% were physically abused, 3.33% were emotionally abused, while no adolescent was sexually abused. The percentage representation of different forms of maltreatment among male and female adolescents in abused group was presented in Table 1. There are no official reports of abuse of adolescents in the control group.

Table 1. Various forms of maltreatment among male and female adolescents in abused group (percentage data)

Form of abuse and neglect		Male		Female	
		Number	%	Number	%
Physical abuse		3	15%	/	/
Neglect		10	50%	4	40%
Emotional abuse		/	/	1	10%
Sexual abuse		/	/	/	/
Combined several forms	Ph and E	2	10%	1	10%
	Ph and N	2	10%	4	40%
	E and N	1	5%	/	/
	Ph, E, Exp and WFV	1	5%	/	/
	Ph, N, WFV	1	5%	/	/
Total		20	100%	10	100%

Note. Ph-physical abuse, E-emotional abuse, N-neglect, Exp-exploitation, WFV-witnessing family violence

Based on the self-reported CTQ questionnaire significantly more adolescents have been noticed from the abused group compared to the control group experienced physical neglect ($p<0.001$, Cohen's d 1.046), emotional neglect ($p<0.001$, Cohen's d 0.990), physical abuse ($p<0.05$, Cohen's d 0.688) and emotional abuse ($p<0.05$, Cohen's d 0.699). Adolescents in the control group were significantly more disposed to minimize the negative experience than abused adolescents ($p<0.001$, Cohen's d -1.162). In the group of abused adolescents, 16,6% (5/30) adolescents reported that they experienced sexual abuse, although these were not officially registered. In the control group, no adolescent reported having been sexually abused, but they declared that they experienced some form of emotional neglect and abuse, and physical neglect and abuse (Figure 1).

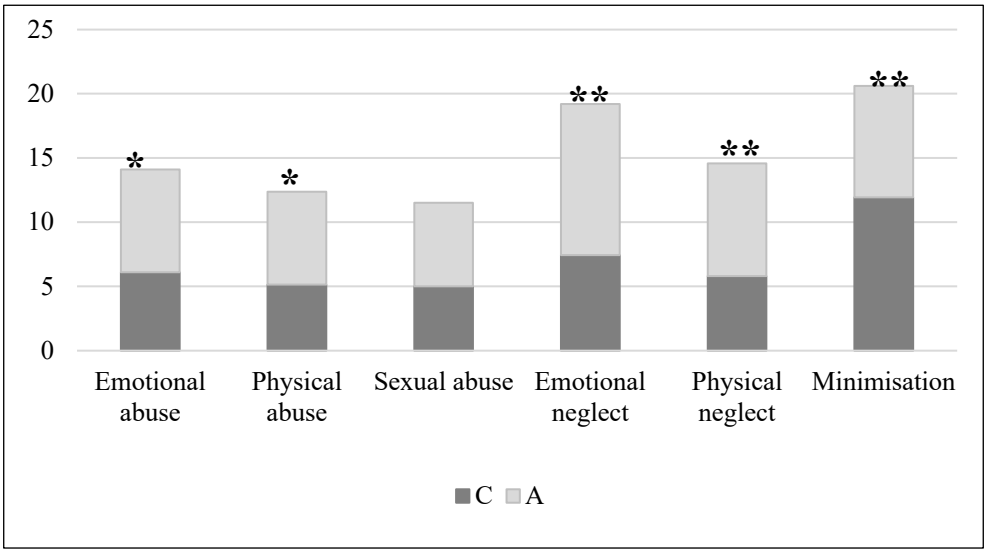


Figure 1. Childhood traumatic experiences in abused group and control group (mean values of maltreatment intensity)

Note. C-control group, A-abused group, * $p<0.05$, ** $p<0.001$, a lack of experience indicates the value of 5 on abscissa

A significant difference was observed between the abused group and the control group in the degree of prominent delinquent and aggressive behavior and somatic disturbances ($p<0.05$) (Table 2), and no significant difference was found in the obtained results on other scales, based on self-report inventory of emotional-behavioral symptoms. There was no gender difference in the level of problems in emotional-behavioral functioning ($p> 0.05$).

Table 2. Arithmetic means and standard deviations of results on Achenbach's sub-scales for both groups of adolescents

Symptoms	Group	N	Mean	SD	p-value	Cohen's d
Withdrawn	A	30	4.400	2.896		
	C	30	3.733	2.638	0.355	0.241
Somatic complaints	A	30	4.333	3.055		
	C	30	2.067	1.929	**0.001***	0.887
Anxiety/depression	A	30	7.733	5.388		
	C	30	5.567	4.666	0.101	0.430
Social problems	A	30	3.867	2.813		
	C	30	2.567	2.388	0.059	0.498
Thought problems	A	30	3.000	2.626		
	C	30	2.033	2.414	0.143	0.383
Attention problems	A	30	6.033	3.548		
	C	30	4.400	3.349	0.072	0.473
Delinquent behavior	A	30	4.633	2.282		
	C	30	2.933	1.999	**0.003***	0.793
Aggressive behavior	A	30	10.500	4.876		
	C	30	6.667	4.873	**0.003***	0.786
Total score	A	30	44.500	20.905		
	C	30	29.967	18.397	**0.006***	0.738

Note. N-number of adolescents; SD-standard deviation; * $p<0.01$

The Table 3 presents number of adolescents with cut-off scores on Achenbach's sub-scales for both groups and genders.

Table 3. Cut-off score on Youth Self Report (frequency)

Symptoms	A		C	
	Male	Female	Male	Female
Withdrawn	3	1	2	0
Somatic complaints	4	1	1	0
Anxiety/depression	5	0	3	0
Social problems	5	1	2	0
Thought problems	3	1	2	0
Attention problems	4	3	2	1
Delinquent behavior	5	0	0	0
Aggressive behavior	2	0	1	0

Note. C-control group, A-abused group

The association between severity of maltreatment on CTQ and intensity of symptoms on YSR is presented in Table 4 by Pearson's correlation.

Table 4. Pearson's r correlation between abuse types and psychopathology (A and C group)

		W	SC	A/D	SP	TP	AP	DB	AB
EA	r	0.102	0.333	0.284	0.360	0.371	0.204	0.144	0.380
	p-value	0.436	**0.009****	**0.028***	0.005	**0.004****	0.117	0.273	**0.003****
PA	r	-0.093	0.022	-0.001	-0.028	0.133	-0.056	-0.013	0.110
	p-value	0.479	0.865	0.993	0.829	0.310	0.670	0.922	0.402
SA	r	0.209	0.250	0.300	0.259	0.377	0.173	0.180	0.190
	p-value	0.110	0.054	**0.020***	**0.045***	**0.003****	0.187	0.170	0.146
EN	r	0.186	0.179	0.262	0.160	0.203	0.092	0.184	0.174
	p-value	0.155	0.170	**0.043***	0.223	0.119	0.482	0.160	0.185
PN	r	0.054	0.221	0.158	0.180	0.191	0.053	0.136	0.053
	p-value	0.684	0.089	0.228	0.168	0.145	0.685	0.299	0.686

*Note.** p<0.05, ** p<0.01, EA-emotional abuse, PA-physical abuse, SA-sexual abuse, EN-emotional neglect, PN-physical neglect, W-withdrawn, SC-somatic complaints, A/D-anxiety/depression, SP-social problems, TP-thought problems, AP-attention problems, DB-delinquent behavior, AB-aggressive behavior

Regarding the applied interventions in the field of mental health protection, 56,6% of adolescents in the abused group reported that they visited a psychiatrist (50% for psychoactive substances or alcohol abuse, 33.33% for behavioral problems (breaking rules, opponent behavior, aggressive behavior) and 16.67% for emotional difficulties (anxiety and depression symptoms, suicidal behavior). In the control group, 6.6% of adolescents visited psychiatrists for emotional or behavioral symptoms. In the abused group, interventions were available from professionals from social institutions in the form of monitoring or counseling for 8% of adolescents, but not on a regular basis, while all adolescents from the abused group had financial and practical assistance related to education, extracurricular activities and other personal needs. Respondents from the control group had no contact with social services. The percentage representation of different forms of treatment is shown in Table 5. 36.6% of abused adolescents were included in some form of psychotherapy and 16.6% of adolescents from the control group.

Table 5. Different types of treatment used by the abused and control group (percentage data)

Treatment types	Abused group	Control group
	%	%
Psychiatric treatment	56,6%	6,6%
Social services counseling	86,0%	/
Psychotherapy	36,6%	16,6%
Psychotherapy forms		
Supportive psychotherapy	54,5%	20,0%
Cognitive behavioral therapy	27,3%	60,0%
Trauma focused therapy	18,2%	/
Family therapy	/	20,0%

Discussion

The study found that most adolescents were exposed to neglect and multiple abuse, which is in accordance with other studies (Araghol et al., 2016; Iniguez & Stankowski, 2016; Kobulsky et al., 2020; Stoltenborgh et al., 2015; U.S. Department of Health & Human Services, 2018). The results of this study show that the most common forms of maltreatment (neglect and physical abuse) are interconnected, which is in line with international studies (Araghol et al., 2016; Dale, 2019; Jordanova Peshevska et al., 2014; U.S. Department of Health & Human Services, 2018). According to data from different studies, the frequency of joint reporting is high as for neglect and emotional abuse (Kobulsky et al., 2020; Stoltenborgh et al., 2012).

Data on the frequency of various forms of child maltreatment, based on self-reported retrospective measures in this study, partly correspond to data in the study of aversive childhood experiences (ACE) in representative Serbian national sample of 2792 respondents (Pejović Milovančev & Tošković, 2019), which registers the highest prevalence of experiences of emotional abuse, followed by physical abuse and emotional neglect. Compared to the data of some international studies (Finkelhor et al., 2014; Moody et al., 2018), a smaller number of cases of sexual abuse is registered in this study according to official and self-reported measures, which may indicate insufficient recognition and reporting of this type of abuse, due to social stigma, victims' fear of talking about sexual violence and the perception of insufficient legal and social protection of victims once they report sexual violence (Mathews, 2019).

In the control group of adolescents, in which no official register of abuse was obtained, adolescents reported the experience of all forms of abuse and neglect, except sexual abuse, based on self-reported measures. Most common forms of maltreatment were emotional neglect and abuse, followed by physical neglect and abuse, but in insignificant or less significant intensity in relation to the group of abused adolescents (Vejnović et al., 2019). The obtained results indicate that several young people from the general population suffer from certain forms of abuse, especially emotional, which is not recognized by official institutions and experts. These children and adolescents do not receive adequate protection and support from social and other institutions. Other studies also show that only a few cases of abuse are reported by the social services (Minton et al., 2018) and that the number of registered cases depends on the availability of social and health services (Rapoport et al., 2021). Social services are more effective in registering more severe forms of abuse and neglect, because they are more noticeable in the social environment and most often occur in socially deprived families who use social protection services, while failing to register milder forms of abuse and neglect, especially emotional and physical in families of middle and higher socio-economic status.

Significantly, 16% of adolescents in the abused group have reported that they have experienced sexual abuse in their childhood, while these cases have not been registered by social services. This can be understood by the matter of fact that sexual abuse is more difficult to detect, because the physical signs of abuse are often missing (Vejnović et al., 2019). Such abuse is often detected years after sexual violence (Murray et al., 2014). These data can reflect the distrust and resistance of children in contact with social welfare institutions, which results in the decision to remain silent about sexual abuse, and the question arises as to how to improve the detection of sexual abuse in children (Alaggia et al., 2019). These data are in line with international studies showing that a large increase in the number of children referred to child social services have not led to a significant increase in the detection of child abuse over the last decades (Devine & Parker, 2019). Given the significant limitations of social services in registering child maltreatment, a multi-sector, interdisciplinary approach is needed (Wales Audit Office, 2015).

This study shows that a higher percentage of maltreated adolescents without parental care in relation to adolescents from general population asks for help due to mental problems: behavioral problems (aggressiveness, delinquency), substance abuse (alcohol and marijuana), somatoform problems, suicidal behavior, and anxiety-depression symptoms (Marić & Sakač, 2017). Adolescents from abused groups report significantly more externalizing (large effect sizes) and somatic problems (medium effect sizes) on self-reported measures compared to adolescents from the control group. A clinically significant problem level (≥ cut-off score) has been reached by 26.6% of adolescents from the abused group and 13.3% of adolescents from the control group on YSR subscales. This is in line with the research, that showed significantly more mental health problems in adolescents without parental care than adolescents in the general population (Beal & Grenier, 2016; Nsabimana et al., 2019; Tordon et al., 2018; UNICEF, 2021). Maltreated adolescents in residential care had a very high prevalence of psychiatric diagnoses compared with the non-maltreated adolescents in residential youth care (Greger et al., 2016). The obtained results indicate that the group of children without parental care is a particularly vulnerable group, as it is exposed to several family risk factors, which result in separation from the family. Although the largest percentage of these children are abused within the family, they are also more exposed to the later risk of being victims of institutional or peer violence during their stay in social care institutions (Longfield, 2020).

Taking into account that adolescents from the general population also reported certain forms of maltreatment, the connection between different types of abuse/neglect and emotional-behavioral difficulties was examined on the entire sample. A moderate positive association was found between self-reported emotional abuse and somatic complaints, thought problems, and aggressive behavior. Weak positive association was registered between scores of emotional abuse and neglect and anxiety/depression. A moderate positive association was found between self-reported sexual abuse and anxiety/depression and thought problems, as well as a

weak positive association between sexual abuse and social problems. These results are consistent with other studies showing that exposure to child maltreatment is significantly associated with a higher degree of anxiety-depressive symptoms, as well as aggressive and antisocial behavior (Afifi et al., 2019; Child Welfare Information Gateway, 2019; Fagan, 2019; Herrenkohl et al., 2017; Horan et al., 2014; Iniguez & Stankowski, 2016; Kobulsky at al., 2021; Zolog et al., 2011). It is possible that abused children and adolescents adopt aggressive forms of behavior and themselves become bullies (Spatz Widom, 2015; Yang et al., 2018). Adolescents that are emotionally abused and neglected describe significant difficulties with their mental health, social relationships, unhealthy sexual practices and alcohol or substance misuse (Li et al., 2021; Naughton et al., 2017; Kobulsky et al., 2020). Adolescents who had experienced sexual abuse showed lower self-esteem and more depressive symptoms (Kim et al., 2017). Sexual abuse is associated with anxiety disorders, especially posttraumatic stress disorder (Maniglio et al., 2012).The study found that problems in psychosocial development in abused children can occur, and that children can manifest attachment problems and persisting difficulties in social functioning and relationship outcomes (Doyle & Cicchetti, 2017).

There is a huge need for services in the field of social and health care of abused adolescents without parental care (Tordon et al., 2018). Although almost all respondents from the abused group have some form of support and monitoring in the field of social protection, this support is dealing less with emotional support and counseling, and more with solving specific problems (schooling, extracurricular activities, material assistance, contact with family members). Also, children's contacts with social services do not take place on a regular and frequent basis, but depending on current needs. This is in line with data from other studies that in most cases, children referring to social care institutions were seen and related to but, in a small number of visits. Social workers are influenced by organizational culture, time limits on their work, insufficient resources, skills and training in the field, and insufficient support to cope with work stress (Constantinescu et al., 2017; Ferguson, 2017).

In this sample, more than 50% of abused and/or neglected adolescents in a certain period required psychiatric treatment, while only a third were involved in certain forms of psychological treatment, predominantly in psychological supportive treatment, and cognitive behavioral treatment (CBT). The data indicates that the needs of these children for psychotherapeutic treatment are not sufficiently met. What is worrying is the fact that there is a lack of evidence-based treatments, as well as treatments aimed at resolving trauma. The higher frequency of referrals to psychiatric treatment in relation to psychotherapeutic treatments may indicate a higher prevalence of various mental and developmental disorders that require pharmacotherapeutic treatment, greater severity of mental disorders, but also require greater availability of psychiatric services compared to psychotherapeutic within the existing health and social system. Problems in the field of psychotherapeutic treatment of abused children and adolescents, such as conflicting and contradictory

evidence-based of therapeutic approaches, unclear criteria for referral on treatment and absence of clear and culturally specific guides to therapy, may also lead to less availability treatment for this population (Narang et al., 2019). A very small percentage of adolescents from the general population have contact with mental health professionals, even though certain forms of neglect and abuse are registered in this group of children, with a trend towards children from the general population focusing more on psychological than psychiatric care.

The limitations of this research are reflected in the small sample size, and the lack of control of the impact of other risk factors, since the identified emotional-behavioral difficulties in abused and neglected adolescents did not occur solely as a result of abuse. Also, this is a selected sample and should not be taken as a representative of the entire population of maltreated adolescents, nor it could be considered representative of the population of adolescents without parental care. Guidelines for future research concern the repetition of the research on a larger sample of adolescents without parental care. Also, further research is needed that will target adolescents from the general population who report experiences of abuse or neglect, with the goal of determining the relationship between self-reported measures of abuse and mental health problems in the general adolescent population.

Conclusion

The study found that the most abused adolescents were exposed to neglect and multiple abuse, and that self-reported retrospective measures compared to social services more successfully registered sexual and emotional abuse, as well as milder forms of child abuse. These findings indicate the need for individualized assessment that will ensure the active participation of children and the application of self-reported measures. Given the limitations of the child welfare system in registering child maltreatment, an interdisciplinary approach is needed, as well as sensitization and training of professionals in different domains (school, primary health care) in order to recognize the risks and signs of possible abuse, given more frequent and regular contacts of these professionals with children and adolescents from the general population.

Mental health problems in adolescents with a history of neglect and/ or abuse in the form of behavioral problems, substance abuse, somatoform problems, anxiety and depression symptoms and suicidal behavior, indicate the specific needs of abused adolescents without parental care for psychotherapeutic and psychiatric support and treatment, in order to prevent and mitigate the consequences later in adulthood, especially taking into account the registered trend in this study that adolescents are insufficiently referred to psychotherapeutic treatments, especially evidence-based and trauma-oriented treatments.

Conflict of interest statement

We hereby declare that there are no potential conflicts of interest associated with this publication, and that any financial support has been noted.

References

Alaggia, R., Collin-Vezina, D., & Lateef, R. (2019). Facilitators and barriers to child sexual abuse (CSA) disclosures: A research update (2000–2016). Trauma, Violence and Abuse, 20(2), 260-283.https://doi.org/10.1177/1524838017697312.

Afifi, T. O., Fortier, J., Sareen, J., & Taillieu, T. (2019). Associations of harsh physical punishment and child maltreatment in childhood with antisocial behaviors in adulthood. *JAMA Network Open*, 2(1): e187374.https://dx.doi.org/10.1001%2Fjamanetworkopen.2018.7374.

Arabghol, F., Derakhshanpour, F., Davari Ashtiyani, R., Chimeh, N., & Panaghi, L. (2016). Identification and evaluation of abused children at Imam Hossein hospital. *International Journal of High Risk Behaviors and Addiction*, 5(1), e27531. https://doi.org/10.5812/ijhrba.27531.

Austin, A. E., Lesak, A. M., & Shanahan, M. E. (2020). Risk and protective factors for child maltreatment: A review. *Current Epidemiology Reports*, 7(4), 334–342. https://doi.org/10.1007/s40471-020-00252-3.

Beal, S. J., & Grenier, M. V. (2016). Children in nonparental care: health and social risks. *Pediatric Research*, 79, 184–190.https://doi.org/10.1038/pr.2015.198.

Bernstein, D. P, Ahluvalia, T, Pogge, D., & Handelsman, L. (1997). Validity of the Childhood Trauma Questionnaire in an adolescent psychiatric population. *Journal of American Academy of Child and Adolescent Psychiatry*, 36(3), 340-348. https://doi.org/10.1097/00004583-199703000-00012.

Cancian, M., Slack, K. S., & Yang, M. Y. (2010). The effect of family income on risk of child maltreatment. *Institute for Research on Poverty Discussion*, 1385-10. https://www.irp.wisc.edu/publications/dps/pdfs/dp138510.pdf.

Child Welfare Information Gateway. (2019). *Long-term consequences of child abuse and neglect*. https://www.childwelfare.gov/pubpdfs/long_term_consequences.pdf.

Cicchetti, D., & Handley, E. D. (2019). Child maltreatment and the development of substance use and disorder. *Neurobiology of Stress*, 10, 100114. https://doi.org/10.1016/j.ynstr.2018.100144.

Colin-Vezina, D., Sablonniere-Griffin, D. M., Palmer, A. M., & Milne, L. A. (2015). Preliminary mapping of individual, relational, and social factors that impede disclosure of childhood sexual abuse. *Child Abuse and Neglect*, 43,123–134. https://doi.org/10.1016/j.chiabu.2015.03.010.

Constantinescu, M., Constantinescu, C., & Tabacaru Dumitru, C. (2017). Social work and protection of abused and neglected children. *Revista de Asistenţă*

Socială, 16(3), 39–49. https://www.researchgate.net/profile/Cristina-Dumitru/publication.

Dale, C. A. (2019). Nature of child physical abuse and neglect among 12-year-old girls. *Journal of Social, Behavioral, and Health Sciences*,13(1), 98-114. https://doi.org/10.5590/JSBHS.2019.13.1.06.

Devine. L., & Parker, S. (2019). The care cases crisis. Social Justice Research Group, University of the West of England, Bristol.

Doyle, C., & Cicchetti, D. (2017). From the cradle to the grave: The effect of adverse caregiving environments on attachment and relationships throughout the lifespan. *Clinical Psychology: Science and Practice*, 24(2), 203–217. https://doi.org/10.1111/cpsp.12192.

Fagan, A. A. (2019). Child maltreatment and aggressive behaviors in early adolescence: Evidence of moderation by parent/child relationship quality. *Child Maltreatment*, 25(2), 182-191. https://doi.org/10.1177/1077559519874401.

Ferguson, H. (2017). Children become invisible in child protection work: Findings from research into day-to-day social work practice. *The British Journal of Social Work*, 47(4), 1007–1023. https://doi.org/10.1093/bjsw/bcw065.

Finkelhor, D., Turner, H. A., Shattuck, A., & Hamby S. L.(2013). Violence, crime, and abuse exposure in a national sample of children and youth: an update.*JAMA Pediatrics*, 167(7), 614–621. https://doi.org/10.1001/jamapediatrics.2013.42.

Finkelhor, D., Shattuck, A., Turner, H. A., & Hamby, S. L. (2014). *The lifetime prevalence of child sexual abuse and sexual assault assessed in late adolescence. Journal of Adolescent Health*, 329, 329–333. https://doi.org/10.1016/j.jadohealth.2013.12.026.

Greene, P. L., & Jones, A. S. (2015). Chronic neglect and aggression/delinquency: A longitudinal examination. *Child Abuse and Neglect*, 45, 9-20. https://doi.org/10.1016/j.chiabu.2015.04.003.

Greger, H. K, Myhre, A. K., Lydersen, S., & Jozefiak, T. (2016). Child maltreatment and quality of life: a study of adolescents in residential care. *Health and Quality of Life Outcomes*, 10, 14–74. https://doi.org/10.1186/s12955-016-0479-6.

Hampton, R. L., & Newberger, E. H. (1985). Child abuse incidence and reporting by hospitals: significance of severity, class, and race. *American Journal of Public Health*, 75(1), 56–60.https://doi.org/10.2105/ajph.75.1.56.

Harker, L., Jutte, S., Murphy, T., Bentley, H., Miller, P., & Fitch, K. (2013). *How safe are our children?* London: National Society for the Prevention of Cruelty to Children. https://learning.nspcc.org.uk/research-resources/how-safe-are-our-children.

Herrenkohl, T. I., Jung, H., Lee, J. O., & Kim, M. H. (2017). *Effects of child maltreatment, cumulative victimization experiences, and proximal life stress on adult crime and antisocial behavior*. Office of Justice Programs' National Criminal Justice Reference Service. https://www.ncjrs.gov/ pdffiles1/nij/grants/250506.pdf.

Horan, J. M., & Widom, C. S. (2014). Cumulative childhood risk and adult functioning in abused and neglected children grown up. *Development and Psychopathology*, 1–15. http://dx.doi.org/10.1017/S095457941400090X.

Iniguez, K. C, & Stankowski, R. V. (2016). Adverse child experiences and health in adulthood in a rural population-based sample. *Clinical Medicine and Research*, 14(3–4), 126–137. https://doi.org/10.3121/cmr.2016.1306.

Jacobs, M. A., Bruhn, C., & Graf, I. (2008). Methodological and validity issues involved in the collection of sensitive information from children in foster care. *Journal of Social Service Research*, 34(4), 71–83. https://doi.org/10.1080/01488370802162517.

Jordanova Peshevska, D., Raleva, M., Filov, I., Sethi, D., Jordanova, T., HazdiHamza, K., Tozija, F., & Damchevska Ilievska, V. (2014). Association between physical abuse, physical neglect and health risk behaviours among young adolescents: Results from the national study. *Open Access Macedonian Journal of Medical Sciences*, 2(2), 384–389. https://doi.org/10.3889/oamjms.2014.066.

Kavanaugh, B.C., Dupont-Frechette, J. A., Jerskey, B.A., & Holler, K. A. (2016). Neurocognitive deficits in children and adolescents following maltreatment: Neurodevelopmental consequences and neuropsychological implications of traumatic stress. *Applied Neuropsychology: Child*, 6, 64–78. https://doi.org/10.1080/21622965.2015.1079712.

Kelley, F. (2017). Child welfare involvement and contexts of poverty: The role of parental adversities, social networks, and social services.*Children and Youth Services Review*, 72,5–13. https://doi.org/10.1016/j.childyouth.2016.10.011.

Kim, B. N., Park, S., & Park, M. H. (2017). The relationship of sexual abuse with self-esteem, depression, and problematic internet use in Korean adolescents. *Psychiatry Investigation,* 14(3), 372-375. https://doi.org/10.4306/pi.2017.14.3.372.

Kim, H., Wildeman, C., Jonson-Reid, M., &Drake, B. (2017). Lifetime prevalence of investigating child maltreatment among U.S. children. *American Journal of Public Health*, 107(2), 274-280. https://dx.doi.org/10.2105%2FAJPH.2016.303545.

Klevens, J.,& Ports, K. A. (2017). Gender inequity associated with increased child physical abuse and neglect: a cross-country analysis of population-based surveys and country-level statistics. *Journal of Family Violence*, 32(8), 799–806. https://dx.doi.org/10.1007%2Fs10896-017-9925-4.

Kobulsky, J. M., Dubowitz, H., & Xu, Y. (2020). The global challenge of the neglect of children. *Child Abuse & Neglect*, 110(1).https://doi.org/10.1016/j.chiabu.2019.104296.

Kobulsky, J. M., Villodas, M., Yoon, D., Wildfeur, R., Stainberg, L., & Dubowitz, H. (2021). Adolescent Neglect and Health Risk. *Child Maltreatment*. https://doi.org/10.1177%2F10775595211049795.

Laurin, J., Wallace, C, Draca, J., Aterman, S., & Tonmyr, L. (2018). Youth self-report of child maltreatment in representative surveys: a systematic review. *Health Promotion and Chronic Disease Prevention in Canada*, 38(2). https://doi.org/10.24095/hpcdp.38.2.01.

Li, Q., Guo, L., Zhang, S., Wang, W., Li, W., Chen, X. … McIntyre, R. S. (2021). The relationship between childhood emotional abuse and depressive symptoms

among Chinese college students: The multiple mediating effects of emotional and behavioral problems. *Journal of Affective Disorder*, 288, 129-135. https://doi.org/10.1016/j.jad.2021.03.074.

Longfield, A. (2020). Children in institutional settings. *Lancet: Child and Adolescent Health*, 4(8), 563-565. https://doi.org/10.1016/S2352-4642(20)30185-1.

Maniglio, R. (2012). Child sexual abuse in the etiology of anxiety disorders: A systematic review of reviews. *Trauma, Violence, and Abuse*, 14(2), 96–112. https://doi.org/10.1177%2F1524838012470032.

Marić, M., & Sakač, M. (2017). Personal, enviromental and socio-demographic factors of alcohol use in adolescence. *Journal of Evidence-Based Psychotherapies*, 17(2), 105-118. http://jebp.psychotherapy.ro/vol-xvii-no-2-2017/personal-environmental-socio-demographic-factors-alcohol-use-adolescence/.

Marusak, H. A., Martin, K. R, Etkin, A., & Thomason, M. E. (2015). Childhood trauma exposure disrupts the automatic regulation of emotional processing. *Neuropsychopharmacology*, 40, 1250-1258. https://dx.doi.org/10.1038%2Fnpp.2014.311.

Mathews, B. (2019). A taxonomy of duties to report child sexual abuse: Legal developments offer ways to facilitate disclosure. *Child abuse and neglect*, 88, 337–347. https://doi.org/10.1016/j.chiabu.2018.12.003.

McLaughlin, M. (2017). Less money, more problems: How changes in disposable income affect child maltreatment. *Child Abuse and Neglect*, 67, 315–321. https://doi.org/10.1016/j.chiabu.2017.03.006.

Minton, S. J., Dimushevska, E., Shkrijelj, S., & Dimitrievska, V. (2018). *Prevention, identification, reporting and referral of cases of violence against children: Overview of state response mechanisms*. UNICEF. Violence against Children in the Child Protection System. https://www.unicef.org/northmacedonia/media/4216/file/MK_ViolenceAgainstChildrenShort_Report_ENG.pdf.

Moody, G., Cannings-John, R., Hood, K., Kemp, A. & Robling, M. (2018). Establishing the international prevalence of self-reported child maltreatment: a systematic review by maltreatment type and gender. *BMC Public Health*, 18(1), 1–15. https://doi.org/10.1186/s12889-018-6044-y.

Murray, L. K., Nguyen, A., & Cohen, J. A. (2014). Child sexual abuse. *Child and Adolescent Psychiatric Clinics of North America*, 23(2), 321–337. https://dx.doi.org/10.1016%2Fj.chc.2014.01.003.

Narang, J., Schwannauer, M., Quayle, E., & Chouliara, Z. (2019). Therapeutic interventions with child and adolescent survivors of sexual abuse: A critical narrative review. *Children and Youth Services Review, 107*. https://doi.org/10.1016/j.childyouth.2019.104559.

Naughton, A. M., Cowley, L. E., Tempest, V., Maguire, S. A., Mann, M. K., & Kemp, A. M. (2017). Ask me! Self-reported features of adolescents experiencing neglect or emotional maltreatment: A rapid systematic review. *Child: Care, Health and Development*, 43(3), 348–360. https://doi.org/10.1111/cch.12440.

Negriff, S., Schneiderman, J. U, & Trickett, P. K. (2017). Concordance between self-reported childhood maltreatment versus case record reviews for child welfare-

affiliated adolescents: Prevalence rates and associations with outcomes. *Child Maltreatment*, 22(1), 34–44. https://dx.doi.org/10.1177%2F1077559516674596.

Nsabimana, E., Rutembesa, E., Wilhelm, P, & Martin-Soelch, C. (2019). Effects of institutionalization and parental living status on children's self-esteem, and externalizing and internalizing problems in Rwanda. *Frontiers in Psychiatry*, 10, 442. https://doi.org/10.3389/fpsyt.2019.00442.

Özcan, N. K., Boyacioğlu, N. E., Enginkaya, S., Bilgin, H., & Tomru, N. B. (2016). The relationship between attachment styles and childhood trauma: a transgenerational perspective – a controlled study of patients with psychiatric disorders. *Journal of Clinical Nursing*, 25(15–16), 2357–2366. https://doi.org/10.1111/jocn.13274.

Pejović Milovančev, M., & Tošković, O. (2019). *The adverse childhood experiences (ACE) study. Research on adverse childhood experiences in Serbia*. UNICEF in Serbia. https://www.unicef.org/serbia/sites/unicef.org.serbia/files/2019-05/Adverse_Childhood%20Experiences_study.pdf.

Rapoport, E., Reisert, H., Schoeman E., & Adesman, A. (2021). Reporting of child maltreatment during the SARS-CoV-2 pandemic in New York City from March to May 2020. *Child Abuse and Neglect*, 116(2), 104719. https://doi.org/10.1016/j.chiabu.2020.104719.

Rus, A., Parris, S., & Stativa, E. (2017). *Child maltreatment in residential care.* USA: Springer, Cham. doi: 10.1007/978-3-319-57990-0.

Sethi, D., Yon, Y., Parekh, N., Anderson, T., Huber, J., Rakovac, I. & Meinck, F. (2018). *European status report on preventing child maltreatment*. Copenhagen, Denmark: WHO Regional Office for Europe. https://www.euro.who.int/__data/assets/pdf_file/0017/381140/wh12-ecm-rep-eng.pdf.

Spatz Widom, C., Czaja, S. J., &Dumont, K. A. (2015). Intergenerational transmission of child abuse and neglect: Real or detection bias? *Science*, 347(6229), 1480–1485. https://doi.org/10.1126/science.1259917.

Stoltenborgh, M., Bakermans- Kranenburg, M., Alink, L., & Van IJzendoorn, M. H. (2012). The universality of childhood emotional abuse: A meta-analysis of worldwide prevalence. *Journal of Aggression Maltreatment and Trauma*, 21(8), 870–890. https://doi.org/10.1080/10926771.2012.708014.

Stoltenborgh, M., Bakermans-Kranenburg, M. J., Alink, L. R. A., &Van Ijzendoorn, M. H. (2015). The prevalence of child maltreatment across the globe: review of a series of meta-analyses. *Child Abuse Review*, 24, 37–50. https://doi.org/10.1002/car.2353.

Tordon, R., Svedin, C. G., Fredlund, C., Jonsson, L., Priebe, G., &Sydsjo, G. (2018). Background, experience of abuse, and mental health among adolescents in out-of-home care: a cross-sectional study of a Swedish high school national sample. *Nordic Journal of Psychiatry*, 73(1), 16–23.https://doi.org/10.1080/08039488.2018.1527397.

UNICEF. (2021). *Children in alternative care*. https://www.unicef.org/protection/children-in-alternative-care.

U.S. Department of Health & Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children's Bureau.

(2018). *Child maltreatment 2016*. https://www.acf.hhs.gov/cb/research-datatechnology/statistics-research/child-maltreatment.

Wales Audit Office. (2015). *Annual Report and Accounts 2015-16*. https://www.audit.wales/sites/default/files/Annual_Report_2016_ENG_6.pdf.

Vandivere, S., Yrausquin, A., Allen, T., Malm, K., &McKlindon, A. (2012).Children in nonparental care: A review of the literature and analysis of data gaps. *ASPE Reports*. https://aspe.hhs.gov/reports/children-nonparental-care-review-literature-analysis-data-gaps-0.

Vejnović, A. M., Ivanović Kovačević, S., & Šobot, V. (2019). Trauma symptoms and personality traits in adolescents with experience of child maltreatment. Engrami, 41(2), 34-49. https://doi.org/10.5937/engrami1902034v.

WHO. (2014). *Child maltreatment*. http://www.who.int/mediacentre/factsheets/fs150/en/.

WHO Regional Office for Europe. (2016). *Measuring and monitoring national prevalence of child maltreatment: a practical handbook.* https://www.euro.who.int/__data/assets/pdf_file/0003/317505/Measuring-monitoring-national-prevalence-child-maltreatment-practical-handbook.pdf.

Yang, M., Font, S. A., Ketchum, M., & Kim, Y. K. (2018). Intergenerational transmission of child abuse and neglect: Effects of maltreatment type and depressive symptoms. *Children and Youth Services Review*, 91, 364–371. https://doi.org/10.1016/j.childyouth.2018.06.036.

Zolog, T., Jane-Ballabriga, M. C., Bonillo-Martin, A., Canals-Sans, J., Hernandez-Martinez, C., &Romero-Acosta, K. (2011). Somatic complaints and symptoms of anxiety and depression in a school-based sample of preadolescents and early adolescents. Functional impairment and implications for treatment. *Journal of Evidence-Based Psychotherapies* 2011, 11(2), 191–208. http://jebp.psychotherapy.ro/vol-xi-no-2-2011/somatic-complaints-and-symptoms-of-anxiety-and-depression-in-a-school-based-sample-of-preadolescents-and-early-adolescents-functional-impairment-and-implications-for-treatment/.

Journal of Evidence-Based Psychotherapies,
Vol. 22, No. 1, March 2022, 39-54.

10.24193/jebp.2022.1.3

THE EFFECT OF GROUP-BASED EMOTIONAL SCHEMA THERAPY ON ANXIETY SENSITIVITY AND ANXIETY SEVERITY IN OUTPATIENT FEMALES WITH GENERALIZED ANXIETY DISORDER

Akbar Rezaeifard[1], Nasrollah Mazraeh[2], Siamak Khodarahimi[3], Mahdieh Mohammadi Giski[4], Ali Rasti[5]*

[1] Assistant Professor of Educational Sciences, Farhangian University, Iran. Email: akbarrezayifard5528@gmail.com
[2] Susangerd Payam Noor University, Susangerd, Iran. Email: nasrollah.mazraeh.s8@gmail.com
[3] Nursing Department, Eghlid Branch, Islamic Azad University, Eghlid, Iran.
[4] Kheradmand Addiction Treatment Center, Kerman, Iran. Email: mohammadi0006@gmail.com
[5] Rasti Psychological Clinic, Shiraz, Iran. Email: arasti@gmail.com

Abstract

Purpose: The aim of the present study was to examine the effectiveness of Group-Based Emotional Schema Therapy (GBEST) on anxiety sensitivity and anxiety severity decrease in females with Generalized Anxiety Disorder (GAD). Methods: This was a double-blind randomized experimental study that was carried out with three pretest, posttest, and follow-up stages within an experimental group and the control group. The participants were 50 outpatient females with GAD that they recruited by a random sampling method in each group. The Anxiety Sensitivity Index (ASI) and the Generalized Anxiety Disorder 7-Item Scale (GAD-7) were used in this study. The experimental group was imposed on the GBEST in 10 sessions which were held weekly for 90 minutes; finally, the post-test was applied to both experimental and control groups and three months later, they were followed up. Results: Findings showed that the experimental group had a significant decrease in anxiety sensitivity and anxiety severity compared with the control group during the post-test and the follow-up stages. Conclusions: The GBEST is recommended for the treatment of anxiety sensitivity and anxiety severity in females with GAD.

Keywords: Group-Based Emotional Schema Therapy; Anxiety Sensitivity; Anxiety Severity; Generalized Anxiety Disorder; Females.

[*] Correspondence concerning this article should be addressed to Siamak Khodarahimi, Assistant Professor of Psychology, Eghlid Branch, Islamic Azad University, Eghlid, Iran. Email: Khodarahimi@yahoo.com

Introduction

Generalized anxiety disorder (GAD) is one of the most widespread mental disorders in the world (Bandelow et al., 2013; Liu et al., 2019). GAD is a common disorder with an estimated lifetime prevalence of 3.7 percent globally (Ruscio et al., 2017). The main characteristics of GAD include severe worries about several events or activities in most of the days at least for about 6 months, disturbances in social and occupational performances, difficulties in controlling anxiety, and having anxiety which is far more than what threaten situations would cause (American Psychiatric Association, 2013). The prevalence of GAD is higher among females (APA, 2013; Hantsoo, & Epperson, 2017). Some studies suggested that GAD is associated with the couple functioning into a marriage (Scott et al., 2010; Yoon et al., 2007). The GAD would cause severe interference in performance and without treatment, the odds of overcoming it are very low (Halgin & Whitbourne, 2003). In cognitive-behavioral terms, GAD results from cognitive distortions. People with GAD easily become overwhelmed by small problems of daily life, they tend to exaggerate their problems of daily life and are too nervous about its consequences. Their attention to the problem would be replaced by their own concerns, so their anxiety would rise. When anxiety begins with any cause, it becomes out of control, and anxieties and worries build up. The main problem here is the lack of individual confidence in their ability to control feelings, anxiety reactions, and the lack of confidence in the ability to manage life's responsibilities correctly (Mousavi, 2011). Overall; GAD has been the subject of numerous mental health studies; however, as Dugas et al. (2010) have argued, few of these studies have focused on this in terms of the importance of anxiety sensitivity (Lieb, Becker & Altamura 2005, Yang et al., 2021). Thus, the purpose of this study was to investigate the effectiveness of group-based emotional schema therapy (GBEST) on anxiety sensitivity in outpatients females with GAD.

Anxiety sensitivity (AS) is one of the concepts that have been the subject of many GAD studies (Rabian et al., 1993; Taylor, 2020). AS is defined as an individual cognitive-emotional difference in fear of bodily sensations and sometimes described as "fear of fear" (Reiss et al., 1986, Taylor, 1999). AS is the fear of feelings associated with anxiety when the person believes that such feelings would be a threat to his/her social, somatic, or psychological life. AS is an intense fear of body sensations related to arousal that producing from dysfunctional beliefs about the meaning and consequences of sensations (Taylor, 2020). Reiss (1991) proposed an expectation-based model whereby AS includes three fundamental concerns: injury, anxiety, and negative evaluation. AS reflects the fear of arousal-related sensations (Taylor, 1999; Taylor et al., 2007). AS is a risk factor for anxiety disorders and behavioral health problems, as well as a mechanism for change in their treatment (Gutner et al., 2013; McHugh, 2019; Otto et al., 2019; Reiss, 1991; Taylor, 2020). Studies have shown that AS would be the start of developing an anxiety disorder and

it is positively associated with anxiety symptoms (McHugh, 2019; Norton & Edwards, 2017; Otto et al., 2019; Olthuis, Watt, & Stewart, 2014). Taylor, Kash, and McNally (1992) showed that the scores on the anxiety sensitivity index (ASI) are related to anxiety disorders (Mantar, Yemez, & Alkin, 2011). Studies suggest that AS is a risk factor for the development of all types of anxiety disorders, and to a large extent it determines how individuals monitor and manage the physical, cognitive, and behavioral symptoms of their anxiety (McHugh, 2019; Capron, Kotov, & Schmidt, 2013; Otto et al., 2019). In agreement with the hypothesis of trans-diagnosis, Mohammadkhani et al. (2016) showed that AS can predict the generalized severity of anxiety, but its effect is due to repetitive negative thinking generating. They speculated that experiential avoidance and repetitive thinking, as transdiagnostic response factors, may explain the relationship between anxiety susceptibility and generalized anxiety. Benton and Allen (1996) demonstrated that AS can cause emotional excitement and heighten interpersonal distress in females. Farris et al. (2019) have shown that AS, particularly the fearful assessment of bodily sensations, is related to anxiety symptoms in females. Moreover, studies have shown that treatment of AS was positively associated with the change in the severity of anxiety symptoms (Hovenkamp-Hermelink et al., 2019; Ino et al., 2017; Ogawa et al., 2018; Taylor, 1999).

Alternatively, it seems that emotional schema therapy (EST) can influence emotional regulation, emotional patterns, and anxiety symptoms (Morvaridi et al., 2019). EST differs from other wave models in that emotional pattern therapy emphasizes interpretations of a person's emotions rather than simply acceptance or conscious awareness of the emotions. While these strategies are useful, the EST model tries to clarify the specific theory of the individual's emotions, modify it, and encourage more adaptive strategies for regulating emotions (Morvaridi et al., 2019). The focus is on validation, the understanding of emotion, the normalization of emotion, the expansion and differentiation of emotions, the connection between emotions and meanings, the expansion of meanings, changing beliefs about time and the lack of emotional control, and greater acceptance of shared feelings (Leahy, 2019). The EST derives from certain aspects of conventional cognitive therapy and metacognitive and acceptance models (Erfan et al., 2018; Leahy, 2019). The treatment has less emphasized how thought produces emotion and more focused on the content of thought on emotions and its resulting ineffective adversarial approaches. The emotional schema therapist uses some cognitive, provisional, and behavioral interventions to regulate and alter dysfunctional emotional patterns and emotional control strategies (Leahy, 2019, 2012). Khaleghi et al. (2017) showed that EST could be an effective therapy for changing interpretations, strategies, and emotional responses in a person with GAD. However, this study was limited because there was only one case study. Thereby, the EST is a new therapeutic model that has

provided a potential alternative for the development and continuity of emotional disorders like GAD.

The emotional schema model proposes that individuals differ in their awareness, interpretations, evaluations, and acceptance of their negative emotions (Leahy, 2002, 2015; Leahy et al., 2011). Leahy (2002) speculated that anxiety is related to superior guilt over emotion, a more simplistic view of emotion, more contemplation and rumination, viewing one's emotions as less clear, lower receipt of feelings, and looking at emotions as less manageable. Leahy (2019) conceptualised that the emotional schema theory and therapy increase the use of positive emotional schemas, and decrease the use of negative emotional schemas. Since patients with GAD are often involved in some negative emotions like excessive worry and emotional sensitivity this study suggests that the emotional schema theory and therapy work, particularly for GAD. The emotional schema model suggests that individuals with GAD are required managing of their negative emotions and the emotions experienced by others, and to learn efficient coping with negative emotions. These negative emotions are involved physical sensations, feeling and action tendencies, habitual maladaptive styles in response to the environment, and relational or interactive functions. This model can help them to modify over evaluations of these negative emotions that may result in dysfunctional coping styles such as fear, uncertainty, unpredictability and uncontrolled emotional outburst, worry and avoidance, self-blaming, sense of threat, and thought rumination.

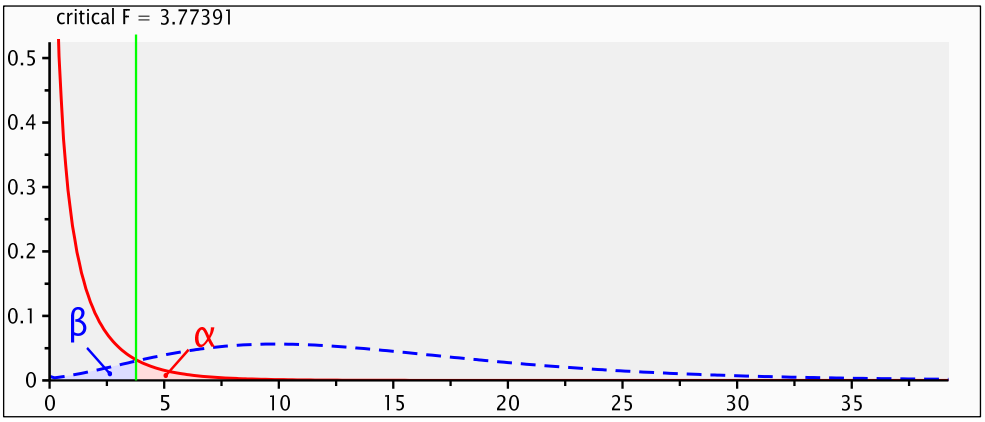
Thus, this therapy mainly focused on interpretation and assessment of emotional experiences and dealing with negative emotions with a new approach like experiential avoidance. Really, this model emphasizes how individuals conceptualize their emotional experiences, what they expect, how they evaluate their emotions, and what interpersonal and personal strategies they use to respond to their emotional experiences (Leahy, 2019, 2012; Leahy, Tirch, & Napolitano, 2011; Morvaridi et al., 2019). However, only a few studies have shown that schema therapy can decrease AS in general (Capron et al. 2012; Hawke, & Provencher, 2011; Jafari et al., 2014). But it is not clear how EST and GBEST can influence the level of AS in patients with GAD. Therefore, the objective of this study was to investigate the effectiveness of GBEST on AS decline in females with GAD. As an important issue in the field of psychotherapy; therefore, this study is essential to understanding how GBEST can influence AS and severity of anxiety symptoms in females with GAD. The main hypothesis is that GBEST would have a significant effect on anxiety sensitivity and anxiety severity decrease in outpatients females with GAD.

Methods

Participants

The sample involved 50 female outpatients with GAD from Shiraz City, Fars province, Iran.

The patients are recruited via clinics. When all subjects are identified and diagnosed they are randomly assigned with equal size into two A and B groups in this study. So, all participants were assigned by a random sampling procedure in two experimental (N=25) and the control groups (N=25). Sample size estimation using G*Power 3.1.9.2 is warranted on the basis of a predicted variance in the dependent variables among two groups in this study (Figure 1).



Note: Input parameters: effect size f(v)=0.25, β/α ratio=1, total sample size=50, number of groups=2, number of measurement=3. Type of power analysis: Compute α & power-given β/α ratio, sample size and effect size. Non-centrality parameter=9.37, Critical F= 3.77, Numerator df=1, Actual Power=.90.

Figure 1. Central and Non-central Distributions of Sample Size

This sample size is appropriate for comparison between and within groups in a double-blind randomised trial study (Rosner, 2015; Saunders, Lewis, & Thornhill, 2012). The real power analysis was .90 in this study. Since the power is typically greater than 0.80, this power is suitable for generalization of the results. The mean of age for the experimental and control groups were 32.16 (SD= 4.35) and 33.12 (3.30) respectively. The educational level ranged from high school diploma (N=12), associate (N = 18), and bachelor (N=10) in the sample. All patients were married and Muslim. The occupations in this sample comprised office employees (N=15), sales and service staff (N=15), and housewives (N=10). After informed consent was acquired, patients accomplished a demographic questionnaire and two measures through pre-test, post-test, and following-up phases.

Instruments

Anxiety Sensitivity Index (*ASI*; Reiss et al., 1986). The ASI is a self-report index that has 16 items in the form of a five-point Likert scale from very low (0) to very high (4). Each item reflects this idea that feelings of anxiety would lead to unpleasant experiences and may lead to harmful consequences. The scores range from 0 to 64. The original ASI has good psychometric properties in several samples (Peterson, & Reiss, 1992). The ASI showed a high internal consistency from .80 to .90. The ASI test-retest reliability, after 2 weeks was .75 and it was .71 for 3 years (Floyd et al., 2005). The internal consistency, test-retest, and bisection of the ASI were .93, .95, and .97 respectively. The concurrent reliability of the ASI with SCL-90 was .56 (Moradi-Manesh et al., 2007). The ASI showed an internal Cronbach's consistency reliability of .91 in this study.

Generalized Anxiety Disorder 7-Item Scale (*GAD-7;* Spitzer et al., 2006). The GAD-7 is a communal instrument of assessment for GAD and for estimating its severity in both clinical practice and inquiries. The GAD-7 score is calculated by giving scores of 0 (not at all) to 3 (nearly every day) in all questions. The total score of GAD-7 for the seven items ranges from 0 to 21. The GAD-7 has suitable reliability and validity in different cultures (Johnson et al., 2019; Lowe et al., 2008; Rutter & Brown, 2016; Zinchuk et al., 2021). The Persian version of GAD-7 showed adequate validity and reliability in numerous studies (Abasi et al., 2017; Naeinian et al., 2011; Omani-Samani et al., 2018; Veisy et al., 2021). This study indicated a Cronbach's alpha of .88 for the GAD-7.

Procedure

This is an experimental study that examined the effect of GBEST on AS in a sample of females with GAD. Based on the DSM 5 (APA, 2013), patients were diagnosed by a Structured Clinical Interview for DSM-5 (SCID-5, First et al., 2015). Within a Controlled Randomized Trial (CRT), authors randomly assigned patients to one of two groups including GBEST and a control group. The intervention assignment was finished randomly within blocks of two. The sample size is determined with regard to the logic for covariate analysis in an experimental design with two groups (Randolph, & Myers, 2013). Inclusion situations were (1) being an adult, (2) being offered for the cure by psychotherapy techniques, (3) having all criteria for GAD in DSM-5 (APA, 2013), (4) having no disease with mental symptoms, (5) have no simultaneous or comorbid clinical mental disorders, and (6) the medication for anxiety was not recently introduced or modified for them. According to a face-to-face interview by a clinical psychologist in the clinic, there were no comorbidity disorders for these patients. AS was assessed using the ASI in both groups during the pre-test, post-test, and follow-up phases. Subsequently the recruitment of all patients in both experimental and control groups by a random sampling method within an experimental design, the experimental group received the GSET (Leahy, 2019, 2015, 2012, 2011). The GBEST emphasize a variety of

emotion regulation procedures such as validation and self-validation, recognizing and distinguishing emotions, appreciation of the transience of emotions, coping with negative beliefs about emotion, focusing on accomplishment toward goals while tolerating emotion, dropping guilt over emotions, and accommodating emotions. In addition, therapy focuses on evaluating negative involuntary thoughts about emotions and boosting the use of detached mindfulness (Leahy, 2019, 2015, 2012, 2011). The GBSET is a manualized evidence-based treatment in the field of psychotherapy. Patients in the experimental treatment group received 10 sessions of GBEST once every week. The GBEST has done in 10 sessions (each session lasted for 90 minutes). A clinical psychologist with ten years of experience delivered the GBEST. The AS was the dependent variable, and the GBEST was the independent variable. Post-treatment assessments were completed at the termination of the intervention stage and at a 3-month follow-up. Females in the control group had not got any healing assistance during the study, and authors can attribute changes in AS and anxiety severity to the GBEST because placebo effects and disorder's symptomatology were controlled.

Statistical analysis

The IBM SPSS AMOS 22 software was applied for data analysis in this study (Arbuckle, 2013). The repeated measures of multivariate analysis of variances was used to examine the effect of the GBEST as an independent variable, and AS and anxiety severity as within-subjects or dependent variable in females with GAD. Then, comparisons were computed during the pre-test, post-test and following phases among groups (i.e., experimental and control groups) as between-subject factor in this study. This analysis is useful to investigate between groups and within groups differences in dependent variables during the pre-test, post-test and following periods in the present study.

Results

To examine the basic hypothesis, initially entire basic normality assumptions were calculated which shows a normal distribution for the administration of ANOVAs in this study. Kolmogorov-Smirnov and Shapiro-Wilk indicators of normality test did not show the normal distribution for ASI and the GAD-7 as dependent variables during the pre-test, post-test, and follow-up stages (Table 1). Notice that repeated ANOVAs are robust to deviations of the normal distribution of the dependent variables. Also, Box's M and Mauchly's test for the equivalence of covariances between experimental and control groups did not indicate a normal distribution of ASI and GAD-7 (Table 2). The results of the homogeneity of the variances show that Lewin Test in the ASI and GAD-7 in all stages (pre-test, post-test, and follow-up) is more than 0.05.

Table 1. Test of Normality for Anxiety Sensitivity and Anxiety Severity during Pre-Test, Post-Test and Follow-up Stages

Stages	Variables	Kolmogorov-Smirnov		Shapiro-Wilk	
		Statistic	p	Statistic	p
Pre-test	ASI	.24	.0001	.90	.0001
	GAD-7	.18	.0001	.85	.0001
Post-test	ASI	.24	.0001	.87	.0001
	GAD-7	.20	.0001	.85	.0001
Follow-up	ASI	.26	.0001	.87	.0001
	GAD-7	.24	.0001	.83	.0001

Note: ASI = Anxiety Sensitivity Index, GAD-7= Generalized Anxiety Disorder 7-Item Scale (GAD-7).

Table 2. Results of Box's M and Mauchly's Test of Dependents Variables

Variables	Box's M		Mauchly's Test	
	Statistic	p	Statistic	p
ASI	44.15	.0001	.26	.0001
GAD-7	33.10	.02	.04	.0001

Note: ASI = Anxiety Sensitivity Index, GAD-7= Generalized Anxiety Disorder 7-Item Scale (GAD-7).

Therefore, the Huynh-Feldt statistic was applied instead of Sphericity Assumed for tests of within-subjects effects in the calculation of repeated measures ANOVAs. Table 3 shows the mean and the standard deviation of AS and anxiety severity in females between the experimental and the control groups during the pre-test, post-test, and follow-up stages. Multivariate tests of repeated measures ANOVA indicated significant differences in ASI (Hotelling's Trace =20.16, $F(2, 48) = 508.12$; $p < .0001$) and the GAD-7 (Hotelling's Trace =2.05, $F(2, 48) = 30.62$; $p < .0001$).

Table 3. The Mean and the Standard Deviation of Anxiety Sensitivity and Anxiety Severity among Experimental and Control Groups during Pres-test, Post-test and Follow-up Stages

Assessments		Groups			
		Experimental		Control	
		Mean	SD	Mean	SD
ASI	Pre-test	34.97	8.16	33.44	8.60
	Post-test	14.60	7.03	34.19	7.06
	Follow-up	15.80	6.67	35.50	6.40
GAD-7	Pre-test	18.11	4.19	17.28	3.88
	Post-test	7.46	2.01	17.46	2.06
	Follow-up	7.26	1.74	17.06	1.85

Note: ASI = Anxiety Sensitivity Index, GAD-7= Generalized Anxiety Disorder 7-Item Scale (GAD-7).*(*

To investigate the main hypothesis, covariance analysis was used to determine the differences between two groups in AS and anxiety severity during the pre-test, post-test, and follow-up stages. Therefore, covariance analysis was

computed to examine the main hypothesis (table 4). This analysis showed significant differences between experimental and control groups in AS and anxiety severity during the post-test; F = 9.94, p <.01; and follow-up; F = 19.14, p <.01 stages. Figures 2 and 3 show the within x between group interaction using the repeated measures ANOVAs as the main outcome variables among experimental and control groups.

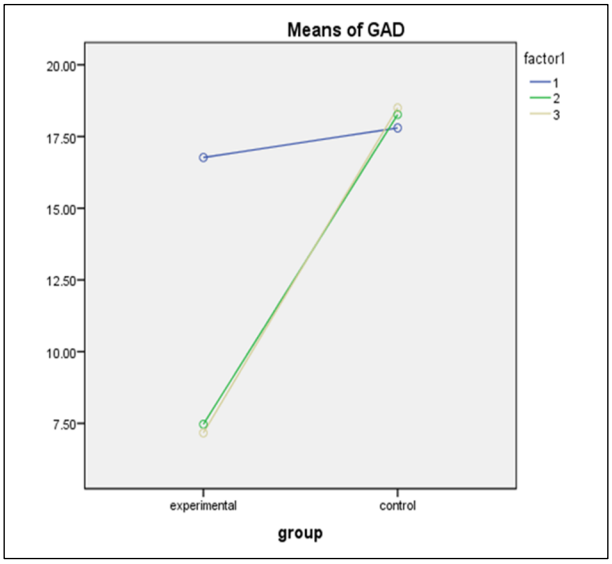


Figure 2. The within x between group interaction in GAD

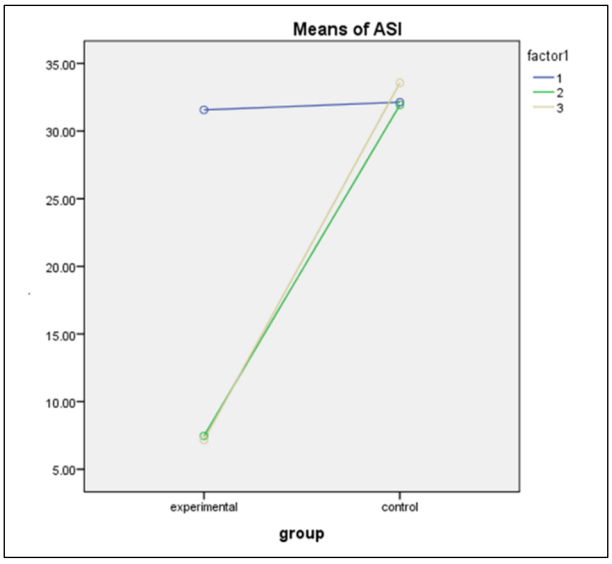


Figure 3. The within x between-group interaction in anxiety sensitivity

Finally, computation of the ANCONA affirmed the effect of GBEST in post-test and follow-up stages in the total score of ASI and GAD-7 in this study (Table 4).

Table 4. The Univariate Covariance Analysis of the Effect of GBEST on Anxiety Sensitivity and Anxiety Severity among Females with GAD

Variable	Stages	Variables	MM	df	MS	F	p	Eta	Statistical Power
ASI	Post-test	Pre-test	104.42	1	104.42	8.76	0.05	0.22	0.77
		Group	122.82	1	122.82	10.94	0.01	0.28	0.80
	Follow-up	Pre-test	120.38	1	120.38	10.91	0.05	0.26	0.85
		Group	268.02	1	268.02	19.19	0.01	0.48	0.99
GAD-7	Post-test	Pre-test	106.40	1	106.40	9.16	0.05	0.23	0.78
		Group	123.74	1	123.74	11.02	0.01	0.29	0.84
	Follow-up	Pre-test	124.13	1	124.13	11.20	0.05	0.28	0.87
		Group	285.12	1	285.12	20.16	0.01	0.58	0.99

Note: ASI = Anxiety Sensitivity Index, GAD-7= Generalized Anxiety Disorder 7-Item Scale (GAD-7).

Discussion

The results of the main hypothesis showed that GBEST significantly reduced AS and anxiety severity between females in the experimental group in comparison with the control group during the post-test and three-month follow-up stages. The results showed that the GBEST reduced the level of AS and anxiety severity from the severe range to the low level in the pre-test and the follow-up stages among females with GAD. Furthermore, because of the high-reliability change index, it can be supposed that GBEST has desired reliability for AS and anxiety severity reduction in females with GAD. These results are in congruency to the previous literature which supported the efficacy of EST in the treatment of anxiety disorders and decrease of AS in general (Capron et al. 2012; Hawke, & Provencher, 2011; Jafari et al., 2014; Khaleghi et al., 2017; Morvaridi et al., 2019; Otto et al., 2019; Taylor, 2020; Yang et al., 2021). Studies have shown that EST is effective in a wide variety of disorders such as depression, anxiety, AS, drug addiction, inefficient relationships, and personality disorders (Leahy, 2019, 2015, 2012, 2011; Leahy et al., 2011, Yang et al., 2021). In a study of two patients with chronic GAD, it was found that EST significantly reduced a wide range of anxiety severity (anxiety and worry) and that these benefits were maintained several months of follow-up (Khaleghi et al., 2017). According to GBEST, when emotion is stimulated or recalled, it is the interpretations, reactions, and emotion adjustment strategies that determine whether this emotion would go on, intensify or decline. Really, the

GBEST is founded on this assumption that people with anxiety disorder would use AS as a strategy to resist the excited and stimulated emotion. In line with the results of the present study, many studies showed that EST can modify and adjust to AS-related meta-cognitive beliefs and also reduce the use of AS as an inefficient strategy in the adjustment of emotions (Leahy, 2019, 2015; Leahy et al., 2011).

Also, these results are consistent with the conceptual and empirical evidence that affirmed the potential role of AS as an emotional risk factor in the development of anxiety disorders, particularly in GAD (Rabian et al., 1993; Gutner et al., 2013; Mantar, Yemez, & Alkin, 2011; McHugh, 2019; Norton & Edwards, 2017; Otto et al., 2019; Olthuis, Watt, & Stewart, 2014; Reiss, 1991; Reiss et al., 1986; Taylor, 2020). As Taylor (2020) and Taylor et al. (2007) noted already these finding shows that AS reflects the fear of arousal-related sensations in GAD. In agreement with the previous investigations (McHugh, 2019; Capron, Kotov, & Schmidt, 2013; Otto et al., 2019), AS influence dysfunctional interpretations of cognitive and behavioral symptoms of anxiety, in turn, and produce emotional dysregulation in patients with GAD. In line with the hypothesis of trans-diagnosis (Mohammadkhani et al., 2016), AS can influence the generalized severity of anxiety symptoms and the GBEST helps to decrease this transdiagnostic factor for susceptibility toward GAD. Particularly, this finding is congruent to the previous studies that explored the role of AS in emotional excitement, interpersonal distress and, the fearful evaluation of bodily sensations and anxiety symptoms in women (Benton & Allen, 1996; Farris et al., 2019). Furthermore, the present results are incongruent to the earlier evidence about the role of AS treatment in the decrease of anxiety symptoms (Hovenkamp-Hermelink et al., 2019; Ino et al., 2017; Ogawa et al., 2018; Taylor, 2020, 1999). This study suggests that GBEST reduce the signs and symptoms of anxiety, and AS with top-down control activation; besides that, clinicians can educate the patient to manage and adjust their emotions so that they can apply the strategies they have learned from the sessions when facing the other emotions such as anger, sadness, despair and etc. Overall, AS is a predisposition to the psychological vulnerability that is related to anxiety disorders.

In conclusion, this study adds to the present psychotherapy literature with regards to the positive influence of GBEST on the reduction of AS and anxiety severity in outpatients females with GAD. Mental health and community psychology professionals may use these findings for prevention and therapeutic goals in females. Therefore, the use of AS measures may help to screen vulnerable individuals for the development of GAD in community-based mental health programs. However, the results from this study only show a decrease in ASI and anxiety severity with an only self-rating instrument, but it is not enough to show an improvement of it in all anxiety disorders. The fact that there was only one therapist can be a limit since it is uncertain if the therapy or the therapist himself was effective. Also, this study was done in females with GAD and it is limited due to the small sample size, gender of subjects, and one follow-up period. Moreover, GAD-7 and ASI were outcomes measures in this study but future investigations may investigate the effectiveness of GBEST on

GAD by conducting a mediation analysis with anxiety sensitivity as a mediator/mechanism of change. Thus, it is recommended that future studies should be done to investigate the efficacy of GBEST on AS treatment in adults and children with GAD among females and males using multidimensional and psychophysiological measurements measures of AS in different cultural contexts.

Declarations

Funding: Funding is not available for this study.

Conflict of Interest: The authors have no conflict of interest in this study.

Ethical Approval: All procedures performed in studies involving human participants followed to the ethical standards of the institution research committee.

Informed consent: Informed consent was acquired from all individuals participated in the study.

References

Abasi, I., Mohammadkhani, P., Pourshahbaz, A., & Dolatshahi, B. (2017). The psychometric properties of Attentional Control Scale and its relationship with symptoms of anxiety and depression: A study on Iranian population. Iran Journal of Psychiatry, 12(2), 109-117.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5*. Arlington, Va.: American Psychiatric Association.

Bandelow, B., Boerner, J. R., Kasper, S., Linden, M., Wittchen, H. U., & Moller, H. J. (2013). The diagnosis and treatment of generalized anxiety disorder. *Deutsches Ärzteblatt International, 110*(17), 300-309. https://doi.org/10.3238/arztebl.2013.0300.

Benton, F. A., & Allen, G. J. (1996). Relationships between anxiety sensitivity, emotional arousal, and interpersonal distress. Journal of Anxiety Disorders, 10(4), 267-282. doi: https://doi.org/10.1016/0887-6185(96)00011-4.

Capron, D. W., Kotov, R., & Schmidt, N. B. (2013). A cross-cultural replication of an interactive model of anxiety sensitivity relevant to suicide. *Psychiatry Research, 205*(1-2), 74-78. https://doi.org/10.1016/j.psychres.2012.08.006.

Erfan, A., Noorbala, A. A., Karbasi Amel, S., Mohammadi, A., & Adibi, P. (2018). The Effectiveness of Emotional Schema Therapy on the Emotional Schemas and Emotional Regulation in Irritable Bowel Syndrome: Single Subject Design. Advanced biomedical research, 7, 72. https://doi.org/10.4103/abr.abr_113_16.

Fardaeni Sofla, H., Karsazi, H., Emami Ezat, A., & Bakhshipour Roodsari, A. (2015). The structural relationship of anxiety sensitivity, worry and difficulty in regulating emotions with generalized anxiety disorder, social anxiety

disorder and panic disorder. *Thoughts and Behavior in Clinical Psychology, 9*(36), 77-87.

Farris, S. G., Burr, E. K., Abrantes, A. M., Thomas, J. G., Godley, F. A., Roth, J. L., Lipton, R. B., Pavlovic, J. M., & Bond, D. S. (2019). Anxiety Sensitivity as a Risk Indicator for Anxiety, Depression, and Headache Severity in Women With Migraine. Headache, 59(8), 1212–1220. https://doi.org/10.1111/head.13568.

Floyd, M., Garfield, A., & LaSota, M. (2005). Anxiety sensitivity and worry. *Personality and Individual Differences, 38*(5), 1223-1229. doi: https://doi.org/10.1016/j.paid.2004.08.005.

Gutner, C. A., Nillni, Y. I., Suvak, M., Wiltsey-Stirman, S., & Resick, P. A. (2013). Longitudinal course of anxiety sensitivity and PTSD symptoms in cognitive-behavioral therapies for PTSD. Journal of anxiety disorders, 27(7), 728–734. https://doi.org/10.1016/j.janxdis.2013.09.010.

Halgin, R. P., & Whitbourne, S. K. (2003). *Abnormal psychology: Clinical perspectives on psychological disorders*. Boston: McGraw-Hill.

Hantsoo, L., & Epperson, C. N. (2017). Anxiety Disorders Among Women: A Female Lifespan Approach. Focus (American Psychiatric Publishing), 15(2), 162–172. https://doi.org/10.1176/appi.focus.20160042.

Hawke, L. D., & Provencher, M. D. (2011). Schema theory and schema therapy in mood and anxiety disorders: A review. Journal of Cognitive Psychotherapy, 25(4), 257–276. https://doi.org/10.1891/0889-8391.25.4.257.

Hovenkamp-Hermelink, J., van der Veen, D. C., Oude Voshaar, R. C., Batelaan, N. M., Penninx, B., Jeronimus, B. F., Schoevers, R. A., & Riese, H. (2019). Anxiety sensitivity, its stability and longitudinal association with severity of anxiety symptoms. Scientific reports, 9(1), 4314. https://doi.org/10.1038/s41598-019-39931-7.

Ino, K., Ogawa, S., Kondo, M., Imai, R., Ii, T., Furukawa, T. A., & Akechi, T. (2017). Anxiety sensitivity as a predictor of broad dimensions of psychopathology after cognitive behavioral therapy for panic disorder. Neuropsychiatric disease and treatment, 13, 1835–1840. https://doi.org/10. 2147/NDT.S121360.

Jafari, A., Pouyamanesh, J., Ghorbanian, N., & Kabiri, M. (2014). The effectiveness of schema therapy on moderating early maladaptive schemas and reducing students' anxiety sensitivity. *Journal of Instruction and Evaluation, 6*(24), 79-91.

Johnson, S. U., Ulvenes, P. G., Øktedalen, T., & Hoffart, A. (2019). Psychometric Properties of the General Anxiety Disorder 7-Item (GAD-7) Scale in a Heterogeneous Psychiatric Sample. Frontiers in psychology, 10, 1713. https://doi.org/10.3389/fpsyg.2019.01713.

Khaleghi, M., Leahy, R. L., Akbari, E., Mohammadkhani, S., Hasani, J., & Tayyebi, A. (2017). Emotional schema therapy for generalized anxiety disorder: A single-subject design. International Journal of Cognitive Therapy, 10(4), 269–282. https://doi.org/10.1521/ijct.2017.10.4.269.

Leahy, R. L. (2019). Introduction: Emotional Schemas and Emotional Schema Therapy. International Journal of Cognitive Therapy, 12(1), 1-4. https://doi.org/10.1007/s41811-018-0038-5.

Leahy, R. (2015). Emotional schema therapy. New York: The Guilford Press.

Leahy, R. (2012). Emotional schema therapy: A bridge over troubled waters. In J. Herbert & E. Forman (Eds.), Acceptance and mindfulness in cognitive behavior therapy: Understanding and applying the new therapies (pp. 109-131). John Wiley & Sons, Inc. : Hoboken.

Leahy, R. (2007). Emotion and Psychotherapy. *Clinical Psychology: Science and Practice, 14*(4), 353-357. https://doi.org/10.1111/j.1468-2850.2007.00095.x.

Leahy, R. (2002). A model of emotional schemas. Cognitive and Behavioral Practice, 9(3), 177-190. https://doi.org/10.1016/S1077-7229(02)80048-7.

Leahy, R., Tirch, D., & Napolitano, L. (2011). *Emotion regulation in psychotherapy : A practitioner's guide*. New York: Guilford Press.

Lieb, R., Becker, E., & Altamura, C. (2005). The epidemiology of generalized anxiety disorder in Europe. *European Neuropsychopharmacology, 15*(4), 445-452. https://doi.org/10.1016/j.euroneuro.2005.04.010.

Liu, H., Tian, Y., Liu, Y., Nigatu, Y. T., & Wang, J. (2019). Relationship between major depressive disorder, generalized anxiety disorder and coronary artery disease in the US general population. *Journal of Psychosomatic Research, 119*, 8-13. doi: https://doi.org/10.1016/j.jpsychores.2019.01.007.

Löwe, B., Decker, O., Müller, S., Brähler, E., Schellberg, D., Herzog, W., & Herzberg, P. Y. (2008). Validation and standardization of the Generalized Anxiety Disorder Screener (GAD-7) in the general population. Medical care, 46(3), 266–274. https://doi.org/10.1097/MLR.0b013e318160d093.

Mantar, A., Yemez, B., & Alkin, T. (2011). Anxiety sensitivity and its importance in psychiatric disorders. *Turk psikiyatri dergisi, 22*(3), 187-193.

McHugh, R. K. (2019). 2 – Assessing anxiety sensitivity. In J. A. J. Smits, M. W. Otto, M. B. Powers & S. O. Baird (Eds.), The Clinician's Guide to Anxiety Sensitivity Treatment and Assessment (pp. 9-29): Academic Press.

Mohammadkhani, P., Pourshahbaz, A., Kami, M., Mazidi, M., & Abasi, I. (2016). Anxiety Sensitivity Dimensions and Generalized Anxiety Severity: The Mediating Role of Experiential Avoidance and Repetitive Negative Thinking . Iranian journal of psychiatry, 11(3), 140–146.

Morvaridi, M., Mashhadi, A., Shamloo, Z. S., & Leahy, R. L. (2019). The Effectiveness of Group Emotional Schema Therapy on Emotional Regulation and Social Anxiety Symptoms. International Journal of Cognitive Therapy, 12(1), 16-24. https://doi.org/10.1007/s41811-018-0037-6.

MoradiManesh, F., MirJafari, S. A., Goudarzi, M., & Mohammadi, N. (2007). Evaluate the psychometric properties of the revised anxiety sensitivity index (ASIR). *Journal of Psychology, 11*(4), 426-446.

Mousavi, F. (2011). *Examine relationships anxiety sensitivity and Big Five Personality and academic achievement in female high school students in Shiraz.* Master's Thesis, Shahid Beheshti University, Tehran.

Naeinian, M. R., Shaeiri, M. R., Sharif, M., & Hadian, M. (2011). To study reliability and validity for a brief measure for assessing Generalized Anxiety Disorder (GAD-7). *Clinical Psychology & Personality*, 2(4), 41-50. https://www.sid.ir/en/journal/ViewPaper.aspx?id=299776.

Norton, P. J., & Edwards, K. S. (2017). Anxiety sensitivity or interoceptive sensitivity. *European Journal of Psychological Assessment, 33*(1), 30-37. https://doi.org/10.1027/1015-5759/a000269.

Olthuis, J. V., Watt, M. C., & Stewart, S. H. (2014). Anxiety Sensitivity Index (ASI-3) subscales predict unique variance in anxiety and depressive symptoms. Journal of Anxiety Disorders, 28(2), 115-124. https://doi.org/10.1016/j.janxdis.2013.04.009.

Ogawa, S., Kondo, M., Ino, K., Imai, R., Ii, T., Furukawa, T. A., & Akechi, T. (2018). Predictors of Broad Dimensions of Psychopathology among Patients with Panic Disorder after Cognitive-Behavioral Therapy. Psychiatry Journal, 2018, 5183834. https://doi.org/10.1155/2018/5183834.

Omani-Samani, R., Maroufizadeh, S., Ghaheri, A., & Navid, B. (2018). Generalized Anxiety Disorder-7 (GAD-7) in people with infertility: A reliability and validity study. *Middle East Fertility Society Journal*, 23(4), 446-449. https://doi.org/10.1016/j.mefs.2018.01.013.

Otto, M. W., Smits, J. A. J., Fitzgerald, H. E., Powers, M. B., & Baird, S. O. (2019). Anxiety sensitivity and your clinical practice. In J. A. J. Smits, M. W. Otto, M. B. Powers, & S. O. Baird (Eds.), The clinician's guide to anxiety sensitivity treatment and assessment (pp. 179–193). Elsevier Academic Press. https://doi.org/10.1016/B978-0-12-813495-5.00009-7.

Peterson, R. A., and Reiss, S. (1992). Anxiety Sensitivity Index Manual, 2nd Edn. Worthington, OH: International Diagnostic Services.

Rabian, B., Peterson, R. A., Richters, J., & Jensen, P. S. (1993). Anxiety sensitivity among anxious children AU – Rabian, Brian. *Journal of Clinical Child Psychology, 22*(4), 441-446. https://doi.org/10.1207/s15374424jccp2204_4.

Reiss, S. (1991). Expectancy model of fear, anxiety, and panic. Clinical Psychology Review, 11(2), 141–153. https://doi.org/10.1016/0272-7358(91)90092-9.

Reiss, S., Peterson, R. A., Gursky, D. M., & McNally, R. J. (1986). Anxiety sensitivity, anxiety frequency and the prediction of fearfulness. Behaviour research and therapy, 24(1), 1–8. https://doi.org/10.1016/0005-7967(86)90143-9.

Rosner, B. (2015). Fundamentals of biostatistics. Nelson Education.

Ruscio, A. M., Hallion, L. S., Lim, C., Aguilar-Gaxiola, S., Al-Hamzawi, A., Alonso, J., Andrade, L. H., Borges, G., Bromet, E. J., Bunting, B., Caldas de Almeida, J. M., Demyttenaere, K., Florescu, S., de Girolamo, G., Gureje, O., Haro, J. M., He, Y., Hinkov, H., Hu, C., de Jonge, P., Karam, E.J., Lee, S., Lepine, J.P., Levinson, D., Mniemneh, Z., Navarro-Mateu, F., Posada-Villa, J., Slade, T., Stein, D.J., Torres, Y., Uda, H., Wojtyniak, B., Kessler, R.C., Chatterji, S., & Scott, K. M. (2017). Cross-sectional comparison of the epidemiology of DSM-5 generalized anxiety disorder across the globe. *JAMA Psychiatry, 74*(5), 465-475. https://doi.org/10.1001/jamapsychiatry.2017.0056.

Rutter, L. A., & Brown, T. A. (2017). Psychometric Properties of the Generalized Anxiety Disorder Scale-7 (GAD-7) in Outpatients with Anxiety and Mood Disorders. *Journal of psychopathology and behavioral assessment*, *39*(1), 140–146. https://doi.org/10.1007/s10862-016-9571-9.

Saunders, M., Lewis, P., & Thornhill, A. (2012). Research methods for business students. Pearson Education Ltd.

Scott, K. M., Wells, J. E., Angermeyer, M., Brugha, T. S., Bromet, E., Demyttenaere, K., de Girolamo, G., Gureje, O., Haro, J. M., Jin, R., Karam, A. N., Kovess, V., Lara, C., Levinson, D., Ormel, J., Posada-Villa, J., Sampson, N., Takeshima, T., Zhang, M., & Kessler, R. C. (2010). Gender and the relationship between marital status and first onset of mood, anxiety and substance use disorders. Psychological medicine, 40(9), 1495–1505. https://doi.org/10.1017/S0033291709991942.

Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of internal medicine*, *166*(10), 1092–1097. https://doi.org/10.1001/archinte.166.10.1092.

Taylor, S. (2020). Anxiety sensitivity. In J. S. Abramowitz & S. M. Blakey (Eds.), Clinical handbook of fear and anxiety: Maintenance processes and treatment mechanisms (pp. 65–80). American Psychological Association. https://doi.org/10.1037/0000150-004.

Taylor, S. (1999). Anxiety sensitivity theory: Research, and treatment of the fear of anxiety. Routledge.

Taylor, S., Zvolensky, M. J., Cox, B. J., Deacon, B., Heimberg, R. G., Ledley, D. R., ... Cardenas, S. J. (2007). Robust dimensions of anxiety sensitivity: Development and initial validation of the Anxiety Sensitivity Index-3. *Psychological Assessment, 19*(2), 176-188. https:// https://doi.org/10.1037/1040-3590.19.2.176.

Veisy, F., Farahani, H., Togha, M., Gharaee, B., Janani, L., Aghebati, A. (2021). Rapid screening for generalized anxiety disorder in patients with migraine. Current Journal of Neurology, 20(2), 102-110. http://dx.doi.org/10.18502/cjn.v20i2.6746.

Yang, H., Zhao, X., Fang, J., & Elhai, J. D. (2021). Relations between anxiety sensitivity's cognitive concerns and anxiety severity: Brooding and reflection as serial multiple mediators. *Current Psychology*, 1–7. https://doi.org/10.1007/s12144-021-02195-4.

Yoon, K. L., & Zinbarg, R. E. (2007). Generalized anxiety disorder and entry into marriage or a marriage-like relationship. Journal of anxiety disorders, 21(7), 955–965. https://doi.org/10.1016/j.janxdis.2006.10.006.

Zinchuk, M., Kustov, G., Pashnin, E., Gersamia, A., Rider, F., Yakovlev, A., Voinova, N., Popova, S., Avedisova, A., & Guekht, A. (2021). Validation of the Generalized Anxiety Disorder-7 (GAD-7) in Russian people with epilepsy. *Epilepsy & Behavior*, 123, 108269. https://doi.org/10.1016/j.yebeh.2021.108269.

Journal of Evidence-Based Psychotherapies,
Vol. 22, No. 1, March 2022, 55-86.

10.24193/jebp.2022.1.4

DEEP DIVE INTO THE CONSTRUCTIVE MIND: RELATING INTERPRETIVE DIVERSITY UNDERSTANDING TO ANXIETY SYMPTOMS AND PARENTAL PRACTICES IN MIDDLE CHILDHOOD

Melania Moldovan[1], Narcisa Prodan[1], Andra Diana Coman[2], and Laura Visu-Petra[1]*

[1] Research in Individual Differences and Legal Psychology (RIDDLE) Lab, Department of Psychology, Babeș-Bolyai University, Cluj-Napoca, Romania.
[2] Department of Psychology, Babeș-Bolyai University, Cluj-Napoca, Romania.

Abstract

The relation between the understanding of the mind as being constructive, anxiety, and parental factors is not fully elucidated. *Interpretive diversity understanding* represents an understanding that people can have a different interpretation of the same situation due to differences in beliefs, attitudes, and knowledge. We aim to bring together two approaches to this concept: the *interpretive theory of mind (ToMi)*, and the *constructivist theory of mind (ToMc)* and relate them to *anxiety* symptoms and *parental practices* during *middle childhood* (8-12 years). In two studies, we used a restricted view paradigm to assess ToMi, a questionnaire to assess ToMc (the Constructivist Theory of Mind Interview, short written version in Study 1, and extended interview in Study 2) and parental and child reports of parental practices, as well as children's anxiety symptoms. Results revealed that the two interpretive diversity understanding tasks were positively associated (Study 2). Overall, warm parental practices were positively associated with ToM tasks and a significant predictor for the ToMc interview answers. On the other hand, parental rejection and overprotection were negatively associated with performance on the ToMi task, with the ToMc score and positively with anxiety symptoms. Understanding the relationship between ToM, anxiety, and parental practices is essential for preventing early social and emotional difficulties during middle childhood.

Keywords: interpretive diversity understanding, interpretive theory of mind, constructivist theory of mind, anxiety, parental practices, middle childhood.

[*] Correspondence concerning this article should be addressed to Laura Visu-Petra, Department of Psychology, Babeș-Bolyai University, Republicii Street, nr. 37, Cluj-Napoca, 400015.
https://orcid.org/0000-0001-6905-9279
Email: laurapetra@psychology.ro

Deep Dive into the Constructive Mind: Relating Interpretive Diversity Understanding to Anxiety Symptoms and Parental Practices in Middle Childhood

More than 30 years of research have revealed that early on, children come to an understanding that people have various mental states: beliefs, desires, intentions, which drive their behavior, this insight into the minds of others being termed Theory of Mind (ToM; Wellman et al., 2001). The 1st and 2nd order ToM emerge at around 3-4, and 7 years of age respectively, when children become aware that another person can form a false belief about reality or somebody else's belief, and act upon it (e.g., if the mother mistakenly thinks the ball is in the yard, she will look for it there; Wellman et al., 2001).

When it comes to middle childhood and adolescence, 1st and 2nd order ToM have been deemed insufficient to fully account for children's understanding of the mind (Lalonde & Chandler, 2002). These two forms of ToM encompass how children understand various beliefs in the context of different existing knowledge (e.g., the mother knows the ball is in another yard, the child does not; hence their beliefs are different). However, this does not reflect the complex understanding of the mind as being in and of itself constructive (Lalonde & Chandler, 2002; Miller, 2000). Pillow (1995) proposed the *active-passive hypothesis* stating that initially, children consider knowledge as being passively constructed, a result of perceptual information being received, without interacting with the other mental states or cognitive process of the individual. This approach changes into an active one over the years, as children become more capable of appreciating the importance of psychological processes in mediating the received information (Pillow, 1995). At around 7-8 years of age, they realize that people exposed to the same situation can construct diverse interpretations due to their previous beliefs, attitudes, and knowledge (Carpendale & Chandler, 1996; Pillow & Mash, 1998). This understanding of interpretive diversity has been termed *constructive* or *interpretive ToM (ToMi;* Carpendale & Chandler, 1996).

To measure this ability, the *restricted pictures paradigm* was developed, in which ambiguous pictures and two puppets looking at them are introduced to the child. Researchers have observed that children younger than 7 have difficulties understanding that more than one interpretation can be assigned to a picture by the two puppets (Lalonde & Chanlder, 2002). Subsequent studies investigated if children's own past experience with the ambiguous picture would influence their reasoning about another's interpretation. Firstly, children presented with an ambiguous covert picture were asked to infer what the complete picture could be so that their expectations (e.g., to see a shark) were not met when the image was uncovered (revealing a witch hat). Despite this experience of an expectation-reality gap, they could not reason that another person would form a similar expectation to their initial one in the same situation (Lalonde & Chandler, 2002; Ross et al., 2005).

Moreover, in one study, children were introduced to a puppet that was serially exposed to two identical covert pictures that, once uncovered, revealed two similar full images. When they were asked what the puppet would expect of a third covert picture, similar to the first two, the younger ones could not use the past experience in inferring the puppet's interpretation, failing to understand *biased interpretation* (Pillow & Henrichon, 1996).

Approaching another dimension of interpretive diversity understanding, Schwanenflugel and colleagues (1996, p. 228) defined it as an understanding that "knowledge can be more or less certain, that feelings of uncertainty are important in evaluating information, that things can have multiple meanings, and that these meanings can arise solely from differences in interpretive mental processes". They describe a developmental change around the age of 11 years favoring mental processes compared to external aspects when the child evaluates how a person is making sense of a situation. This developmental change allows the child to understand that two or more people can have different representations of the same information (Weimer et al., 2017), an ability termed *constructivist ToM (ToMc).* The authors developed a distinct measure of the understanding of interpretive diversity, *The Constructivist Theory of Mind Interview* questionnaire, in both short and long versions (Weimer et al., 2017), adequate for middle childhood and adolescence. The potential convergence between these two dimensions of understanding interpretive diversity (ToMi and ToMc) remains unexplored.

ToM deficits have been long associated with various forms of psychopathologies, such as anxiety and depression disorders (Plana et al., 2014), autism (Tahazadeh et al., 2020), as well as body dysmorphic disorders (Buhlmann et al., 2015) and schizophrenia (Andrzejewska et al., 2017), in children (Hazel & McNally, 2014), as well as adults (Reid, 2017). However, much less is known about ToM deficits in anxiety during middle childhood (Authors, 2021; Tafreshi & Rachine, 2016). We will discuss next how emotional difficulties (anxiety) shape ToM understanding in general and extract preliminary evidence regarding their interplay with interpretive diversity understanding.

ToM and Anxiety

Researchers have documented either a deficit or a hyperactive ToM in people suffering from clinical or subclinical anxiety (Plana et al., 2014; Tibi-Elhanany & Shamay-Tsoory, 2011). More specifically, hyperactive ToM or over-mentalization refers to the tendency to attribute "more intense emotions and greater meaning to what the characters in the movie were thinking, feeling and intending" (Hazel & McNally, 2014, p. 530). For example, participants with social anxiety disorder tend to read too much into other people's feelings, incorrectly attributing beliefs, and intentions to others, which is detrimental to their understanding of the

social situation (Hazel & McNally, 2014; Washburn et al., 2016). On the other hand, there is also significant evidence of poor performance on ToM tasks for those suffering from anxiety disorders (Reid, 2017).

The preliminary findings in children illustrate an anxiety-related ToM deficit. In one study, after anxious preschoolers were regularly excluded from a computerized game, they attended less to other's mental states compared to non-anxious preschoolers (White et al., 2016). Primary school children with social anxiety had difficulties in understanding the links between emotions, intentions, and beliefs in social situations, and were rated as having lower social skills that require insight into others' mental states (Banerjee & Henderson, 2001). Social anxiety in school predicted mentalizing deficits in adolescence (Ballespí et al., 2018). Others, however, found that both low and high levels of mind reading are related to social anxiety symptoms as a function of the individual's clinical anxiety level. More specifically, low mindreading was related to clinical levels of social anxiety, while high mindreading was related to subclinical levels of social anxiety through blushing (Nikolić et al., 2019). To summarize, the literature indicates that the relationship between ToM and anxiety is far more complex than the straightforward deficit ToM hypothesis (Nikolić et al., 2019). However, to the best of our knowledge, only one study looked at ToMi in relation to anxiety. Results have shown that in a group of 9- to 11-years old children, as their anxiety symptoms and number of threatening interpretations of an ambiguous situation increased, their ability to understand that two people can form two different interpretations on the same ambiguous action was reduced (Moldovan & Visu-Petra, 2022).

ToM and Parental Practices

As Weimer and colleagues (2021) have discussed, in order to fully understand the developmental path of ToM through middle childhood, we need to investigate the interrelations between ToM and contextual factors such as parental practices. Parental rearing practices refer to specific behaviors employed by caregivers to socialize their children (Darling & Steinberg, 1993) and are linked to numerous outcomes throughout development, such as socioemotional adjustment (Rapee, 1997). The quality of the parent-child emotional bond before adolescence has a long-lasting impact on mental health (Perris et al., 1980), with the absence of a nurturing relationship being associated with internalizing problems (e.g., depression, anxiety disorders) later in life (Perris et al., 1986). Other studies have found negative associations between ToM performance and parental authoritarianism (emphasizing obedience and strict adherence to rules) and a positive association between ToM and authoritative parenting (emphasizing discipline and warmth; O'Reilly & Peterson, 2014).

To our knowledge, only one study investigated interpretive diversity in relation to parental practices rather than parenting styles. Tafreshi and Racine (2016) have found that the frequency of mother-child talks, and mother's conceptions of

knowledge were positively correlated with children's performance on the Droodle Task (ToMi), reinforcing the idea that rich conversations about psychological processes are important for children's understanding of the mind.

Parental Practices and Anxiety

The current study focused only on three parental practices – Emotional Warmth, Rejection, and Overprotection (Aluja et al., 2006; Arrindell et al., 1999; Gerlsma et al., 1991) which can impact both the development of ToM and of the internalizing symptoms that a child might manifest. *Emotional warmth* includes direct indicators of parents' care, affection, and acceptance towards their children (Rohner, 2004). Maternal warmth, for example, is a relevant predictor for children's social and emotional development (Davidov & Grusec, 2006). Moreover, warm and nurturing parental practices are negatively associated with internalizing symptoms (Rose et al., 2018). Lack of warmth, negative affect behavior, and *rejection*, on the other hand, have been associated with an increase in internalizing and externalizing symptoms (Conger et al., 2002; Grüner et al., 1999). So far, most of the parent-child research has focused on the role of mothers in relation to their children and minimalized the contribution of the fathers in this dynamic (Cabrera et al., 2000; Rinaldi & Howe, 2021). However, one study suggested that maternal rejection was linked to higher levels of depression and aggression in girls. In contrast, paternal rejection was a negative predictor of depression and aggression in boys (Roelofs et al., 2006). *Parental overprotection* is described as the tendency towards controlling every aspect of a child's life and discouraging attempts of autonomy. Overprotective parents put pressure on their children to behave, "think or feel in desired ways" (Van Der Bruggen et al., 2008, p. 1257), which might increase the risk for developing both internalizing and externalizing problems (Muris et al., 2003).

Current Studies

The main aim of our two studies was to broaden the limited knowledge on the understanding of interpretive diversity by bringing together, for the first time in literature, two approaches to it: the understanding of the multiple interpretations on ambiguity (ToMi; Lalonde & Chandler, 2002) and the understanding of cognitive activities as part of interpretation construction (ToMc; Weimer et al., 2017). We focused on middle childhood and early adolescence, as ToMi and ToMc understanding is thought to emerge during this developmental stage (Lalonde & Chandler, 2002; Weimer et al., 2017). Our current studies significantly contribute to the existing literature by expanding the developmental window from primary school (Lalonde & Chandler, 2002) to middle childhood (8 to 12 years old). Another extension was to use – besides the Droodle Task (designed to measure ToMi) – another measure of interpretive diversity, the Constructivist Theory of Mind

Interview (in both a short and an extended version). Considering the fact that this ability does not develop in a socioemotional vacuum, we were also interested in exploring how parental practices and emotional symptoms relate to this advanced form of ToM. Therefore, we measured individual differences in emotional (anxiety/internalizing symptoms), and contextual factors (parental practices and socio-economic status), adding baseline cognitive assessments (IQ, Comprehension, and Vocabulary) as control variables.

Firstly, we anticipated a positive relation between ToMi and ToMc, as two facets of the understanding of *interpretive diversity*. A second hypothesis was that *warm parental practices* would positively predict children's performance on the ToMc and ToMi tasks, while overprotection and rejection parental practices would be negative predictors. Thirdly, we hypothesized that children's *anxiety symptoms* would be negatively related with their ToMi and ToMc performance. Last, but not least, warm parental practices were also expected to be negatively related with anxiety symptoms, as opposed to overprotective and rejection practices.

Study 1

Method

Participants and Procedure

We recruited 136 primary school children with ages between 8-12 years (M = 120 months, SD = 12.85) from a public school in a northwestern part of Romania. 90% of the families declared Romanian as the primary language, and their household earnings were reported as the minimum (36%) or above minimum wage (36.8%; National Institute of Statistics, 2021). Parent's education varied, most of them having completed a bachelor's degree (35.3% of mothers and 29.4 % of fathers; the national average of people with bachelor's degrees was of approximately 26.3% in 2017; European Commission Romania, 2021). Children with chronic diseases (as reported by parents) were not included in the study.

We included children from schools with the help of the teachers. We initially approached parents from 12 classes, of which approximately 35% agreed to participate. Caregivers' written consent and children's verbal assent were necessary for inclusion, and children were free to withdraw from the study or decline to complete any task at any point.

In the first step, parents completed the demographic questionnaire and the parent version of the anxiety and parental practices questionnaires. Afterwards, children were administered the child version of the two questionnaires and the short version of the Constructivist Theory of Mind Interview, all in one session. In the last step, children were tested individually, by an experimenter, in the school counselor's office, with the Droodle task and the IQ tasks. The three phases were approximately 1 week apart from each other. An initial a priori analysis for the upcoming

correlational analysis was conducted with G*power (Faul et al., 2007) and revealed that with $\alpha = .05$ and a power $1-\beta = .80$, we needed 64 participants in order to find effects of 0.25.

Materials

The Constructivist Theory of Mind Interview-Short Version. We used the paper-pencil short version of the interview developed by Weimer and colleagues (2017), which contains 6 scenarios from the original 10. In these scenarios one or two persons are faced with visual, auditory, or verbal stimuli and children were asked about the person(s)/s'(s) mental processes (Comprehension, Attention, Memory, Comparison, Planning, and Inference) regarding those stimuli. The questions explored children's understanding of interpretive diversity and whether they considered this to be a consequence of the constructive nature of mental processes or other stimulus-related factors. Children were instructed to circle "Yes" or "No" for each question and to provide further explanations if they answered "Yes". Their answers were subsequently coded as follows: "No", "Yes, with Non-Active Mental Process Explanation", or "Yes, with Active Mental Process Explanation". The response was coded as "Non-Active Mental Process Explanation" if children made references to stimuli properties or knowledge differences between individuals, such as poor quality of perceptual information (e.g., the response "Talking too fast" to the question, "Could somebody hear everything that someone said to them but not understand it?"), but also if they failed to give explanations (e.g., "I don't know how."). However, if children's response referred to the inherent differences of mental processes across individuals (e.g., the answer "Could get a different meaning" for the aforementioned question), it was scored as an "Active Mental Process Explanation". Based on 25 % of the responses, the interrater reliability was very high (Cohen's kappa = .90).

The Restricted Picture Paradigm (Droodle Task). ToMi was assessed using the `Droodle` task, displaying various drawings (e.g., an elephant and an orange; Lalonde & Chandler, 2002). The child was introduced to two dolls (naïve observers). Then, the child was shown the complete picture of the first drawing and was asked to describe it. The drawing was then fitted within an envelope that had a small viewing window. In this way, the envelope masked most of the drawing, leaving only an ambiguous part to be seen (e.g., the trunk of an elephant and a part of an orange). The participants were asked to infer how each doll would interpret the identity of the full drawing based on the visible, ambiguous part of it. A second trial with the next drawing immediately followed.

The participants' responses to each drawing were coded according to the following criteria: a) the connection of children's response with the full original picture (1 = *no connection*, 0 = *obvious connection* to the picture) and b) the similarity between the two puppets interpretations (1 = *no similarity*, 0 = *similar*). Only if both a) and b) were 1, the score for the droodle was 1. As such, children could have a score of 0 – no ToMi, 1 – partial ToMi, and a score of 2 – total ToMi.

Based on 25 % of the responses, the interrater reliability was very high (Cohen's kappa = .84).

Parental Rearing Behaviors-Egna, Minnen, Betraffande, Uppfostran (EMBU). Parental rearing behaviors were assessed with adolescents' version of the EMBU questionnaire (My memories of upbringing; Perris et al., 1980) – EMBU – A (Paloş & Drobot, 2010) and parents' version of the same instrument – EMBU – P. The 49 items used from the EMBU-A questionnaire evaluate children's perception regarding their parents' rearing practices according to three different factors: Emotional Warmth, which involved parental acceptance and emotional/ verbal/ physical expressed affection as perceived by the child (e.g., "Do you feel that your father/mother minds helping you if you have to do something difficult?"), Rejection as an expression of punishment, hostility and lack of affection towards the child (e.g., "Does your father/mother say unpleasant things about you to other people, for example, that you are lazy or difficult?"), and Overprotection or the tendency to over-nurture or control the child's actions (e.g., "Do you have to tell your father/mother what you've been doing when you get home?"). Children first completed the assessment for parental practices of their mother and then for their father. EMBU – P has an identical structure as the one described for EMBU–A, the items being formulated from the parents' perspective (e.g., "Have you respected your child's opinions?"). Only Emotional Warmth and Overprotection subscales were used for the present investigation.

The Revised Child Anxiety and Depression Scale – Parent and Child Versions (RCADS). RCADS (Visu-Petra et al., 2011; Chorpita et al., 2000) is a 47-item questionnaire used to measure the frequency of the most relevant anxiety symptoms (the Anxiety Subscales are: Generalized Anxiety Disorder Subscale, Social Phobia Subscale, Separation Anxiety Subscale, Panic Disorder Subscale, Obsessive-Compulsive Disorder Subscale, 37 items) and Depression (10 items for Depression Subscale), as indicated by DSM-IV. Responses range from 0 to 3 (0 = *never*, 1 = *sometimes*, 2 = *often*, 3 = *always*). Both caregiver's and children's versions were administered. The RCADS for parents has high internal consistency, $\alpha = .85$, as well as RCADS for children, $\alpha = .88$.

IQ – Vocabulary, Comprehension, and Coding. Children's verbal and non-verbal IQ was evaluated using several subtests (Comprehension, Coding, and Symbol Search) from the Romanian adaptation of the WISC-IV (Dobrean, 2012; Wechsler, 2004). The WISC-IV is widely used and has excellent internal consistency, test-retest reliability, criterion validity, and construct validity (Wechsler, 2004).

SES. We evaluated socioeconomic status (SES) in two ways. Firstly, parents were asked to complete a demographic survey that included their education level and income. Secondly, we adapted the scale from the one used in Bocquier and colleagues (2013) to evaluate children's perspectives regarding their familial SES. It included 6 questions measuring the number of objects a family owns and activities (e.g., "How many cars does your family own?"). Its internal consistency was poor, $\alpha = .52$.

Design and Analytical Strategy

This study has a correlational and observational design, and all analyses were conducted using SPSS Statistics Software 21. Firstly, the descriptive statistics of each outcome were examined. The missing data were analyzed and resolved with multiple imputation analysis. The normality of each distribution was examined in order to choose between the parametrical or non-parametrical tests. Secondly, we conducted a correlation analysis to test our first hypothesis regarding the relation between the two interpretive diversity understanding tasks. Regression analyses were used to test for our second, third, and fourth hypothesis regarding the relation between parental practices and ToM, anxiety symptoms and ToM, and parental practices and anxiety symptoms, respectively. Thirdly, based on identifying a correlation with child age in the previous analysis, we conducted a post-hoc analysis of variance to investigate differences between younger and older children in terms of the proportions of the ToMc response categories to the interview. The reason behind this choice was that the previous study (Weimer et al., 2017), which constructed the interview tested for similar effects. The Greenhouse – Geisser method (Field, 2009) was used for the ANCOVA test statistics as the sphericity assumption was violated.

Results

Descriptive Statistics

Descriptive data for the Droodle task (interpretive diversity understanding), anxiety and internalizing symptoms, parental practices, IQ tests, and SES questionnaires are provided in Table 1. The mean proportions and standard deviations of each response category of the ToMc interview in the younger group (8- to 10-year-olds) and older group (11- to 12-year-olds) are shown in Table 2. For the questionnaires, we used the multiple imputation method to generate estimates for missing values (Penn, 2007). Next, we dealt with the outliers using Field's (2009) method of transforming each outlier score into the sum of the measurement's mean plus 2 *SD*s.

Table 1. Descriptive Statistics for the Main Variables

Variable	*N*	*Range*	*Min*	*Max*	*M*	*SD*
Interpretive Diversity Understanding tasks						
Droodle Task	136	2	0	2	1.19	.84
Parental Practices						
Warmth Mother	136	25	56	81	69.86	5.6
Rejection Mother	136	17	19	36	24.81	4.87
Overprotection Mother	136	23	16	39	27.91	5.43
Warmth Father	136	31.77	51	82.77	68.17	7.17
Rejection Father	136	17.83	15.95	33.79	23.81	4.56

Variable	*N*	*Range*	*Min*	*Max*	*M*	*SD*
Overprotection Father	136	25	14	39	25.83	5.56
Warmth Parents	136	15.3	55	70.3	63.29	3.47
Control Parents	136	27.64	32	59.64	45.61	6.58
Anxiety and Depression symptoms						
Anxiety Child	136	77	3	80	30.18	15.83
Internalizing Child	136	74.74	4	78.74	36.1	18.56
Anxiety Parent	136	36.65	1	37.65	17.09	8.92
Internalizing Parent	136	43.97	1	44.97	20.75	10.49
IQ tests						
Comprehension	136	22	14	36	25.95	5.67
Coding	136	43	23	66	45.27	10.53
Symbol Searching	136	22	13	35	24.37	5.59
SES	136	12	1	13	6.96	2.37

Note: Anxiety and Internalizing Scores are outcomes of the Revised Child Anxiety and Depression questionnaire completed by children and their parents. Coding and Symbol Searching are two subscales from the Processing Speed Index.

Table 2. Mean Proportions (and Standard Deviations) of Response Categories of ToMc Interview by Age Group

Age group	*N*	Yes, with Active Mental Process Explanation	Yes, with Non-Active Mental Process Explanation	No explanation
8-10 years	59	.01 (.05)	.23 (.22)	.74 (.24)
11-12 years	77	.09 (.12)	.37 (.21)	.52 (.26)

We further conducted a mixed ANCOVA in order to find differences between children in terms of proportions of the response categories. We introduced the three ToM Interview responses as a within factor variable (Active Mental Process Explanation, Non-Active Mental Process Explanation, No Explanation), age as a between factor variable (that was coded as a dummy variable with two categories, 1 for 8- to 10-year-olds, and 2 for 11- to 12-year-olds) and Comprehension as a covariate. Since the sphericity assumption was violated, ANCOVA test statistics were estimated using the Greenhouse – Geisser method. Our results indicated that there was a significant difference between the ToM responses, $F(1.259, 16.258) = 16.590$, $p < .001$, $\eta_p^2 = .11$ and a significant interaction between ToM responses and age, $F(1.536, 16.258)$, $p < .001$, $\eta_p^2 = .086$. Considering the pairwise contrasts, children in both categories of age tended to give significantly higher proportion of responses with no explanation than with non-active and active mental process explanations. The contrasts showed that 8- to 10-year-old children had significantly

higher proportion of responses with no explanation and significantly lower proportions of active mental process explanations than 11- to 12-year-olds.

The ToMi (Droodle task) did not correlate with any anxiety or parental practices variables, except with Warmth (Parent), $r_s(136) = .17$, $p = .04$. That means that as their parents reported more parental practices based on affection and support, children tended to give more valid interpretations to the same ambiguous drawings.

Parental Rearing Practices and Anxiety Symptoms

We have obtained positive correlations between total scores on Anxiety Child and Rejection Mother, $r_s(136) = .35$, $p < .001$, Overprotection Mother, $r_s(136) = .32$, $p < .001$, Rejection Father, $r_s(136) = .25$, $p = .003$, as well as with Overprotection Father, $r_s(136) = .32$, $p < .001$ (see Table 3). Similar correlations were obtained with parent's reports of child anxiety, as we have obtained significant positive correlations between Overprotection Parents and Anxiety Parent, $r_s(136)=.31$, $p < .001$, as well as with Internalizing Parent, $r_s(136) = .33$, $p < .001$. This means that as children reported more parental practices based on the expression of hostility, punishment, and tendency to over-nurture the child, children's anxiety and internalizing symptoms were higher, as reported by themselves and by their parents. This partly supports our third hypothesis.

Table 3. Correlations between EMBU and RCADS,
Both with Parent and Child Version, as well as Coding, Symbol Search and Comprehension

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.Warmth Mother															
2. Rejection Mother	-.31**														
3. Overprotection Mother	.08	.31**													
4. Warmth Father	.43**	-.31**	-.08												
5. Rejection Father	-.16	.64**	.20*	-.32**											
6. Overprotection Father	.05	.22**	.69**	.02	.26**										
7. Warmth Parent	.08	.00	.10	-.01	-.11	.01		.							
8. Overprotection Parent	.05	.20*	.29**	-.07	.15	.23**	.18*								
9. Anxiety Child	.00	.35**	.32**	-.06	.25**	.32**	.01	.18*							
10. Internalizing Child	-.02	.40**	.30**	-.11	.29**	.30**	.00	.18*	.98**						
11. Anxiety Parent	-.00	.02	.14	-.04	.01	.12	-.01	.31**	.25**	.24**					
12. Internalizing Parent	-.02	.05	.12	-.06	.04	.14	-.04	.33**	.26**	.25*	.98**				
13. Coding	.01	-.30**	-.15	.13	-.26**	-.10	-.08	-.05	-.08	-.10	-.03	-.06			
14. Symbol Search	.03	-.09	-.01	.14	-.13	.01	-.13	-.10	-.07	-.09	-.07	-.09	.59**		
15. Comprehension	.17*	-.24**	-.19*	.28**	-.22**	-.63	-.07	-.04	-.03	-.04	.03	.04	.31**	.27**	

Note: RCADS = Revised Child Anxiety and Depression Subscale for anxiety symptoms. EMBU = Egna, Minnen, Betraffande, Uppfostran-My memories of upbringing for parental practices. Significance level: $^{*}p < .05$. $^{**}p <. 01$.

In order to determine the specific effect of parental practices on anxiety while controlling for children's IQ, we ran a series of robust hierarchical regressions using the bootstrap method, which is recommended when the dependent variables violate the assumption of normality. In the first regression, we included as the dependent variable the level of depression symptoms as reported by children. The control variables were age, Comprehension, Coding, and Symbol Searching. In the second step, we included two composite scores reflecting the means of both parent's levels of Rejection and Overprotection. The results showed that the overall regression model predicted 26% of the variance, $R^2 = .26$, $F(6, 129) = 7.544$, $p < .001$. Depressive symptoms were positively predicted only by the Rejection of both parents, $\beta = .495$, $p = .001$, CI [.319; .658].

In the second regression, we included general anxiety disorder as the dependent variable, and the predictors remained the same as those described above. The overall model explained 16.8% of the variance, $R^2 = .168$, $F(6, 129) = 4.327$, $p < .001$. The control variables were not significant. The results showed that the Rejection outcomes of both parents positively affects the level of general anxiety symptoms, $\beta = .21$, $p = .005$, CI [.057; .376]. At the same time, the Overprotection result of both parents was a positive predictor of the level of general anxiety symptoms, $\beta = .175$, $p = .004$, CI [.056; .287].

Discussion

In the current study, we found significant relations between parental practices, anxiety symptoms, and IQ tests. We also found that parental practices were significant predictors of various anxiety symptoms. Firstly, the younger children tend to give more No responses and fewer active mental process explanations than the older children. Secondly, it seems that rejection and overprotection of both parents are important predictors of various anxiety symptoms.

However, the hypothesis according to which the two measurements of interpretive diversity understanding would be positively associated was not fully supported. Therefore, also taking into account the fact that the written responses of the children were not particularly detailed, we conducted a second study in which we used the extended version of the Constructivist Theory of Mind Interview that implies an individual discussion between the researcher and each participant, without a time limit. Hence, we tried to increase the chances of the children carefully considering the questions and giving a proper response. We further used the same tasks and questionnaires and added a Vocabulary test. Coding and Symbol Searching didn't seem relevant in relation to ToM; therefore, in the second study we focused on the verbal predictors.

Study 2

Method

Participants and Procedure

We included 200 children with ages between 8 and 12 years (M = 124 months, SD = 9.8) from nine public schools from northwestern and northeastern parts of Romania. Parental education varied, with most of them having a bachelor's degree (41% of mothers and 47 % of fathers, which is high compared with the national average of approximately 26.3% in 2017; European Commission Romania 2021). The primary language was declared as Romanian by 91 % of the families, and their household earnings were reported as under minimum wage for 39 % of them (National Institute of Statistics, 2021). Children with chronic disease (as reported by parents) were not included in the study. The process of inclusion was the same, and from selected 28 classes, approximately 24% of children agreed to participate. Caregivers' written consent and children's verbal assent were necessary for inclusion, and children were free to withdraw from the study or decline to complete any task at any point. The three phases of the study were the same as in the previous one, except that the ToMc interview was administered by an experimenter, in the school counselor's office, along with the Droodle and verbal tasks.

The same questionnaires from Study 1 were used, more specifically the RCADS-Parent and Child versions (Visu-Petra et al., 2011; Chorpita et al., 2000), and EMBU – Mother, Father, the children versions, and the EMBU Parent, the parent version. The internal consistency was low for EMBU Mother, α = .64, moderate for EMBU father, α = .74, and high for EMBU Parent, α = .80. As for RCADS Children, the internal consistency was high, α = .87, as well as for RCADS Parent, α = .87. The ToMi task, Droodle task, had high interrater reliability, based on 10% of the responses, Cohen's kappa = .85. Although the internal consistency was low for the EMBU Mother subscale, we didn't eliminate it for reasons explained in the first study regarding the same subscale.

Materials

The Constructivist Theory of Mind Interview – Long Version. We used the extended version of the Constructivist Theory of Mind interview to allow for a more ample child-interviewer interaction without any time pressure. The long and the short version are identical in terms of the targeted mental processes (Comprehension, Attention, Memory, Comparison, Planning, and Inference), but it contains 10 scenarios instead of 6. Also, the interview is conducted face to face, individually, with an experimenter. The responses are coded the same way as in the short version, with the following difference. If the initial response given by the child was judged to be a "Non-Active/Non-Mental Process explanation the experimenter gave the child a second chance to construct an "Active Mental Process explanation". For example, the experimenter emphasized that knowledge deficiencies or

perceptual difficulties were not a problem, highlighting the question's purpose, and prompting the child to consider everyday situations. Based on 10% of the responses, interrater reliability was very high (Cohen's kappa = .86).

Vocabulary Test. We used the Expressive Vocabulary from the WISC-IV Verbal Comprehension Index to evaluate children's word knowledge (Wechsler, 2014). The Expressive Vocabulary subtest includes 36 items for which children were asked to define the words provided by the experimenter. The total score could vary between 0 and 72 points.

Design and Analytical Strategy

The analytical strategy was the same as for the previous study, except for an additional analysis, a comparison between children with different Droodle Task scores (0, 1, or 2 of correct responses) in terms of parental practices and anxiety symptoms scores. The reason behind this choice was that the previous studies (Pillow & Weed, 1995), which used this type of vignettes, tested for individual differences between groups of children with different numbers of correct responses. Since the normality assumption was violated, the Kruskal-Wallis test was considered suitable (Field, 2009).

Results

Descriptive Statistics

Descriptive data for the Droodle task (interpretive diversity understanding), anxiety and internalizing symptoms, parental practices, IQ tests, and SSE questionnaires are provided in Table 4. The mean proportion and standard deviation of each response category of the Constructivist Theory of Mind Interview in the younger group (8- to 10-year-olds) and older group (11- to 12-year-olds) are shown in Table 5. Again, for the questionnaires, we used the multiple imputation method to generate estimates for missing values (Penn, 2007) and applied the transformation method for the outliers (Field, 2009).

Table 4. Descriptive Statistics for the Main Variables

Variable	*N*	*Range*	*Min*	*Max*	*M*	*SD*
Interpretive Diversity Understanding						
Droodle Task	200	2	0	2	1.35	.82
Parental Practices						
Warmth Mother	200	21.78	58	79.78	69.59	4.81
Rejection Mother	200	20.56	17	37.56	25.21	5.5
Overprotection Mother	200	19.19	18	37.19	27.34	4.83
Warmth Father	200	32.65	50	82.65	68.65	6.81
Rejection Father	200	22.4	17	39.4	24.63	5.99
Overprotection Father	200	22.1	14	36.1	25.21	5.34
Warmth Parents	200	15.44	54	69.44	62.67	3.38
Control Parents	200	28.21	30	58.21	45.16	6.46

Variable	*N*	*Range*	*Min*	*Max*	*M*	*SD*
Anxiety and Depression symptoms						
Anxiety Child	200	57.68	0	57.68	28.62	13.33
Internalizing Child	200	69.67	0	69.67	34.44	16.1
Anxiety Parent	200	39.52	0	39.52	18.55	9.34
Internalizing Parent	200	47.95	0	47.95	22.37	11.39
IQ tests						
Comprehension	200	23	15	38	29.79	6.52
Vocabulary	199	45	18	63	47.5	12.66
SSE	200	13	0	13	8.1	2.72

Note: Anxiety and Internalizing Scores are outcomes of the Revised Child Anxiety and Depression questionnaire completed by children and their parents, as well. Coding and Symbol Searching are two subscales from the Processing Speed Index.

Table 5. Mean Proportions (and Standard Deviations) of Response Categories of the Interview by Age Group

Age group	*N*	Yes, with Active Mental Process Explanation	Yes, with Non-Active Mental Process Explanation	No Explanation
8-10 years	59	.22 (.16)	.45 (.19)	.32 (.18)
11-12 years	77	.29 (.15)	.43 (.17)	.27 (.17)

Interpretive Diversity Understanding: ToMc and ToMi

We have found a positive correlation between Active Mental Process Explanations and Droodle task, $r_s(200) = .16$, $p = .018$, supporting our first hypothesis. As children reported more active mental process explanations, they were also more likely to offer two different interpretations on the ambiguous pictures. When we split the data into two groups, according to age, their correlation, however, was not significant for the younger group (8- to 10-years old) but remained significant for the older one (10- to 12-years old), $r_s(200) = .44$, $p < .001$. Also, both ToM measurements were positively correlated with age; for Active Mental Process Explanation, $r_s(200) = .31$, $p < .001$, and for Droodle task, $r_s(200) = .15$, $p < .001$. This indicates that as children's age increased, they performed better at the ToM tasks, giving more active mental process explanations and inferring more than one interpretation on the ambiguous drawings. The relation between Active Mental Process Explanations and Droodle Task remained marginally significant when controlling for age, $r_s(200) = .13$, $p = .065$, which means that age does explain a part of their significant relationship. Moreover, the Non-Active Mental Process Explanations were negatively correlated with performance on the Droodle task, $r_s(200) = -.14$, $p = .047$, meaning that as children gave fewer explanations with no reference to mental processes, their understanding of the interpretive nature of an ambiguous situation increased.

A first look over the two sets of ToM interview data showed an increase in the proportions of Active Mental Process Explanations in the second study, more closely resembling the results obtained by Weimer and colleagues (2017) who

worked with older children (9-11 years). In order to analyse the differences between the proportion of Active Mental Process Explanations, No-Active Mental Process Explanations and No responses, we conducted a mixed ANOVA. As a between factor variable, we introduced age (coded as a dummy variable with two categories, 1 was 8- to 10-year-olds, and 2 was 11- to 12-year-olds). The results showed no difference between age groups, but there was a significant difference within individuals regarding ToM. According to the post-hoc tests (using the Bonferroni correction), children of both ages tended to show a higher response proportion with non-Active Mental Process Explanations than with Active Mental Process and No explanations, $p < .001$.

Interpretive Diversity, Parental Practices and Anxiety Symptoms

Using the Spearman's correlation test, we obtained several significant correlations between ToM measurements and parental practices measurements. More specifically, a positive correlation between Active Mental Process explanations and Warmth Mother, $r_s(200) = .23$, $p = .001$, as well as with, Warmth Father $r_s(200) = .19$, $p = .005$, respectively. This means that as children answered with more active mental process explanations, they also reported more parental practices based on acceptance and expressed affection. Moreover, the Active Mental Process and Droodle task seemed to be negatively correlated with Rejection Mother (see Table 6), which means that as children reported less parental practices based on punishment, hostility, and lack of affection, they also offered more active mental process explanations and showed a higher understanding that two different interpretations are valid upon the same ambiguous pictures.

In order to test our second hypothesis, we conducted a hierarchical regression using the bootstrap method. We introduced active mental process explanations as the dependent variable. In the first step, we included as a control variable, age, and mother's education. In the second step, we introduced warmth from both parents (composite score). In the third step, we added internalizing symptoms. The overall model predicted 21.7% of variance ($R^2 = .217$, $p < .001$). All, except internalizing symptoms, were significant predictors, age $\beta = .005$, $p = .001$, CI [.004; .007], mother's education $\beta = .017$, $p = .022$, CI [.005; .030], Warmth Mother and Father, $\beta = .008$, $p = .004$, CI [.003; .012]. The effects are significant albeit very small.

In order to test the second and third hypotheses, we analysed if there were differences between the three groups of the Droodle task (no ToMi, partial ToMi, and total ToMi) regarding the level of separation anxiety, panic attack, depression, and parental behaviours. We have calculated the mean of Rejection of both parents, and the mean of Overprotection of both parents and we used these composite scores as parental behaviours. We have run a series of nonparametric ANOVA's. However, we did not run a parametric MANOVA because the assumption of multivariate normality was violated.

First, we tested for significant differences between the three groups of Droodle Task regarding the level of separation anxiety. The results showed that there were significant differences between groups, $X^2 = 10.179$, $p = .006$. Mann-Whitney tests were used to follow up this finding. A Bonferroni correction was applied so that all effects are reported at a .0167 level of significance. It appeared the only significant difference is between the group with no ToMi and the group with total ToMi. The group with total ToMi has a significantly lower level of separation anxiety than the group with no ToMi, $U = 1781.500$, $p = .002$.

Secondly, we used the Kruskal-Wallis to see if there were significant differences between groups regarding the level of Panic Attack, $H(2) = 8.971$, $p = .011$. A Bonferroni correction was applied so that all effects are reported at a .0167 level of significance. The only significant difference was obtained between the group with no ToMi and the group with total ToMi. The group with total ToMi had a significantly lower level of Panic Attack compared to the group with no ToMi, $U = 1856.500$, $p = .006$. There were no differences between groups regarding the levels of depression.

Thirdly, the following Kruskal-Wallis showed significant differences between groups with respect to the levels of rejection of both parents, $H(2) = 9.892$, $p = .007$. Children with no ToMi had significantly higher levels of rejection from both parents compared to children with total ToMi, $U = 1754.500$, $p = .002$. There were no differences between groups regarding the level of overprotection of both parents.

We obtained negative correlations between both interpretive diversity understanding tasks and Anxiety and Internalizing Score Child (see Table 6). This means that as children reported fewer anxiety symptoms, they gave more active mental process explanations. They were also more likely to offer two different interpretations on the ambiguous pictures. Hence, we confirmed our third hypothesis. Again, there was only one variable, Comprehension, that significantly correlated with anxiety, $r_s(200) = -.20$, $p = .004$, and internalizing, $r_s(200) = -.20$, $p = .003$) symptoms reported by parents.

Parental Practices and Anxiety Symptoms

In order to test our fourth hypothesis, we conducted a hierarchical regression using the bootstrap method. As the dependent variable, we added internalizing symptoms. We introduced age as a control variable, and then in the second step, we introduced rejection and overprotection scales of both parents. In the third step, we added Active Mental Process Explanations and Droodle task. The overall model predicted 25.4% of variance ($R^2 = .254$, $F(5, 194) = 13.204$, $p < .001$). Results showed that only rejection of both parents was a positive and significant predictor of internalizing symptoms, $\beta = 1.152$, $p < .001$, CI [.642; 1.623].

Table 6. Correlation Between ToM Tasks, EMBU, RCADS; Income and Vocabulary and Comprehension

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1.Warmth Mother													
2. Rejection Mother	-.46**												
3. Overprotection Mother	-.07	.36**											
4. Warmth Father	.39**	-.32**	-.04										
5. Rejection Father	-.30**	.73**	.31**	-.35**									
6. Overprotection Father	.00	.32**	.65**	.05	.29**								
7. Active Mental Process	.23**	-.22**	-.08	.19**	-.11	-.09		.					
8. Droodle task	.12	-.22**	-.04	.07	-.18*	-.03	.16**						
9. Anxiety Child	-.12	.38**	.32**	-.09	.35**	.24**	-.15*	-.18*					
10. Internalizing Child	-.14*	.45**	.34**	-.03	.41**	.24**	-.16*	-.17*	.98**				
11. Vocabulary	-.06	-.04	-.15*	-.07	-.01	-.20**	-.05	-.09	-.05	-04			
12. Comprehension	.04	-.04	-.08	.09	-.09	-.10	-.02	-.09	-.01	-.04	.39**		
13. SSE	-.05	-.05	-.06	.09	-.01	-.18**	.00	-.05	-.09	.06	.28*	.23**	

Note: RCADS= Revised Child Anxiety and Depression Subscale. EMBU= Egna, Minnen, Betraffande, Uppfostran-My memories of upbringing. Significance level: $^{*}p < .05$. $^{**}p < .0$.

General Discussion

The ability to reason about the mind continues to develop beyond preschool years (Dumontheil et al., 2010; Vetter et al., 2013) and represents a milestone in children's social behavior (Wyman et al., 2018), and success (Banerjee & Henderson, 2001), contributing to the narrative self-organization and self-understanding in late childhood (Bialecka-Pikul et al., 2020; Kober et al., 2019). ToM is essential to a healthy development throughout the lifespan; hence, understanding how ToM develops beyond primary school years into middle childhood and preadolescence is of paramount importance. Interpretive diversity understanding is an understudied advanced ToM that pertains to the understanding of the constructivist nature of the mind (Lalonde & Chandler, 2002). This concept, however, has been approached differently across literature, being either defined as the ability to understand that an ambiguous stimulus can be interpreted differently by different people (ToMi; Lalonde & Chandler, 2002) or as the ability to understand that knowledge can be uncertain, that things can have multiple meanings on account of differences in interpretive mental processes (ToMc; Schwanenflugel et al., 1996; Weimer et al., 2017). Both approaches refer to the understanding of the subjective processes implied in mental states constructions. For the first time in the literature, we intended to integrate them in one research design and relate them to individual differences in anxiety and internalizing symptoms, IQ and verbal ability, and contextual factors, such as parental practices and socio-economic status.

ToMc and ToMi

In the first study of the present paper, we investigated interpretive diversity understanding using the Droodle Task (Lalonde & Chandler, 2002) and the paper and pencil short version of the Constructivist Theory of Mind Interview (Weimer et al., 2017). The results showed that the ToMc performance wasn't associated with any of the other measurements. In order to understand this, some notable differences between our study and Weimer and colleagues' (2017) study, with respect to administration method are worth mentioning. First, the short paper and pencil version of the interview used in Study 1 was validated and applied by Weimer and colleagues (2017) only on freshmen high-schoolers. Hence, our meager proportions of Active Mental Process Explanation can be explained by the fact that we administered it to a much younger population. Second, in Weimer and colleagues (2017), the questionnaires were completed in groups, as part of an English class, similar to our procedure. However, their participants completed two surveys, while our children had to complete 4 questionnaires in one hour, which may have induced fatigue for some youngsters. The Constructivist Theory of Mind Interview was last, and given the difficulty of the questions, we inferred that the children didn't have the necessary cognitive resources to go through it properly and take sufficient time to write down the answers (the mean length of response was between 3-5 words). On the other hand, from a theoretical standpoint, Weimer and colleagues (2017) revealed that only around 10 and 12 years of age children significantly change their responses in the sense that they consider the differences in mental activities as required when reaching different cognitive outcomes in the same situation, more than external factors (over 50% of our participants in both studies were below this age). Hence, it wasn't easy for our younger children to offer constructive, active mental process explanations. In line with Weimer and colleagues' (2017) findings, we found notable age differences between children's responses to the interview, with younger children giving more No explanation responses and fewer Active Mental Process Explanations than older children. Following these considerations, in the second study, we used the extended version of the Constructivist Theory of Mind Interview, which was applied by an experimenter with each child individually, without any time-limit. The experimenter wrote down the answer; hence the child was not constrained by their own writing skills. These new conditions improved children's performance on the second study (Active explanations, $M = .26$) compared to children from the first study ($M = .06$). Future research with children from the 8-12 years interval should consider these aspects when choosing between the short and extended versions of this task.

The most notable improvement in the second study was the positive correlation between the two tasks of interpretive diversity understanding, which

remained marginally significant after we accounted for the age variance. This indicates that the two measurements are tapping the same ability of interpretive diversity understanding, yet are independent enough to address different aspects of it. The weak correlation is in line with the theoretical account that ToM may not be a single construct and should be tackled as a variety of component processes (Schaafsma et al., 2015). Indeed, there seems to be minimal correlations among ToM measures across development, including middle childhood (Warnell & Redcay, 2019). Taking this into account, we view interpretive diversity understanding as a multidimensional process, with the two tasks reflecting different components: interpretive and constructivist ToM.

The Droodle Task has been constructed for younger children, and it appeals more to the child's imagination, and creative processes ("What does Ana think the full picture is, based on these two visible triangles?"). ToMi emerges at around 6 years of age (Lalonde & Chandler, 2002), and continues to develop into middle childhood, with considerable improvements up to 9 years (Malti et al., 2010), as well as 11 years (Harari & Weinstock, 2021). In a modified Droodle task, Lagattuta and colleagues (2010) have showed that children aged 4-7 years, compared with older children (7-9 year-olds) would mistakenly overuse past irrelevant experience with the ambiguous drawings in predicting a character's interpretation on a subsequent ambiguous drawing, while older ones would mistakenly attribute the same interpretation to two naïve characters (Lagattuta et al., 2010). In our sample of 8- to 12-year-olds, we didn't find any age differences in terms of correct responses (Droodle task), but almost half of the children in both studies answered on both trials with two different valid interpretations of the same ambiguous picture (total ToMi; 47% in Study 1 and 57% in Study 2), in contrast with Lagattuta and colleagues' (2010) findings.

On the other hand, the interview includes complex questions about mental processes and has been used on adolescents (Weimer et al., 2017). Even though the research context we provided in the first study did not support children's performance on the short version of the interview, we have found that the younger children (8- to10-years old) gave a significantly higher proportion of responses with No Explanation, and had fewer responses with Active Mental Process Explanations as well, compared to the older group (11- to 12-years old). In the second study, using the long version of the interview, we found that children of both ages showed a higher response proportion with Non-Active Mental Process Explanations than with Active Mental Process and No explanations. Indeed, Weimer and colleagues (2017) stated that only at around 10 years of age is there a change in how children evaluate the importance of differences in mental processes when knowledge is constructed. In line with our study, they found that children between 8 and 11 years tended to give more responses with non-active mental process explanations than adults. Hence, in our age frame, it's expected of children to try to find an explanation to differentiate between people's reaction/approach to a situation, by mainly focusing on external factors and not on the constructivist nature of mental activities.

ToM and Anxiety Symptoms

The relation between these constructs followed a similar pattern across both studies. Children with higher understanding of interpretive diversity had lower anxiety and internalizing symptoms. This supports our third hypothesis, as well as the deficit ToM hypothesis in anxiety (Reid, 2017). The ability to understand the constructivist nature of the mind by acknowledging the inherent differences in mental activities and the fact that two interpretations of a stimulus can be both valid has been found in children with lower anxiety levels in both of our studies. Children with the ability to comprehend that there could be more interpretations to a situation may have access to a more neutral or benign explanation to a possible anxiogenic situation, such as a temporary departure from the attachment figure (separation anxiety) or an ambiguous physical pain (panic disorder).

Previous studies demonstrated that in middle childhood and early adolescence, higher mentalizing capacities were significantly associated with lower depressive, panic disorder, and separation anxiety symptoms (Caputi et al., 2018), as well as with low levels of separation and social anxiety (Scaini et al., 2020). Indeed, in a group of 9- to 11 year-olds, ToMi was negatively correlated with anxiety symptoms and interpretive bias (Moldovan & Visu-Petra, 2022). Furthermore, in another study, ToM at 11 years predicted lower levels of social anxiety later in time, which, in turn, predicted higher levels of peer acceptance as well as lower levels of peer rejection one year later (Ronchi et al., 2020). Other studies found lower ToM performance for socially anxious children (but only when they tended to express shyness in a non-adaptive way; Colonnesi et al., 2017). This underlines the importance of ToM – anxiety studies in middle childhood in order to better understand the social and emotional consequences of ToM difficulties. A similar pattern was identified later in development, as researchers found that a group of adolescents with social anxiety disorder had difficulties correctly identifying emotions in faces and eyes expressions shown in pictures, which is an indicator of social cognition and ToM abilities (Öztürk et al., 2020). Disturbances in socio-cognitive abilities were deemed responsible for the dysregulated social emotions that contribute to the development of social anxiety disorder in childhood (Nikolić et al., 2019).

These results have clinical implications, as training and treatment programs could include this socio-cognitive ability in order to improve anxious children's social functioning. Researchers have previously raised the issue of improving ToM in various other disorders, such as bipolar and major depressive disorders (Inoue et al., 2004; Epa & Dudek, 2015), as well as autism (Feng et al., 2008). This is relevant as Cognitive-Behavioral Therapy strategies make use of ToM abilities, more specifically the awareness of someone's thoughts and behavior (Chalfant et al.,

2007). Practitioners could target ToM in their interventions in order to reduce anxiety symptoms, by helping children in being more mindful of their reasoning and flexible regarding their interpretations of a situation (Ooi et al., 2008). Interventions on children's rational evaluations have already been proved efficient (Wilde, 2008).

ToM and Parental Practices

In both studies, we only found partial support for our hypothesis regarding the association between ToM and parental practices. In the second study, as children reported more parental practices based on affection, support, and emotional warmth, their ability to understand the constructivist nature of the mind (i.e., answering with more active mental process explanations) increased. This relation indicates that maybe in a parent-child relationship marked by support and affection, the child might feel more encouraged to explore different ideas about people's intentions. When children are confronted with different reactions to a situation, the parent may take more time to explain them. These discussions about the diversity of reactions to a situation may include explanations about differences between different mental activities. When this security and support are lacking, the opposite is expected. We found that children with the highest score on parental practices based on rejection were the ones who couldn't understand that an ambiguous picture can be interpreted in two different and valid ways. This could also indicate that the children had, in fact, the ability, but they didn't express it by fear of punishment or rejection from the adult.

These results are in line with literature on younger children, where harsh and negative parental practices were predictors of ToM failure (Hughes & Devine, 2016), while acceptance of the child, rich conversations about affect and thoughts were predictors of ToM success (Tafreshi & Racine, 2016). In adolescent groups a similar link was found between attachment-related anxiety with the mother and low mentalizing capacities (Hünefeldt et al., 2013). However, our studies covered the gap regarding the more advanced forms of ToM and strengthen the idea that parents influence the child's socio-cognitive development, well after school age. However, a longitudinal study is recommended in order to determine if early parental practices are a more critical predictor than current parental practices of this advanced ToM.

Parental Practices and Anxiety Symptoms

In both studies, we found partial support for our fourth hypothesis. We found that parental practices based on rejection and overprotection (as reported by children) are positive predictors for anxiety and internalizing symptoms. These results add to the existing ones that found rejection parenting to be positively associated with child

depression (Johnco et al., 2021). Even adolescents and young adults who perceive their parents as rejecting, controlling and coercive, reported higher emotional dysregulation, and suppression of sadness and worry, and more social withdrawal, which are related to anxiety symptoms (Gardner & Zimmer-Gembeck, 2018). In our group of children, rejection may follow a similar pattern, hindering children's development of emotional managing skills, consequently influencing their vulnerability to anxiety (Niditch & Varela, 2012; Wood et al., 2003). Similarly, children raised in a household where they are confronted with controlling behaviors that hinder autonomy and identity development will probably feel insecure in a new context, such as novel social interactions, and will probably be prone to infer adverse outcomes for their actions (Johnco et al., 2021). This is in line with other studies (Conger et al., 2002), and it requires special attention from practitioners, as the literature indicates that anxiety and depression disorders have detrimental effects on children's cognitive development, as well as on their academic achievements and social relations (Buta et al., 2015; Owens et al., 2012; Verboom et al., 2014).

Limitations

We had several limitations pertaining to one or both studies that should be noted. Firstly, in Study 1 we used the paper and pencil version on a very young group that still struggled at the writing tasks in a time-limited setting. Future studies should strongly consider the face-to-face interview version in these situations. Secondly, we infer that social desirability played a role in the weak results obtained with the parental reports, on both parental practices and children's emotional dimensions. Thirdly, the EMBU questionnaire has been used with children as young as 11 years old (Lindhout et al., 2006). This version for adolescents is similar to the one for primary children, EMBU-C (Castro et al., 1993; Muris et al., 2003) in terms of factors and items, with minor differences (1 item for Emotional Warmth, 5 for Rejection and 4 for Overprotection subscale). However, we made sure that the translation is appropriate for children, and, during the testing phase, we gave explanations if necessary. Markus and colleagues (2003) discuss that over the years, children change their view on some of their parents' behavior, perceiving them more as intrusive, rather than being involved or engaged. However, in our study/studies, we have obtained good results with the Rejection and Overprotection scale/scales.

Conclusions

Our studies investigated, for the first time in the literature, the interpretive diversity understanding using two distinct approaches for it. Moreover, this ability was put in relation to emotional, cognitive, and contextual factors shaping it,

investigating it for a sample of children with the ages between 8 and 12. Our results suggest that there are other forms of advanced ToM ability, less studied, in this age frame, that seem to be positively associated with fewer emotional difficulties, as well as with reported parental practices based on support and emotional warmth, and negatively with rejection and controlling parental behaviors. Our study is among the first ones to look at the relationship between these constructs and are in line with other studies that focused on earlier forms of ToM (e.g., Hughes & Devine, 2016). The lack of research on advanced ToM in the context of psychopathology is concerning, as ToM has been shown to exert a significant influence upon social behavior, as well as in academic achievement (Weimer et al., 2021). Given the already supported positive relationship between ToMi and empathic prosocial moral reasoning (Harari & Weinstock, 2020), as well as the negative one with anxiety symptoms and interpretive bias (Moldovan & Visu-Petra, 2022), the understanding of ToM development during middle childhood seems imperative. Future longitudinal studies could identify the causal links between these constructs, in order to develop programs that could prevent emotional difficulties for those at risk. Previous training studies showed incremental benefits to ToM performance in a couple of weeks (Bianco et al., 2015; Lecce et al., 2014), and future ones can include discussions on the interpretive nature of the mind, as part of a conversational based training.

Acknowledgements

We wish to thank PhD student Simina Cacuci for her support with data collection, as well as Alexandra Ramona Marian and Dana Seucan for their proof reading of the manuscript.

References

Aluja, A., Barrio, V. D., & Garcia, L. F. (2006). Do parents and adolescents differ in their perceptions of rearing styles? Analysis of the EMBU versions for parents and adolescents. *Scandinavian Journal of Psychology*, *47*(2), 103-108. https://doi.org/ 10.1111/j.1467-9450.2006.00497.x.

Andrzejewska, M., Wójciak, P., Domowicz, K., & Rybakowski, J. (2017). Emotion recognition and theory of mind in chronic schizophrenia: Association with negative symptoms. *Archives of Psychiatry and Psychotherapy*, *19*(4), 7-12. https://doi.org/10.12740/APP/79878.

Arrindell, W. A., Sanavio, E., Aguilar, G., Sica, C., Hatzichristou, C., Eisemann, M., Recinos, L. A., Gaszner, P., Peter, M., Battagliese, G., Kállai, J., & van der Ende, J. (1999). The development of a short form of the EMBU: Its appraisal with students in Greece, Guatemala, Hungary and Italy. *Personality and*

individual Differences, *27*(4), 613-628. https://doi.org/10.1016/S0191-8869(98)00192-5.

Astington, J. W., Pelletier, J., & Homer, B. (2002). Theory of mind and epistemological development: The relation between children's second-order false-belief understanding and their ability to reason about evidence. *New Ideas in Psychology*, *20*(2-3), 131-144. https://doi.org/10.1016/S0732-118X(02)00005-3.

Ballespí, S., Pérez-Domingo, A., Vives, J., Sharp, C., & Barrantes-Vidal, N. (2018). Childhood behavioral inhibition is associated with impaired mentalizing in adolescence. *PloS ONE*, *13*(3), e0195303. https://doi.org/10.1371/journal.pone.0195303.

Banerjee, R., & Henderson, L. (2001). Social-cognitive factors in childhood social anxiety: A preliminary investigation. *Social Development*, *10*(4), 558-572. https://doi.org/10.1111/1467-9507.00180.

Białecka-Pikul, M., Szpak, M., Zubek, J., Bosacki, S., & Kołodziejczyk, A. (2020). The psychological self and advanced theory of mind in adolescence. *Self and Identity*, *19*(1), 85-104. https://doi.org/10.1080/15298868.2018.1538900.

Bianco, F., Lecce, S., & Banerjee, R. (2016). Conversations about mental states and theory of mind development during middle childhood: A training study. *Journal of Experimental Child Psychology, 149*, 41-61. https://doi.org/10.1016/j.jecp.2015.11.006.

Bocquier, A., Cortaredona, S., Verdoux, H., Sciortino, V., Nauleau, S., & Verger, P. (2013). Social inequalities in new antidepressant treatment: A study at the individual and neighborhood levels. *Annals of Epidemiology*, *23*(3), 99-105 https://doi.org/10.1016/j.annepidem.2012.12.008.

Buhlmann, U., Wacker, R., & Dziobek, I. (2015). Inferring other people's states of mind: Comparison across social anxiety, body dysmorphic, and obsessive-compulsive disorders. *Journal of Anxiety Disorders*, *34*, 107-113. https://doi.org/10.1016/j.janxdis.2015.06.003.

Buta, M., Ciornei, O., Fizeşan, C., Jurje, O., & Visu-Petra, L. (2015). Anxiety symptoms in primary school-age children: Relation with emotion understanding competences. In K. A. Moore, S. Howard, & P. Buchwald (Eds.), *Stress and anxiety. Applications to schools, well-being, coping, and internet use*, (pp. 67-76), Logos Verlag Berlin GmbH.

Cabrera, N., Tamis-LeMonda, C. S., Bradley, R. H., Hofferth, S., & Lamb, M. E. (2000). Fatherhood in the twenty-first century. *Child Development*, *71*(1), 127-136. https://doi.org/10.1111/1467-8624.00126.

Caputi, M., Lecce, S., Pagnin, A., & Banerjee, R. (2012). Longitudinal effects of theory of mind on later peer relations: The role of prosocial behavior. *Developmental Psychology*, *48*(1), 257. https://doi.org/10.1037/a0025402.

Caputi, M., & Schoenborn, H. (2018). Theory of mind and internalizing symptoms during middle childhood and early adolescence: The mediating role of coping strategies. *Cogent Psychology*, *5*(1), 1487270. https://doi.org/10.1080/23311908.2018.1487270.

Carpendale, J. I., & Chandler, M. J. (1996). On the distinction between false belief understanding and subscribing to an interpretive theory of mind. *Child Development*, *67*(4), 1686-1706. https://doi.org/10.1111/j.1467-8624.1996.tb01821.x.

Castro, J., Toro, J., Van der Ende, J., & Arrindell, W. A. (1993). Exploring the feasibility of assessing perceived parental rearing styles in Spanish children with the EMBU. *International Journal of Social Psychiatry*, *39,* 47–57. https://doi.org/10.1177/002076409303900105.

Chalfant, A. M., Rapee, R., & Carroll, L. (2007). Treating anxiety disorders in children with high functioning autism spectrum disorders: A controlled trial. *Journal of Autism and Developmental Disorders, 37*(10), 1842-1857. https://doi.org/10.1007/s10803-006-0318-4.

Chorpita, B. F., Yim, L., Moffitt, C., Umemoto, L. A., & Francis, S. E. (2000). Assessment of symptoms of DSM-IV anxiety and depression in children: A revised child anxiety and depression scale. *Behaviour Research and Therapy, 38*(8), 835-855. https://doi.org/10.1016/S0005-7967(99)00130-8.

Colonnesi, C., Nikolić, M., de Vente, W., & Bögels, S. M. (2017). Social anxiety symptoms in young children: Investigating the interplay of theory of mind and expressions of shyness. *Journal of Abnormal Child Psychology*, *45*(5), 997-1011. https://doi.org/10.1007/s10802-016-0206-0.

Conger, R. D., Wallace, L. E., Sun, Y., Simons, R. L., McLoyd, V. C., & Brody, G. H. (2002). Economic pressure in African American families: A replication and extension of the family stress model. *Developmental Psychology*, *38*(2), 179. https://doi.org/10.1037/0012-1649.38.2.179.

Darling, N., & Steinberg, L. (1993). Parenting style as context: An integrative model. *Psychological Bulletin*, *113*(3), 487. https://doi.org/10.1037/0033-2909.113.3.487.

Davidov, M., & Grusec, J. E. (2006). Untangling the links of parental responsiveness to distress and warmth to child outcomes. *Child Development, 77*, 44–58. https://doi.org/10.1111/j.14678624.2006.00855.x.

Dobrean A. (coord.) (2012). Scala de inteligenţă Wechsler pentru copii – ediţia a IV-a. Romanian Psychological Testing Services.

Dumontheil, I., Apperly, I. A., & Blakemore, S. J. (2010). Online usage of theory of mind continues to develop in late adolescence. *Developmental Science*, *13*(2), 331-338. https://doi.org/10.1111/j.1467-7687.2009.00888.x.

Epa, R., & Dudek, D. (2015). Theory of mind, empathy and moral emotions in patients with affective disorders. *Archives of Psychiatry and Psychotherapy*, *17*(2). https://doi.org/10.12740/APP/44569

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175-191. https://doi.org/10.3758/BF03193146.

Feng, H., Lo, Y. Y., Tsai, S., & Cartledge, G. (2008). The effects of theory-of-mind and social skill training on the social competence of a sixth-grade student with autism. *Journal of Positive Behavior Interventions*, *10*(4), 228-242. https://doi.org/10.1177/1098300708319906.

Field, A. (2009). *Discovering statistics using SPSS: Introducing statistical method* (3rd Ed.). Thousand Oaks, CA: Sage Publications.

Gardner, A., & Zimmer-Gembeck, M. (2018). Rejection sensitivity and responses to rejection: Serial mediators linking parenting to adolescents and young adults' depression and trait-anxiety. *Journal of Relationships Research, 9*, E9. doi:10.1017/jrr.2018.8.

Gerlsma, C., Arrindell, W. A., Van der Veen, N., & Emmelkamp, P. M. (1991). A parental rearing style questionnaire for use with adolescents: Psychometric evaluation of the EMBU-A. *Personality and Individual differences*, *12*(12), 1245-1253. https://doi.org/10.1016/0191-8869(91)90196-I.

Grüner, K., Muris, P., & Merckelbach, H. (1999). The relationship between anxious rearing behaviours and anxiety disorders symptomatology in normal children. *Journal of Behavior Therapy and Experimental Psychiatry*, *30*(1), 27-35. https://doi.org/10.1016/S0005-7916(99)00004-X.

Harari, Y., & Weinstock, M. (2020). Interpretive theory of mind and empathic prosocial moral reasoning. *British Journal of Developmental Psychology*, *39*(1), 78-97. https://doi.org/10.1111/bjdp.12345.

Hazel, D. M., & McNally, R. J. (2014). Theory of mind impairments in social anxiety disorder. *Behavior Therapy*, *45*(4), 530-540. https://doi.org/10.1016/j.beth. 2014.02.010.

Hughes, C., & Devine, R. T. (2016). Family influences on theory of mind: A review. In V. Slaughter, & M. de Rosnay (Eds.), *Theory of mind development in context* (pp. 63-78). Routledge.

Hünefeldt, T., Laghi, F., Ortu, F., & Belardinelli, M. O. (2013). The relationship between 'theory of mind'and attachment-related anxiety and avoidance in Italian adolescents. *Journal of Adolescence*, *36*(3), 613-621. https://doi.org/ 10.1016/j.adolescence.2013.03.012.

Inoue, Y., Tonooka, Y., Yamada, K., & Kanba, S. (2004). Deficiency of theory of mind in patients with remitted mood disorder. *Journal of Affective Disorders*, *82*(3), 403-409. https://doi.org/10.1016/j.jad.2004.04.004.

Johnco, C. J., Magson, N. R., Fardouly, J., Oar, E. L., Forbes, M. K., Richardson, C., & Rapee, R. M. (2021). The role of parenting behaviors in the bidirectional and intergenerational transmission of depression and anxiety between parents and early adolescent youth. *Depression and Anxiety*. https://doi.org/10.1002/ da.23197.

Lagattuta, K. H., Sayfan, L., & Blattman, A. J. (2010). Forgetting common ground: Six-to seven-year-olds have an overinterpretive theory of mind. *Developmental Psychology*, *46*(6), 1417. https://doi.org/10.1037/a0021062.

Lalonde, C. E., & Chandler, M. J. (2002). Children's understanding of interpretation. *New Ideas in Psychology*, *20*(2-3), 163-198. https://doi.org/10.1016/S0732-118X(02)00007-7.

Lecce, S., Bianco, F., Devine, R. T., Hughes, C., & Banerjee, R. (2014). Promoting theory of mind during middle childhood: A training program. *Journal of Experimental Child Psychology*, *126*, 52-67. https://doi.org/10.1016/j.jecp.2014.03.002.

Lindhout, I., Markus, M., Hoogendijk, T., Borst, S., Maingay, R., Spinhoven, P., van Dyck, R., & Boer, F. (2006). Childrearing style of anxiety-disordered parents. *Child Psychiatry Human Development, 37*(1)**,** 89–102 (2006). https://doi.org/10.1007/s10578-006-0022-9.

Malti, T., Gasser, L., & Gutzwiller-Helfenfinger, E. (2010). Children's interpretive understanding, moral judgments, and emotion attributions: Relations to social behaviour. *British Journal of Developmental Psychology*, *28*(2), 275-292. https://doi.org/10.1348/026151009X403838.

Markus, M. T., Lindhout, I. E., Boer, F., Hoogendijk, T. H., & Arrindell, W. A. (2003). Factors of perceived parental rearing styles: The EMBU-C examined in a sample of Dutch primary school children. *Personality and Individual Differences*, *34*(3), 503-519. https://doi.org/10.1016/S0191-8869(02)00090-9.

Miller, S. A. (2000). Children's understanding of preexisting differences in knowledge and belief. *Developmental Review, 20*(2), 227-282. https://doi.org/10.1006/drev.1999.0501.

Moldovan, M., & Visu-Petra, L. (2022). Theory of Mind, Anxiety, and Interpretive Bias During Middle Childhood. *Journal of Child and Family Studies, 31*(1), 99-113. https://doi.org/10.1007/s10826-021-02023-0.

Muris, P., Meesters, C., & van den Berg, S. (2003). Internalizing and externalizing problems as correlates of self-reported attachment style and perceived parental rearing in normal adolescents. *Journal of Child and Family Studies*, *12*(2), 171-183. https://doi.org/10.1023/A:1022858715598

Muris, P., Meesters, C., & van Brakel, A. (2003). Assessment of anxious rearing behaviors with a modified version of "Egna Minnen Beträffande Uppfostran" questionnaire for children. *Journal of Psychopathology and Behavioral Assessment*, *25*(4), 229-237. https://doi.org/10.1023/A:1025894928131.

Niditch, L., & Varela, R. (2012). Perceptions of parenting, emotional self-efficacy, and anxiety in youth: Test of a mediational model. *Child and Youth Care Forum, 41*(1), 21–35. https://doi.org/10.1007/s10566-011-9150-x.

Nikolić, M., van der Storm, L., Colonnesi, C., Brummelman, E., Kan, K. J., & Bögels, S. (2019). Are socially anxious children poor or advanced mindreaders? *Child Development*, *90*(4), 1424-1441. https://doi.org/10.1111/cdev.13248.

Ooi, Y. P., Lam, C. M., Sung, M., Tan, W. T. S., Goh, T. J., Fung, D. S. S., ... & Chua, A. (2008). Effects of cognitive-behavioural therapy on anxiety for children with high-functioning autistic spectrum disorders. *Singapore Medical Journal*, *49*(3), 215-220.

O'Reilly, J., & Peterson, C. C. (2014). Theory of mind at home: Linking authoritative and authoritarian parenting styles to children's social understanding. *Early Child Development and Care*, *184*(12), 1934-1947. https://doi.org/10.1080/ 03004430.2014.894034.

Owens, M., Stevenson, J., Hadwin, J. A., & Norgate, R. (2012). Anxiety and depression in academic performance: An exploration of the mediating factors of worry and working memory. *School Psychology International*, *33*(4), 433-449. https://doi.org/10.1177/0143034311427433.

Öztürk, Y., Özyurt, G., Turan, S., Mutlu, C., Tufan, A. E., & Akay, A. P. (2020). Association of theory of mind and empathy abilities in adolescents with social anxiety disorder. *Current Psychology*, 1-10. https://doi.org/10.1007/s12144-020-00707-2.

Paloş, R., & Drobot, L. (2010). The impact of family influence on the career choice of adolescents. *Procedia-Social and Behavioral Sciences*, *2*(2), 3407-3411. https://doi.org/10.1016/j.sbspro.2010.03.524.

Penn, D. A. (2007). Estimating missing values from the general social survey: An application of multiple imputation. *Social Science Quarterly*, *88*(2), 573-584. https://doi.org/10.1111/j.1540-6237.2007.00472.x.

Perris, C., Jacobsson, L., Linndström, H., von Knorring, L. & Perris, H. (1980). Development of a new inventory for assessing memories of parental rearing behaviour. *Acta Psychiatrica Scandinavica, 61*, 265-274. https://doi.org/10.1111/j.1600-0447.1980.tb00581.x.

Perris, C., Arrindell, W. A., Perris, H., Eisemann, M., Van der Ende, J., & von Knorring, L. (1986). Perceived depriving parental rearing and depression. *British Journal of Psychiatry, 148*(2), 170. https://doi.org/10.1192/bjp.148.2.170.

Plana, I., Lavoie, M. A., Battaglia, M., & Achim, A. M. (2014). A meta-analysis and scoping review of social cognition performance in social phobia, posttraumatic stress disorder and other anxiety disorders. *Journal of Anxiety Disorders*, *28*(2), 169-177. https://doi.org/10.1016/j.janxdis.2013.09.005.

Pillow, B. H. (1995). Two trends in the development of conceptual perspective-taking: An elaboration of the passive-active hypothesis. *International Journal of Behavioral Development*, *18*(4), 649-676. https://doi.org/10.1177/01650254 9501800405.

Pillow, B. H., & Henrichon, A. J. (1996). There's more to the picture than meets the eye: Young children's difficulty understanding biased interpretation. *Child Development*, *67*(3), 803-819. https://doi.org/10.1111/j.1467-8624.1996.tb017 65.x.

Pillow, B. H., & Mash, C. (1998). Children's understanding of misinterpretation: Source identification and perspective-taking. *Merrill-Palmer Quarterly, 44*, 129-140. http://www.jstor.org/stable/23093662.

Pillow, B. H., & Weed, S. T. (1995). Children's understanding of biased interpretation: Generality and limitations. *British Journal of Developmental Psychology*, *13*(4), 347-366. https://doi.org/10.1111/j.2044-835X.1995.tb0068 5.x.

Rapee, R. M. (1997). Potential role of childrearing practices in the development of anxiety and depression. *Clinical Psychology Review*, *17*(1), 47-67. https://doi.org/10.1016/S0272-7358(96)00040-2.

Reid, S. (2017). What am I thinking right now? Social anxiety symptomology and its impact on theory of mind ability. Retrieved from https://digitalcommons.butler.edu/ugtheses/409/.

Rinaldi, C. M., & Howe, N. (2012). Mothers' and fathers' parenting styles and associations with toddlers' externalizing, internalizing, and adaptive behaviors. *Early Childhood Research Quarterly*, *27*(2), 266-273. https://doi.org/10.1016/j.ecresq.2011.08.001.

Roelofs, J., Meesters, C., Ter Huurne, M., Bamelis, L., & Muris, P. (2006). On the links between attachment style, parental rearing behaviors, and internalizing and externalizing problems in non-clinical children. *Journal of Child and Family Studies*, *15*(3), 331-344 https://doi.org/10.1007/s10826-006-9025-1.

Rohner, R. P. (2004). The parental "acceptance-rejection syndrome": Universal correlates of perceived rejection. *American Psychologist*, *59*(8), 830-840. https://doi.org/10.1037/0003-066X.59.8.830.

Ronchi, L., Banerjee, R., & Lecce, S. (2020). Theory of mind and peer relationships: The role of social anxiety. *Social Development*, *29*(2), 478-493. https://doi.org/10.1111/sode.12417.

Rose, J., Roman, N., Mwaba, K., & Ismail, K. (2018). The relationship between parenting and internalizing behaviours of children: A systematic review. *Early Child Development and Care, 188*(10), 1468-1486. https://doi.org/10.1080/03004430.2016.1269762.

Ross, H. S., Recchia, H. E., & Carpendale, J. I. (2005). Making sense of divergent interpretations of conflict and developing an interpretive understanding of mind. *Journal of Cognition and Development*, *6*(4), 571-592. https://doi.org/10.1207/s15327647jcd0604_7.

Scaini, S., Caputi, M., Ogliari, A., & Oppo, A. (2020). The Relationship Among Attributional Style, Mentalization, and Five Anxiety Phenotypes in School-Age Children. *Journal of Research in Childhood Education*, *34*(4), 551-565. https://doi.org/10.1080/02568543.2019.1710729.

Schaafsma, S. M., Pfaff, D. W., Spunt, R. P., & Adolphs, R. (2015). Deconstructing and reconstructing theory of mind. *Trends in Cognitive Sciences, 19*(2), 65–72. https://doi.org/10.1016/j.tics.2014.11.007.

Schwanenflugel, P. J., Fabricius, W. V., & Noyes, C. R. (1996). Developing organization of mental verbs: Evidence for the development of a constructivist theory of mind in middle childhood. *Cognitive Development*, *11*(2), 265-294. https://doi.org/10.1016/S0885-2014(96)90005-2.

Tafreshi, D., & Racine, T. P. (2016). Children's interpretive theory of mind: The role of mothers' personal epistemologies and m other-child talk about interpretation. *Cognitive Development*, *39*, 57-70. https://doi.org/10.1016/j.cogdev.2016.04.003.

Tahazadeh, S., Barahmand, U., Yaghooti, F., & Nazari, M. A. (2020). Mind reading in films task to assess social cognitive deficits in autism spectrum conditions. *Journal of Evidence-Based Psychotherapies*, *20*(2). https://doi.org/10.24193/jebp.2020.2.13.

Tibi-Elhanany, Y., & Shamay-Tsoory, S. G. (2011). Social cognition in social anxiety: First evidence for increased empathic abilities. *The Israel Journal of Psychiatry and Related Sciences*, *48*(2), 98-106.

Van Der Bruggen, C. O., Stams, G. J. J., & Bögels, S. M. (2008). The relation between child and parent anxiety and parental control: A meta-analytic review. *Journal of Child Psychology and Psychiatry*, *49*(12), 1257-1269. https://doi.org/10.1111/j.1469-7610.2008.01898.x.

Vetter, N. C., Altgassen, M., Phillips, L., Mahy, C. E., & Kliegel, M. (2013). Development of affective theory of mind across adolescence: Disentangling the role of executive functions. *Developmental Neuropsychology*, *38*(2), 114-125. https://doi.org/10.1080/87565641.2012.733786.

Verboom, C. E., Sijtsema, J. J., Verhulst, F. C., Penninx, B. W., & Ormel, J. (2014). Longitudinal associations between depressive problems, academic performance, and social functioning in adolescent boys and girls. *Developmental Psychology*, *50*(1), 247-257. https://doi.org/10.1037/a0032547.

Visu-Petra, L., Cheie, L., Benga, O., Alloway, T. P. (2011). Effects of anxiety on memory storage and updating in young children. *International Journal of Behavioral Development, 35*(1) 38–47. DOI: 10.1177/0165025410368945.

Washburn, D., Wilson, G., Roes, M., Rnic, K., & Harkness, K. L. (2016). Theory of mind in social anxiety disorder, depression, and comorbid conditions. *Journal of Anxiety Disorders*, *37*, 71-77. https://doi.org/10.1016/j.janxdis.2015.11.004.

Wechsler, D. (2014). *WISC-V: Technical and interpretive manual*. NCS Pearson, Incorporated.

Warnell, K. R., & Redcay, E. (2019). Minimal coherence among varied theory of mind measures in childhood and adulthood. *Cognition*, *191*, 103997. https://doi.org/10.1016/j.cognition.2019.06.009.

Wellman, H. M., Cross, D., & Watson, J. (2001). Meta-analysis of theory-of-mind development: The truth about false belief. *Child Development*, *72*(3), 655-684. https://doi.org/10.1111/1467-8624.00304.

Weimer, A. A., Dowds, S. J. P., Fabricius, W. V., Schwanenflugel, P. J., & Suh, G. W. (2017). Development of constructivist theory of mind from middle childhood to early adulthood and its relation to social cognition and behavior. *Journal of Experimental Child Psychology*, *154*, 28-45. https://doi.org/10.1016/j.jecp.2016.10.002.

Weimer, A. A., Warnell, K. R., Ettekal, I., Cartwright, K. B., Guajardo, N. R., & Liew, J. (2021). Correlates and antecedents of theory of mind development during middle childhood and adolescence: An integrated model. *Developmental Review*, *59*, 100945. https://doi.org/10.1016/j.dr.2020.100945.

White, L. O., Klein, A. M., von Klitzing, K., Graneist, A., Otto, Y., Hill, J., Over, H., Fonagy, P., & Crowley, M. J. (2016). Putting ostracism into perspective: Young children tell more mentalistic stories after exclusion, but not when anxious. *Frontiers in Psychology*, *7*, 1926. https://doi.org/10.3389/fpsyg.2016.01926.

Wilde, J. (2008). Rational-Emotive behavioral interventions for children with anxiety problems. *Journal of Cognitive and Behavioral Psychotherapies*, *8*(1), 133-141.

Wood, J. J., McLeod, B. D., Sigman, M., Hwang, W., & Chu, B. C. (2003). Parenting and childhood anxiety: Theory, empirical findings, and future directions. *Journal of Child Psychology and Psychiatry, 44*, 134–151. https://doi.org/10.1111/1469-7610.00106.

Wyman, J., Cassidy, H., & Talwar, V. (2021). Utilizing the Activation-Decision-Construction-Action Theory to predict children's hypothetical decisions to deceive. *Acta Psychologica*, *218*, 103339. https://doi.org/10.1016/j.actpsy.2021.103339.

Journal of Evidence-Based Psychotherapies,
Vol. 22, No. 1, March 2022, 87-102.

10.24193/jebp.2022.1.5

POST-TRAUMATIC STRESS DISORDER AND DIFFICULTIES IN EMOTION REGULATION AMONG UNIVERSITY STUDENTS UNDER THE COVID-19 CONDITION

Amani Safwat ElBarazi[1,2,3*]

[1] Clinical Practice Department, Faculty of Pharmacy, The British University in Egypt, P.O. Box 43, El-Sherouk City, Cairo 11837, Egypt.
[2] The Center for Drug Research and Development (CDRD), Faculty of Pharmacy, The British University in Egypt, P.O. Box 43, El-Sherouk City, Cairo 11837, Egypt.
[3] Clinical Psychology Clinic, Safwat Elgolf Hospital, Almaza, Nasr City, Cairo, Egypt.

Abstract

The new global situation of COVID-19 affects the whole world in all aspects of life including mental health.

The study's goal is to detect the relationship between post-traumatic stress disorder (PTSD) and Emotion Regulation (ER) difficulties under the COVID-19 condition.

Methods: University students were asked to complete: 1) Emotion Regulation Difficulties Questionnaire (DERS) 2) PTSD Checklist (PCL- 5). 3) Life Events Checklist for DSM-5 (LEC-5).

Results: There were 441 students with suspected COVID-19 symptoms out of 1195 students. When compared to students who did not have suspected COVID-19 symptoms, those who did had a greater prevalence of PTSD symptoms (18.2% vs. 4.7%) and DERS (34.5% vs. 23.3%). Additionally, correlation studies demonstrated a significant positive link (*Ps*< .01) between the PCL, the overall DERS, and all six categories of emotion regulation difficulties.

Conclusion: Students with suspected COVID-19 symptoms have more difficulty with emotion regulation and post-traumatic stress disorder than students without such symptoms. This research recommends that during the pandemic, health professionals should implement a suitable psychological intervention for students who exhibit COVID-19 symptoms.

Keywords: Difficulties in Emotion Regulation, Post-traumatic stress Disorder, University students, COVID-19, Egypt.

[*] Correspondence concerning this article should be addressed to Amani Safwat ElBarazi, Ph.D., Phone: +201020282555, ORCID: 0000-0002-5023-728X.
Email: amani.safwat@bue.edu.eg

Introduction

Coronavirus disease 2019 (COVID-19) is a highly contagious virus that was initially identified in December 2019 in Wuhan, China (WHO, 2021). The ensuing lockdown interrupted many people's daily lives and had a detrimental effect on their mental health (Wang et al., 2020). Students may experience a sense of constraint in their independence, distress, worry and depression (Sun et al., 2020). Suicidal ideation, anxiety, negative thoughts, and insomnia were all associated with the lockdown and stay-at-home instructions. Due to the rapid spread of the COVID-19 pandemic around the world, some experts feel the pandemic is a traumatic experience that may result in chronic psychiatric diseases (Jacobson et al., 2020; Kira et al., 2020; Boyraz & Legros, 2020). Liu et al. (2020) found that 7% of individuals matched diagnostic criteria for PTSD one month after the COVID-19 epidemic. Females experienced much more PTSD in terms of re-experience and negative cognitive or mood changes. Participants who resided in Wuhan, one of the world's most severely damaged areas, reported higher PTSD symptoms than those who lived nearby. During COVID-19, researchers examined risk factors for PTSD, including as demographic characteristics and disease exposure, such as infection, residence in severely afflicted areas, or knowledge of someone who has been sick (e.g., Wathelet et al., 2021). FJiang et al. (2020) examined the association between (COVID-19) and post-traumatic stress symptoms and indicated that young people, women, and those with responsibilities and care for others were more prone to PTS symptoms.

Post-traumatic stress disorder (PTSD) is a condition that. characterized by repetitive thinking, flashbacks of prior traumatic events, nightmares, avoiding memories of trauma, avoidance behaviors, irritability, emotional numbing, hypervigilance, and sleep disruptions. Several different forms of trauma contribute to PTSD (APA, 2013). COVID-19 can be classified as type III trauma due to the fact that it is a case of chronic traumatic stress (Kira et al., 2008; Kira et al., 2020; Bridgland et al., 2021). The continuous and repeated traumatic experience makes the symptoms of post-traumatic stress disorder are more severe (Goral et al., 2017).

Previous study has established that patients with PTSD have greater difficulties regulating their emotions than individuals without PTSD (e.g., Bardeen et al., 2013, Powers et al., 2015, Sippel et al., 2016, Henschel et al., 2020, Klanecky Earl et al., 2020). Emotion regulation (ER) is the ability to successfully recognize, monitor, evaluate, modify, and manage emotional reactions, particularly in the context of goal-directed action (Gratz & Roemer, 2004). Gratz and Roemer (2004) identified six components of ER: emotional awareness, emotional acceptance, emotional clarity, impulse control, goal-directed activity, and strategies of emotional control.

Number of studies have demonstrated a correlation between the severity of PTSD and emotion dysregulation, and impulsive aggressiveness (e.g., Miles et al.,

2016). Lack of emotional acceptance, difficulty engaging in goal-directed activity when distressed, impulse control issues, limited availability to effective emotion regulation tools, and a lack of emotional clarity have all been identified as significant variables in PTSD (Tull et al., 2007). Additionally, PTSD was associated with a greater degree of expressive suppression and a decreased reliance on cognitive techniques (Boden et al., 2013). PTSD has been associated to ruminating, cognitive repression, and experience avoidance (Seligowski et al., 2015; Nagulendran & Jobson 2020).

Panayiotou et al. (2021) investigated the function of emotion regulation in determining overall quality of life during the COVID-19 pandemic. Panayiotou et al. (2021) found that the quality of life deteriorated among college students in Cyprus during the COVID-19 pandemic and lockdown. Significant predictors of reduction in quality of life were difficulty identifying feelings and difficulty accessing emotion regulation mechanisms. This highlights the relevance of emotional clarity and the availability of diverse range of distress-coping strategies. Also, Panayiotou et al. (2021) conducted prospective research with 210 American Indian participants to determine if emotion management skills are associated with subsequent PTSS associated with the initiation of a traumatic experience (COVID-19). They discovered that increased reappraisal was associated with decreased reported PTSS and increased suppression was associated with increased PTSS.

Shuwiekh et al. (2020) investigated the impact of COVID-19 on Arab countries' mental health. The researchers examined the prevalence of PTSD, depression, anxiety, and cumulative stressors in Egypt, Kuwait, Jordan, Saudi Arabia, Algeria, Iraq, and Palestine. According to Shuwiekh et al. (2020), Egypt has much higher rates of COVID-19 traumatic stress, anxiety, and depression than the other Arab countries. El-Zoghby, Soltan, and Salama (2020) found that the COVID-19 had a significant influence on 41.4% of people, with 34.1% experiencing increased work stress and 55.7% experiencing financial stress, according to researchers in Egypt. Additionally, Abdelghani et al. (2021) examined PTSD in an Egyptian sample of COVID-19 post-remission survivors and discovered that 72% of COVID-19 survivors experienced moderate-to-severe PTSS, compared to 53% of control patients.

Thus, the purposes of this study were to detect the relationship between (PTSD) and (ER) difficulties under the COVID-19 condition. This is the first study that investigates the association between PTSD and DERS among university students under the COVID-19 condition in Egypt.

Materials and Methods

Study design

This study is a descriptive cross-sectional correlational study.

Time and place of the study

The study was conducted between December 2020 and February 2021. The study was completed on 25 February 2021. The study was carried out in Cairo-Egypt.

Population and sample

All individuals were university students, who lived in Egypt, and met the inclusion criteria.

Inclusion & Exclusion criteria

Inclusion criteria were as follows: 1) Being an active student at the University, Exclusion criteria were having 1) cognitive difficulties, 2) schizophrenia (or any other psychotic disorders)

Data collection tools

A standardized e-questionnaires were generated using the Microsoft Form, and the links were shared through the student's university emails and social media—Facebook. The study data were collected using:

Personal information and questions on the COVID-19: such as participants' sociodemographic traits, personal, family-related, social, educational information.

Life Events Checklist for DSM-5 (LEC-5): is a self-report questionnaire that examines a person's life for potentially traumatic events. The LEC-5 assesses exposure to 16 events that have been linked to PTSD or distress, as well as one additional item that assesses any other severely stressful event not covered by the first 16 items (Weathers et al., 2013). An additional item that evaluates if the trauma was caused by COVID-19 was added in the current study.

Post-traumatic Stress Disorder Checklist (PCL-5) (Blevins, Weathers, Davis, Witte, & Domino, 2015) to measure the severity of the PTSD symptoms by the 20 items.

The PCL-5 is a self-report questionnaire that assesses PTSD symptoms as defined by the DSM–5 in the last month (Weathers et al., 2013). Items are assessed on a 5-point Likert scale from 0 (not at all) to 4 (extremely), and then the overall severity score is calculated. Subscale severity scores are obtained by adding items from each of the four DSM–5 PTSD symptom clusters: intrusions (Items 1–5), avoidance (Items 6–7), negative cognitions and mood (Items 8–14), and arousal and reactivity (AR; Items 15–20). (Weathers, et al. 2013). A cutoff score of PCL for the

present study was 45 or greater. The PCL has demonstrated acceptable psychometric properties (Blanchard et al., 1996; Weathers et al., 1993; Ruggiero et al., 2003). For the present study, internal consistency was acceptable at both time points (α = 0.90 and 0.94). Cronbach's alpha reliability of the scale in the current study was .93.

Emotion regulation difficulties scale

The (DERS; Gratz & Roemer, 2004) is a 36-item self-report questionnaire that assesses the difficulty in controlling emotions. Participants score items on a 5-point Likert scale (1 = nearly never to 5 = almost always), indicating how they feel about stressful emotional experiences. The DERS has six subscales: (a) Awareness, (b) Clarity, (c) Nonacceptance, (d) Impulsivity, (e) Goals, and (f) Strategies, as well as a total overall score for ER problems. The DERS subscales exhibited good internal consistency in the current study with Cronbach's α values ranging from 0.82 to 0.94.

Study process

Students in Egypt were requested to submit a questionnaire including personal information and questions about COVID-19, LEC, PCL, and DERS. Participants were asked if they had experienced any of the COVID-19 symptoms described by the World Health Organization in the preceding 14 days (WHO, 2020). COVID-19 symptoms were assigned to students who demonstrated any of these characteristics. The students were requested to complete the surveys online using Microsoft Forms. The surveys took roughly 25–35 minutes to complete by the students. Additionally, the PCL-5 was administered with special consideration for the LEC-5. The LEC-5 was completed by participants based on the most painful traumatic incident indicated on the LEC-5.

Ethics and Human Subjects Issues

Data Management

All participants' data and demographic information are stored at OneDrive of the (------) University in Egypt.

Data analysis

The data were evaluated using the IBM SPSS Statistics, version 23 software program. Descriptive statistics were employed. The binary logistic regression was utilized to investigate correlations between PTSD symptoms, DERS, and having suspected COVID-19 symptoms. Independent *t-tests* and *Chi-square* were conducted to compare PTSD and DERS scores of participants with and without susception of COVID-19. Due to multiple comparisons, the alpha level was corrected according to the Bonferroni correction or according to the recommendations concerning multiple correlated tests (Li & Ji, 2005; Nyholt, 2004).

To control for Type I error, the Bonferroni adjustment was done by dividing the significance level (in this case, 0.05) by the number of tests were used, the new significance level is 0.05/2 = 0.025. This means that if the *p*-value is larger than 0.025, we do not have a statistically significant result.

Sample size

SPSS Sample Power was used, statistical analyses ensured that the sample size was sufficient to detect meaningful differences in the outcomes. We set the following parameters based on previous research: the two-tailed test of significance, desired power=0.80, unstructured covariance matrix, the margin of error =5%. With (1000 students), the study has 80% power to detect a medium effect size of 0.60 for groups differences on primary outcomes

3. Results

Sociodemographic characteristics

There were (*N*=1195), 50.7% female students. Table 1 presents the demographic and descriptive characteristics of the study sample. There were (*N*=441) students with suspected COVID-19 symptoms, and (*N*=754) students with no suspected COVID-19 symptoms.

Table 1. Association between Participants' sociodemographic characteristics, and suspicion of COVID-19

Variables		Students without suspected COVID-19 symptoms *n* (%) 754 (63.1)	Students with suspected COVID-19 symptoms *n* (%) 441 (36.9)
Gender	Males	428 (35.8)	161 (13.5)
	Females	326 (27.3)	280 (23.4)
Academic Level	Undergrade	635 (53.1)	340 (28.5)
	Postgrads	108 (9)	88 (7.4)
	Master	6 (0.5)	1 (0.1)
	Ph.D.	5 (0.4)	12 (1)
Age	15-19	559 (46.8)	316 (26.4)
	20-24	116 (9.7)	75 (6.3)
	25-29	29 (2.4)	36 (3)
	30-34	35 (2.9)	9 (0.8)
	>35	15 (1.3)	5 (0.4)
Subject of Study	Law	1 (0.1)	1 (0.1)
	Dentistry	80 (6.7)	24 (2)
	Media	104 (8.7)	37 (3.1)
	Pharmacy	453 (37.9)	357 (29.9)
	Computer sciences	34 (2.8)	16 (1.3)
	Engineering	82 (6.9)	6 (0.5)

Variables		Students without suspected COVID-19 symptoms *n* (%) 754 (63.1)	Students with suspected COVID-19 symptoms *n* (%) 441 (36.9)
Region of residence	Urban	741 (62)	407 (34.1)
	Rural	13 (1.1)	34 (2.8)
Income status	Income lower than expenses	11 (0.9)	23 (1.9)
	Equal income and expenses	685 (57.3)	378 (31.6)
	Income higher than expenses	58 (4.9)	40 (3.3)
Loneliness	Alone	56 (4.7)	108 (9)
	Living with family	698 (58.4)	333 (27.9)

PTSD, Difficulties in Emotion Regulation, and COVID-19

Binary logistic regression revealed that the overall model was statistically significant when compared to the null model, ($\chi 2(2) = 770.6$, $p < .000$), which explained 64% of the variation of suspected to COVID-19 and correctly predicted 84.6% of cases. When comparing students with suspected COVID-19 symptoms to students without suspected COVID-19 symptoms, PCL scores were higher ($\beta 1 = 1.1$, $p < .000$; 95%*CI*: 1.07 to 1.10). Also, when comparing students with suspected COVID-19 symptoms to students without suspected COVID-19 symptoms, DERS scores were higher ($\beta 1 = 1.04$, $p < .000$; 95%*CI*: 1.03 to 1.05).

There was a significant difference in DERS scores between students with and without PTSD [$t(1193) = -85.3$, $P<.000$]. Students who have had PTSD have a considerably higher DERS (M=105.6, SD=25.1) than students who do not have experienced PTSD (M=69.79, SD=27.5).

PTSD outcomes

Participants were assessed to define if they have experienced trauma or developed PTSD. Nearly 22.8% of the sample (N= 273) met DSM-5 criteria for having current PTSD. Among the 22.8% that meet the criteria for PTSD, 4.18% are attributed to COVID-19. When compared to students who did not have suspected COVID-19 symptoms, those who did had a greater prevalence of PTSD symptoms (18.2% vs. 4.7%).

There was a significant difference between students who did not have suspected COVID-19 symptoms and those who did regarding their PCL scores [$t(1193) = -35.3$, $P<.000$, 95%*CI*: -27.7–24.7]. Students who have suspected COVID-19 symptoms have significantly higher PCL scores (M=45.8, SD=8.3) than students who did not (M=19.6, SD=17.2).

As shown in Table 3. There was a significant association between the type of trauma and PCL's score ($\chi 2= 62.8$, $p<.000$).

Table 2 shows that when compared to students who did not have suspected COVID-19 symptoms, those who did had significantly (Ps<.000) greater scores on the PCL subscales.

Table 2. Association of having suspected COVID-19 symptoms with PCL's subscales and DERS's subscales

		Students without suspected COVID-19 symptoms *n (%)* 754 (63.1)	Students with suspected COVID-19 symptoms *n* (%) 441 (36.9)	*Association with* suspicion of COVID-19					
		M(SD)	*M(SD)*	*t*	*df*	*Sig.*	*Mean Difference*	*95% CI. for EXP(B)*	
								Lower	*Upper*
PTSD	Intrusion symptoms	4.5 (4.5)	10.7 (4.1)	-23.6	1193	.000	-6.2	-6.8	-5.7
	Avoidance symptoms	2.3 (2.6)	4.8 (2.2)	-16.5	1193	.000	-2.4	-2.7	-2.1
	Cognitive-mood changes symptoms	6.3 (6.6)	16.6 (4.5)	-28.7	1193	.000	-10.2	-10.9	-9.5
	Arousal symptoms	6.4 (5.7)	13.5 (4.1)	-23.1	1193	.000	-7.1	-7.7	-6.5
DERS	Emotional awareness	8.6 (3.6)	13.8 (3.1)	-25.8	1193	.000	-5.2	-5.6	-4.8
	Emotional clarity	8.6 (3.8)	14.1 (3.2)	-26.1	1193	.000	-5.4	-5.8	-5.1
	Nonacceptance	9.1 (3.8)	14.7 (3.1)	-27.4	1193	.000	-5.5	-5.9	-5.1
	Impulsivity	13.4 (6.3)	22.3 (5.1)	-26.9	1193	.000	-8.9	-9.6	-8.3
	Goal-directed behavior	11.3 (6.1)	20.2 (5.1)	-26.5	1193	.000	-8.8	-9.5	-8.2
	Regulation Strategies	11.2 (4.7)	19.3 (4.6)	-30.3	1193	.000	-8.1	-8.6	-7.5

DERS Scores

When compared to students who did not have suspected COVID-19 symptoms, those who did had a greater prevalence of DERS (34.5% vs. 23.3%). There was a significant difference between students who did not have suspected COVID-19 symptoms and those who did regarding their DERS scores [t (1193) = -32.7, P<.000, 95%*CI*: -44.7–39.6]. Students who have suspected COVID-19 symptoms have significantly higher DERS (M=104.6, SD=18.7) than students who did not (M=62.4, SD=25.4)

Table 2 shows that when compared to students who did not have suspected COVID-19 symptoms, those who did had significantly (Ps<.000) greater scores on the DERS subscales. Their scores of the DERS were ordered from the highest to the lowest as follows: Impulsivity, Goals, Strategies, Nonacceptance, Clarity,

awareness. The students' impulsivity was (*M*=16.7, *SD*=7.29) and their difficulties in engaging in goal-directed behavior during the emotional distress were (*M*=14.6, *SD*=7.2), and their difficulties in practicing the healthy emotion regulation strategies were (*M*=14.2, *SD*=6.1), and their difficulties in acceptance were (*M*=11.1, *SD*=4.48), and their difficulties in having a clear insight of their emotions were (*M*=10.6, *SD*=4.46), difficulties in self-awareness were (*M*=10.5, *SD*=4.26).

The Life Events Checklist scores

As indicated in Table 3, the "Sudden accidental death" was the most frequent traumatic incident experienced by the students during the COVID-19 Epidemic (22%), with average PCL scores of (*M*=36.2, *SD*=14.7) and DERS scores of (*M*=86.3, *SD*=28.6). There was a significant difference in PCL ratings between students exposed to stressful events and those who were not ($\chi 2(1) = 62.8$, $p < .000$). There was a statistically significant difference in DERS ratings between students who were exposed to stressful situations and those who were not ($\chi 2(1) = 160.2$, $p < .000$).

Table 3. The association between the Life Events Checklist for DSM-5, PTSD and DERS

	PTSD		Total	*Total PCL M (SD)*	*Total DERS M (SD)*	*Association with PTSD χ2*	*Association with DERS χ2*
	No PTSD	PTSD					
None	388	63	451	18 (20.7)	63.8 (31.1)	62.8***	160.2***
Fire or explosion	3	1	4	35 (13)	75 (30.7)		
Transportation accident (for example, car accident, boat accident, train wreck, plane crash)	56	3	59	24.1 (12.3)	69.03 (26.2)		
Serious accident at work, home, or during recreational activity	2	0	2	30 (4.2)	70.5 (16.2)		
Physical assault (for example, being attacked, hit, slapped, kicked, beaten up)	6	7	13	49.1 (15.6)	109.07 (20.2)		
Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb)	5	0	5	23.4 (14.5)	71.8 (25.5)		
Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm)	10	7	17	37.2 (17.2)	83.3 (29.8)		
Other unwanted or uncomfortable sexual experience	18	8	26	38.1 (13.05)	93.5 (27.1)		
Combat or exposure to a warzone (in the military or as a civilian)	17	5	22	35.5 (10.8)	88.4 (28.1)		
Captivity (for example, being kidnapped, abducted, held hostage, prisoner of war)	1	0	1	44	116		
Life-threatening illness or injury	38	15	53	32.3 (15.2)	78.5 (26)		
Severe human suffering	41	0	41	21.4 (6.4)	64.2 (21.3)		
Sudden violent death (for example, homicide, suicide)	4	2	6	43.8 (11.7)	99 (25.2)		
Sudden accidental death	185	78	263	36.2 (14.7)	86.3 (28.6)		

	PTSD		Total	*Total PCL M (SD)*	*Total DERS M (SD)*	*Association with PTSD χ2*	*Association with DERS χ2*
	No PTSD	PTSD					
Serious injury, harm, or death you caused to someone else	1	0	1	34	96		
Any other very stressful event or experience	73	34	107	38.7 (13.5)	88.5 (25.5)		
COVID-19	74	50	124	44.6 (9.7)	101.1 (17.8)		

Discussion

The primary focus of the current study was to detect the relationship between PTSD and ER difficulties under the COVID-19 condition in Egypt. The results showed that students who had COVID-19 symptoms, had a greater prevalence of PTSD symptoms and DERS. The current study adds to the body of knowledge suggesting a link between emotion regulation difficulties and PTSD (Weiss et al., 2012; Ehring & Quack, 2010; Tyra et al., 2021). Students who exposed to trauma reported significantly higher levels of overall difficulty with emotion regulation, as well as difficulties controlling impulsive behaviors when distressed, difficulties engaging in goal-directed behavior when upset, limited access to effective emotion regulation strategies, difficulties accepting emotions, difficulties having a clear understanding of their emotions, and difficulties with self-awareness.

Additionally, our data suggested that the most prevalent stressful event faced by students during the COVID-19 Epidemic was "Sudden accidental death." The unexpected loss of a loved one is the most devastating event, and in the event of an epidemic, guilt and worry are compounded (Banerjee, 2020). The unexpected death has been associated with subsequent increases in the symptoms of a number of psychopathologies, including severe depressive episodes, panic disorder, and post-traumatic stress disorder (Keyes et al., 2014).

Our data indicate that PTSD was prevalent among Egyptian students (22.8%). This might be because Egypt faces several stressors, since its citizens have endured numerous historical traumas, including the Arab-Israeli war (Schulze, 2016), the Arab Spring, and the Arab Winter (Dabashi, 2012; Kurzman et al., 2013). Additionally, Egypt's dense population and economic hardships may add to the trauma epidemic's high frequency (Shuwiekh et al., 2020).

The continuing COVID-19 epidemic is causing psychological problems, including an increased likelihood of feeling trauma. Participants may have negative emotions and lose interest during the lockdown. They have developed an inability to make significant life decisions as a result of their anxieties about the future (Jacobson et al., 2020). Additionally, quarantine decreased social activities, resulting in a decline in social and emotional support (Cao et al., 2020).

Another possible explanation for our findings is that we spent more time watching and reading COVID-19 news about the disease's case count and death

count everyday than we did prior to the lockdown. Research has indicated that viewing and reading COVID-19 news in excess and for extended periods of time might result in psychological problems such as anxiety and depression (Dong et al., 2020, Gao et al., 2020, Huang et al., 2020).

The consequences and suggestions of this study include instructing participants on ways for strengthening their emotion regulation abilities in order to safeguard them against trauma.

Limitations and future directions: first, this study depends on self-reporting; a significant constraint is participants' capacity and willingness to share sensitive and personal information concerning trauma and ER difficulties. Second, the data were cross-sectional; the results indicated correlation, but correlation does not imply causality because no experimental manipulation occurred. Future research might incorporate longitudinal data on the association between PTSD and DERS, as well as a larger sample size. Third, the current study enrolled students from a single university. Despite being one of the major private colleges in Egypt, the present findings may not apply to all Egyptian students. Future study should involve students from different governorates to ensure that they are representative of all Egyptian students. Finally, because the primary objectives of the study, PTSD and DERS, were assessed using self-rating scales, there was a danger of response bias.

Conclusions

Our findings indicate a significant positive association between PTSD and ER problems in COVID-19 condition. Mental health practitioners should pay close attention to the mental health of the students and give appropriate psychological therapies and coping skills.

Compliance with Ethical Standards

Funding: there are no funds for this research

Conflict of Interest: No actual or potential conflicts of interest exist for any authors on this paper

Ethical approval: "All procedures performed in studies involving human subjects were following the ethical standards of the Egyptian clinical standards of practice." Also, according to the Helsinki Declaration, the study was conducted in strict conformity with all human subject protections

Approval from the (-------) University in Egypt Institutional Review Board was obtained to conduct the study (IRB Protocol CL-2101). Participants signed up for an online information sheet and an online consent form. They were informed of nature and procedure, the aims of the study, confidentiality of data, choice to

participate in the study, right to withdraw at any time from the study. Participants were made aware that the experiment includes psychological assessments.

The corresponding author can provide reasonable access to the datasets created during and/or analyzed during the current investigation.

References

Abdelghani, M., Hassan, M.S., Alsadik, M.E. et al. (2021). Post-traumatic stress symptoms among an Egyptian sample of post-remission COVID-19 survivors: prevalence and sociodemographic and clinical correlates. *Middle East Current Psychiatry,* 28, 20. https://doi.org/10.1186/s43045-021-00102-y.

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders,* Fifth Edition. Washington, D.C: American Psychiatric Association Press.

Banerjee, D. (2020). How COVID-19 is overwhelming our mental health. *Nature India*.

Bardeen, J.R., Kumpula, M.J., Orcutt, H.K. (2013): Emotion regulation difficulties as a prospective predictor of post-traumatic stress symptoms following a mass shooting. *Journal of Anxiety Disorder*, 27:188-196 http://dx.doi.org/10.1016/j.janxdis.2013.01.003.

Blanchard, E. B., Jones Alexander, J., Buckley, T. C., & Forneris, C. A. (1996). Psychometric properties of the PTSD Checklist (PCL). *Behavior Research and Therapy*, 34, 669-673.

Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The post-traumatic stress disorder checklist for DSM-5 (PCL-5): Development and initial psychometric evaluation. *Journal of Traumatic Stress*, 28, 489–498.

Boden, M. T., Westermann, S., McRae, K., Kuo, J., Alvarez, J., Kulkarni, M. R., Gross, J. J., & Bonn-Miller, M. O. (2013). Emotion regulation and post-traumatic stress disorder: A prospective investigation. *Journal of Social and Clinical Psychology*, 32(3), 296–314. https://doi.org/10.1521/jscp.2013.32.3.296.

Boyraz, G., & Legros, D. N. (2020). Coronavirus Disease (COVID-19) and traumatic stress: Probable risk factors and correlates of post-traumatic stress disorder. *Journal of Loss and Trauma*. Advance online publication. https://doi.org/10.1080/15325024.2020.1763556.

Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for post-traumatic stress disorder in trauma-exposed adults. *Journal of consulting and clinical psychology*, 68(5), 748–766. https://doi.org/10.1037//0022-006x.68.5.748.

Bridgland, V.M.E., Moeck, E.K., Green, D.M., Swain, T.L., Nayda, D.M., Matson, L.A., et al. (2021) Why the COVID-19 pandemic is a traumatic stressor. *PLoS ONE* 16(1): e0240146. https://doi.org/10.1371/journal.pone.0240146.

Cao W, Fang Z, Hou G, Han M, Xu X, Dong J, et al. (2020). The psychological impact of the COVID-19 epidemic on college participants in China. *Psychiatry Research*, 287, 112934.

Dabashi, H. (2012). *The Arab spring: The end of postcolonialism*. Zed Books Ltd.

Dong, M., & Zheng, J. (2020). Letter to the editor: Headline stress disorder caused by Netnews during the outbreak of COVID-19. *Health Expectations*, 23, 259–260.

Ehring, T., & Quack, D. (2010). Emotion regulation difficulties in trauma survivors: the role of trauma type and PTSD symptom severity. *Behavior therapy*, 41(4), 587–598. https://doi.org/10.1016/j.beth.2010.04.004.

El-Zoghby, S. M., Soltan, E. M., & Salama, H. M. (2020). Impact of the COVID-19 Pandemic on Mental Health and Social Support among Adult Egyptians. *Journal of community health*, 45(4), 689–695. https://doi.org/10.1007/s10900-020-00853-5.

Gao, J., Zheng, P., Jia, Y., Chen, H., Mao, Y., Chen, S., et al. (2020). Mental health problems and social media exposure during the COVID-19 outbreak. *PLoS One*, 15, e0231924.

Goral, A., Lahad, M., & Aharonson-Daniel, L. (2017). Differences in post-traumatic stress characteristics by the duration of exposure to trauma. *Psychiatry Research*, 258, 101–107.Return to ref 2017 in article.

Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment*, 26, 41–54. https://doi.org/10.1023/B:JOBA.0000007455.08539.94.

Henschel, A., Williams, J., Hardt, M. (2020) The Role of Experiential Avoidance and Emotion Regulation in DSM-5 Post-traumatic stress Symptomatology. *Journal of Loss and Trauma*, 0, 1-13.

Huang, Y., & Zhao, N. (2020). Generalized anxiety disorder, depressive symptoms, and sleep quality during the COVID-19 outbreak in China: A web-based cross-sectional survey. *Psychiatry Research*, 288, 112954.

Jacobson, N. C., Lekkas, D., Price, G., Heinz, M. V., Song, M., O'Malley, A. J., & Barr, P. J. (2020). Flattening the Mental Health Curve: COVID-19 Stay-at-Home Orders Are Associated with Alterations in Mental Health Search Behavior in the United States. *JMIR mental health*, 7(6), e19347. https://doi.org/10.2196/19347.

Jiang, H., Nan, J., Lv, Z., & Yang, J. (2020). Psychological impacts of the COVID-19 epidemic on Chinese people: Exposure, post-traumatic stress symptom, and emotion regulation. *Asian Pacific Journal of Tropical Medicine*. Advance online publication. http://www. apjtm.org/preprintarticle.asp?id=281614.

Keyes, K. M., Pratt, C., Galea, S., McLaughlin, K. A., Koenen, K. C., & Shear, M. K. (2014). The burden of loss: unexpected death of a loved one and psychiatric disorders across the life course in a national study. *The American journal of psychiatry*, 171(8), 864–871. https://doi.org/10.1176/appi.ajp.2014.13081132.

Kira, I. A., Lewandowski, L., Templin, T., Ramaswamy, V., Ozkan, B., & Mohanesh, J. (2008). Measuring cumulative trauma dose, types, and profiles using a development-based taxonomy of traumas. *Traumatology*, 14(2), 62–87.

Kira, I.; Shuwiekh, H.; Rice, K.; Ashby, J; Elwakeel, S.; Sous, M.; Alhuwailah, A; Baali, S.; Azdaou, C.; Oliemat, E.& Jamil, H. (2020). Measuring COVID-19 as traumatic stress: Initial psychometrics and validation. *Journal of Loss and Trauma: International Perspectives on Stress & Coping.*

Klanecky Earl, A., Robinson, A., Mills, M., Khanna, M., Bar-Haim, Y., Badura-Brack, A. (2020) Attention bias variability and post-traumatic stress symptoms: the mediating role of emotion regulation difficulties. *Cognition & Emotion*, 34, 6, 1300-1307.

Kurzman, C., Fahmy, D. F., Gengler, J., Calder, R., & Whitson, S. L. (2013). Arab winter. *Contexts*, 12(2), 12–21.

Liu, N., Zhang, F., Wei, C., Jia, Y., Shang, Z., Sun, L., Wu, L., Sun, Z., Zhou, Y., Wang, Y., & Liu, W. (2020). Prevalence and predictors of PTSS during COVID-19 outbreak in China hardest-hit areas: Gender differences matter. *Psychiatry Research*, 287, 112921. https://doi.org/10.1016/j.psychres.2020.112921.

Nagulendran, A., Jobson, L. (2020) Exploring cultural differences in the use of emotion regulation strategies in post-traumatic stress disorder. *European Journal of Psychotraumatology*, 11, 1-8.

Panayiotou, G., Panteli, M., & Leonidou, C. (2021). Coping with the invisible enemy: The role of emotion regulation and awareness in quality of life during the COVID-19 pandemic. Journal of Contextual Behavioral Science, 19, 17-27. https://doi.org/10.1016/j.jcbs.2020.11.002.

Powers, A., Cross, D., Fani, N., Bradley, B. (2015). PTSD, emotion dysregulation, and dissociative symptoms in a highly traumatized sample. *Journal Psychiatry Research*, 61, 174-179. http://dx.doi.org/10.1016/j.jpsychires.2014.12.011.

Schulze, K. E. (2016). *The Arab-Israeli conflict*. Taylor & Francis.

Seligowski, A.V., Lee, D.J., Bardeen, J.R., Orcutt, H.K. (2015). Emotion regulation and post-traumatic stress symptoms: a metanalysis. *Cognitive Behavior Therapy*, 44, 87-102 http://dx.doi.org/10.1080/16506073.2014.980753.

Shuwiekh, H. A., Kira, I. A., Sous, M. S. F. et al. The differential mental health impact of COVID-19 in Arab countries. *Current Psychology* (2020). https://doi.org/10.1007/s12144-020-01148-7.

Sippel, L. M., Roy, A. M., Southwick, S. M., & Fichtenholtz, H. M. (2016). An examination of the roles of trauma exposure and post-traumatic stress disorder on emotion regulation strategies of Operation Iraqi Freedom, Operation Enduring Freedom, and Operation New Dawn veterans. *Cognitive behavior therapy*, 45(5), 339–350. https://doi.org/10.1080/16506073.2016.1183037.

Sun, L., Sun, Z., Wu, L., Zhu, Z., Zhang, F., Shang, Z., Jia, Y., Gu, J., Zhou, Y., Wang, Y., Liu, N., & Liu, W. (2020). Prevalence and risk factors of acute post-traumatic stress symptoms during the COVID-19 outbreak in Wuhan, China. MedRxiv. https://doi.org/10.1101/ 2020.03.06.20032425.

Tull, M.T., Barrett, H.M., McMillan, E.S., Roemer, L. (2007) A preliminary investigation of the relationship between emotion regulation difficulties and post-

traumatic stress symptoms. *Behavior Therapy*, 38, 303-313. http://dx.doi.org/10.1016/j.beth.2006.10.001.

Tyra, A. T., Ginty, A. T., & John-Henderson, N. A. (2021). Emotion regulation strategies predict PTSS during the COVID-19 pandemic in an American Indian population. International Journal of Behavioral Medicine, 1-5. https://doi.org/10.1007/s12529-021-09964-2.

Wang, C., Pan, R., Wan, X., Tian, Y., Xu, L., McIntyre, R. S., Choo, F. N., Tran, B., Ho, R., Sharma, V. K., & Ho, C. (2020). A longitudinal study on the mental health of the general population during the COVID-19 epidemic in China. *Brain, behavior, and immunity*, 87, 40–48. https://doi.org/10.1016/j.bbi.2020.04.028.

Wathelet, M., Fovet, T., Jousset, A. et al. (2021). Prevalence of and factors associated with post-traumatic stress disorder among French university students 1 month after the COVID-19 lockdown. *Translational Psychiatry*, 11, 327. https://doi.org/10.1038/s41398-021-01438-z.

Weathers, F.W., Blake, D.D., Schnurr, P.P., Kaloupek, D.G., Marx, B.P., & Keane, T.M. (2013). The Life Events Checklist for DSM-5 (LEC-5). Instrument is available from the National Center for PTSD at www.ptsd.va.gov.

Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013). *The PTSD Checklist for DSM–5 (PCL-5)*.

Weiss, N. H., Tull, M. T., Davis, L. T., Dehon, E. E., Fulton, J. J., & Gratz, K. L. (2012). Examining the association between emotion regulation difficulties and probable posttraumatic stress disorder within a sample of African Americans. *Cognitive behaviour therapy*, 41(1), 5–14. https://doi.org/10.1080/16506073.2011.621970.

World Health Organization. (2021). Coronavirus disease (COVID-19) pandemic. Retrieved February 10, 2021.

Journal of Evidence-Based Psychotherapies,
Vol. 22, No. 1, March 2022, 103-116.

10.24193/jebp.2022.1.6

A ROMANIAN VERSION OF THE EXPERIENCES IN CLOSE RELATIONSHIP SCALE – SHORT FORM (ECR-S) MEASURE OF ADULT ATTACHMENT

Natalia Constantinescu[1], Fabien Bacro[2] and Margareta Dincă[3]*

[1] Department of Psychology, Institute of Philosophy and Psychology "Constantin Rădulescu-Motru", Romanian Academy, Calea Victoriei 125, 010071 Bucharest, Romania.
[2] Faculty of Psychology, Centre de Recherche en Education de Nantes (EA 2661), University of Nantes, Chemin de la Censive du Tertre, 44312 Nantes Cedex 3, France.
[3] Faculty of Psychology, Titu Maiorescu University, Dâmbovnicului Street 22, 040441 Bucharest, Romania.

Abstract

The present research objective is to adapt the 12-item *Experiences in Close Relationship Scale – Short Form* (ECR-S) on the Romanian population. This self-report scale is used to assess adult attachment, by two dimensions: *Anxiety* and *Avoidance*. The psychometric properties of the instrument were assessed in a cross-sectional approach, by examining the reliability (in terms of internal consistency, as well as test-retest reliability), factor structure, convergent and predictive validity, in a sample from general population. A total number of 440 participants, aged 18 to 71 years-old, filled out a socio-demographics data sheet, the ECR-S and the Patient Health Questionnaire-9 (PHQ-9). The incomplete questionnaires were removed, resulting in a final number of 421 participants for the analysis. Results indicated good internal consistency (Cronbach`s alpha coefficients 0.79, 0.73, McDonald`s omega coefficients 0.80, 0.74) and good test-retest reliability over 2-weeks period (Spearman coefficients 0.86, 0.74) for both subscales (*Anxiety* and *Avoidance*). The confirmatory analysis revealed a bifactorial structure, with 11 items. Results confirmed convergent and predictive validity. Influence of socio-demographic variables was also assessed. The results indicate that the Romanian version of ECR-S has good psychometric properties, being a suitable instrument for assessing adult attachment.

Keywords: adult attachment; cultural adaptation; reliability; factor structure; convergent validity; predictive validity.

[*] Correspondence concerning this article should be addressed to Natalia Constantinescu, Institute of Philosophy and Psychology "Constantin Rădulescu-Motru", Romanian Academy, Calea Victoriei 125, 010071 Bucharest, Romania.
Email: natalia_constantinescu@yahoo.com

Introduction

The attachment theory, developed by John Bowlby, reveals the importance of the relationship with the primary care figure, during childhood, on personality development, on physical and mental health, as well as on relationships in later life (Bowlby, 1973, 1980). Based on his interactions with the primary care figure, in the first years of life, the child develops mental representations about himself and others (representations called "internal working models"), which will influence his interactions with other people, during his life course (Bowlby, 1982). Thus, if the primary care figure is always available and responds adequately to his needs, the child develops a positive representation of self ("I can be loved") and of others ("The others will be available and will respond properly to my needs"), these representations corresponding to a secure attachment. On the other hand, if the primary care figure isn`t always available and/or fails to fulfill his needs, the child develops a negative representation of self ("I do not deserve to be loved") and/or of others ("The others will not be available and/or will not be able to provide me the emotional support I need"), these representations corresponding to an insecure attachment (Bowlby, 1973).

Bowlby`s theory was considered to be a good frame for understanding adult intimate relationships. Thus, romantic love was conceptualized as an attachment process, in which adults with secure attachment will manage to establish good and fulfilling relationships, while those with insecure attachment will tend to adopt an extreme attitude toward their partners, by approaching too much or by avoiding them (Hazan & Shaver, 1987). Based on Bowlby`s theory, Bartholomew and Horowitz (1991) developed a four-category model of adult attachment, depending on the model of self (positive or negative) and the model of others (positive or negative): secure, preoccupied, dismissing and fearful.

Subsequently, Brennan et al. (1998) conducted an analysis, by including 323 items corresponding to 60 attachment constructs from the existing self-report attachment scales. Their analysis revealed a two-dimensional structure of adult attachment: *Anxiety* and *Avoidance*, an approach which proved to be more appropriate for adult attachment assessment, by comparison to the categorical perspective (Fraley et al., 2015). Brennan et al. (1998) found that *Anxiety* is related to preoccupation, jealousy/fear of abandonment and fear of rejection, while *Avoidance* is related to discomfort with closeness, avoidance of intimacy and the tendency of self-reliance. Finally, out of the total pool of 323 items, the authors kept only 18 items for each factor, which resulted into a 36-item questionnaire (Brennan et al., 1998), called *Experiences in Close Relationships* (ECR), one of the most relevant instruments for adult attachment measurement (Ravitz et al., 2010). The scale has been translated into many languages and revealed a high level of internal consistency (near or above 0.90), as well as test-retest reliability (coefficients

between 0.50 and 0.75) (Mikulincer & Shaver, 2007). The validity was supported by the positive correlations between the two dimensions (*Anxiety* and *Avoidance*) and other constructs, such as depression, anxiety (Wei et al., 2005; Williams & Risking, 2004), emotion dysregulation (Liu & Ma, 2019), relationship dissatisfaction (Alonso-Arbiol et al., 2007; Conradi et al., 2006; Treboux et al., 2004) etc.

Although *Experiences in Close Relationships* (ECR) has good psychometric properties, it can be quite difficult to be used in research or psychotherapy, because of the high numbers of items. In order to overcome this challenge, Wei et al. (2007) developed the *Experiences in Close Relationship Scale-Short Form (ECR-S)*, a shorter version of the above-mentioned instrument, with only 12 items selected from the initial scale, corresponding to *Anxiety* or *Avoidance*. The authors validated the 12-item form in six studies, with American undergraduate students samples and the results showed psychometric properties comparable to the original 36-items version. Thus, the internal consistency was 0.77-0.86 for *Anxiety* and 0.78-0.88 for *Avoidance*; test-retest reliability was 0.82 for *Anxiety* and 0.89 for *Avoidance*, over a 3-week period, respectively 0.80 for *Anxiety* and 0.83 for *Avoidance*, over 1-month period. The two-factor structure model proved adequate fit to the data after removing the influence of response sets on the items, by adding two orthogonal response sets factors (a positively worded factor and a negatively worded factor). Construct validity was confirmed by correlations between the two subscales and other relevant constructs, such as depression or anxiety (Wei et al., 2007).

The *Experiences in Close Relationship Scale-Short Form (ECR-S*) was translated into languages other than English, including German (Neumann et al., 2007; Petrowski et al., 2020), Korean (Lee & Shin, 2019), Norwegian (Olssøn et al., 2010; Pedersen et al., 2015), Portuguese – Brazil (Natividade & Shiramizu, 2015), Spanish (Brasch, 2018), Urdu (Imran et al., 2020). The studies confirmed the two-factor structure of the scale, but some differences were reported in terms of the number of items, compared to the English version: 6 items (German version), 10 items (Portuguese – Brazil version), 11 items (Korean and Spanish version), 12 items (Urdu version).

Although there is a long form of the scale, adapted for Romania (Negrei & Sava, 2006), no studies have been conducted, to the extent of the authors` knowledge, on the validation of the *Experiences in Close Relationship Scale-Short Form (ECR-S)* on the Romanian population. Having considered the importance of such instrument in various contexts (research, psychotherapy, organizational environment etc.), it would be of a great use to translate and validate this scale on Romanian population. Thus, the aim of the present study, performed in the general population, is to test the bifactorial model of the scale, to evaluate reliability, convergent and predictive validity, as well as to investigate the influence of the socio-demographic variables.

Methodology

Participants and procedure

The study was conducted on a sample (N=440) from the general Romanian population, selected from several companies, institutions and online groups. The total sample included 380 (86%) women and 60 (14%) men, within the age range of 18-71 years (M = 33.09; SD = 12.00), being geographically distributed in all the Romanian regions. In terms of current relationship status, 110 (25%) participants were single, while 330 (75%) participants were in a relationship. Participants` educational level was secondary education (124 participants – 28%) or higher education (316 participants – 72%) and their socio-economic status was low (158 participants – 36%), medium (192 participants – 44%) or high (89 participants – 20%), one participant not offering information regarding the socio-economic status.

Participants were invited to take part in the research and received an information sheet about the study, as well as an information content form, a socio-demographic data sheet, the Romanian translation of ECR-S and other questionnaire which was used to assess construct validity. After two weeks, 117 participants completed again the ECR-S scale, in order to investigate the stability in time of the results. The participants took part in the study on a voluntary basis, with no financial compensation. The study was carried out according to the American Psychology Association (APA) ethical standards.

Measuring instruments

The Experiences in Close Relationships Scale-Short Form (ECR-S) is a self-report 12-item scale for adult attachment assessment. The scale is comprised of two 6-item subscales (*Anxiety* and *Avoidance*), with 8 normal-scored items and 4 reverse-scored items. Participants rate the degree they agree with the 12 statements describing possible ways of experiencing romantic relationships. The answers are rated on a 7-point Likert scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree) (Wei et al., 2007). The score for each of the two subscales (computed as mean[*] of the 6 items corresponding to the subscale) ranges from 1 to 7. People who obtain high scores for *Anxiety* and *Avoidance* are considered to have an insecure attachment, while people who obtain low scores are considered to have a secure attachment (Brennan et al., 1998).

The scale was initially translated from English into Romanian, by two psychologists, PhD students, having an advanced level of English. The original "romantic partner" was replaced with the word "partner," in masculine and feminine form („partener/parteneră"). Based on the two translations, an initial Romanian version of the scale was developed. This version was translated back to English by

[*] Similar to the longer version of the scale, developed by Brennan et al. (1998).

two psychologists, PhD students, having an advanced level of English. These translations were compared to the original questionnaire and proved to have a good match with the English version. Subsequently, the first Romanian version was analyzed by a jury of 23 Master`s degree psychology students, which suggested replacing the plural form "partners", which could have the meaning of having multiple relationships at the same time, by the singular "partner", in order to avoid confusion. After these suggestions, the final form of Romanian ECR-S was developed.

The *Patient Health Questionnaire-9* is a 9-item questionnaire, integrated as a subscale of a larger self-administred questionnaire, *Patient Health Questionnaire*, developed by Spitzer et al. (1999), for assessing eight mental disorders. The *Patient Health Questionnaire-9* is used for assessing depressive symptoms severity. Participants rate how often they have been bothered by symptoms, over the last two weeks. The answers are rated on a 4-point Likert scale ranging from 0 (Not at all) to 3 (Nearly every day). The total score ranges from 0 to 27, with higher score indicating a higher severity and cutoff values at 5, 10, 15, 20 for mild, moderate, moderately severe and severe depression (Kroenke et al., 2001). This instrument was used in this study due to its psychometric properties: excellent internal reliability (0. 89 and 0.86 in two studies), criterion and construct validity. Criterion validity was confirmed by the correlation of 0.84 between PHQ-9 scores and Mental Health Professional (MHP) interview scores, as well as the area under the ROC curve (AUC) of 0.95, indicating an outstanding capacity of PHQ-9 to discriminate between people with and without major depression. Construct validity was indicated by correlations between PHQ-9 and other constructs, such as functional status (0.33–0.73 for all the subscales), self-reported disability days (0.39), clinic visits (0.24), symptom-related difficulty in activities and relationships (0.55) (Kroenke et al., 2001). Moreover, compared to other instruments for assessing depression, PHQ-9 has the advantage of being a brief and efficient measure (only 9 items, mean scores nearly identical to the clinical interview) (Kroenke et al., 2001). This questionnaire proved to be adequate to detect depression not only in clinical, but also in the general population (Kocalevent et al., 2013; Martin et al., 2006). The Romanian version of PHQ-9 is free to use (as stated at http://www.phqscreeners.com) and its psychometric properties are similar to the original version (Lupascu et al., 2019). Previous research indicated correlations between adult attachment dimensions and depressive symptoms (Guzmán-González, et al., 2020; Petrowski et al., 2020), as well as the predictive role of adult attachment insecurity in depression (Vowels et al., 2022; Wei et al., 2003), therefore PHQ-9 would be a proper instrument to assess convergent and predictive validity of ECR-S.

Statistical analysis

Statistical analysis was conducted with the free soft Jasp, version 0.14.1, available online for research purpose.

Before the data entry, 19 questionnaires were excluded because of the incomplete answers (10 participants) or because the uncertain degree of cultural relevance (9 participants are living abroad and the number of years lived in Romania is not known). The exclusion of these 19 surveys led to a final sample of 421 participants for analysis (85.7% women and 14.3% men).

Data were assessed for normality, based on visual assessment of the histograms and also on skewness and kurtosis values. Reliability was assessed in terms of internal consistency, using Cronbach`s alpha coefficient and McDonald`s omega reliability coefficient (ω), as well as in terms of results stability (test-retest) after two-weeks, using Spearman`s correlation coefficient (r_s), because the data were not normally distributed. Missing data of ECR-S (completed after two weeks) were imputed by the mean of the other scores corresponding to the subscale.

A confirmatory factor analysis (CFA) using a diagonally weighted least squares (DWLS) estimation method, was conducted in order to determine whether the data fit the hypothesized bifactorial model of ECR-S. In order to assess the goodness of fit of the model within the given data, the following indices have been considered: chi-square (χ^2) – insignificant, p-value>0.05 (Barrett, 2007, apud Hooper et al., 2008); normed chi-quare (χ^2/df) – between 1 and 5 (Bollen, 1989, apud Guzmán-González et al., 2020), lower values indicating a better model fit; comparative fit index (CFI – comparative fit index) – minimum 0.95 (Hu & Bentler, 1999), 0.90 (Bentler & Bonett, 1980) or even 0.85 (Sava, 2011); TLI (Tucker-Lewis index) – minimum 0.95 (Hu & Bentler, 1999), 0.90 (Bentler & Bonett, 1980) or even 0.85 (Sava, 2011); SRMR (standardized root mean square residual) – maximum 0.08 (Hu & Bentler, 1999); RMSEA (root mean square error of approximation) – good fit for values < 0.05, acceptable fit for values 0.05-0.08, marginal fit for values 0.08-0.10, poor fit for values > 0.10 (Browne & Cudeck, 1992, Steiger, 1989, apud Fabrigar et al., 1999).

Convergent validity was assessed by correlations between the scores of ECR-S subscales and the score of PHQ-9, for 407 participants. Missing data of PHQ-9 where imputed by the mean of the other scores of the questionnaire. Predictive validity was investigated by multiple regression analysis, considering both *Anxiety* and *Avoidance* in the same analysis as predictors for depression, in order to accommodate their shared variance, as recommended by Cameron et al. (2012). Influence of socio-demographic variables was assessed by Spearman`s correlation coefficient (for age), Mann-Whitney U test (for gender, relationship status and education) and Kruskal-Waills H test (for socio-economic status) for comparison between subgroups. Effect size was given by the rank biserial correlation (for Mann-Whitney U test) and η^2 (for Kruskal-Waills H test).

Results

Descriptive statistics and subscales correlation

The descriptive statistics (mean, standard deviation, skewness and kurtosis) for the two subscales (*Anxiety* and *Avoidance*) of ECR-S are reported in Table 1. According to (Kim, 2013), the z-score (absolute value / standard error) for skewness should have values in (-2, 2) and the z-score for kurtosis should have values in (-7, 7), for sample sizes grater than 300. The values obtained show that the two subscales don`t follow a normal distribution, which was an expected result.

Table 1. Descriptive statistics for ECR-S subscales

Subscale ECR-S	M	SD	Skewness (Standard Error)	Z Skewness	Kurtosis (Standard Error)	Z Kurtosis
Anxiety	3.449	1.370	0.436 (0.119)	3.664	– 0.541 (0.237)	– 2.283
Avoidance	2.338	1.054	0.898 (0.119)	7.546	0.672 (0.237)	2.835

Note. N = 421 participants

Correlation (Spearman`s correlation coefficient) between the *Anxiety* and *Avoidance* subscales was r_s=0.424 ($p<0.001$).

Reliability

Internal consistency was assessed by Cronbach`s alpha (this coefficient being used by the authors of the original scale), as well as by McDonald`s omega, which is considered a better option for estimating reliability (Revelle & Zinbarg, 2009). The results show good internal consistency, comparable to the values obtained for the original instrument.

Test-retest reliability was assessed after two-weeks, for a number of 117 participants. Data were not normally distributed, so Spearman`s correlation coefficient (r_s) was used. The results show good test-retest reliability, comparable to the values obtained for the original scale.

Table 2. Reliability for ECR-S subscales

Subscale ECR-S	Internal consistency		Test-retest reliability
	Cronbach`s α	McDonald`s ω	Spearman`s r_s
Anxiety	0.79	0.80	0.86 ($p<0.001$)
Avoidance	0.73	0.74	0.74 ($p<0.001$)

Note. N = 421 participants (for Cronabch`s α and McDonald`s ω); N=117 (for Spearman`s r_s)

Confirmatory factor analysis

The bifactorial model, with 12 items, had a good fit, according to χ^2/df, CFI and TLI and a poor fit, according to SRMR and RMSEA. Results indicated the removal of item 5. The second model (two factors, item 5 removed) revealed a good fit to data.

Table 3. Fit indexes for the confirmatory factor analysis

Model	χ^2 *(df)*	χ^2/*df*	CFI	TLI	SRMR	RMSEA [90% CI]
12 items, two factors	$\chi^2(53) = 234.7$, $p<0.001$	4.43	0.913	0.892	0.107	0.090 [0.079 – 0.102]
11 items, two factors	$\chi^2(43) = 111.7$, $p<0.001$	2.60	0.965	0.956	0.074	0.062 [0.048 – 0.076]

The items and factor loadings for the final model are reported in Table 4. Each item loads on only one factor (anxiety or avoidance) and loadings to the other factor are set to 0, according to confirmatory factor analysis approach (Sava, 2011).

Table 4. Final model (items and factor loadings) for ECR-S

ECR-S Items (English / Romanian)	Factor loadings
Anxiety subscale	
2. I need a lot of reassurance that I am loved by my partner. / Am nevoie de o mulțime de garanții că sunt iubit de partenerul meu (partenera mea).	0.573
4. I find that my partner(s) don't want to get as close as I would like. / Consider că partenerul meu (partenera mea) nu vrea să se apropie atât cât mi-aș dori.	0.802
6. My desire to be very close sometimes scares people away. / Dorința mea de a fi aproape, uneori sperie oamenii.	0.658
8(R). I do not often worry about being abandoned. / Nu îmi fac prea des griji că voi fi abandonat(ă).	0.429
10. I get frustrated if romantic partners are not available when I need them. / Devin frustrat(ă) dacă partenerul meu (partenera mea) nu este disponibil(ă) atunci când am nevoie de el (ea).	0.439
12. I worry that romantic partners won't care about me as much as I care about them. / Îmi fac griji că partenerul meu (partenera mea) nu va ține la mine la fel de mult cât țin eu la el (ea).	0.781
Avoidance subscale	
1(R). It helps to turn to my romantic partner in times of need. / La nevoie, îmi este de ajutor să apelez la partenerul meu (partenera mea).	0.294
3. I want to get close to my partner, but I keep pulling back. / Vreau să mă apropii de partenerul meu (partenera mea), dar continuu să mă îndepărtez de el (ea).	0.857
7. I try to avoid getting too close to my partner. / Încerc să evit să mă apropii prea mult de partenerul meu (partenera mea).	0.656
9(R). I usually discuss my problems and concerns with my partner. / De obicei, discut despre problemele și îngrijorările mele cu partenerul meu (partenera mea).	0.484
11. I am nervous when partners get too close to me. / Sunt neliniștit(ă) atunci când partenerul (partenera) se apropie prea mult de mine.	0.546

Note. The reverse-scored items are marked by "R"

Convergent and predictive validity

Convergent validity was investigated by correlations between the scores of ECR-S subscales and the score of PHQ-9, for 407 participants. Positive significant correlations have been found between *Anxiety* dimension and depression (r_s=0.439, p<0.001), as well as between *Avoidance* dimension and depression (r_s=0.344, p<0.001). Both correlations were moderate.

Predictive validity was assessed by using a multiple regression, considering the scores of both attachment dimensions as predictors for PHQ-9 score. Higher levels of *Anxiety* and *Avoidance* predicted higher levels of depression (F(2, 404)=61.318, p<0.001) and both attachment dimensions predicted 22.9% of the variance in depression ($r^2_{adjusted}$=0.229), the influence of *Anxiety* on depression being greater than the influence of *Avoidance* ($\beta_{Anxiety}$=0.352, $\beta_{Avoidance}$=0.196).

Influence of socio-demographic variables

Nonparametric tests were conducted to investigate the mean differences between subgroups (Mann-Whitney U test for gender, relationship status and education; Kruskal-Waills H for socio-economic status), for both *Anxiety* and *Avoidance* subscales. The influence of age was assessed by Spearman`s correlation coefficient.

Table 5. Influence of socio-demographic variables

Socio-demographic variable	Anxiety		Avoidance	
	M (SD)	Test statistic (U, H), p, effect size	M (SD)	Test statistic (U, H), p, effect size
Gender				
Male (N=60)	3.27 (1.24)	U=11559, p=0.404	2.57 (1.07)	U=8987.5, p=0.034, effect size= –0.17
Female (N=361)	3.48 (1.39)		2.29 (1.13)	
Relationship status				
Single (N=108)	3.97 (1.43)	U=21866, p<0.001, effect size=0.294	2.87 (1.21)	U=23077.5, p<0.001, effect size =0.365
In a relationship (N=313)	3.27 (1.30)		2.15 (1.03)	
Education				
Secondary education (N=117)	3.81 (1.29)	U=13717.5, p<0.001, effect size= –0.229	2.44 (1.11)	U=16242.5, p=0.167
Higher education (N=304)	3.31 (1.38)		2.29 (1.12)	
Socio-economic status				
Low (N=154)	3.75 (1.40)	H(2)=15.747, p<0.001, effect size=0.039	2.51 (1.24)	H(2)=4.001, p=0.135
Medium (N=82)	3.01 (1.21)		2.18 (0.96)	
High (N=185)	3.39 (1.36)		2.25 (1.06)	

Note. Effect size was reported only for statistically significant differences

Regarding the *Anxiety* subscale, results revealed statistically significant differences between subgroups, in terms of relationship status, education and socio-economic status: single participants scored higher than those having a relationship, people with lower education scored higher than people with high education and participants with a low socio-economic status scored higher than those with a medium or high level. Significant, but low negative correlation has been found between age and *Anxiety* (r_s= –0.165, p<0.001).

Regarding the *Avoidance* subscale, results revealed statistically significant differences between subgroups, in terms of gender and relationship status: men scored higher than women and single participants scored higher than those having a relationship. There was no significant correlation between age and *Avoidance* (r_s=0.05, p=0.308).

Discussion

The bifactorial structure of ECR-S was confirmed, but the Romanian version has 11 items, compared to the 12-item original version. This result is line with other studies (Lee & Shin, 2019; Natividade & Shiramizu, 2015), which also reported a number of 11 items, when adapting the original English scale on different population. The model obtained for this sample had good fit to data.

The Romanian ECR-S showed good internal consistency and good test-retest reliability after two-weeks. These results are comparable to the original version of the scale (Wei et al., 2007), as well as the versions adapted for other cultures and languages (Brasch, 2018; Natividade & Shiramizu, 2015).

Convergent validity was supported by positive statistically significant correlations between attachment dimensions (*Anxiety* and *Avoidance*) and depression. Moreover, predictive validity was supported by multiple regression and the results showed that both attachment dimensions predict depression, influencing almost 23% of the variance in depression. Brasch (2018) and Guzmán-González et al. (2020) also reported that people with higher scores at attachment *Anxiety* and *Avoidance* had greater depressive symptomatology. In the present study, the comparisons based on socio-demographic variables revealed higher score for men, on *Avoidance* subscale, and no differences for *Anxiety*, in terms of gender. Similar results have been obtained by Petrowski et al. (2020), while other studies (Natividade & Shiramizu, 2015) revealed higher score for men on *Avoidance*, but, contrary to our results, differences have been also reported for *Anxiety*, women scoring higher than men. Our results indicated that single participants scored higher on both attachment dimensions, compared to those having a relationship. Other studies (Natividade & Shiramizu, 2015; Olssøn et al., 2010) also reported higher scores obtained by single people on *Anxiety* and *Avoidance*. Moreover, the present study revealed that participants having secondary education and low income scored higher

on *Anxiety* and no differences have been found for *Avoidance*, in terms of education and socio-economic status. Different results have been reported by Petrowski et al. (2020), who found no differences for *Anxiety*, in terms of education level, but significant differences for *Avoidance*, people with a lower education level having higher scores. In the current sample, there was a negative correlation between age and *Anxiety* and no correlation between age and *Avoidance*, similar findings being reported by Petrowski et al. (2020). Thus, the results of the present study are in line with the results indicated in the attachment literature.

Conclusion

The present research represents the first attempt in validating the ECR-S scale on the Romanian population. The main advantage of such an instrument for adult attachment assessment consists in the ease of use due to the small number of items. Thus, the instrument offers a good input in a short time, which is valuable for research and psychotherapy. The Romanian version of ECR-S has good psychometric results, comparable to the English version, and is, therefore, a reliable short instrument for assessing adult attachment.

The sample had a good level of diversity, including people from all the Romanian geographical regions, with various socio-demographic characteristics. Compared to the original English version (Wei et al., 2007), validated on students, the Romanian version provides results for the general population. However, there are some limitations of the study. The selection method (convenience sampling) led to a considerable disproportion in terms of gender (86% women and 14% men), therefore the extrapolation of the results to the general population should be made cautiously. Further research is needed in order to investigate the psychometric properties of the ECR-S, on other populations, clinical and non-clinical.

Authors Note

We have no known conflict of interest to disclose.

References

Alonso-Arbiol, I., Balluerka, N., Shaver, P. R. (2007). A Spanish version of the Experiences in Close Relationships (ECR) adult attachment questionnaire. *Personal Relationships, 14*(1), 45–63.

American Psychological Association (2017, March). *Ethical Principles of Psychologists and Code of Conduct*. Retrieved from https://www.apa.org/ethics/code (last accessed July 12, 2021).

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), 226–244.

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88*(3), 588–606.

Bowlby, J. (1973). *Attachment and Loss*, *Vol. 2. Separation: anxiety and anger*. New York: Basic Books.

Bowlby, J. (1980). *Attachment and Loss*, *Vol. 3. Loss: sadness and depression*. New York: Basic Books.

Bowlby, J. (1982). *Attachment and Loss*, *Vol. 1. Attachment* (2nd ed.). New York: Basic Books.

Brasch (2018). A Spanish version of the Experiences in Close Relationships scale – Short form (ECR-S) adult attachment questionnaire [Dissertation – The University of Texas Southwestern Medical Center at Dallas, Texas].

Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment: An integrative overview. In Simpson, J. A. Rholes, W. S. (Eds.), *Attachment theory and close relationships*, 46–76. New York: Guilford.

Cameron, J.J., Finnegan, H., Morry, M. M. (2012). Orthogonal dreams in an oblique world: A meta-analysis of the association between attachment anxiety and avoidance. *Journal of Research in Personality, 46*, 472–476.

Conradi, H. J., Gerlsma, C., Van Duijn, M., De Jonge, P. (2006). Internal and external validity of the Experiences in Close Relationships Questionnaire in an American and two Dutch samples. *The European Journal of Psychiatry, 20*(4), 258–269.

Fabrigar, L. R., MacCallum, R. C., Wegener, D. T., Strahan, E. J. (1999). Evaluating the Use of Exploratory Factor Analysis in Psychological Research. *Psychological Methods, 4*(3), 272–299.

Fraley, R., Hudson, N. W., Heffernan, M., Segal, N. (2015). Are Adult Attachment Styles Categorical or Dimensional? A Taxometric Analysis of General and Relationship-Specific Attachment Orientations. *Journal of personality and social psychology, 109*(2), 354–368.

Guzmán-González, M., Rivera-Ottenberger, D., Brassard, A., Spencer, R., Lafontaine, M. F. (2020). Measuring adult romantic attachment: psychometric properties of the brief Spanish version of the experiences in close relationships. *Psicologia: Reflexão e Crítica, 33*(1), e9.

Hazan, C., Shaver, P. (1987). Romantic Love Conceptualized as an Attachment Process. *Journal of Personality and Social Psychology, 52*(3), 511–524.

Hooper, D., Coughlan, J., Mullen, M. (2008). Structural Equation Modelling: Guidelines for Determining Model Fit. *Electronic Journal of Business Research Methods, 6*(1), 53–60.

Hu, L., Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1–55.

Imran, S., MacBeth, A., Quayle, E., Chan, S. W. Y. (2020). Psychometric Properties of the Experiences in Close Relationship Scale (Short Form) with Pakistani Adolescents. *Journal of Psychology and Psychotherapy, 10*(5), e379.

JASP Team (2020). JASP (Version 0.14.1) [Computer software].

Kim, H.-Y. (2013). Statistical notes for clinical researchers: assessing normal distribution (2) using skewness and kurtosis. *Restorative Dentistry & Endodontics*, 52–54.

Kocalevent, R. D., Hinz, A., Brähler, E. (2013). Standardization of the depression screener patient health questionnaire (PHQ-9) in the general population. *General Hospital Psychiatry, 35*(5), 551–555.

Kroenke, K., Spitzer, R. L., Williams, J. B. (2001). The PHQ-9: validity of a brief depression severity measure. *Journal of General Internal Medicine, 16*(9), 606–613.

Lee, J.-Y., Shin, Y.-J. (2019). Experience in close relationships scale-short version (ECR–S) validation with Korean college students. *Measurement and Evaluation in Counseling and Development, 52*(2), 119–127.

Liu, C., Ma, J.-L. (2019). Adult Attachment Style, Emotion Regulation, and Social Networking Sites Addiction. *Frontiers in Psychology, 10*, e2352.

Lupascu, N., Timar, B., Albai, A., Roman, D., Potre, O., Timar, R. (2019). Validation and cross-cultural adaptation of the depression Patient's Health Questionnaire – 9 in the Romanian population of patients with Type 2 Diabetes Mellitus. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy, 12*, 841–849.

Martin, A., Rief, W., Klaiberg, A., Braehler, E. (2006). Validity of the Brief Patient Health Questionnaire Mood Scale (PHQ-9) in the general population. *General Hospital Psychiatry*, 28(1), 71–77.

Mikulincer, M., Shaver, P. R. (2007). *Attachment in adulthood: Structure, dynamics, and change*. New York: The Guilford Press.

Natividade, J. C., Shiramizu, V. K. M. (2015). Uma medida de apego: versão brasileira da Experiences in Close Relationship Scale – Reduzida (ECR-R-Brasil) [An attachment measure: Brazilian version of Experiences in Close Relationship Scale – Short Form]. *Psicologia USP, 26*(3), 484–494.

Negrei, N., Sava, F. A. (2006). Adaptation of the adult attachment styles inventory for the Romanian population. *Social psychology, 18*, 155–169.

Neumann, E., Rohmann, E., Bierhoff, H.-W. (2007). Entwicklung und Validierung von Skalen zur Erfassung von Vermeidung und Angst in Partnerschaften: Der Bochumer Bindungsfragebogen (BoBi) [Development and validation of scales for measuring avoidance and anxiety in romantic relationships – The Bochurn Adult Attachment Questionnaire]. *Diagnostica, 53*(1), 33–47.

Olssøn, I., Sørebø, Ø., Dahl, A. A. (2010). The Norwegian version of the Experiences in Close Relationships measure of adult attachment: psychometric properties and normative data. *Nordic Journal of Psychiatry, 64*(5), 340–349.

Pedersen, G., Eikenæs, I., Urnes, Ø., Skulberg, G. M., Wilberg, T. (2015). Experiences in Close Relationships – Psychometric properties among patients with personality disorders. *Personality and Mental Health, 9*(3), 208–219.

Petrowski, K., Brähler, E., Suslow, T., Zenger, M. (2020). Revised short screening version of the attachment questionnaire for couples from the German general population. *PLoS ONE, 15*(4), e0230864.

Pfizer (n.d.). *Patient Health Questionnaire (PHQ) Screeners*. Retrieved from https://www.phqscreeners.com/images/sites/g/files/g10060481/f/201412/PHQ9_Romanian%20for%20Romania.pdf (last accessed July 12, 2021).

Ravitz, P., Maunder, R., Hunter, J., Sthankiya, B., Lancee, W. (2010). Adult attachment measures: a 25-year review. *Journal of Psychosomatic Research, 69*(4), 419–432.

Revelle, W., Zinbarg, R.E. (2009). Coefficients Alpha, Beta, Omega, and the glb: Comments on Sijtsma. *Psychometrika 74*, 145–154.

Sava, F. A. (2011). *Analiza datelor în cercetarea psihologică* [Data analysis in psychological research]. Cluj-Napoca: ASCR.

Spitzer, R. L., Kroenke, K., Williams, J. B. (1999). Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. Primary Care Evaluation of Mental Disorders. Patient Health Questionnaire. *JAMA, 282*(18), 1737–1744.

Treboux D, Crowell JA, Waters E. (2004). When "new" meets "old": configurations of adult attachment representations and their implications for marital functioning. *Developmental Psychology, 40*(2), 295–314.

Vowels, L. M., Carnelley, K. B., Stanton, S. C. E. (2022). Attachment anxiety predicts worse mental health outcomes during COVID-19: Evidence from two studies. *Personality and Individual Differences, 185*, e111256.

Wei, M., Heppner, P. P., Mallinckrodt, B. (2003). Perceived coping as a mediator between attachment and psychological distress: A structural equation modeling approach. *Journal of Counseling Psychology, 50*(4), 438–447.

Wei, M., Mallinckrodt, B., Larson, L. M., Zakalik, R. A. (2005). Adult Attachment, Depressive Symptoms, and Validation From Self Versus Others. *Journal of Counseling Psychology, 52*(3), 368–377.

Wei, M, Russell, D. W., Mallinckrodt, B., Vogel, D. L. (2007). The Experiences in Close Relationship Scale (ECR)-short form: reliability, validity, and factor structure. *Journal of Personality Assessment, 88*(2), 187–204.

Williams, N. L., Risking, J. H. (2004). Adult Romantic Attachment and Cognitive Vulnerabilities to Anxiety and Depression: Examining the Interpersonal Basis of Vulnerability Models. *Journal of Cognitive Psychotherapy, 18*(1), 7–24.

Journal of Evidence-Based Psychotherapies,
Vol. 22, No. 1, March 2022, 117-136.

10.24193/jebp.2022.1.7

EARLY NEGATIVE MEMORIES, HUMILIATION AND DEFECTIVENESS/SHAME SCHEMA: AN EMOTION-FOCUSED THERAPEUTIC APPROACH TO SOCIAL ANXIETY

Yousef Asmari[1], Behrouz Dolatshahi[2], Hamid Poursharifi[2] and Usha Barahmand[3]*

[1] University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.
https://orcid.org/0000-0002-9334-6697

[2] Department of Clinical Psychology, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.
https://orcid.org/0000-0002-1999-7774
https://orcid.org/0000-0003-3864-9924

[3] City University of New York, Queens College, New York, USA.
https://orcid.org/0000-0003-3049-2854

Abstract

Introduction: Recently emotion-focused therapy has developed as an additional approach and considers the role of primary emotions such as shame in the formation and persistence of SAD.

Objectives: The purpose of this study was to investigate the theoretical model of emotion-focused therapy for SAD by considering the role of early negative memories, humiliation and the mediating role of self-defectiveness/shame schema in the etiology of SAD.

Method: This cross-sectional descriptive study recruited a sample of 105 students, 44 males (41.9%) 61 females (58.1%), diagnosed with SAD by psychologists from Shahid Beheshti University Counseling Center. Participants ranging in age from 18 to 34 with a mean age of 23.1 years (*SD*=3.5) completed the Social Phobia Inventory, Humiliation Inventory, Early Life Experiences Scale, Defectiveness /Shame Schema subscale of the Young Schema Questionnaire-Short Form.

Results: Data were analyzed using SmartPLS-SEM. The results showed that early childhood experiences and humiliation significantly predict SAD. Also, the indirect effects of the independent variables through defectiveness/shame schema on SAD were significant.

Conclusions: Consistent with the assumptions of the emotion-focused approach to SAD, these results confirm that early life experiences and

[*] Correspondence concerning this article should be addressed to Usha Barahmand, Department of Psychology, Division of Mathematics and Natural Sciences, Queens College, City University of New York, 65-30 Kissena Blvd., Flushing, NY11367, USA.
Email: usha.barahmand@qc.cuny.edu

humiliation with the development of shame schemes play an important role in the etiology of SAD and must be considered for therapy to be effective. The results of this study suggest that the components of the emotion-focused model can have therapeutic value as targets of intervention in randomized clinical trials.

Keywords*:* social anxiety disorder, emotion-focused therapy, defectiveness/ shame schema, humiliation

Early Negative Memories, Humiliation and Defectiveness/Shame Schema: An Emotion-Focused Psychopathological Approach to Social Anxiety

Also known as Social Phobia, Social Anxiety Disorder (SAD) is the condition in which an individual experiences persistent and debilitating anxiety, fear, or panic in social interactions typically because he or she anticipates being embarrassed or negatively judged by others (American Psychiatric Association, 2013). The 12-month prevalence of social anxiety disorder is estimated to be around 2.3% (Spence et al., 2018) to 7.4% (Kessler et al., 2012). while its lifetime prevalence is reported to be about 10.7% (Kessler et al., 2012), making it the third most common mental disorder after depression and substance use (Kessler et al., 2012). In a recent study (Jefferies & Ungar, 2020), the prevalence of social anxiety in seven countries with diverse cultures and economic conditions from different parts of the world was estimated to be 36%, with an additional 18% not perceiving themselves as having social anxiety yet meeting the criteria for a social anxiety disorder. The negative consequences and impairment associated with social anxiety disorder are wide-ranging including academic performance (Archbell & Coplan, 2021), emotion regulation strategy use (Daros et al., 2019), interpersonal relations both offline (Acquah et al., 2016) and online (Weidman & Levinson, 2015), occupational functioning (Nordahl & Wells, 2020), quality of life (Alsamghan, 2021) and cannabis use (Walukevich-Dienst et al., 2020).

There are two main cognitive models and treatments of Social anxiety disorder (SAD), one suggested by Clark and Wells (1995) and the other by (Rapee & Heimberg, 1997). The Clark and Wells' model holds that self-regulatory cognitive processes (e.g. self-focused attention) maintain social anxiety. According to this model, when an individual with SAD enters a social situation, negative cognitive beliefs about the self are triggered, which leads to negative interpretations of performance. Attention is then shifted to the self in a biased manner. The individual also uses safety behaviors to deal with negative beliefs about how one appears to others. Furthermore, anticipatory worry before social encounters and post-event rumination after social interactions serve to maintain SAD. A systematic review of treatments for adults with SAD (Mayo-Wilson et al., 2014), found individual cognitive-behavioral therapy (CBT) to be the best intervention for the initial

treatment of SAD as it was associated with large effect sizes and lower risk of side-effects.

The Rapee and Heimberg model suggests that individuals with SAD hold assumptions that others are critical and judgmental (Heimberg et al., 2014). According to this cognitive model, individuals with SAD form a mental representation of the self as viewed from an observer perspective. This mental representation is influenced by internal cues, such as symptoms of anxiety and memories of previous social interactions, and external cues such as observable signs of feedback from others in the social situation. Individuals with SAD then compare this mental image of the self to beliefs about the standards of performance expected by the audience, and perceive a discrepancy, with their performance viewed as not meeting those expectations. This leads to negative thoughts, emotions, and avoidance behaviors, which only serve to reinforce and maintain the negative self-image and the perceived social threat. In this model, a distorted negative self-image is considered to be the key maintenance factor of SAD (Heimberg et al., 2014). Imagery-enhanced CBT targets the individual's negative self-image, but robust empirical support for it has yet to accumulate.

Another model that is gaining recognition is the metacognitive model proposed by Wells and Matthews (1996). In this model, any psychological disorder including SAD is conceptualized as resulting from a thinking style called the cognitive attentional syndrome (CAS). The CAS consists of excessive thinking including worry/rumination, self-focused attention and maladaptive coping strategies which are the cause of SAD. Metacognitive therapy has been reported to be very effective for anxiety and depression (Normann et al., 2014).

Emotion-Focused Approach to Social Anxiety

Given the widespread research on maladaptive cognitive processing in the development of SAD (Craske et al., 2008; Heimberg et al., 2010) some theoretical models suggest the presence of underlying shame-based cognitive-affective structures that shape the negative self-referent cognitions and symptoms of SAD (Moscovitch, 2009).

SAD is conceptualized as traumatic shame-based memories that result in the internalizing of shame-based cognitive-affective schemes(Lazarus & Shahar, 2018; Matos et al., 2013). Shahar explains that in the emotion-focused therapy case formulation of SAD, the primary source of SAD is the experience of social degradation in early childhood or adolescence (Shahar, 2014). Social degradation is rooted in early attachment injuries such as bullying, criticism, rejection, neglect or any form of interpersonal trauma such as physical, emotional or sexual abuse by primary caregivers, siblings or peers. Social degradation experiences characterized by invalidation and lack of emotional support result in traumatic emotional pain (shame, humiliation, fear and/or sadness) and are stored as traumatic shame-based memories that are then incorporated into a maladaptive emotional scheme marked

by shame and inadequacy. This emotional scheme then results in the individual becoming hypervigilant and anxious about the potential exposure of his or her deficiencies in social situations, the symptomatology of SAD. More specifically, the early injuries of rejection, abuse, or neglect are internalized as an aspect of the self that serves as a harsh internal critic/coach which primes the individual to look out for dangers so as to protect him or her from harm (Elliott, 2013).

Literature review

A large body of research has demonstrated that parenting characteristics such as overprotection (Yaffe, 2021), harsh punitive control (Chubar et al., 2020), intrusive and manipulative control (Gómez-Ortiz et al., 2019), lower autonomy support (Nelemans et al., 2020), rejection (Smout et al., 2019) are also associated with social anxiety. Longitudinal studies have demonstrated that parenting behavior has an impact on the emotion regulation strategies that children with behavioral inhibition use, which in turn contributes to social anxiety outcomes (Suarez et al., 2021). That is, parental overprotection, psychological control and lack of support for autonomy can be postulated to lead to a decrease in opportunities for exploration and acquisition of new skills which in turn results in a reduction of social competence and an increase in anxiety about and avoidance of exposure to social situations.

Shahar et al. (Shahar et al., 2015) endorsed that shame and self-criticism mediate the relationship between childhood maltreatment and symptoms of social anxiety. More recently, shame and hostile criticism from parents were found to make individuals prone to paranoid ideation regarding others' behaviors (Carvalho et al., 2019). Self-criticism is posited to serve as a regulatory coping strategy when experiencing shame, thereby leading to SAD (Lazarus & Shahar, 2018).

Like shame, humiliation is also associated with SAD (Association, 2013). The internal experience of humiliation is a deep emotional pain associated with the perception of the self that has been unjustly ridiculed, degraded or disparaged (Lazare & Levy, 2011), so that the individual's identity has been undermined and deemed worthless (Hartling & Luchetta, 1999). Similar to shame, humiliation is another self-conscious emotion that involves the distortion of the whole self and carries long-term consequences (Hartling & Luchetta, 1999). Historically, it has been difficult to differentiate humiliation from shame, as both involve feeling inferior, a decrease in self-esteem, and withdrawal/avoidance behaviors (Elshout et al., 2017). However, unlike shame, humiliation focuses on the actual Humiliating event rather than just blaming the self, and the victim's appraisal of the humiliating act as unjust and thus partial blame is placed on the perpetrator (Elshout et al., 2017; Fernández et al., 2015).

One experience of humiliation in childhood is being a victim of bullying in which the individual is humiliated, ridiculed and physically abused by a peer. This kind of humiliation is known to be associated with SAD (Copeland et al., 2013; Gómez-Ortiz et al., 2018; Pörhölä et al., 2019). Although several studies have

implied the role of traumatic family experiences in SAD (Binelli et al., 2012; Bruijnen et al., 2019), the association of humiliation as an independent factor that occurs mostly in relationships with peers and early life experience that are not necessarily traumatic have not been explored. So also studies have suggested the role of traumatic experiences in the formation of social anxiety (Fitzgerald, 2021; Fitzgerald & Gallus, 2020; Shahar et al., 2015), but early life experiences that are not necessarily traumatic, such as discrediting emotions in childhood and the mechanism of action based on the emotion-focused treatment model, have not been studied.

These factors have been derived from the theoretical model of Shahar and Elliott in which they are hypothesized to impact social anxiety through the development of shame-ridden/defective-self schemes. Two hypotheses were examined in this study: i) levels of early life experience will significantly predict the levels of SAD through the mediation of shame-ridden/defective-self schemes; ii) levels of the experience of humiliation mediated by shame-ridden/defective-self schemes will significantly predict levels of SAD.

Method

Participants

This was a descriptive-cross sectional study. Data from the sample was obtained only at one point in time. The primary goal was to collect data on exposure (early life experiences) and outcomes (humiliation, shame and social anxiety) which would reveal patterns and possible associations among them. Participants with social anxiety were selected as they were relevant to the study question. There was no prospective follow-up.

The sample was selected from among all clients seeking therapeutic services at the Shahid Beheshti University Counseling Center between April 3rd 2019 and March 4th 2020 and had received a diagnosis of Social Anxiety Disorder based on a semi-structured clinical interview conducted by clinical psychologists. The Persian version of the Structured Clinical Interview for DSM-5® Disorders—Clinician Version (SCID-5-CV) was used. Each interview lasted 45 minutes. For each client, two interview sessions were conducted to receive the final diagnosis of social anxiety and to review the inclusion and exclusion criteria. In this study, four clinical psychologists were trained on the symptoms and accurate diagnosis of social anxiety based on diagnostic and statistical manual of mental disorders (DSM–5).

Following the interview, only those individuals who also scored above the cut-off score of 19 on the Social Phobia Inventory (SPIN) (Connor et al., 2000) and met the inclusion and exclusion criteria were retained in the study. The SPIN was administered for the purpose of having a quantitative measure of social phobia which was necessary for the examination of the study hypotheses. The inclusion criteria

were 1) being at least 18 years old, 2) being a college student, and 3) having a principal diagnosis of social anxiety disorder. The exclusion criteria were 1) having a medical condition, 2) having a history of mental illness other than social anxiety disorder, and 3) existence of current substance use.

To determine sample size, we used the *a priori* power analysis using G*Power (Faul et al., 2007). With the selection of the F test family for linear multiple regression and the recommended medium effect size (f^2 = 0.15) for multiple regression analyses (Cohen, 1992), three predictor variables, a target power of .80 and an alpha of .05, a minimum sample size of 77, and with a power of .95, a minimum sample size of 119 was recommended. Based on the results of the power analysis, we settled on having a minimum number of 100 participants for the present study. We began the study when we had 105 participants that met the inclusion criteria.

The study sample included 105 students, 44 males (41.9%), 61 females (58.1%) ranging in age from 18 to 34 with a mean age of 23.1 *(SD* = 3.5). There was no gender difference in social anxiety ($t_{(101)} = 0.037, p > .05$). In terms of educational status, 46 individuals (43.8%) were undergraduates, 48 (45.7%) were master's students and 11 (10.5%) were doctoral students. No significant differences in social anxiety were observed across these three groups ($F_{(2, 100)} = 0.425; p > .05$). The majority of the participants (94.3%) were single, never married, and 6 (5.7%) were married. The two groups did not differ in social anxiety ($t_{(101)} = 1.81; p > .05$). All participants provided written informed consent to participate in research. The demographic characteristics of the sample are presented in Table 1.

Measures

Social Phobia Inventory (SPIN)

The Social Phobia Inventory (SPIN) was developed by Connor et al. (2000) and was based on the Brief Social Phobia Scale. This 17-item scale measures social phobia using three subscales: fear, avoidance and physiological symptoms. Items are scored on a five-point Likert scale, ranging from zero ("not at all") to four ("extremely"). The fear subscale refers to fears of social events, of authority, of receiving criticism and includes items such as "being criticized scares me a lot" and "Being embarrassed or looking stupid are among my worst fears" (Connor et al., 2000). The avoidance subscale refers to one's avoidance of interpersonal interactions and conditions under which they may be forced to interact with others or be criticized by others ("I avoid talking to people I don't know"). The physiological subscale describes the different symptoms of physiological discomfort, such as sweating and blushing ("Trembling or shaking in front of others is distressing to me"). The SPIN has demonstrated adequate test-retest reliability, which varied from 0.78 to 0.89 (Connor et al., 2000). Cronbach's alpha was found to vary from 0.68 to 0.94, suggesting acceptable internal consistency (Connor et al., 2000). In this study, internal consistency with Cronbach's alpha was 0.82

Humiliation Inventory (HI)

The Humiliation Inventory (HI) measures humiliation along two subscales: fear of humiliation and cumulative (Hartling & Luchetta, 1999). This 32-item scale is divided into four sections, the first of which assesses how much participants believe themselves to have been affected by particular experiences ("Throughout your life how seriously have you felt harmed by being ridiculed?"). The second section measures how fearful participants are of being humiliated ("At this point in your life, how much do you fear being harassed?"). The next section attempts to measure participants' concerns over experiencing humiliation ("At this point in life, how concerned are you about being discounted as a person?"). The last section consists of only two items, which assesses participants worries ("How worried are you about being viewed by others as incompetent?"). All 32 items are measured on a five-point Likert scale, ranging from one ("Not at all") to five ("Extremely"). Cronbach's alpha for the fear of humiliation subscale and the cumulative humiliation subscale was found to be 0.96 and 0.94 respectively, suggesting high internal consistency (Hartling and Luchetta, 1999). The instrument was found to have good reliability as reflected by the coefficients of internal consistency: Cronbach's alpha for HI, CHS, and FHS were .96, .87, and .94, respectively.

Early Life Experiences Scale (ELES)

The Early Life Experiences Scale (ELES) is used to measure participants' emotional memories and personal feelings regarding early life experiences with significant, familial figures (Gilbert et al., 2003). Each item on this 15-item scale is scored along a five-point Likert scale, where one indicates that the item is "completely untrue" and five indicates that the item is "very true". The ELES consists of three subscales: threat, submissiveness, and unvalued. The first factor, threat, refers to how threatened participants felt as young children ("I felt on edge because I was unsure if my parents might get angry with me"). The second factor, submissiveness, assesses participants' inclinations towards feeling dominated by the significant figures in their childhood ("I often had to give in to others at home"). The items belonging to the last factor, unvalued, are reverse coded and measure participants' personal beliefs and feelings of being an equal member of their family ("I felt able to assert myself in my family"). The fear, submissiveness, and unvalued subscales demonstrate acceptable internal consistency with Cronbach's alpha values of 0.89, 0.85, and 0.71 respectively. In the current sample, Cronbach's alpha for each of the subscales was good (ELES: α=0.92, Unvalued: α=0.83, Submissiveness: α=0.80, Threatened: α=0.82).

Young Schema Questionnaire-Short Form (YSQ-SF)

The Young Schema Questionnaire-Short Form (YSQ-SF) provides a measure of early maladaptive schemas (Young & Brown, 1998). The 75 items on the YSQ-SF are scored using a six-point Likert scale, ranging from one ("Completely

untrue for me") to six ("Describes me perfectly"). Higher scores indicate the presence of more maladaptive schemas/core beliefs. There are 15 maladaptive schemas considered in this scale, which may be grouped under five broader domains: disconnection and rejection, impaired autonomy, impaired limits, other-directedness, and over vigilance and inhibition (Young, 1998). Internal consistency is acceptable and is typically greater than 0.80 for the 15 early maladaptive schemas/factors considered (Waller et al., 2001). In this study, only the subscale assessing defectiveness/shame schema (Questions 21, 22, 23, 24, 25) was used. The Persian version of this scale has been translated by Sadooghi and acceptable reliability and validity have been reported (Sadooghi et al., 2008). The internal consistency of the subscale in this study was found to be excellent (Cronbach's α= .93)

Results

Descriptive statistics and Pearson product-moment correlation coefficients of study variables are presented in Table 2. Specifically, early life experiences (r = .49, p < .001) and humiliation (r = .52, p < .001) were both positively associated with social anxiety. Early life experiences (r = .40, p < .001) and humiliation (r = .62, p < .001) were also found to correlate positively with shame schema. Thus, both early life experiences and humiliation appear to be risk factors for both shame schema and SAD. The positive association between shame schema and SAD (r = .68, p < .001) also suggests that shame schema may be a risk factor for SAD.

Table 1. Demographic Characteristics of the Sample and Relevant Descriptive Statistics of Study Variables

Variable	Frequency (% of Total)	SA		H		ELE		SS	
		M(SD)	*p*	*M(SD)*	*p*	*M(SD)*	*p*	*M(SD)*	*p*
Gender			.80		.59		.17		.78
Male	44 (41.9%)	44.5 (5.9)		65.3 (21.8)		43.8 (11.4)		13.8 (6.3)	
Female	61 (58.1%)	44.1 (7.09)		62.7 (23.9)		40.4 (11.7)		13.5 (6.6)	
Marital Status			.06		.31		.19		.13
Single	99 (94.3%)	44.8 (5.5)		63.2 (12.3)		41.5 (11.7)		13.7 (6.3)	
Married	6 (5.7%)	49.3 (6.5)		73.1 (10.6)		48.3 (12.4)		17.7 (6.4)	
Education			.74		.21		.97		.24
Bachelor's	46 (43.8%)	43.8 (6.4)		39.0 (13.2)		63.9 (22.8)		12.3 (5.2)	
Master's	48 (45.7%)	44.5 (6.9)		43.1 (12.1)		62.7 (25.2)		14.1 (6.8)	
Doctorate	11 (10.5%)	44.3 (5.4)		44.1 (10.3)		64.7 (16.2)		14.1 (6.1)	
Residence Status			.91		.89		.91		.43
Native to Tehran	41 (39%)	44.9 (6.3)		63.1 (21.2)		41.5 (12.2)		13.5 (7.6)	
Non-native	64 (61%)	44.5 (6.6)		64.2 (21.3)		41.7 (12.7)		14.7 (6.4)	

Note. SA = Social Anxiety; H = Humiliation; ELE = Early Life Experiences; SS = Shame Schema

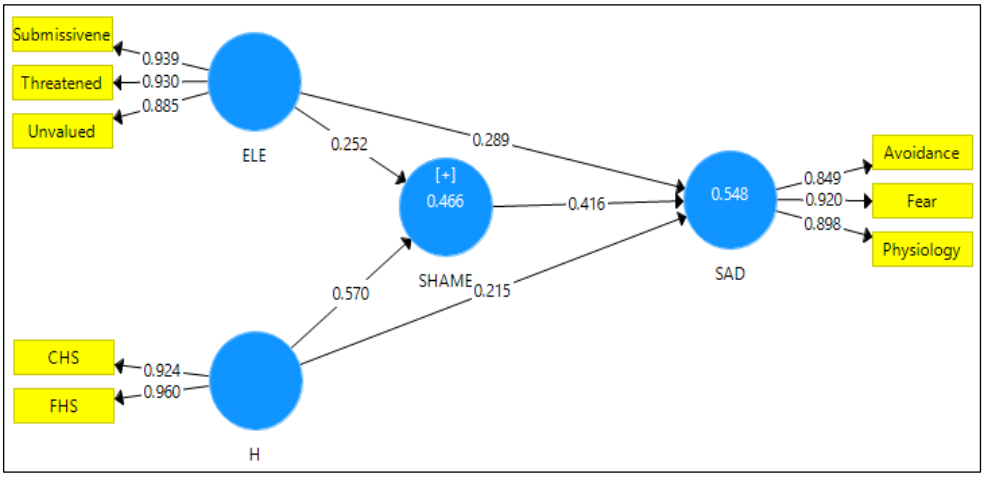
To examine the potential mediating role of shame schema in the association of both early life experience and humiliation with SAD in college students, SmartPLS-SEM v3.3.7 was used. With SmartPLS, direct and indirect effects in mediation models are estimated using the partial least squares path modeling method. The procedure utilizes bootstrapping and bias correction of the bootstrapping distribution. A benefit of SmartPLS is that it makes no distribution assumption, and can, therefore, account for possible non-normality and/or asymmetry of the indirect effect. The bootstrap method based on 5000 resamples of the data can produce 95% bias-corrected confidence intervals to test the significance of indirect effects. Compared with other methods, this method can provide a more accurate balance between power and Type 1 error and generate the most accurate confidence intervals for indirect effects (Hair et al., 2021).

The structural model reflects the paths hypothesized in the research framework. A structured model is assessed based on R^2, Q^2, and significance of paths. The goodness of the model is determined by the strength of each structural path determined by the R^2 value for the dependent variable (Briones Peñalver et al., 2018), the value for R^2 should be equal to or greater than 0.1 (Falk & Miller, 1992). The results in Table 3 show that all values are over 0.1. Therefore, the predictive capability is established. Furthermore, Q^2 establishes the predictive relevance of the endogenous constructs. If the value of Q^2 is greater than 0, it shows that the model has predictive relevance. The results show that there is significant prediction of the constructs (see Table 3). The model fit was assessed by SRMR which was found to be .08 Indicating acceptable model fit as an SRMR $\leq$ .09 indicates an acceptable level of model fit (Cho et al., 2020).

Table 2. Means, Standard Deviations and Correlations for the Study Variables along with Scale Reliabilities

Variables	Cronbach's α	M	SD	2	3	4
1. Social anxiety	.82	44.3	6.61	.68***	.52***	.49***
2. Shame Schema	.93	13.4	6.29		.62***	.40***
3. Humiliation	.96	63.1	21.3			.19
4. Early Events	.92	42.0	12.7			

As outlined in Fig. 1, in the current study, two indirect pathways arise, one reflecting the influence of early life experience and the other reflecting the effect of humiliation on social anxiety. Both these pathways include effects through shame schema. Bootstrapping (n = 5,000) was used to construct 95% bias-corrected, accelerated (BCa) confidence intervals (CIs) for each effect; significant mediation ($p < 0.05$) was established if CIs did not contain zero.



H1 = Early life experiences → Social Anxiety
H2 = Early life experiences → Shame → Social Anxiety
H3 = Humiliation → Shame → Social Anxiety

Figure 1. Three-Path Mediation Model

Mediation analysis was conducted to examine the possible mediating role of shame schema in the relationship between early life experience and social anxiety (see Fig. 1). According to results obtained, early life experiences were found to have significant positive associations with shame schema (β=.25, t =3.14, p < .001, 95% CI [.1, .4]). In addition, shame schema (β=.41, t = 4.57, p < .01, 95% CI [.25, .61]) was positively associated with social anxiety. The findings show significant indirect effects through shame schema (β=.10, t = 2.34, p < .001, 95% CI [.03, .20]) as well as significant direct effect of early life experience on social anxiety (β=.29, t = 3.1, p < .001, 95% CI [.10, .46]). Accordingly, it was seen that the entire model was statistically significant and explained about 55% of the variance (R^2 = 0.548, p < .001). The mediation effect is decided only by looking at the significance of the indirect effect, and Bootstrap bias correction is an effective way to reveal the mediating effect (Hair et al., 2021). Based on this method, the mediating role of shame schema in the relationship between early life experience and social anxiety was found to be significant.

Shame schema also mediated the association of humiliation with social anxiety. Specifically, humiliation positively predicted shame schema (β=.57, t =7.23, p < .001, 95% CI [.41, .71]). which in turn positively predicted social anxiety (β=.21, t =2.9, p < .001, 95% CI [.05, .34]). The findings show significant indirect effects through shame schema (β=.23, t =3.36, p < .001, 95% CI [.12, .39]). Therefore, the hypotheses of this study were supported.

Estimates of the effect and 95% BCa CIs from all pathways are reported in Table 3.

Table 3. Path Coefficients and Indirect Effects for Mediation Model

	Path Coefficients		Indirect Effects Bias Corrected	
	To SA $R^2 = .548$ $Q^2 = .418$	**To SS $R^2 = .455$ $Q^2 = .377$**	**Estimate**	**Bootstrap 95% Confidence Interval**
Effects from EE to SA				
EE	.29 (.002)	.25 (.001)		
SS	.41 (.001)			
Total	.39 (.001)			
Effects from H to SA				
H	.21 (.004)	.57 (.001)		
SS	.41 (.001)			
Total	.45 (.001)			
EE → SS → SA			.10 (.01)	.03, .21
H → SS → SA			.23 (.001)	.12, .39

Note. EE = Early Events; H = Humiliation; SS = Shame Schema; SA= Social Anxiety

Discussion

In this study, based on the psychopathological model of emotion-focused approach to SAD, the effect of early life experiences and humiliation mediated by the shame-based cognitive-affective schema on social anxiety was investigated. The first hypothesis was to investigate the role of the defectiveness/shame schema in the relationship between early life experiences and social anxiety in students with SAD. The results showed that early life experiences had a positive and significant correlation with social anxiety. This finding is consistent with the results of Cunha et al**.** (Cunha et al., 2015), and Binelli et al (Binelli et al., 2012) who showed that early negative life experiences significantly predict social anxiety**.** These findings were also consistent with previous research that early life experiences lead to the formation of the defectiveness/shame schema (Sedighimornani et al., 2020) and the defectiveness/shame schema significantly predicts social anxiety (Lee et al., 2014).

These findings imply that early life experiences mediated by shame/defect significantly predict social anxiety are in line with those of Lazarus and Shazar (Lazarus & Shahar, 2018), Shahar et al. (Shahar et al., 2015), Elliott and Ben Shahar (2017), who suggested, consistent with the emotion-focused model, that childhood abuse and maltreatment experiences contribute to the development of social anxiety by creating shame-based cognitive-affective schema (Elliott & Shahar, 2017). The emotion of shame causes people with social anxiety to have a feeling of inferiority

and imperfection and constantly worry that their flaws will be seen and ridiculed by others (Moscovitch, 2009).

The emotion-focused approach in the psychopathology of social anxiety emphasizes two types of childhood experiences in the family: actual maltreatment in the form of physical, sexual, and emotional abuse or neglect that occurred during the childhood of a person with social anxiety and other experiences not necessarily abusive but involving social degradation experiences characterized by invalidation and lack of emotional support (Elliott & Shahar, 2017). This study, unlike previous research hereof, focused on the second category of early childhood experiences in people with social anxiety. As Gilbert's psycho-evolutionary perspective (Gilbert, 2000; Gilbert & Trower, 2001) explains, feelings of shame, inferiority and deficiency experienced in childhood come to be internalized as autobiographical schemas that lead the individual with social anxiety to perceive the social world in terms of hierarchies, and the self as ranking low and being inferior to others with the likelihood of losing social status and being socially excluded. That is, in social situations, individuals who have experienced shame and invalidation in childhood recall autobiographical shame memories which then activate a shame-based cognitive-affective schema. This schema is composed of components such as experiencing the self as inferior and deficient and others as superior, dominant, critical and rejecting. The evolutionary function of these components is to induce the individual to engage in submissive, appeasing behaviors which signal to others that the individual is not a threat and elicit empathy rather than rejection. Shame is thus a self-conscious emotion that regulates social rank and the preoccupation with social rank is associated with social anxiety (Shahar et al., 2015).

In examining the second hypothesis of the study, the results showed that the experiences of humiliation mediated by the defectiveness/shame schema are significant predictors of social anxiety. The experience of humiliation examined in this study were mostly related to interactions with peers, including experiences such as being a victim of bullying. Based on the emotion-focused psychopathology model, it is one of the sources of SAD (Elliott & Shahar, 2017). These results support prior research that reported a greater likelihood of peer victimization among students with SAD compared to those without (Pontillo et al., 2019). Adolescents experience changes and increases in social anxiety levels as they struggle to understand puberal development while transitioning to larger schools, and encountering difficulties managing changes in peer groups (Gómez-Ortiz et al., 2018). Those experiencing high levels of social anxiety are likely to engage in dysfunctional emotion regulation strategies and, attempting to control their emotional responses to situations before the emotion is fully developed, and, therefore, failing to mitigate the actual physiological reactions or the subjective, emotional affect (Gómez-Ortiz et al., 2018).

The interpersonal humiliating event in which the victim is placed in an inferior, degraded position by someone who is in a superior, powerful position compared to the victim (Hartling & Luchetta, 1999) is similar to the aforementioned definition of bullying provided by Olweus (1993; cited in Gredler, 2003). Also, like

bullying, humiliating situations include three roles; the victim, the perpetrator, and the witness, although the witness may be imagined and internally constructed by the victim, or the perpetrator alone may serve as the witness to the victim's exposed, violated self (Dorahy, 2019). Although victims Internalize the devaluation of the self and perceive that they were unfairly devalued during the humiliating incident and may seek revenge, oftentimes they do not carry out such intentions, initiating a "quiet rage" or an inertia effect (Fernández et al., 2015). It also may appear paradoxical that humiliation is associated with both withdrawal behaviors (e.g. wanting to leave, avoiding eye contact) and seeking revenge, however avoidance behaviors are more prototypical of humiliation (Elshout et al., 2017).

Humiliating experiences such as childhood/adolescent peer victimization can arouse shame when the humiliating or bullying events are perceived as attacks on the victim's social self, resulting in a decrease in social status, social attractiveness, and possible exclusion from social groups (Strom et al., 2018). Childhood/adolescent bullying typically occurs within view of other peers, and the resulting loss of social status incurred during an age in which peer acceptance or rejection greatly contributes to the victim's social identity may stimulate feelings of shame (Strøm et al., 2018).

From the emotion-focused formulation of social anxiety, early childhood experiences of being bullied, criticized, rejected, or neglected elicit strong feelings of shame and humiliation which are encoded as memories and internalized into an overall maladaptive shame-based emotion scheme, characterized by a sense of inferiority, rendering the individual hypervigilant that core deficiencies might be exposed to others (Moscovitch, 2009). Therefore, in this model, social anxiety is a secondary emotion just symptomatic of the basic sense of worthlessness (Elliott & Shahar, 2017).

Research Limitations

One of the limitations of this study is that was since a descriptive cross-sectional design with self-report questionnaires were used, the development and causal trend cannot be inferred from its results. Another important limitation of this study is the difference in the meaning of constructs in emotion-focused therapy theory with what is quantitatively measured on a scale. This means that each construct in the emotion-focused psychopathology model is based on an individual's phenomenal world and is part of each individual's lived experiences (including memories and symptoms of the disorder). Despite these limitations the study has certain strengths. Firstly, this study looked into childhood experiences which were not necessarily traumatic, such as disparaging experiences and secondly, data were collected from patients with a diagnosis of social anxiety, not from a non-clinical community.

Conclusions

The results of the study confirm that early childhood experiences and shame play an important role in the psychopathology of social anxiety. Previous research has examined the relationship between childhood abuse and social anxiety, but this study revealed the role played by individual memories of disparaging experiences in childhood in social anxiety. Attention to the traumatic history and addressing the unresolved childhood emotions and underlying shame can lead to better treatment outcomes for social anxiety. Future studies may investigate the emotion-focused model in larger samples and in different subtypes of social anxiety. Furthermore, the components mentioned in this model may be studied as a target variable or a change process in randomized clinical trial studies for social anxiety,

Conflict of interest

The authors have no conflict of interest to disclose.

References

Acquah, E. O., Topalli, P.-Z., Wilson, M. L., Junttila, N., & Niemi, P. M. (2016). Adolescent loneliness and social anxiety as predictors of bullying victimisation. *International Journal of Adolescence and Youth, 21*(3), 320-331.

Alsamghan, A. S. (2021). Social Anxiety Symptoms and Quality of Life of Secondary School Students of Abha, Saudi Arabia. *The Journal of Genetic Psychology, 182*(1), 18-30.

Archbell, K. A., & Coplan, R. J. (2021). Too Anxious to Talk: Social Anxiety, Academic Communication, and Students' Experiences in Higher Education. *Journal of emotional and behavioral disorders*, 106342662110600. https://doi.org/10.1177/10634266211060079.

Association, A. P. (2013). *Diagnostic and statistical manual of mental disorders (DSM-5®)*. American Psychiatric Pub.

Binelli, C., Ortiz, A., Muñiz, A., Gelabert, E., Ferraz, L., S Filho, A., Crippa, J. A. S., Nardi, A. E., Subirà, S., & Martín-Santos, R. (2012). Social anxiety and negative early life events in university students. *Brazilian Journal of Psychiatry, 34*, 69-74.

Briones Peñalver, A. J., Bernal Conesa, J. A., & Nieves Nieto, C. (2018). Analysis of Corporate Social Responsibility in Spanish Agribusiness and Its Influence on Innovation and Performance. *Corporate social-responsibility and environmental management, 25*(2), 182-193. https://doi.org/10.1002/csr.1448.

Bruijnen, C. J., Young, S. Y., Marx, M., & Seedat, S. (2019). Social anxiety disorder and childhood trauma in the context of anxiety (behavioural inhibition), impulsivity (behavioural activation) and quality of life. *South African Journal of Psychiatry, 25*(1).

Carvalho, C. B., Sousa, M., da Motta, C., & Cabral, J. M. (2019). The Role of Shame, Self-criticism and Early Emotional Memories in Adolescents' Paranoid Ideation. *Journal of Child and Family Studies, 28*(5), 1337-1345.

Cho, G., Hwang, H., Sarstedt, M., & Ringle, C. M. (2020, 2020/12/01). Cutoff criteria for overall model fit indexes in generalized structured component analysis. *Journal of Marketing Analytics, 8*(4), 189-202. https://doi.org/10.1057/s41270-020-00089-1.

Chubar, V., Van Leeuwen, K., Bijttebier, P., Van Assche, E., Bosmans, G., Van den Noortgate, W., van Winkel, R., Goossens, L., & Claes, S. (2020). Gene-environment interaction: New insights into perceived parenting and social anxiety among adolescents. *European psychiatry, 63*(1), e64. https://doi.org/10.1192/j.eurpsy.2020.62.

Clark, D. M., & Wells, A. (1995). *A cognitive model of social phobia* (R. G. Heimberg, M. R. Liebowitz, D. A. Hope, & F. R. Schneier, Eds.). The Guilford Press.

Connor, K. M., Davidson, J. R., Churchill, L. E., Sherwood, A., Weisler, R. H., & Foa, E. (2000). Psychometric properties of the Social Phobia Inventory (SPIN): New self-rating scale. *The British Journal of Psychiatry, 176*(4), 379-386.

Copeland, W. E., Wolke, D., Angold, A., & Costello, E. J. (2013). Adult psychiatric outcomes of bullying and being bullied by peers in childhood and adolescence. *JAMA psychiatry, 70*(4), 419-426.

Craske, M. G., Kircanski, K., Zelikowsky, M., Mystkowski, J., Chowdhury, N., & Baker, A. (2008). Optimizing inhibitory learning during exposure therapy. *Behaviour research and therapy, 46*(1), 5-27.

Cunha, M., Pereira, C., Galhardo, A., Couto, M., & Massano-Cardoso, I. (2015). Social anxiety in adolescents: The role of early negative memories and fear of compassion. *European Psychiatry, 30*(S1), 1-1.

Daros, A. R., Daniel, K. E., Meyer, M. J., Chow, P. I., Barnes, L. E., & Teachman, B. A. (2019). Impact of social anxiety and social context on college students' emotion regulation strategy use: An experience sampling study. *Motivation and emotion, 43*(5), 844-855. https://doi.org/10.1007/s11031-019-09773-x.

Dorahy, M. J. (2019). Shame as a compromise for humiliation and rage in the internal representation of abuse by loved ones: Processes, motivations, and the role of dissociation. In *The Abused and the Abuser* (pp. 141-154). Routledge.

Edition, F. (2013). Diagnostic and statistical manual of mental disorders. *Am Psychiatric Assoc, 21*.

Elliott, R. (2013, 2013/03/01). Person-centered/experiential psychotherapy for anxiety difficulties: Theory, research and practice. *Person-Centered & Experiential Psychotherapies, 12*(1), 16-32. https://doi.org/10.1080/14779757.2013.767750.

Elliott, R., & Shahar, B. (2017). Emotion-focused therapy for social anxiety (EFT-SA). *Person-Centered & Experiential Psychotherapies, 16*(2), 140-158.

Elshout, M., Nelissen, R. M., & van Beest, I. (2017). Conceptualising humiliation. *Cognition and Emotion, 31*(8), 1581-1594.

Falk, R. F., & Miller, N. B. (1992). *A primer for soft modeling*. University of Akson Press.

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). GPower 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior research methods, 39*(2), 175-191. https://doi.org/10.3758/BF03193146.

Fernández, S., Saguy, T., & Halperin, E. (2015). The paradox of humiliation: The acceptance of an unjust devaluation of the self. *Personality and Social Psychology Bulletin, 41*(7), 976-988.

Fitzgerald, M. (2021). A Drive for Redemption: Relationship Quality as a Mediator Linking Childhood Maltreatment to Symptoms of Social Anxiety and Depression. *Journal of Adult Development*, 1-11.

Fitzgerald, M., & Gallus, K. (2020). Emotional support as a mechanism linking childhood maltreatment and adult's depressive and social anxiety symptoms. *Child Abuse & Neglect, 108*, 104645.

Gilbert, P. (2000). The relationship of shame, social anxiety and depression: The role of the evaluation of social rank. *Clinical Psychology & Psychotherapy: An International Journal of Theory & Practice, 7*(3), 174-189.

Gilbert, P., Cheung, M. S. P., Grandfield, T., Campey, F., & Irons, C. (2003). Recall of threat and submissiveness in childhood: Development of a new scale and its relationship with depression, social comparison and shame. *Clinical Psychology & Psychotherapy: An International Journal of Theory & Practice, 10*(2), 108-115.

Gilbert, P., & Trower, P. (2001). Evolution and process in social anxiety.

Gómez-Ortiz, O., Roldán, R., Ortega-Ruiz, R., & García-López, L.-J. (2018). Social anxiety and psychosocial adjustment in adolescents: Relation with peer victimization, self-esteem and emotion regulation. *Child indicators research, 11*(6), 1719-1736.

Gómez-Ortiz, O., Romera, E. M., Jiménez-Castillejo, R., Ortega-Ruiz, R., & García-López, L. J. (2019). Parenting practices and adolescent social anxiety: A direct or indirect relationship? *International journal of clinical and health psychology, 19*(2), 124-133. https://doi.org/10.1016/j.ijchp.2019.04.001.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2021). *A primeron partial least squares structural equation modeling (PLS-SEM)*. Sage Publications.

Hartling, L. M., & Luchetta, T. (1999). Humiliation: Assessing the impact of derision, degradation, and debasement. *Journal of Primary Prevention, 19*(4), 259-278.

Heimberg, R. G., Brozovich, F. A., & Rapee, R. M. (2010). A cognitive behavioral model of social anxiety disorder: Update and extension. In *Social anxiety* (pp. 395-422). Elsevier.

Heimberg, R. G., Brozovich, F. A., & Rapee, R. M. (2014). A cognitive-behavioral model of social anxiety disorder. In S. G. Hofmann & P. M. DiBartolo (Eds.), *Social anxiety: Clinical, developmental, and social perspectives* (3 ed., pp. 705-728). Academic Press.

Jefferies, P., & Ungar, M. (2020). Social anxiety in young people: A prevalence study in seven countries. *PLoS One, 15*(9), e0239133.

Kessler, R. C., Petukhova, M., Sampson, N. A., Zaslavsky, A. M., & Wittchen, H. U. (2012). Twelve-month and lifetime prevalence and lifetime morbid risk of anxiety and mood disorders in the United States. *International journal of methods in psychiatric research, 21*(3), 169-184.

Lazare, A., & Levy, R. S. (2011). Apologizing for humiliations in medical practice. *Chest, 139*(4), 746-751.

Lazarus, G., & Shahar, B. (2018). The role of shame and self-criticism in social anxiety: a daily-diary study in a nonclinical sample. *Journal of Social and Clinical Psychology, 37*(2), 107-127.

Lee, J., Kim, M., & Park, M. (2014). The Impact of Internalized Shame on Social Anxiety in Adolescence: The Mediating Role of Experiential Avoidance. *Journal of Asia Pacific Counseling, 4*(1).

Matos, M., Pinto-Gouveia, J., & Gilbert, P. (2013). The effect of shame and shame memories on paranoid ideation and social anxiety. *Clinical Psychology & Psychotherapy, 20*(4), 334-349.

Mayo-Wilson, E., Dias, S., Mavranezouli, I., Kew, K., Clark, D. M., Ades, A. E., & Pilling, S. (2014, Oct). Psychological and pharmacological interventions for social anxiety disorder in adults: a systematic review and network meta-analysis. *Lancet Psychiatry, 1*(5), 368-376. https://doi.org/10.1016/s2215-0366(14)70329-3.

Moscovitch, D. A. (2009). What is the core fear in social phobia? A new model to facilitate individualized case conceptualization and treatment. *Cognitive and Behavioral Practice, 16*(2), 123-134.

Nelemans, S. A., Keijsers, L., Colpin, H., Van Leeuwen, K., Bijttebier, P., Verschueren, K., & Goossens, L. (2020). Transactional links between social anxiety symptoms and parenting across adolescence: Between- and within-person associations. *Child development, 91*(3), 814-828. https://doi.org/10.1111/cdev.13236.

Nordahl, H., & Wells, A. (2020). Social anxiety and work status: the role of negative metacognitive beliefs, symptom severity and cognitive-behavioural factors. *Journal of mental health (Abingdon, England), 29*(6), 665-669. https://doi.org/10.1080/09638237.2017.1340622.

Normann, N., van Emmerik, A. A. P., & Morina, N. (2014). The efficacy of metacognitive therapy for anxiety and depression: a meta-analytic review. *Depression and anxiety, 31*(5), 402-411. https://doi.org/10.1002/da.22273.

Pontillo, M., Tata, M. C., Averna, R., Demaria, F., Gargiullo, P., Guerrera, S., Pucciarini, M. L., Santonastaso, O., & Vicari, S. (2019). Peer victimization and onset of social anxiety disorder in children and adolescents. *Brain sciences, 9*(6), 132.

Pörhölä, M., Almonkari, M., & Kunttu, K. (2019). Bullying and social anxiety experiences in university learning situations. *Social Psychology of Education, 22*(3), 723-742.

Rapee, R. M., & Heimberg, R. G. (1997). A cognitive-behavioral model of anxiety in social phobia. *Behaviour research and therapy, 35*(8), 741-756. https://doi.org/10.1016/S0005-7967(97)00022-3.

Sadooghi, Z., Aguilar-Vafaie, M. E., Rasoulzadeh Tabatabaie, K., & Esfehanian, N. (2008). Factor Analysis of the Young Schema Questionnaire-Short Form in a Nonclinical Iranian Sample. *Iranian Journal of Psychiatry and Clinical Psychology, 14*(2), 214-219.

Sedighimornani, N., Rimes, K., & Verplanken, B. (2020). Factors contributing to the experience of shame and shame management: Adverse childhood experiences, peer acceptance, and attachment styles. *The Journal of Social Psychology*, 1-17.

Shahar, B. (2014). Emotion-focused therapy for the treatment of social anxiety: An overview of the model and a case description. *Clinical Psychology & Psychotherapy, 21*(6), 536-547.

Shahar, B., Doron, G., & Szepsenwol, O. (2015). Childhood maltreatment, shame-proneness and self-criticism in social anxiety disorder: A sequential mediational model. *Clinical Psychology & Psychotherapy, 22*(6), 570-579.

Smout, A., Lazarus, R. S., & Hudson, J. L. (2019). The Relationship Between Parenting and Anxiety in Emerging Adulthood. *Cognitive therapy and research, 44*(1), 182-195. https://doi.org/10.1007/s10608-019-10037-8.

Spence, S. H., Zubrick, S. R., & Lawrence, D. (2018). A profile of social, separation and generalized anxiety disorders in an Australian nationally representative sample of children and adolescents: Prevalence, comorbidity and correlates. *Australian & New Zealand Journal of Psychiatry, 52*(5), 446-460.

Strøm, I. F., Aakvaag, H. F., Birkeland, M. S., Felix, E., & Thoresen, S. (2018). The mediating role of shame in the relationship between childhood bullying victimization and adult psychosocial adjustment. *European journal of psychotraumatology, 9*(1), 1418570.

Suarez, G. L., Morales, S., Miller, N. V., Penela, E. C., Chronis-Tuscano, A., Henderson, H. A., & Fox, N. A. (2021). Examining a developmental pathway from early behavioral inhibition to emotion regulation and social anxiety: The moderating role of parenting. *Developmental psychology, 57*(8), 1261-1273. https://doi.org/10.1037/dev0001225.

Waller, G., Meyer, C., & Ohanian, V. (2001). Psychometric properties of the long and short versions of the Young Schema Questionnaire: Core beliefs among bulimic and comparison women. *Cognitive therapy and research, 25*(2), 137-147.

Walukevich-Dienst, K., Lewis, E. M., & Buckner, J. D. (2020). Cannabis-Related Impairment and Social Anxiety: The Role of Use to Manage Negative and Positive Affect in Social Situations. *Substance use & misuse, 55*(2), 271-280. https://doi.org/10.1080/10826084.2019.1664590.

Weidman, A. C., & Levinson, C. A. (2015). I'm still socially anxious online: Offline relationship impairment characterizing social anxiety manifests and is accurately

perceived in online social networking profiles. *Computers in human behavior, 49*, 12-19. https://doi.org/10.1016/j.chb.2014.12.045.

Wells, A., & Matthews, G. (1996). Modelling cognition in emotional disorder: The S-REF model. *Behaviour research and therapy, 34*(11), 881-888. https://doi.org/10.1016/S0005-7967(96)00050-2.

Yaffe, Y. (2021, 2021/04/01/). Students' recollections of parenting styles and impostor phenomenon: The mediating role of social anxiety. *Personality and Individual Differences, 172*, 110598. https://doi.org/https://doi.org/10.1016/j.paid.2020.110598.

Young, J. E., & Brown, G. (1998). Young schema questionnaire short form. *New York: Cognitive Therapy Centre*.

Weidman, A. C., & Levinson, C. A. (2015). I'm still socially anxious online: Offline relationship impairment characterizing social anxiety manifests and is accurately perceived in online social networking profiles. *Computers in Human Behavior*, *49*, 12–19. https://doi.org/10.1016/j.chb.2014.12.045.

Wong, Q. J., Gregory, B., McLellan, L. F., Kangas, M., Abbott, M. J., Carpenter, L., McEvoy, P. M., Peters, L., & Rapee, R. M. (2017). Anticipatory Processing, Maladaptive Attentional Focus, and Postevent Processing for Interactional and Performance Situations: Treatment Response and Relationships With Symptom Change for Individuals With Social Anxiety Disorder. *Behavior Therapy*, *48*(5), 651–663. https://doi.org/10.1016/j.beth.2017.03.004.

Journal of Evidence-Based Psychotherapies,
Vol. 22, No. 1, March 2022, 137-168.

10.24193/jebp.2022.1.8

A MOTOR IMAGERY TRAINING FOR IMPROVING ACTION COGNITION RESULTS IN THE REDUCTION OF RESIDUAL SYMPTOMS AFTER MAJOR DEPRESSIVE DISORDER: A SINGLE-CASE STUDY

Alexandru I. Tiba[1], Laura Voss[2]*

[1] Department of Psychology, University of Oradea, Romania and to Private Practice in Clinical Psychology and Cognitive Behavior Therapy, Oradea, Romania. Address: 4 Calea Clujului Street, 410053, Oradea, Bihor, Romania

[2] The Hull York Medical School, University of York. Address: Heslington York YO10 5DD, UK

Abstract

The high rate of recurrence and residual symptoms of depression continuously motivate the search for new treatments addressing this challenging condition. In this single-case study, we reported the application of a cognitive rehabilitation skills training based on remote kinematics as a treatment for residual depression by targeting deficits of mental simulations of action. We found that the administration of Kinect-based rehabilitation training resulted in important improvements showed by significant mean baseline reductions (MBLR) of difficulty in imagining positive actions (MBLR= 54 %), negative emotions (MBLR = 36.3 %), cognitive flexibility (MBLR= 69.7 %), depressive symptoms (MBLR= 80%), and physical retardation (MBLR= 50 %). Similarly, improvements in positive affect (MBLR = 107 %) and vividness of motor imagery for positive actions were registered (MBLR= 100 %). We also found unique effects of our intervention such as reports of involuntary action simulations to distant stimuli or extended affordances. The training was well-accepted and the patient considered it was an entertaining way to do physical exercises and to get in physical and mental shape. We concluded that further scientific research of remote Kinematic interventions in depression may be warranted.

Keywords: embodied cognition; action simulation; Kinect; depression; rehabilitation.

[*] Correspondence concerning this article should be addressed to Alexandru I. Tiba, Department of Psychology, University of Oradea, Romania and to Private Practice in Clinical Psychology and Cognitive Behavior Therapy, Oradea, Romania. Address: 4 Calea Clujului Street, 410053, Oradea, Bihor, Romania.
Phone number: 0040754598233; Fax number: 0040359730106
E-mail: alexandrutiba@gmail.com

Theoretical and Research Basis for Treatment

Major depressive disorder (MDD) is one of the leading causes of disability worldwide with high recurrence rates and a chronic course (World Health Organisation; WHO, 2017). Although treatments for acute episodes of major depression are moderately effective in short-term (Undurraga & Baldessarini, 2012), the high rates of relapse (up to 75%, Hollon et al., 2005), recurrence and residual symptoms have always been a challenge for the treatment of depression. It was estimated that after treatment, 30–50 % of recovered patients are still troubled by residual symptoms (Hollon et al., 2005). Moreover, residual symptoms result in impaired functioning and increased relapse of depression (Beshai et al., 2011; Simet al., 2016). Currently, the National Institute for Health and Care Excellence (NICE) guidelines recommendation for people with residual depression is to continue either with antidepressant treatment or with psychological therapy focused on residual symptoms that act as maintenance factors (avoidance, rumination and interpersonal difficulties, NICE, 2019).

One way to improve the efficacy of psychological treatment for residual depression is to adapt the treatment to specifically address core residual symptoms (Hvenegaard et al., 2015). Previously, addressing rumination as a residual symptom has been shown as a promising strategy for treatment of residual symptoms (e.g., Watkins et al., 2007, 2011). Yet, rumination was not the only residual symptom of depression. Recent reports suggested treating other types of residuals, such as cognitive deficits associated with psychomotor retardation, as a viable target for developing future treatments for residual depression (Bortolato et al., 2016). One such cognitive deficit linked to psychomotor retardation was alteration of motor imagery (Bennabi et al., 2014). Motor imagery has been defined as mental simulations of action or mental rehearsal of actions/movements without executing the movements involved (Decety, 1996; Jeannerod, 2001). Action simulations have been proposed as key cognitive markers involved both in higher thinking (self-efficacy, Bandura, 1997) and control of conscious actions (Land et al., 2013) which are affected in depressive disorder. Thus, targeting deficits of action simulations may improve several thought processes and action related manifestations as well, making the motor imagery deficits appealing for the treatment of residual depression.

Building on the existing classifications of general mental imagery in clinical disorders (Holmes et al., 2016; Pearson et al., 2013, several processes and types of motor imagery were distinguished. Based on a computational model of mental imagery, Kosslyn et al. (2006) proposed (1) generation, (2) maintenance, (3) inspection, and (4) transformation processes of action simulations (Pearson et al., 2013). According to the mechanism of generation of action simulations can be (1) voluntary (mental action transformation, such as mental rotation tasks) and (2) involuntary action simulations (automatic mental rehearsal). Furthermore, according to whether the individuals have access to the content of simulations, action

simulations were identified as conscious (e.g., mental rehearsal or transformation) or as implicit (e.g., action identification, hand laterality judgments). Specifically, motor imagery was classified as (1) visuomotor imagery (imagining doing an action from the first perspective) and (2) kinesthetic imagery (imagining the feelings of movement during the action).

Previous research has suggested that depressed individuals are slower than non-depressed individuals in the mental generation (Bennabi et al., 2014) and transformation of actions (Chen et al., 2013). They imagine actions less vividly (Holmes et al., 2016), more general (Dickson & Moberly, 2013) and using an external perspective (Lemogne et al., 2006) than non-depressed individuals. This research highlighted a deficit of motor imagery in depressed individuals. Moreover, motor imagery deficits and, more generally, psychomotor retardation were proposed to play an important role in (residual) depression because they: (a) represent a common residual symptom and they remain significant after remission from depression (Bennabi et al., 2014; Bortolato et al., 2016; Gorwood et al., 2014); (b) are associated with reduced responsiveness to both common antidepressant (SSRIs) and cognitive-behavioural interventions (Dunkin et al., 2000); (c) prospectively predict the severity and the recurrence of depression (e.g., Bennabi et al., 2014; Chen et al., 2013; Hasselbalchet al., 2010; Wagner et al., 2015), and d) are proposed to underlie the gender differences in depression (Oshiyama et al., 2018).

We hypothesized that motor imagery deficits are potential targets for treatment because manipulation of different types of motor imagery such as action simulations in thinking of depressed individuals (1) resulted in improvements in emotional reactivity (Watkins, Moberly, & Moulds, 2008) and problem-solving (Watkins & Baracaia, 2002; Watkins & Moulds, 2005), (2) mediated the effect of well recognized cognitive mechanisms on depression manifestations (rumination, Moberly & Watkins, 2006), (3) moderated the effects of mindfulness cognitive-behavioural treatments (Kuyken & Moulds, 2009), and (4) promoted behavioural activation (Renner et al., 2017). Previously, it has been suggested that improving motor imagery deficits have potential therapeutic benefits for the treatment of depression. However, to our knowledge, there were no studies that investigated interventions targeting the rehabilitation of motor imagery in depression.

In this case study we investigated the effects of rehabilitation of motor imagery in the thinking of a patient with a previous history of MDD. We reported the application of a cognitive rehabilitation intervention based on remote kinematics (Kinect) as a treatment for residual depression by targeting an intermediate cognitive endophenotype: deficits of motor imagery (mental simulations of action). We expected that following motor rehabilitation training, the patient will experience improvement in cognitive processes affected by psychomotor retardation such as action simulations (frequency and easiness), subjective reports of kinaesthetic sensation and speed at psychomotor tasks. We also expected that the patient will show improvement in higher action cognition such as hopelessness.

Mental Simulation of Action in Depression

Deficits of motivation and action are core features of MDD. Increasing evidence across multiple research paradigms on motor imagery showed that depressed individuals are also characterized by deficient representational dimensions of action systems. For instance, deficits of motor simulation of action in thinking of depressed people have been evidenced in both explicit (i.e., motor imagery, Bennabi et al., 2014; Chen et al., 2013; Rogers et al., 2002) and implicit (i.e., action identification, Watkins et al., 2011; external visual orientation, Lemogne et al., 2006; Kuyken & Howell, 2006; overgeneralisation of goal representations, Dickson & Moberly, 2013) cognitive tasks across multiple research perspectives such as motor imagery, action identification, visual orientation, and goal representations. Furthermore, emerging research indicated that these deficits play the role of maintenance mechanism; they moderated treatment effects and improved with antidepressant treatment. Thus, the deficits in motor imagery were promising targets for treatment of depression. Of importance, studies showed that (1) deficits in thinking-related action simulations in depressed people moderated the effect of well recognized cognitive mechanisms on depression manifestations (rumination, Moberly & Watkins, 2006), predicted depression recurrence (Chen et al., 2013), and moderated the effects of mindfulness cognitive-behavioural treatments (Kuyken & Moulds, 2009), and (2) promoting simulations of action in thinking of depressed individuals resulted in improvements in both emotional reactivity (Moberly & Watkins, 2006; Watkins et al., 2008) and problem-solving (Watkins & Baracaia, 2002; Watkins & Moulds, 2005).

There was a growing interest in depression research for evidencing alterations of explicit mental simulations (mental imagery) and imagery-based treatment strategies in depression (Holmes et al., 2016; Renner et al., 2017). Yet, the main focus was on positive and negative explicit visual imagery rather than whether rehabilitation and promotion of motor simulations in thinking would be effective in depressed individuals with motor imagery deficits or recurrent depression. This paper presented a motor imagery rehabilitation training programme developed to enhance and promote motor simulations in thinking aimed to reduce residual motor imagery deficits in a formerly depressed patient.

Embodied Distorted Cognition: Integrating Motor Simulations in Distorted Cognition

We based our intervention on an embodied model of distorted cognition (Tiba, 2010, 2018; Tiba et al., 2012; Tiba & Manea, 2018) applied for deficits in action cognition. According to the embodied model of distorted cognition (in certain contexts) cognition has the ability to re-use the experience-related systems (affective and motor brain resources) referenced by cognition. Furthermore, it is proposed that this ability is responsible for the emotional and behavioural effects of cognition. When these experience-related systems are altered, the alterations are incorporated

into cognition that carries them into our mental states and maintains them in higher cognitive processing or in the top-down determination of behaviour. This model explains the application of cognitive rehabilitative methods beyond the basic cognitive processes into action cognition and thinking. According to the application of the model to action cognition, the quality (and the effect on emotion and behaviour) of higher motor cognition are largely dependent on the quality of sensorimotor resources that were simulated in thinking (Glenberg, 2010). Thus, higher motor cognition such as planning, imagery, action, linguistic sentences, and perceived ability to carry out actions can be rooted in sensorimotor resources. Since depressed individuals are deficient in the use of sensorimotor resources, these deficiencies result in deficits in higher action cognition (thinking about action, self-efficacy, and thoughts with reduced ability to influence action etc.) and negative cognitive adaptations (i.e*.,* hopelessness). Furthermore, this model hypothesized that there are several control mechanisms of sensorimotor simulations (e.g., language, episodic memories, schemas, body gestures and postures, environmental contexts and body states) that can be altered and may result in distorted activation of embodied simulations in thinking (Tiba & Manea, 2018).

This model is distinct from the metaphoric model of hopelessness (Lindeman & Abramson, 2008). Opposed to the metaphoric model of hopelessness that focuses on simulations of motor incapacity we have focused on deficits in recruiting sensorimotor resources in thinking. Yet we have not excluded the important role of metaphors of motor incapacity in depression (Lindeman & Abramson, 2008) but we included them as verbal or visual image control mechanisms for recruiting sensorimotor simulations in thinking. To improve higher action cognition, our training aimed both to rehabilitate motor and sensorial resources of action systems (by Kinect practice) and to develop habits for the use of the mechanisms that promote sensorimotor resources in thinking (such as action memory, action language, and gestures that act as supports for motor simulations). Furthermore, our training not only improved the embodiment of action cognition in depressed individuals, but also its grounding in the environment by developing extended (training by Kinect to act on out of reach objects), augmented (by mimicking gestures and fluent postures) and prospective (imagining future contexts for action) affordances (action possibilities afforded by the physical characteristics of the stimuli). Similarly, interventions targeting sensorial mechanisms in depression by using light therapy (recommended for seasonal mood disorders) have recently received supportive evidence as both a stand-alone or add-on (with fluoxetine) treatment for depression (Lam et al., 2016). The promising role of motor imagery training as an effective intervention for depression was also suggested by evidence showing that motor imagery training induces changes in brain networks (default mode network) that are impaired in depression (Chen et al., 2015). Additionally, interventions based on increasing motor activity such as physical exercises (Cooney et al., 2013) or behavioural activation (Cuijpers et al., 2007) were effective in treating depression.

The main objective of this case study was to illustrate and explore the effects of a novel intervention targeting rehabilitation of action simulation in action cognition in a previously depressed individual. We hypothesised that the intervention improves the mental simulations of action, action-related cognition and it reduces psychomotor retardation and depressive symptomatology in a previously depressed individual. Because of the novelty of the intervention we selected a single case study design that allowed the ongoing calibration of the intervention based on direct feedback from the participant. Moreover an idiographic approach allows us to observe in depth fluctuations in the functioning of the participant.

Case Presentation

The Patient

Maria (identifying details, including the client's name, have been modified to protect the anonymity of the client) was a 37-year-old woman who lives alone. She expressed her interest in undergoing an after-depression consolidation treatment. She signed an informed consent form to participate in this programme and she received no incentive for her participation. At the commencement of treatment, she had a full-time job in a marketing department. She had divorced 1 year prior to the beginning of the program. The divorce ended a 10 years troubled marriage. At the assessment interview, Maria reported that she was still experiencing some negative mood and fatigue but not meeting the threshold for a depression episode diagnosis. She also reported reduced interest in doing things. According to the structured clinical interview for DSM-5 criteria, no current depressive episode was identified. She reported no rumination or negative thinking apart from worries and some concerns about problems at work. She reported being stressed about her job. She was countering these thoughts by adaptive self-talk.

History

Maria was the single child of a mixt Romanian-Hungarian family. She remembered being loved by both parents in her early childhood, yet she characterized her mother a**s** being overprotective and critical. She reported that during adolescence her father faced financial difficulties and started drinking and became abusive. She tried to help her father overcome his drinking problem and rescue her family. During that time she learned she was worthy only by doing things perfectly, saving others and being approved by significant others. Many of her symptoms were tracked back in her late adolescence. She left her home town at 19 years old enrolling in university studies. She had two long-term relationships. Soon after graduating from her university studies she got married. SCID 5 interview identified two episodes of depression in the past. The patient's history of depressive

disorder had begun 8 years previously when she was 29. At that time she had experienced panic attacks for several months. Consequently, she developed a depressive episode. The first episode of depression lasted about 9 months and was marked by dysphoric mood and loss of hope about the future. The main trigger of the episode was the death of one of her best friends. She reported that she saw a psychiatrist only 6 months after the beginning of panic attacks and depression when both the panic disorder and depressed mood were severe. The psychiatrist prescribed her medication (escitalopram (Cipralex) and clonazepam (Rivotril) she took for 2 years. Following treatment, the panic attacks stopped and the depressed mood was ameliorated.

The second episode started 2 years later when her husband started to abuse alcohol. Lack of affection, loneliness, verbal abuse, and constant accusations of guilt about his drinking problem were the main triggers of this second episode. The second episode was more severe and began with psychomotor retardation and negative thoughts about self and future. Yet, she remembered the second episode as lasting significantly less than the first one (about 3 months). She also had social anxiety and avoided social contacts due to fear of others being critical regarding her husband's use of alcohol. Her presentation was marked by severe dysphoric mood and social isolation. During this depressive episode she refused to go to work. She received the same medication (Cipralex and Rivotril) that she discontinued after the first episode. Medication improved her functioning and enabled her to go to work but she had no other activities or social contacts. She met no additional diagnosis of anxiety disorders or other personality disorder yet she had anxiety in social situations linked to expectations that she would be negatively evaluated by others because her husband was an alcoholic.

The first depressive episode she had has not been treated with medication for several months. The depression subsided after medication was started. Yet Maria reported that she continued to feel significantly depressed for a long period afterwards. During her second depressive episode (2 years later) she started cognitive behavioural treatment (CBT). CBT treatment lasted for 2 years up to 2016. During the treatment, she learned about the CBT model of depression and how to challenge depressive thoughts. A significant part of the treatment focused on behavioural activation and social problem-solving. She also learned to control perfectionism and the feelings of loneliness. She had a recurrence of depressed mood when she divorced her husband due to his alcohol problems. She had two boost sessions of CBT 6 months before the application of the MIKE treatment.

Assessment

During the evaluation sessions, Maria presented as engaged and interested. She was well oriented to time and place. Maria showed adequate insight into her

symptoms and past manifestation of depression. She denied alcohol or drug use. She also denied suicidal ideation and plans to complete a suicide. At the time of assessment, she displayed a good range of affect reactivity. There was no evidence of hallucinations or psychotic phenomena. Maria appeared to lack energy, and sat in a slumped position. She complained of feeling slowed down but only mild signs of psychomotor retardation were observed. Her speech was low in rate and pitch but not markedly slowed-down. Maria's assessment consisted of a face-to-face assessment in which SCID 5 interview was administered along with clinical scales. Clinical and cognitive scales were administered again one week after the end of the treatment.

Two weekly assessments for main variables were completed before intervention (for the 2 weeks before the training), one mid-treatment (at the end of the week 2), and one week after the end of the intervention. The mid-treatment assessment consisted of 4 daily assessments (the patient did not complete the form for the fifth day) that were aggregated in one score. Given the weekly assessment of data, data analysis included visual inspection of data, minimal important clinical difference (Norman et al., 2003) and mean baseline reduction (MBLR; Campbell, 2003). Mean baseline reduction measures the average reduction of behaviour from baseline calculated by subtracting the mean of posttreatment scores from the mean of the baseline scores, dividing by the baseline score and multiplying by 100 (Campbell, 2003). Based on suggestions of Bell et al. (2009) MBLR values were interpreted as being small (.20), medium (.50) or high (.80).

Posttreatment and follow-up assessments were averaged to provide a post treatment score. According to minimal important difference it was considered that an improvement in more than one-half of standard deviation shows a minimal clinically important difference (Norman et al., 2003). Normative clinical and non-clinical data were used to compare the scores of the patient to establish the significance of change.

Clinical Measures

The structured clinical interview for DSM-5 (SCID5 CV; First et al., 2015)

The SCID 5 was administered by an experienced clinician (A.T.) for both past and current diagnoses. The interview was used pre and post-treatment to ensure that Maria met the study criteria and to examine whether diagnostic status changed across the course of treatment. At pre-treatment, no current diagnosis of a major depressive episode was identified. Two major depressive episodes were identified in the past along with a past diagnosis of panic disorder. Post-treatment the clinical interview revealed no depressive episode or other clinical syndromes.

16 items Quick Inventory of Depressive Symptomatology (QIDS-16 SR; Rush et al., 2003)

It is a 16-item questionnaire measuring the severity of major depressive disorder symptoms. Ratings are made on a four-point scale ranging from 0 to 3.anchored at all points by a description. For example, Question 11, *view of myself* is anchored at 0= "I see myself as equally worthwhile and deserving as other people", 1= "I am more self-blaming than usual", 2="I largely believe that I cause problems for others", and 3="I think almost constantly about major and minor defects in myself" (Rush et al., 2003).

Generalized Anxiety Scale 7 (GAD-7; Spitzer et al., 2006)

It is a self-report scale measuring the severity of generalized anxiety disorder (GAD). GAD-7 contains 7 items related to DSM criteria for GAD.

The Ruminative response styles questionnaire (RRS; Nolen-Hoeksema & Jackson, 2001)

We used the short form of RSS scale. The scale contains 10 items that assess ruminative responses to sad and depressed mood. Participants rate the frequency of ruminative strategies used. Higher scores reflect higher levels of rumination. RRS assesses the less helpful style of rumination, with a number of items focusing on abstract evaluations of the self (e.g., Think "Why do I always react this way?''), with elevated scores on the RRS predicting worse outcomes. RRS was administered pre-treatment and post-treatment.

Kuopio Ischemic Heart Disease Hopelessness Scale (KIHD-HS; Everson et al., 1996)

It is a short scale comprising two items: (1) "I feel it is impossible for me to reach the goals that I would like to strive for" and, (2) "The future seems hopeless to me and I can't believe that things are changing for the better" (Everson et al., 1996). Maria had to indicate whether agree strongly, agree somewhat, disagree somewhat and disagree strongly for each question.

Trial Making Test (TMT; Partington & Leiter, 1949)

It is a commonly-used neuropsychological drawing test that can measure psychomotor retardation (Buyukdura et al., 2011). The TMT consists of two parts: TMT-A requires the drawing of lines sequentially to connect 25 encircled numbers distributed on a sheet of paper in ascending order. Task requirements are similar for TMT-B, except that the subject must alternate between numbers and letters (1, A, 2, B, 3, C, and so on). The score for each part represents the amount of time required to complete the task. It was originally designed to test processing speed (TMT-A) or cognitive flexibility (TMT-B). We used the classic form of the test at pre-treatment (Partington & Leiter, 1949) and an alternative form at post-treatment (Cranston & Blanton, 2016).

The Behavioral Activation for Depression Scale (BADS-short form; Manos et al., 2011)

It measures avoidance and behaviours targeted for treatment by behavioural activation. The BADS-sort form consists of 9 items on a 7-point Likert scale ranging from 0 (*not at all*) to 6 (*completely*)

Repeated measures

Maria completed a form containing items referring to several variables. The form was completed each time in the 19.00-20.00 time intervals.

Mood

We used ten adjectives describing emotion (e.g., sad, depressed, happy) that assessed the level of negative and positive emotions. Items were previously used in a validated version of Profile of Affective Distress (PDA; Opris & Macavei, 2007). Additional items describing fatigue, psychomotor retardation, activation, hopelessness were included. Maria endorsed how much she experienced the emotion described by each item on a Likert type scale from 1 (*not at all*) to 5 (*very much*) for the last week for the pre-treatment and post-treatment assessments. For mid-treatment assessment, Maria completed the same form (at the end of the day) endorsing the daily level for each item.

Psychomotor Retardation

Three items from Mood Spectrum Self-Report (MOODS-SR; Dell'Osso et al., 2002) were selected to continuously assess the behavioural aspects of psychomotor retardation: (1) fatigued, weak, or tired for the smallest task; (2) physically "slowed down"; (3) speech or thinking seems slowed down. Two additional items were added. It felt easy to do my daily tasks (reversed scoring), and I felt difficulty in doing my usual activities. Maria responded on 5-point Likert scale ranging from 1 (*not at all*) to 5 (*very much*). Her response indicated how much each statement was true for her in the last week (day for mid-treatment).

Action Simulation

Two types of action simulations were measured: (1) spontaneous action simulations and (2) object-related action simulations. For spontaneous action simulations, Maria had to rate 3 items on two dimensions: how frequently she experienced that simulation and how much she had kinaesthetic sensations associated with each item. The items were: (1) I had images of me doing things I have to do next days; (2) When I thought of what I will do, I had feelings of movement as I would have if I was doing that action; (3) I had images in my mind of how I would do an action right before doing that action. Two items measured simulations in response to objects: (1) When I saw an object/clothes/shoe, I also saw

in my mind how I use them; and (2) When I saw an object/tools/clothes/shoe, I felt in my body as I would have used it. Maria also responded to additional items regarding the mood in response to thoughts and coping (I have felt my mood changing just thinking of how I would do some activities; When something was bad, I could see in my mind "the movie" of how I can change the things to be better). The last item measured the use of internal or external perspective.

Vividness and Difficulty of Action Simulation

Maria had to imagine three actions in neutral, positive, and negative situations. Then she had to rate for each image, the easiness of simulation and the vividness of kinaesthetic sensations. For vividness, the scale was a 7-point Likert scale ranging from 1 (*not at all*) to 7 (*very vivid*). For difficulty, the scale was a 7-point Likert scale ranging from 1 (*not at all*) to 7 (*very difficult*).

Case Conceptualisation

According to the embodied model of distorted action cognition there are several mechanisms that may maintain the deficits in action cognition in depressed/formerly depressed patients. First, Maria demonstrated difficulty in mental simulation of actions. Maria reported that she did not simulate actions before doing them and she did not have the feelings of movement when she imagines actions (difficulties to represent kinaesthetically action simulations). She also found it very difficult to imagine new actions and felt almost no kinaesthetic sensations when she imagined actions in negative and positive situations. Efficient mental simulations of actions are thought to help us build a sense of efficacy about what we can do and what will follow in everyday situations. For instance, when seeing a cup full of tea before reaching the cup to drink, our mind automatically runs simulations of what would be to reach the cup, drink and taste the tea. When seeing an object such as an opened window, our mind unconsciously simulates possible behaviours for closing the window. When we evaluate the probability of achieving something important we rely on feelings about the easiness of simulating performing that action. Furthermore, the easiness (fluency) of action simulations is also involved in affective evaluations. People judge as more positive the objects and the situations when they can easily act on those objects (Hayes et al., 2008).

Because Maria was deficient in recruiting mental simulations of action in thinking, she probably also developed a sense of low efficacy (she had a low level of self-efficacy), losing the trust in her ability to solve problems and control the external world. She also developed a reduced level of action. Furthermore, she perceived as less positive activities and interactions in daily situations (she reported that she experienced little pleasure in what she was doing). In turn, these changes

might further result in high anhedonia and low activity levels maintaining vulnerability to depression.

An essential condition for proper use of motor simulations is good functioning of our body, of the motor and sensorimotor brain areas and attention.

There are several pathways through which Maria may have developed a deficit of action simulations. Probably, Maria's previous depressive episodes and associated neuro-hormonal changes (in the dopaminergic pathways, depending on her biological vulnerability) affected the proper functioning of the motor and related executive systems providing the structural base for action simulations. This may have resulted in deficiencies in recruiting motor-related areas in cognitive processing. Due to deficiencies in recruiting motor-related areas, she probably developed difficulties of (automatically and voluntarily) simulating possible movements and actions in response to situations or in the content of her thinking, especially in difficult situations.

These deficiencies in recruiting action simulations in thinking are probably to result longitudinally in several cognitive accommodations that may further maintain the deficit. For instance, due to difficulties in recruiting motor resources in thinking, Maria may have developed a view of self as weak and incapacitated with little chance to obtain what is important for her. She may also accommodate, by using predominantly visual representations to imagine actions, over-general thinking, slumped postures, habits of quick disengagement from difficult situations, ruminating about problems and so on. Furthermore, deficient action simulations may result also in low experiences of positive affect related to situations and actions (anhedonia). In turn, these accommodations may further maintain the deficit in action simulation (in a vicious cycle).

A second pathway to the deficit in action simulations was derived from current negative cognitive and mood states. Maria's negative self-focused thinking in response to problem situations ("it is something wrong with me when I cannot find a parking place") may have exacerbated the deficit in action imagery by focusing on her lack of worth instead of engaging action simulations in thinking about overcoming obstacles. Similarly, bouts of dysphoric mood, fatigue, not doing the preparatory parts of activities, and associated slumped posture acted as non-fluent action conditions that blocked the action simulations. Also, Maria described her thinking as lacking specific details which constitutes another pathway through which the patient acquired deficits in action cognition. Not being able to think of specific details of a situation accentuates the deficit of action simulation (Williams et al., 1996), specific simulations of actions requiring specific details in our mind so as to know what action to simulate.

MIKE training aimed to rehabilitate and compensate for action simulation deficits. Through Kinect, we aimed to help Maria boost the activity in the motor and related brain regions so motor representations can be recruited more easily in action-related thinking. We helped Maria (through Kinect) to associate action simulations to out-of-reach objects generating extended affordances. By inducing repeated

practice and memories of actions we helped Maria make action simulations more readily available in memory. By prompting thinking through and including details of future states we supported the simulation of specific actions and fostered prospective affordances. Furthermore, we taught Maria to use movement congruent postures to optimize the current affordances (enhanced affordances). Also, we trained Maria to build habits of using action simulations in recognition of objects (gerundival perceptions; Lambie & Marcel, 2002) thinking and action preparation. Furthermore, we compensated for the action simulation deficit by developing habits of using „online" supports for action simulations such as action language, action memories, and partial imitation to more efficiently recruit action simulations in thinking and action preparation.

Description of the Program

In session 1 (90 minutes) the MIKE program and the session agenda were introduced. We explained to the patient the rationale of the programme, emphasizing the development of the habit of using supports (language, gestures, posture, specific thinking) in order to balance back the action in our thinking. Then, Maria began Kinect practice for 20 minutes. We used a Microsoft Xbox Kinect 360, and a TV output Samsung 100 cm, 40MU6102, 4K Ultra HD screen for the psychologist-assisted sessions. Maria chose bowling (Sports Kinect game) as a practice game. During Kinect exercise, Maria was prompted to rate the level of the kinaesthetic sensations (from 0 to 10) before overtly simulating the movements. After finishing the Kinect practice, Maria was advised that in three sessions she will learn to use Action Simulation Balancing (ASB) Skill in three situations: to perceptions, to obstacles and to disengagement from difficult situations/useless actions. Further, she was shown how to practice the skill: the applied practice, spontaneous practice and the sustained practice exercise.

A skill training format (Miltenberger, 2004) was used to introduce the ASB skill. The psychologist described the ASB skill and demonstrated it using the example of an open window. Then Maria was asked to apply the skill to the open door situation. Feedback was given. The importance of practice was then discussed and applied, and generalization practices of the ASB skill were introduced. The applied practice was explained and demonstrated. The patient was asked to list several situations for applied practice and to illustrate how she would use the applied practice for three objects in the room. In the Applied Training, Maria was asked to practice each action balancing training to 3-5 objects from 3 scenes daily. The spontaneous practice was further explained ("Imagine you are in a real-life Kinect and you practice ASB for an object you see"). Maria was advised to use spontaneous practice whenever she wanted/opportunity arose. Next, the focused exercise was introduced in order to maintain the practice of the ASB skill. Maria was asked to

exercise daily after Kinect. We explained that the exercise aims to strengthen the ASB through practicing dynamic simulation. Then, we presented and demonstrated the steps of the exercise. The steps were (1) Choose a situation and 3-5 objects for practice (2) Count, look at the object, name the action by which to recognize the object (recognize-by-action), get into the stance and use dynamic simulation. Go through each object, give all your attention to the object and simulate the action, (3) Count, go through each object, recognize by action, use a dynamic simulation and repeat two times covert simulation for each object. (4) Count, go rapidly through each object, give all your attention, recognize by action and do a quick covert action simulation. In the second part of the session, we explained to the patient the Intention ASB skill. We explained that the deficit in action simulation following a depressive episode may also extend to our intentions and the exercise aims to address this ("Depression leaves scars on our mind. One such scar is, as in the case of perceptions, that our intentions are no longer balanced with action simulations. Usually, before performing an action, we automatically simulate the action we are about to do. We balance intentions with action simulations. After depression, this balancing is affected. In the following exercise, we relearn to balance our intentions with actions. We will simulate actions before doing them, memorize them and then simulate them to remember next time how we would do those actions"). Then, we demonstrated the exercise, choosing an "Action of the day" simulated before, memorizing while doing the action and re-simulating it for the future. Then the Action of the day log was introduced. Maria was instructed to describe the action of the day in the log and to imagine the action in a neutral and a positive situation. For the next 5 days, Maria practiced daily at home (from Monday to Friday) 15 minutes of Kinect training and then the ASB exercises. The Kinect device was installed at home.

Session 2 began with reviewing the mood and the forms from the previous week. Then the agenda was introduced: (1) learning corrective ASB and (2) review the Kinect practice. The aim of session 2 was to practice the ASB in response to obstacles as a corrective action simulation. The negative and self-focused thinking was introduced as a blocking factor to action simulation in thinking of obstacles. [We explained to the patient that "Most of the success of our actions depends on the adjustment of movements to the feedback from the environment or to its consequences; in other words, our actions require fine tuning to succeed. After depression, when the action does not result in desired consequences we give up on tuning action/or generate corrective action and we evaluate our worth instead. This depressive habit is blocking the action simulation in negative situations. The action balancing skill breaks this depressive habit – in each difficult situation we will balance action to attune it and block the focus on self. It is important to focus on what and how we can do, the consequences of our corrective action and to let go of negative thinking. If negative thoughts pop in just observe them, let them go and bring your attention to action simulations. Stress and negative mood feed on lack of action simulation from our perceptions to grow into depression and hopelessness. By this skill, we stop future stress and negative mood from growing into depression and

thus we become more resilient to further depression." Then, the steps of corrective ASB skill were described [For example, by looking at the mug from an out of reach position, we simulate the correction of the position, the new position and then the action (grab the mug) and its consequences. Steps: recognize as a to-be-adjusted/corrected situation, name the corrective action, simulate the new position of the object/body, get in the stance and then simulate the action and its consequences. It is important to focus on the action and let negative thinking go. If negative thoughts pop in, just observe them, let them go and bring your attention to action simulations]. Maria was asked to practice the scenario of one forgetting to lock the door and then feedback was provided. At the end of the session, the patient was asked to make a list of common obstacles during the day (daily obstacles) when she can use the corrective ASB, utilize the corrective ASB in applied training and in generalization training. She was also prompted to use the corrective ASB in Action of the day – i.e., to imagine the action after overcoming an obstacle without engaging in negative thoughts. She was prompted to use the corrective ASB in the Kinect practice. For the next 5 days, Maria continued the daily practice of Kinect at home. This week Maria had to practice the focused exercise using pragmatic ASB skills. Additionally, she practiced the previously applied ASB exercises.

Similarly to the previous session, Session 3 began by reviewing the mood and the forms. Then the agenda was introduced: (1) learning the pragmatic action simulation balancing skills (pragmatic ASB) and (2) reviewing the Kinect practice. The aim of session 3 was to practice balancing action simulations in response to situations that cannot be changed as a simulation of an alternative useful action. We explained to the patient that ["Depression diminishes our ability to generate simulations of useful actions (and adaptive problem solving and disengagement) in negative situations and prompts the tendency to react with self-criticism instead. By pragmatic ASB skill, we develop the habit of simulating useful action in response to negative mood/situations instead of criticism"]. Then, we explained to the patient the pragmatic ASB skill. Pragmatic ASB involves balancing appraisals of negative situations we cannot change/negative mood ("useless actions") with simulations of actions that are useful for us in that situation [for other desires], more specifically reacting to negative situations with pragmatic action instead of negative thinking. Basically, it involves imagining what else that is useful to me I can do instead of something I perceive as unachievable – i.e., pragmatic action simulation balancing. For instance, if I spill my coffee, I am imagining what I can do in this situation that is useful. The steps are: naming the negative situation, recognising it as a "to disengage" situation, identifying something useful to do, getting into stance and simulating the useful action and its consequences, then engaging in the useful action. In response to negative mood, this skill answers the question: what can I do usefully despite the fact I feel bad/did not do what I wanted in the first place and how can I do it. This is a very useful skill for becoming more resilient after depression. It is important to focus on a useful action and its consequences and to let go of negative

thinking. If negative thoughts recur just observe them, let them go and bring your attention to action simulations.

Similarly to the previous session, Maria was asked to practice the skill to not be able to lock the door (she was asked to imagine she was not able to open the door) and then feedback was provided. At the end of the session, the patient was prompted to make a list of common situations to disengage from during the day (daily obstacles) when she can use pragmatic ASB, insert the pragmatic ASB in Applied Training and in Generalisation Training. Also, she was prompted to insert in Action of the Day imagining the action after negative mood.

In Session 4, Maria undertook the assessment and an interview focused on the acceptability of the treatment. The patient engaged well with the treatment and was able to achieve most of her daily exercises.

Results

Clinical scores were described in Table 1. We hypothesized that Mike training will result in reduction of psychomotor retardation. As expected, after MIKE training, Maria experienced important improvements in her speed of processing (TMT-A) and cognitive flexibility (TMT-B) compared to pre-treatment. Maria showed a reduction in the processing time at TMT-A from 30 seconds to 21 seconds. Pre-treatment, Maria completed the TMT-A in 30 seconds. This result situated Maria (below the scores obtained by depressed patients at 6-8 weeks after antidepressant treatment (M= 40.3, SD = 36.8, Gorwood et al., 2014) more closely to the scores obtained by healthy people in the same age category (M = 28.5, SD =10, Tombaugh, 2004). Although she showed virtually no deficits in processing speed at pre-treatment, after Kinect, Maria needed less time to complete the task. Since the change is more than ½ SD (9 > 5) this change may be considered a minimally important difference. Maria showed an important reduction in the processing time at TMT-B from 149 seconds to 45 seconds. At pre-treatment, Maria completed the TMT-B in 149 seconds (2 mistakes) which indicates a severe deficit above that of formerly depressed (M = 66.3, SD = 58.7) and even above the score of currently depressed individuals (M = 96.8, SD = 77.3, 2.16 mistakes). Post-treatment, Maria completed TMT-B in 45 seconds (no mistake). This score situates Maria in the lowest end of the performance obtained by same age healthy individuals (45< 58.4, SD = 16.4; Tombaugh, 2004) the change being a minimally important difference and indicating a large effect size of the intervention (effect size MBLR = 69.7%).

We hypothesized that MIKE training will reduce depression. No meaningful difference between pre and post-treatment was seen in depression. Although (one week after the end of the treatment) the depression level was reduced after treatment compared to pre-treatment, both the pre (score 5) and post-treatment (score 1) scores situated Maria's level of depression in the no depression interval. Yet the reduction

in depression level corresponded to a large effect size (MBLR = 80%). Also, a small improvement was observed in scores obtained at activation subscale of BADS-SF. Both the pre-treatment and posttreatment scores at BADS (Table 1) situated the level of behavioural activation of Maria in an interval comparable with scores obtained by healthy individuals (activation $M = 13$, $SD = 5.9$; avoidance $M = 7.5$, $SD = 4$; Shudo & Yamamoto, 2017). No meaningful difference between pre and post-treatment was seen in rumination (Table 1). Both pre and post-treatment levels of hopelessness (low level), anxiety (mild anxiety), and rumination (low level) were in the normal non-clinical range (Table 1). Pre-treatment, Maria scored 10 at the brooding scale of RSS. A score of 10 placed Maria`s rumination in the lower interval of negative rumination, people diagnosed with depressive disorder scoring on average around values of 13.2 ($SD = 3.6$; Parola et al., 2017). Maria scored 5 (4 without the last item) at reflection scale. A score of 4 placed the rumination level in the lower interval of reflection, people diagnosed with depressive disorder scoring on average around values of 10.7 ($SD = 2.7$) for reflection (Parola et al., 2017).

Table 1. Scores on Clinical Scales at Pre and Post-Treatment

Time	TMT A	TMT B	QUIDS	GAD 7	BADS Activ	BADS Avoid	HS	RSS-B	RSS-R
Pre	30	149	5	7	12	10	2	10	5
Post	21	45	1	8	15	11	1.5	10	7

Note. Scores for clinical scales at pre and post treatment. TMT-A= Trail Making Test A. TMT-B= Trail Making Test B.QUIDS=16 items Quick Inventory of Depressive Symptomatology. GAD-7= Generalized Anxiety Disorder Scale. BADS Activ = the activation scale of the Behavioural Activation for Depression Scale. BADS Av= the avoidance subscale of the Behavioural Activation for Depression Scale. HS= mean score of the Kuopio Ischemic Heart Disease Hopelessness Scale. RSS-B=The brooding subscale of The Ruminative Response Styles Questionnaire RSS-R = the Reflection subscale of the Ruminative Response Styles Questionnaire.

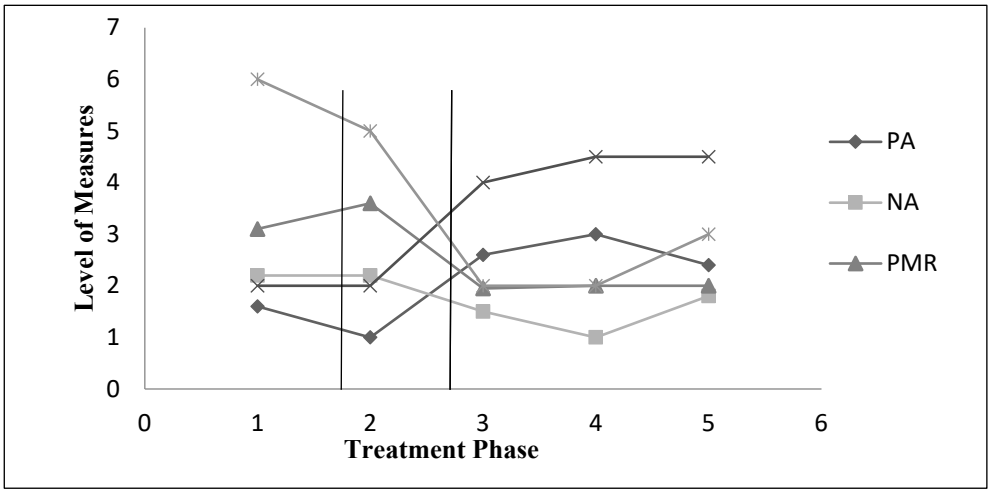
In Figure 1, we described the results from 2 weekly pre-treatment assessments, a mid-treatment assessment (that was an aggregate score composed by the mean of daily assessment of each variable-last week of treatment), one post-treatment (evaluation of the last week after the end of the MIKE) and one follow up (at 1 month after treatment). Maria endorsed the level for each variable on a rating scale where 1 means not at all, 2 little, 3 medium, 4 much and 5 very much (except for the kinaesthetic sensation for which the scale was from 1(no sensation) to 7 (as real sensations). No important differences were observed between the two pre-treatment assessments. Similarly, no important differences were observed between mid-treatment, post-treatment and follow up (see Figure 1). When analysing the pre-treatment with post-treatment/follow up there were several notable differences (Figure 1).

We hypothesized that after MIKE training Maria will have less psychomotor retardation on repeated measures. As expected, the results indicated that after MIKE treatment, Maria experienced a reduction in the psychomotor retardation at

behavioural level (decreasing from a medium level to a little level of psychomotor retardation). Consistently, when asked to rate how slow and slow-down she was, she rated that she was average at pre-treatment and little at mid and post-treatment, change corresponding to a medium effect size (effect size MBLR = 50 %).

We also hypothesized that Mike training results in improvements in action simulations. As expected, Maria improved her level of action simulations (except in automatic simulations to objects and imagery perspective). Although Maria improved in all dimensions of motor imagery, an important reduction was in the difficulty with which she imagined doing actions (from very difficult to little, medium effect size, MBLR = 54 %). Similarly, effects were observed regarding the vividness of kinaesthetic sensations when she was asked to imagine actions in positive situations (from 2 at pre-treatment to 4 at post-treatment, large effect size, MBLR = 100 %).

Additional analyses showed that Maria endorsed experiencing significantly more positive affect (rising from not at all-little positive affect at pre-treatment to average level at post-treatment) (large effect size, MBLR = 107 %). Consistently, when she was asked "*How much she feels pleasure in what she does*'' she responded with little at pre-test and average at mid and post-treatment. Maria also experienced less negative affect at post-treatment compared to pre-treatment (decreasing from a little to not at all) (small effect size, MBLR = 36.3 %).



Note. PMR-psychomotor retardation; PA-positive affect; NA-negative affect; KI= kinaesthetic imagery. The scores for the main variables on a Likert Scale from 1 (not at all), 2 (little), 3 (medium), 4 (much), to 5 (very much). For the vividness and the difficulty of the imagery the rating scale was from 1 (not at all) to 7 (very vivid/difficult). At the horizontal axis, 1=Pre-Treatment 1; 2=Pre-Treatment 2; 3=Mid-Treatment; 4=Post-Treatment; 5=Follow-up.

Figure 1. Changes in the Main Variables as a Function of the Treatment Phase

Complicating Factors

The primary complicating factor was fatigue. Maria had to work 10 hr each day and had many problems at work. Secondary complicating factors were the high working load and the relationship strain. During the treatment, Maria's ex-husband tried to come back and they had some arguments. On that day she did not practice the exercises. However, treatment was robust and positive outcomes remained. Maria was contacted via telephone by A.T for a welfare check. Support was offered but Maria handled the situation well and did not want to interrupt the training. Thirdly, Maria left the country for 4 days after week 2 of Kinect and she did not practice the exercises during that period. Although Maria interrupted the training she continued on return and the results were maintained.

Discussion and Treatment Implications

In this case study, we have illustrated the application of a new cognitive rehabilitation intervention for residual symptoms (motor imagery deficits) in a formerly depressed patient. As opposed to computerized cognitive training (targeting executive function or memory) and physical exercise approaches (Morimoto et al., 2014; Porter et al., 2013; Sun et al., 2017), we targeted deficits in motor imagery by promoting the use of motor resources in daily thinking of a formerly depressed patient. This intervention was new in using remote kinematic technology (Kinect) and skills training to rehabilitate motor cognition. We reported several main findings after administration of Kinect-based rehabilitation training in a formerly depressed patient: (1) an improvement in motor imagery (Maria endorsed higher feelings of vividness of kinaesthetic sensations during action simulations and she found it easier to imagine actions), (2) an improvement in cognitive (TMT-B) and behavioural aspects of psychomotor retardation, (3) an improvement in positive affect, and (4) reports of involuntary action simulations to distant stimuli (extended affordances). Furthermore, the training was well-accepted. Maria thought that the training was an entertaining way to do physical exercises and that the training helped her to get in physical and mental shape.

Firstly, we found that after MIKE Maria found it easier to imagine actions and felt more strongly the kinaesthetic sensations (when she imagined actions) than she did before the MIKE training. One possible explanation for this result was that MIKE training had improved her motor imagery. Thus, Maria imagined kinaesthetic sensations during actions more easily/vividly because MIKE training increased the accessibility of motor representational resources. This result was in line with studies that found that Kinect sessions improved motor imagery in healthy (Wriessnegger et al., 2014) and neurologically disordered (i.e., stroke, Parkinson disorder, cerebral

palsy, and multiple sclerosis) individuals (Da Gama et al., 2015; Mousavi-Hondori & Khademi, 2014; Webster & Celik, 2014). Here, we saw a similar improvement in kinaesthetic imagery after Kinect training in a formerly depressed individual. This result was also consistent with studies which found that repeatedly imagining positive events results in an increase in the vividness of visual imagery (Holmes et al., 2016). If this finding is extrapolated to other persons by subsequent research, Kinect-based training may function as a treatment for residual deficits in motor cognition after MDD. Secondly, Maria's scores at TMT test (form A and B) suggest improvements in the cognitive aspects of psychomotor retardation (processing speed and task switching). The improvement in processing speed may be explained by the rehabilitation effects of Kinect exercises but also by the training in speeding the simulation of actions in response to objects (the focused exercise has a speeding of simulation component). In the third week of the training, Maria also practiced simulation of disengagement from useless actions and engagement in useful actions. This skill might explain the improvement in TMT-B time which involves a set-switching executive process (Arbuthnott & Frank, 2000).

Cognitive deficits (executive control, processing speed) have been consistently linked to depression (McDermott & Ebmeier, 2009; Rock et al., 2014), persisting after treatment as residual symptoms in recurrent depressive disorder (Scult et al., 2017). Furthermore, the antidepressant treatment had limited effect on cognitive deficits improving mainly executive functioning (Austin maze task that involves visuospatial memory) and cognitive flexibility (Stroop task) but no other cognitive deficits (attention, response inhibition, verbal memory, decision speed, and information processing; Shilyansky et al., 2016). Previous, studies found an improvement in cognitive control (executive attention) after physical activity in MDD (Vasques et al., 2011). Yet recent meta-analyses found no effect of physical exercise on cognitive control functions (Sun et al., 2017). Instead, small effects were found for physical exercise interventions with added cognitive activities (Brondino et al., 2017). Thus, our finding was in line with studies that employed physical activity plus cognitive activity (Brondino et al., 2017). Previous findings suggested that when they do, physical exercises improve cognitive control due to changes in the plasticity of prefrontal cortex and the involvements of task-specific processes (Voelcker-Rehageet al., 2011). Thus, one explanation for this improvement in cognitive functioning is that Kinect may involve a similar plasticity mechanism. Research studies may investigate whether this finding can be generalized to other patients and whether Kinect training alone has the same effect. If so, Kinect may be an appealing way to provide physical activity in depressed patients. Since Kinect is a friendly, safe and socially-prone (can be done together with other persons) way to provide physical activity to depressed individuals, this observation warrants further research.

The improvement in cognitive control may also be explained by the reduction in physical aspects of motor retardation. Maria experienced a reduction in behavioural aspects of psychomotor retardation (from medium to little) after Kinect-

based training. Cognitive deficits have been previously linked to motor retardation. Moreover, studies linked cognitive slowing in motor imagery to sensory or motor deficits (Zarrinpar et al., 2006). Thus, it was possible that this reduction in the motor component of psychomotor retardation explained why we also observed an improvement in cognitive control. Yet, Maria showed increased levels of fatigue both pre and post treatment which may question this explanation. It was possible that Maria's fatigue was normal in the context of the prolonged time she spent at work and the increase in job demands (Maria linked her fatigue to increased demands at the job). Since fatigue is a common residual symptom in depression, which is present even in patients who responded to antidepressant treatment (Nierenberg et al., 1999), Maria was monitored to check whether her fatigue was linked to high job demands or persisted even with low work demands.

Nonetheless, this finding, if replicated by research studies, has significant treatment implications. Rehabilitative cognitive treatments targeting cognitive deficits, mostly in computerized format, have been developed for depression (Morimoto et al., 2014; Porter et al., 2013). However, their effects are mixed, small and limited in generalizability to other cognitive tasks and day-to-day functioning. These limits impose constraints on their applicability (Motter et al., 2016). Targeting rehabilitative efforts to intermediate cognitive markers (i.e., motor imagery, the speed of motor simulations) that support higher action cognition and adaptive behaviour (along with prompting generalization to day-to-day functioning) may overcome these limits. Thus, Mike training may be a skill-based alternative of cognitive rehabilitation treatment for intermediate cognitive endo-phenotypes. Maria endorsed experiencing more positive affect in the week after MIKE training. Although we did not expect this result, this finding was consistent with studies that showed that increasing motor fluency (the ease of mentally simulating acting upon an object) towards objects through imagery increased positive emotions to those objects (de la Fuente et al., 2017; Dennehy et al., 2012). According to this idea, targeting motor fluency would recover positive affect. Maria reported an increase in "feelings of fluency" during imagined actions (reduced difficulty of imagining) and the experience of kinaesthetic sensations after Kinect-based training. Some preliminary studies suggested that this motor-related affect is constrained by using kinaesthetic (not visuomotor) imagery (Hayes et al., 2013), individuals who imagine more vividly the kinaesthetic sensations rating more positively the objects they acted on (motor-related affect, Alhashil, 2016). Furthermore, the effect of fluency on affect has been observed only when people reactivate motor information in memory and not for people who have a low ability to do so (Vrana & van den Bergh, 1995).Thus, it was possible that our training involved an imagery-based increase in motor fluency as a mechanism of increasing positive affect in a formerly depressed individual. We also asked Maria to imagine an 'Action of the day' each evening in a positive and another specific (neutral, challenging or disengaging) situation. As such, it was possible that the increase in positive affect resulted also from imagining actions in positive situations.

Notably, after Kinect training, Maria reported involuntary simulations of actions in response to natural stimuli (seeing a door triggered involuntary partial movements of opening doors). Since Maria reported she never had before these manifestations, one possibility was that these simulations were a result of Kinect-based training. This effect may be explained by the fact that by repeatedly reinforcing overt simulations with perceptual consequences (in Kinect) we also extended the affordances of objects. As a consequence, simulations of actions were triggered by remote perceptual stimuli. This finding points to the possibility of a new mechanism that may be used in behavioural interventions. If this mechanism is replicated in research studies it would be a mechanism that would benefit behavioural activation. Thus, clinicians could research whether there are benefits by adding Kinect-augmentation short sessions to behavioural activation in the treatment of depression or to build augmented reality-driven behavioural activation interventions.

Furthermore, the rehabilitation of motor imagery may foster higher action cognition besides the increase in behavioural initiation. These findings are in line with the embodied model of higher cognition (Glenberg, 2010). Accordingly, because the training increased the accessibility of motor resources for thinking and/or the feelings of fluency for actions (Chambon & Haggard, 2012; Wenke et al., 2010) Maria estimated more control and being more efficient in solving problems. This finding raises the intriguing possibility that by increasing the accessibility of motor simulation, patients perceive themselves as more efficacious and in control. Thus, Kinect training may serve as a pre-treatment "booster" for cognitive restructuring and problems solving interventions.

Perhaps the most important implication of this case study was that it provides clinicians with an illustration of a skill-based cognitive rehabilitation treatment targeting an intermediate cognitive endophenotype (deficits in motor imagery) for a patient with residual symptoms after antidepressant treatment. The protocol utilized in this case stretches the traditional cognitive rehabilitation methods in depression. Instead of using a computerized exercise format, we used a skill training format that focused on the generalization of the trained cognitive skills into daily functioning of the patient. The treatment format used in this case is also promising for the (1) use as an adjunct treatment to CBT and antidepressant medication in patient with psychomotor retardation; (2) use as maintenance therapy to prevent recurrences of depression; (3) use as an endophenotype-targeted component treatment for deficit in action cognition in patients who show this deficit in various disorders not limited to MDD, and (4) use as a "pre-treatment boost" for cognitive restructuring, problem-solving or behavioural activation. Remote kinetics is an appealing intervention for individuals with friendly attitudes to technology yet people who are not open to technology will most likely refuse this method. Should the method be applied, attention is required to (1) problems with kinetic apparatus and good preparation, (2) positive interpretation and sustaining adaptive responses to failure (e.g., missing a strike in a bowling match) during the games, and (3) physical limitations of the patients and their level of fatigue.

Several limitations should be considered. Being a single-case study, these findings should be interpreted as illustrative and may not be generalizable to other patients. Another limit was related to controlling the effects of the previous interventions: observed effects may be attributable to after effects of CBT procedures such as behavioural activation. Yet, pre-and post-measures of behavioural activation level show no significant changes in the activation level. Unfortunately having no behavioural activation control group no conclusion about this result may be drawn. Furthermore, the concurrent effect of the intervention on negative cognition may result in the observed benefits of the intervention. An important concern was regarding replicability of the results. The intervention included Kinect exposure along motor imagery rehearsal. Thus, we cannot separate the effects of the training from the effects of the Kinect sessions. It may be possible that the effects were a consequence of the Kinect exercises alone. Further research should address these shortcomings. The next step would be to use multiple baselines across participants' design, feasibility studies and should the intervention prove reliable and feasible then pilot randomized trials may be designed. Experiments using healthy and at risk participants should be carried out to investigate the effect of Kinect intervention alone to dissociate the effects of Kinect exposure and motor training on psychological functioning.

Nevertheless, these findings are valuable in that they provide new ideas for research in the treatment of residual symptoms after MDD.

Final Conclusions

In a single case-study we have illustrated an intervention based on an embodied conceptualisation of cognition in depression: motor rehabilitation of action cognition. We described methods that can change the action-related ingredients of cognition and showed that increasing action simulation results in benefits for improving residual manifestations of depression. Further research using more reliable experimental design is needed.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interests with respect to their authorship or the publication of this article.

Funding

The research has been funded by the University of Oradea, within the Grants Competition "Scientific Research of Excellence Related to Priority Areas with Capitalization through Technology Transfer: INO – TRANSFER – UO", Project No. 322/2021.

Acknowledgements

We thank Ana D'Amore for revising an early draft of this article and Victor Tiba for technical assistance with Microsoft X-box Kinect apparatus. We especially thank the patient for her participation and her willingness for contribution to the development of psychological treatments.

References

Alhashil, N. (2016). *Motor-related affect and its relationship to mindfulness and imagery ability* (Unpublished master's thesis). University of Wales, Bangor, UK. http://doi: 10.13140/RG.2.1.1473.2569.

Arbuthnott, K., & Frank, J. (2000). Trail Making Test, Part B as a measure of executive control: validation using a set-switching paradigm. *Journal of Clinical & Experimental Neuropsychology, 22*(4), 518–528.

Bandura, A. (1997). *Self-efficacy: The Exercise of Control*. Freeman: New York, NY, USA.

Bell, R. J., Skinner, C. H., & Fisher, L. A. (2009). Decreasing putting yips in accomplished golfers via solution focused guided imagery: A single-subject research design. *Journal of Applied Sport Psychology*, 21(1), 1–14.

Bennabi, D., Monnin, J., Haffen, E., Carvalho, N., Vandel, P., Pozzo, T., ... & Papaxanthis, C. (2014). Motor Imagery in Unipolar Major Depression. *Frontiers in Behavioral Neuroscience*, *8*, 413. http://doi.org/10.3389/fnbeh.2014.00413.

Beshai, S., Dobson, K. S., Bockting, C. L., & Quigley, L. (2011). Relapse and recurrence prevention in depression: Current research and future prospects. *Clinical Psychology Review, 31,*1349–1360.

Bortolato, B., Miskowiak, K. W., Köhler, C. A., Maes, M., Fernandes, B. S., Berck, M., ... & Carvalho, A. F. (2016). Cognitive remission: a novel objective for the treatment of major depression? *BMC Medicine*, *14*, 9. http://doi.org/10.1186/s12916-016-0560-3.

Brondino, N., Rocchetti, M., Fusar-Poli, L., Codrons, E., Correale, L., Vandoni, M., ... & Politi, P. (2017). A systematic review of cognitive effects of exercise in depression. *Acta Psychiatrica Scandinavica, 135*(4), 285-295. doi:10.1111/acps. 12690.

Buyukdura, J., McClintock, S., & Croarkin, P. (2011).Psychomotor retardation in depression, biological underpinnings, measurement, and treatment. *Progress in Neuropsychopharmacology and Biological Psychiatry, 35,* 395-409.

Campbell, J. M. (2003). Efficacy of behavioral interventions for reducing problem behavior in persons with autism: A quantitative synthesis of single-subject research. *Research in Developmental Disabilities, 24,* 120–138.

Chambon, V., & Haggard, P. (2012). Sense of control depends on fluency of action selection, not motor performance. *Cognition, 125,* 441–451. 10.1016/j.cognition. 2012.07.011.

Chen, J., Yang, L. Q., Zhang, Z. J., Ma, W.-T., Xing-Qu, W., Zhang, X. R., ... & Jia, T. (2013). The association between the disruption of motor imagery and the number of depressive episodes of major depression. *Journal of Affective Disorders, 150,* http://doi: 10.1016/j.jad.2013.04.015.

Chen, Y., Wang, C., Zhu, X., Tan, Y., & Zhong, Y. (2015). Aberrant connectivity within the default mode network in first-episode, treatment-naïve major depressive disorder. *Journal of Affective Disorders, 183*, 49-56. doi: 10.1016/ j.jad.2015.04.052.

Cooney, G. M., Dwan, K., Greig, C. A., Lawlor, D. A., Rimer, J., Waugh, F. R., … & Mead, G. E.(2013). Exercise for depression. Cochrane Database Systematic Reviews, *12* (9) CD004366. doi: 10.1002/14651858.CD004366.pub6.

Cranston, C. C., & Blanton, P. B. (2016). Alternate form of the Trail Making Test Parts A & B: Preliminary validation. Poster presented at the 44th annual conference of the International Neuropsychological Society, Boston, MA.

Cuijpers, P., van Straten, A., & Warmerdam, L. (2007). Behavioral treatment of depression: A metaanalysis of activity scheduling. *Clinical Psychology Review, 27*(3), 318-326.

Da Gama, A., Fallavollita, P., Teichrieb, V., & Navab, N. (2015). Motor Rehabilitation Using Kinect: A Systematic Review. *Games Health Journal, 4*(2), 123-135. doi:10.1089/g4h.2014.0047.

de la Fuente, J., Casasanto, D., Martínez-Cascales, J. I., & Santiago, J. (2017). Motor imagery shapes abstract concepts. *Cognitive Science, 41*(5), 1350-1360.

Decety, J. (1996).The neurophysiological basis of motor imagery. *Behavioural Brain Research, 77*, 45-52.

Dell'Osso, L., Armani, A, Rucci, P., Frank, E., Fagiolini, A., Corretti, G., ... & Cassano, G.B. (2002). Measuring mood spectrum disorder: Comparison of interview (SCI-MOODS) and self-report (MOODS-SR) instruments. *Comparative Psychiatry, 43,* 69-73.

Dennehy, V., Hayes, A. E., & Callow, N. (2012, April). *Imaged actions produce affective responses*. Paper presented at 19th Cognitive Neuroscience Society Meeting, Chicago, IL, United States.

Dickson, J. M., & Moberly, N. J. (2013). Reduced Specificity of Personal Goals and Explanations for Goal Attainment in Major Depression. *PLoS ONE*, *8*(5), e64512. http://doi.org/10.1371/journal.pone.0064512.

Dunkin, J. J., Leuchter, A. F., Cook, I. A., Kasl-Godley, J. E., Abrams, M., & Rosenberg-Thompson, S. (2000). Executive dysfunction predicts nonresponse to fluoxetine in major depression. *Journal of Affective Disorders, 60*, 13–23.

Everson, S. A., Goldberg, D. E., Kaplan, G. A., Cohen, R. D., Pukkala, E., Tuomilehto, J., … & Salonen, J.T. (1996). Hopelessness and risk of mortality and incidence of myocardial infarction and cancer. *Psychosomatic Medicine, 58,* 113–121.

First, M. B., Williams, J. B. W., Karg, R.S., & Spitzer, R. (2015). Structured Clinical Interview for DMS-5, Clinician Version. Arlington, VA: American Psychiatric Association.

Glenberg, A. M. (2010). Embodiment as a unifying perspective for psychology. *Wiley Interdisciplinary Reviews: Cognitive Science, 1,* 586-596. http://doi: 10.1002/wcs.55.

Hasselbalch, B. J., Knorr, U., & Kessing, L. V. (2010) Cognitive impairment in the remitted state of unipolar depressive disorder: a systematic review. *Journal of Affective Disorders, 134*, 20-31.

Hayes, A. E., Dennehy, V., & Callow, N. (2013, November). *Imaged Motor Fluency Evokes Emotion: Evidence of Embodiment*. Paper presented at Psychonomic Society Annual Meeting, Toronto, Ontario, Canada.

Hayes, A. E., Paul, M. A., Beuger, B., & Tipper, S. P. (2008). Self produced and observed actions influence emotion: the roles of action fluency and eye gaze. *Psychological Research,* 72461–72472. http://doi: 10.1007/s00426-007-0125-3.

Hollon, S. D., DeRubeis, R. J., Shelton, R. C., Amsterdam, J. D., Salomon, R. M., O'Reardon, J., ... & Gallop, R. (2005). Prevention of relapse following cognitive therapy vs medications in moderate to severe depression. *Archives of General Psychiatry, 62,* 417–422.

Holmes, E. A., Blackwell, S. E., Burnett-Heyes, S., Renner, F., & Raes, F. (2016). Mental imagery in depression: Phenomenology, potential mechanisms, and treatment implications. *Annual Review of Clinical Psychology, 12,* 249-280. doi: 10.1146/annurev clinpsy-021815-092925.

Hvenegaard, M., Watkins, E. R., Poulsen, S., Rosenberg, N. K., Gondan, M., Grafton, B., … & Moeller, S. B. (2015). Rumination-focused cognitive behaviour therapy vs. cognitive behaviour therapy for depression: study protocol for a randomised controlled superiority trial. *Trials*, *16*, 344. http://doi.org/10.1186/s13063-015-0875-y.

Jeannerod, M. (2001). Neural simulation of action: a unifying mechanism for motor cognition. *Neuroimage, 14,* 103–109. http://doi: 10.1006/nimg.2001.0832.

Kosslyn, S. M., Thompson, W. L., & Ganis, G. (2006). *The case for mental imagery*. Oxford University Press, New York.

Kuyken, W., & Howell, R. (2006). An exploratory study of autobiographical memory in adolescence: The role of depression and trauma. *Cognition and Emotion, 20,* 466-487.

Kuyken, W., & Moulds, M. L. (2009). Remembering as an observer: How is autobiographical memory retrieval vantage perspective linked to depression? *Memory, 17,* 624–634.

Lam, R. W., Levitt, A. J., Levitan, R. D., Michalak, E. E., Cheung, A. H., Morehouse, R., ...& Tam, E. M. (2016). Efficacy of bright light treatment, fluoxetine, and the combination in patients with nonseasonal major depressive disorder: A randomized clinical trial. *JAMA Psychiatry, 73,* 56–63. http://doi:10.1001/ jamapsychiatry.2015.2235.

Lambie, J. A., & Marcel, A. J. (2002). Consciousness and the Varieties of Emotion Experience A Theoretical Framework. *Psychological Review, 109,* 219-259.

Land, W. M., Volchenkov, D., Bläsing, B. E., & Schack, T. (2013). From action representation to action execution: exploring the links between cognitive and biomechanical levels of motor control. *Frontiers in Computational Neuroscience*, *7*, 127. http://doi.org/10.3389/fncom.2013.00127.

Lemogne, C., Piolino, P., Friszer, S., Claret, A., Girault, N., Jouvent, R., ... & Fossati, P. (2006). Episodic autobiographical memory in depression: Specificity, autonoetic consciousness, and self-perspective. *Consciousness and Cognition, 15,* 258- 268.

Lindeman, L., & Abramson, L. (2008). The Mental Simulation of Motor Incapacity in Depression. *Journal of Cognitive Psychotherapy, 22,* 228-249. http://doi: 10.1891/0889-8391.22.3.228.

Manos, R. C., Kanter, J. W., & Luo, W. (2011). The behavioral activation scale for depression-short form: Development and validation. *Behavior Therapy, 42,* 726-739.

McDermott, L., & Ebmeier, K. P. (2009). A meta-analysis of depression severity and cognitive function. *Journal of Affective Disorders, 119,* 1-8. http://doi:10.1016/ j.jad.2009.04.022.

Miltenberger, R. (2004). *Behaviour Modification: principles and procedure* (3rd ed.) Belmont, CA. Wadsworth Publishing.

Moberly, N. J., & Watkins, E. R. (2006). Processing mode influences the relationship between trait rumination and emotional vulnerability. *Behavior Therapy, 37,* 281-291.

Morimoto, S. S., Wexler, B. E., Liu, J., Hu, W., Seirup, J., & Alexopoulos, G. S. (2014). Neuroplasticity-based computerized cognitive remediation for

treatment resistant geriatric depression. *Nature Communications*, *5*, 4579. http://doi.org/10.1038/ncomms5579.

Motter, J. N., Pimontel, M. A., Rindskopf, D., Devanand, D. P. R, Meeusen, K. M. E., & Sneed, J. R. (2016). Computerized cognitive training and functional recovery in major depressive disorder: *A* meta-analysis. *Journal of Affective Disorders, 189,* 184-191.

Mousavi-Hondori, H., & Khademi, M. (2014). A Review on Technical and Clinical Impact of Microsoft Kinect on Physical Therapy and Rehabilitation. *Journal of Medical Engineering*, 846-514. http://doi.org/10.1155/2014/846514.

National Institute for Health and Care Excellence (2009) *Depression in adults: recognition and management* (NICE Guideline 91). Available at: https://www.nice.org.uk/guidance/CG91 [amended 2018].

Nierenberg, A. A., Keefe, B. R., Leslie, V. C., Alpert, J. E., Pava, J. A., Worthington, J. J. III, ... & Fava, M. (1999). Residual symptoms in depressed patients who respond acutely to fluoxetine. *The Journal of Clinical Psychiatry, 60*(4), 221-225. http://dx.doi.org/10.4088/JCP.v60n0403.

Nolen-Hoeksema, S., & Jackson, B. (2001). Mediators of the gender difference in rumination. *Woman Psychology Quarterly, 25,* 37-47.

Norman, G. R., Sloan J. A., & Wyrwich, K. W. (2003). "Interpretation of changes in health-related quality of life: the remarkable universality of half a standard deviation". Medical Care, 41 (5): 582–92. http://doi:10.1097/01.MLR.0000062554.74615.4C. PMID 12719681.

Opris, D., & Macavei, M. (2007). Profilul distresului afectiv [The Profile of Affective Distress]. in D. David (ed.), Sistem de evaluare clinică [Clinical Assessment System]. Ed. RTS, Cluj-Napoca.

Oshiyama, C., Sutoh, C., Miwa, H., Okabayashi, S., Hamada, H., Matsuzawa, D., ... & Shimizu, E. (2018). Gender-specific associations of depression and anxiety symptoms with mental rotation. *Journal of Affective Disorders, 235,* 277 – 284. http://doi: 10.1016/j.jad.2018.04.006.

Parola, N., Zendjidjian, X. Y., Alessandrini, M., Baumstarck, K., Loundou, A., Fond, G., … Boyer, L. (2017). Psychometric properties of the Ruminative Response Scale-short form in a clinical sample of patients with major depressive disorder. *Patient Preference and Adherence*, *11*, 929–937. http://doi.org/10.2147/PPA.S125730.

Partington, J. E., & Leiter, R. G. (1949). Partington's Pathways Test. *Psychological Service Center Journal, 1,* 11-20.

Pearson, D. G., Deeprose, C., Wallace-Hadrill, S. M. A., Heyes, S. B., & Holmes, E. A. (2013). Assessing mental imagery in clinical psychology: A review of imagery measures and a guiding framework. *Clinical Psychology Review*, *33*(1), 1–23. http://doi.org/10.1016/j.cpr.2012.09.001.

Porter, R. J., Bowie, C. R., Jordan, J., & Malhi, G. S. (2013). Cognitive remediation as a treatment for major depression: A rationale, review of evidence and recommendations for future research. *Australian and New Zealand Journal of Psychiatry, 47,* 1165–1175.

Renner, F., Ji, J. L., Pictet, A., Holmes, E. A., & Blackwell, S. E. (2017). Effects of Engaging in Repeated Mental Imagery of Future Positive Events on Behavioural Activation in Individuals with Major Depressive Disorder. *Cognitive Therapy and Research*, *41*(3), 369–380. http://doi.org/10.1007/s10608-016-9776-y.

Rock, P. L., Roiser, J. P., Riedel, W. J., & Blackwell, A. D. (2014). Cognitive impairment in depression: a systematic review and meta-analysis. *Psychological Medicine, 44,* 2029–2040.

Rogers, M., Bradshaw, J. L., Phillips, J., Chiu, E., Mileshkin, C., & Vaddadi, K. (2002). Mental Rotation in Unipolar Major Depression. *Journal of clinical and experimental neuropsychology, 24,* 101-106. http://doi: 10.1076/jcen.24.1.101.974.

Rush, A. J., Trivedi, M. H., Ibrahim, H. M., Carmody, T. J., Arnow, B., Klein, D. N., ... & Keller, M. B. (2003). The 16-item Quick Inventory of Depressive Symptomatology (QIDS) Clinician Rating (QIDS-C) and Self-Report (QIDS-SR): A psychometric evaluation in patients with chronic major depression. *Biological Psychiatry, 54,* 573-583.

Scult, M. A., Paulli, A. R., Mazure, E. S., Moffitt, T. E., Hariri, A. R., & Strauman, T. J. (2017). The Association Between Cognitive Function and Subsequent Depression: A Systematic Review and Meta-analysis. *Psychological Medicine*, *47*(1), 1–17. http://doi.org/10.1017/S0033291716002075.

Shilyansky, C., Williams, L. M., Gyurak, A., Harris, A., Usherwood, T., & Etkin, A. (2016). Effect of antidepressant treatment on cognitive impairments associated with depression: a randomised longitudinal study. *The Lancet. Psychiatry*, *3*(5), 425–435. http://doi.org/10.1016/S2215-0366(16)00012-2.

Shudo, Y., & Yamamoto, T. (2017). Assessing the relationship between quality of life and behavioral activation using the Japanese Behavioral Activation for Depression Scale-Short Form. *PLoS ONE*, *12*(9), e0185221. http://doi.org/10.1371/journal.pone.0185221.

Spitzer, R. L., Kroenke, K., Williams, J. B., & Lowe, B. (2006). A brief measure for assessing generalized anxiety disorder. *Archives of Internal Medicine, 166*(10), 1092-1097. http://doi: 10.1001/archinte.166.10.109.

Sun, M., Lanctot, K., Herrmann, N., & Gallagher, D. (2017). Exercise for Cognitive Symptoms in Depression: A Systematic Review of Interventional Studies. *The Canadian Journal of Psychiatry, 63,* 115-128. http://doi:10.1177/070674371 7738493.

Tiba, A. I. (2010). Grounded cognition perspective on irrational beliefs in Rational Emotive Behaviour Therapy. *Journal of Cognitive and Behavioral Psychotherapies, 10*, 87-99.

Tiba, A. I. (2018). Feelings-As-Embodied Information: Studying the Role of Feelings As Images in Emotional Disorders. *Frontiers in Psychology***,** *9*, 186**.** http://doi.org/10.3389/fpsyg.2018.00186.

Tiba, A., Johnson, C., & Vadineanu, A. (2012). Cognitive vulnerability and adaptation of parents of children with Autistic Spectrum Disorder. *Journal of Cognitive and Behavioral Psychotherapies*, *12,* 209-218.

Tiba, A. I., & Manea, L. (2018). An Embodied Simulation Account of Cognition in Rational Emotive Behavior Therapy. *New Ideas in Psychology, 48,* 12-20 doi:10.1016/j.newideapsych.2017.08.003.

Tombaugh, T. N. (2004). Trail Making Test A and B: Normative data stratified by age and education. Archives of Clinical Neuropsychology*, 19,* 203-214. https://doi.org/10.1016/S0887-6177(03)00039-8.

Undurraga, J., & Baldessarini, R. J. (2012). Randomized, Placebo-Controlled Trials of Antidepressants for Acute Major Depression: Thirty-Year Meta-Analytic Review. *Neuropsychopharmacology*, *37*(4), 851–864. http://doi.org/10.1038/npp.2011.306.

Vasques, P. E., Moraes, H., Silveira, H., Deslandes, A. C., & Laks, J. (2011). Acute exercise improves cognition in the depressed elderly: the effect of dual-tasks. *Clinics*, *66*(9), 1553–1557. http://doi:10.1590/S1807-59322011000900008.

Voelcker-Rehage, C., Godde, B., & Staudinger, U. M. (2011). Cardiovascular and Coordination Training Differentially Improve Cognitive Performance and Neural Processing in Older Adults. *Frontiers in Human Neuroscience*, *5*, 26. http://doi:10.3389/fnhum.2011.00026.

Vrana, S. R., & Van den Bergh, O. (1995). Perceptual and perceptual-motor fluency as a basis for affective judgements: Individual differences in motor memory activation. *Cognition and Emotion, 9*(6), 529-547.

Wagner, S., Müller, C., Helmreich, I., Huss, M., & Tadić, A. (2015). A meta-analysis of cognitive functions in children and adolescents with major depressive disorder. *European child & adolescent psychiatry, 24,* 5-19. http://doi:10.1007/s00787-014-0559-2.

Watkins, E. R., Moberly, N. J., & Moulds, M. (2008). Processing mode causally influences emotional reactivity: Distinct effects of abstract versus concrete construal on emotional response. *Emotion, 8*, 364-378.

Watkins, E. R., Mullan, E. G., Wingrove, J., Rimes, K., Steiner, H., Bathurst, N., ... & Scott, J. (2011). Rumination-focused cognitive behaviour therapy for residual depression: phase II randomized controlled trial. *British Journal of Psychiatry, 199,* 317- 322. http://doi:10.1192/bjp.bp.110.090282.

Watkins, E., & Baracaia, S. (2002). Rumination and social problem-solving in depression. *Behaviour research and therapy, 40,* 1179-1189. http://doi:10.1016/S00057967(01)000985.

Watkins, E., & Moulds, M. (2005). Distinct modes of ruminative self-focus: Impact of abstract versus concrete rumination on problem solving in depression. *Emotion, 5,* 319-328.

Watkins, E., Scott, J., Wingrove, J., Rimes, K., Bathurst, N., Steiner, H., ... & Malliaris, Y. (2007). Rumination-focused cognitive-behaviour therapy for residual depression: a case series. *Behaviour Research and Therapy,* 45, 2144-2154.

Webster, D., & Celik, O. (2014). Systematic review of Kinect applications in elderly care and stroke rehabilitation. *Journal of NeuroEngineering and Rehabilitation*, *11*, 108. http://doi: 10.1186/1743-0003-11-108

Wenke, D., Fleming, S. M., & Haggard, P. (2010). Subliminal priming of actions influences sense of control over effects of action. *Cognition, (115)*1, 26-38. http://doi:10.1016/j.cognition.2009.10.016.

Williams, J. M. G., Ellis, N. C., Tyers, C., Healy, H., Rose, G., & MacLeod, A. K. (1996). The specificity of autobiographical memory and imageability of the future. *Memory & Cognition, 24,* 116–125.

World Health Organization (2017). *Depression and Other Common Mental Disorders: Global Health Estimates*. Geneva. Licence: CC BY-NC-SA 3.0 IGO.

Wriessnegger, S. C., Steyrl, D., Koschutnig, K., & Müller-Putz, G. R. (2014). Short time sports exercise boosts motor imagery patterns: implications of mental practice in rehabilitation programs. *Frontiers in Human Neuroscience*, *8*, 469. http://doi:10.3389/fnhum.2014.00469.

Zarrinpar, A., Deldin, P, & Kosslyn, S. M. (2006). Effects of depression on sensory/motor vs. central processing in visual mental imagery. *Cognition and Emotion, 20*, 737-758. http://doi: 10.1080/02699930500405600.

Journal of Evidence-Based Psychotherapies,
Vol. 22, No. 1, March 2022, 169-182.

10.24193/jebp.2022.1.9

EFFECTIVENESS OF EMOTION FOCUSED TRAINING FOR SELF-COMPASSION AND SELF-PROTECTION IN INDIVIDUALS WITH INCREASED NARCISSISM

Martina Baránková[1*] *& Katarína Vaďurová*[1]

[1] Institute of Applied Psychology, Faculty of Social and Economic Sciences, Comenius University in Bratislava, Bratislava, Slovakia.

Abstract

Objective: The goal of the study was to map out the effectiveness of a 14-day online intervention (EFT-SCP) focused on self-compassion and self-protection in people with an increased level of narcissism.

Method: The research sample consisted of 63 participants, 19 men and 44 women, aged 21 to 70 years (M = 32.49; SD = 15.73). Participants were randomly assigned to intervention group (N = 32) or to the passive control group (N = 31).

Results: The results indicate that the self-compassion level in the experimental group did not increase following the intervention. However, the same group scored significantly lower on self-criticism after taking part in the intervention.

Conclusion: Short term online intervention was able to decrease self-criticism in subclinical population with increased traits of narcissism but was not effective in increasing self-compassion. It seems that in individuals with increased narcissism, it could take longer to develop kind and warm feelings towards self, connected to self-compassion. The process of decreasing self-criticism was effective and could be the starting point for further cultivating of self.

Keywords: narcissism, self-criticism, self-protection, self-compassion

Introduction

Compassion and prosocial behavior are crucial for mental health, well-being and healthy relationships between people and the world, and therefore, they have

[*] Correspondence concerning this article should be addressed to Martina Baránková, Institute of Applied Psychology, Faculty of Social and Economic Sciences, Comenius University in Bratislava, Mlynské luhy 4, 821 05 Bratislava, Slovakia.
Phone: 00421911278474
E-mail: martina.barankova@fses.uniba.sk

recently been in the forefront of research in psychology (Gilbert, 2013). Research in the area of social psychology and many other professional studies have been pointing to the health benefits of self-compassionate attitude, indicating that there is a connection between self-compassion and well-being. On the other hand, self-criticism is one of the indicators of psychopathology and is associated with numerous mental disorders (Halamová, 2018). The absence of compassion and accessibility in relationships is typical for individuals with a narcissistic personality disorder. The feeling of one's own importance and grandiosity in narcissistic individuals, associated with lack of empathy and compassion, impedes and limits their maintenance and development of relationships and affects their decision making ability and interactions (Kramer, et al., 2018).

Gilbert (2013) explains the term compassion from the evolutionary point of view. He claims that compassion is a developed motivational system designed to regulate negative influences. According to Gilbert (2018), compassion comes from the same capacities developed in primates for the purpose of bonding and attachment, including cooperative behavior, which is important for group survival. He further defines compassion as a deep awareness of the suffering of others associated with the feeling of wanting to alleviate it. At the same time, compassion requires kindness and care towards oneself and a realization that failure or erring is part of the human nature (Neff, 2003).

Self-compassion represents a form of a relationship with oneself, and that is why it is not based on a comparison with others, unlike the concept of self-criticism, for which such a comparison is a characteristic trait. Self-compassion leads us to believe that as human beings we do not need to be particularly excellent or special (Halamová, 2018). In order to feel good and comfortable with ourselves we do not need to be better than others (Neff, 2012).

Self-compassion correlates with a more stable evaluation of oneself, manifests higher emotional resilience (Neff, 2011), and along with self-criticism, which is on the other end of the spectrum of internal self-evaluation and represents its negative forms (Gilbert, 2000), self-compassion is an important part of internal experience of an individual.

Clinical psychologists are showing an ever greater interest in developing interventions and various intervention exercises as well as identifying aspects of current treatment procedures, which can help increase self-compassion levels (Halamová, 2018).

A study by Bluth and Eisenlohr-Moul (2017) presents findings concerning an 8-week self-compassion intervention, which resulted in significant decrease in stress and significant increase in resilience towards stressful situations. Similarly, the aim of Smeets, Neff, Alberts and Peter's (2014) study was to examine the effectiveness of a 3-week self-compassion intervention designed to increase resilience and wellbeing of university students. In this study, the intervention aimed at self-compassion resulted in increased life satisfaction and substantially higher mindfulness, optimism, self-efficacy and self-compassion itself.

The Emotion Focused Training aimed at Emotions of Self-Compassion and Self-Protection (EFT-SCP) invented by Halamová (2018), used in current study, proved to be very effective in increasing self-compassion, which is a necessary component of an individual's health and well-being. Moreover, it has proven to be most effective in the long run because it also decreases the level of self-criticism (Halamová, 2018).

The self-criticism personality trait lies on the other side of the coin of self-compassion and self-kindness. It is a relatively stable trait, but it is also an inner state of an individual, which pertains to sensitivity to various forms of negative self-evaluation and self-judgment focused on various aspects of the self, such as emotions, personality and intellectual attributes, physical appearance, behavior or inner thoughts (Gilbert, 2000). Self-criticism, as an intense and permanent relationship with the self, is identified by uncompromising high performance demands and by expression of hostility and contempt towards oneself when these high standards are not met (Lerman et al., 2015).

The conclusions of research studies carried out in the last 20 years associate self-criticism with a broader spectrum of psychological disorders and illnesses such as, for example, self-harm (Babiker & Arnold, 1997), social anxiety (Cox et al., 2000), posttraumatic stress disorder (Rosen et al., 2005), anger and aggression (Gilbert and Miles, 2000), and mood disorder (Teasdale & Cox, 2001). Self-criticism is also associated with a number of random psychopathologies such as eating disorders, depression and anxiety.

Narcissistic vulnerability, characterized by feelings of isolation or over-identification, which are associated with low self-compassion, has been found to be positively connected to depressive tendencies related to self-criticism (Neff, 2003). Self-critical individuals have a higher probability of developing a self-critical depression (Blatt & Homann, 1992), lower probability of responding to treatment, and greater probability of a relapse if they even do respond to treatment (Teasdale & Cox, 2001). Theoretical and empirical research indicates that a minimum of two interpersonal processes are closely connected with traits, self-criticism and depression, and those are: the inability to self-soothe and to resist attacks on the self (Blatt, 1974). The introjective or self-critical type of depression reflects an excessive harshness of superego introjects in individuals suffering from self-critical depression (Halamová, 2018). In this kind of depression underlied with self-criticism, an individual has a very cruel self-critical inner voice which can lead to the feelings of unworthiness, inferiority, failure or guilt. Individuals afflicted with this type of depression have a chronic fear of disapproval, criticism, loss of love, lack of appreciation and loss of acceptance. They continuously strive for success and perfection, they are often excessively competitive, they place too many demands on themselves and work hard. Sometimes, these individuals accomplish great things but their satisfaction is very short term (Blatt & Homann, 1992).

Narcissism is a personality disorder, which presents itself by an extremely positive view of oneself and hypersensitivity to feedback from others. However,

individuals with narcissistic traits may have a fundamental view of themselves that is fragile, even negative (Morf & Rhodewalt, 2001). Vulnerable narcissism is a characteristic personality trait typical for its manifestation in feelings of isolation or over-identification. Vulnerable narcissism could be also associated with low self-compassion (Neff, 2003).

While narcissism requires intense social comparisons (Krizan & Bushman, 2011), individuals with a high level of self-compassion avoid such comparisons and prefer sharing experiences with others instead of feeling superior to them, which is sometimes manifested by aggression (Neff & Vonk, 2009).

Depressive tendencies concerning self-criticism were significantly positively correlated with narcissistic vulnerability, which includes feelings of inadequacy, inhibition, and hypersensitivity. The relationship between self-critical depressive experience and narcissistic vulnerability is identical to the characteristics of shame, which is the driving force for pathological narcissism (Kohut & Wolf, 1978). Patients suffering from narcissistic vulnerability can find interventions helpful because they improve interpersonal relationships and reject self-criticism (Kealy, 2012).

Aim of the Study

The aim of the study is to map the effectiveness of intervention focused on self-compassion and self-protection in people with non-clinical narcissism.

The following hypotheses arose from the theoretical background:

H1: Participants in experimental group will score higher in self-compassion after the intervention.

H2: There will be no difference in self-compassion between pre-test and post-test in control group.

H3: Participants in experimental group will score higher in self-compassion after the intervention in comparison to the control group.

H4: Participants in experimental group will score lower in self-criticism after the intervention.

H5: There will be no difference in self-criticism between pre-test and post-test in control group.

H6: Participants in experimental group will score lower in self-criticism after the intervention in comparison to the control group.

Method

Sample

Of the 142 participants who filled out the introductory battery of questionnaires, we chose a final sample of 63 individuals, based on their above average score in the

measurements of narcissism, using the Narcissistic Personality Inventory based on the studies by Ames et al., (2006) and Ackerman (2011).

All of our participants were from the Slovak Republic, aged 21 to 80 years; mean age 32.49 (*SD* = 15.73). The sample comprised 19 men (30.2%) and 44 women (68.8%).

Measures

Sussex-Oxford Compassion Scale

The Sussex-Oxford Compassion Scale (SOCS-S; Gu et al., 2020) consists of a series of statements, which describe the type of a relationship an individual can have with the self. It comprises the following 5 subscales: a) recognizing suffering, b) understanding the universality of suffering, c) feeling for the person suffering, d) tolerating uncomfortable feelings, e) motivation to act to alleviate suffering. The participants scored the statements using a 5-point Likert scale (1 = not at all true, 2 = rarely true, 3 = sometimes true, 4 = often true, 5 = always true) designating the degree to which the statements were true for them. The SOCS-S has a very good internal consistency ranged from 0.74 to 0.97 Cronbach´s alpha for total scores and individual subscales.

Narcissistic Personality Inventory

The Narcissistic Personality Inventory-16 (NPI-16; Raskin & Terry, 1988) is a 40-item scale, which captures the range of various aspects of the narcissism construct. It is the most broadly used tool in nonclinical research. The length of the NPI can prevent its use in situations where the main concern or problem is the time constraint and participant fatigue (Ames, 2006). That is the reason why we decided to use the NPI-16 version (Ames et al., 2006), which comprises 16 pairs of statements taken from the NPI inventory. It is a shortened valid version, the reliability of which is expressed by Cronbach's alpha = .746. The participants taking the NPI-16 select one of the pairs of statements that best reflects their feelings and beliefs about themselves (Ames et al., 2006).

The Forms of Self-Criticising and Self-Reassuring Scale

The Forms of Self-Criticising and Self-Reassuring Scale (FSCRS; Gilbert et al., 2004) was designed to measure self-criticism, self-reassurance and the way people feel and think about themselves when they experience their own failures. It consists of a series of 22 statements. The scale comprises the following three factors: inadequate self, which reflects feelings of defeat, set-backs, and failures; self-reassurance, which reflects positive feelings towards the self as well as understanding and acceptance of our own failures (in this case, failures are perceived as part of the human existence); and the hated self, which is characterized by aggression, hate and disgust directed towards the self (Gilbert & Irons, 2004). In a study conducted by Halamová and colleagues (2017) a Slovak standardization sample (N = 1181) was used for the first time to verify the psychometric properties

of the FSCRS scale. The FCSRS and its three subscales have a good convergent validity (-.46***) and a good internal consistency (0.75-0.85). The participants use a 5-point scale (1 = not at true, 2 = rarely true, 3 = sometimes true, 4 = often true, 5 = always true) to express the extent to which the statements are true for them.

Procedure

Emotion Focused Training for Self-Compassion and Self-Protection

In our research, we used the 14-day online version of the Emotion Focused Training for Self-Compassion and Self-protection (EFT-SCP; Halamová, 2018), which consists of 14 exercises for various diagnostic categories and is an original Slovak intervention, which has proven to be the most effective in decreasing the level of self-criticism in the general population, from the long-term point of view (Halamová, et al., 2018). This training focuses on self-compassion and self-protection emotions. It was developed based on current knowledge on self-criticism from Emotion Therapy and previous programs cultivating self-compassion (e.g. Compassion Mind Training and Mindful Self-Compassion Program) (Halamová, et al., 2018). The following are individual exercises used in the intervention: How would you take care of a friend, Emotive drawing of a self-critic, Practicing saying No, Negative feedback practice, Memory projection memories, Expressing protective anger, Self-protective language, Self-protection in everyday life, Memories of compassion, Compassionate letter from a friend, Expressing self-compassion, Self-compassionate touch, Self-compassionate language, Self-compassion in everyday life (Halamová, 2018).

Prior the intervention we sent an introductory e-mail to the participants explaining the course of the research study and the requirements to fill out the battery of the questionnaires online. Following data collection and NPI-16 evaluation, we selected 63 participants with an increased level of narcissism to be our research sample. Subsequently, we divided the participants into an experimental (E) and control (K) group.

The course of the intervention itself (EFT – SCP) went as follows: For 14 consecutive days, every day the experimental group participants were sent one exercise to the e-mail address that they wrote down on their pre-test, which they completed that particular day. Following each exercise, they reflected on it by answering questions such as: How was it doing this exercise? How did you feel? What did you realize while doing this exercise? What can you apply from this exercise in your everyday life? Their opinions were sent to our e-mail address so that we could check that they finished the exercise and the subsequent opinion each day on time. Those participants, who did not finish the intervention or who missed more than 2 exercises were excluded from our study.

In our study, the control group was passive and did not take any specific action. After two weeks, we asked the experimental and the control group to again fill out the original battery of questionnaires.

Data analysis

Data obtained from NPI-16 from 142 participants were evaluated and from the data pool we proceed with 63 participants with higher levels of trait narcissism who were randomly assigned to the experimental or control group. All participant from the experimental and control group filled the pre-test and post-test questionnaires and all the participants in experimental group did at least 12 exercises from 14.

After verifying the data distribution for each group in each condition we proceed with the independent and paired t-tests to test the hypotheses.

Results

Following the intervention, the experimental group scored significantly higher in self-compassion than the control group ($p < 0.05$). Experimental and control group were equal in self-compassion prior the intervention (see Table 1).

In self-compassion, the control group attained significantly higher score in the pre-test than in the post-test, which means that self-compassion decreased in their case (see Table 2).

Table 1. Comparison of pre-test and post-test results in the experimental and the control group in self-compassion

Groups		*N*	*M*	*SD*	*t*	*p*	Cohen´s *d*
Self-compassion	Pre E	32	3.64	.83	0.04	.97	.01
	Pre C	31	3.63	.60			
Self-compassion	Post E	32	3.62	.98	-2.05	.04	.52
	Post C	31	3.17	.73			

Note: C = control group; E = experimental group; n = number of participants; M = mean; SD = standard deviation; p = statistical significance.

Table 2. Pre-test and post-test for the control group in self-compassion

Control group		*n*	*M*	*SD*	*t*	*p*	Cohen´s *d*
Self-compassion	Pre-test	31	3.63	0.60	2.71	.01	.69
	Post-test	31	3.17	0.73			

Note: C = control group; E = experimental group; n = number of participants; M = mean; SD = standard deviation; p = statistical significance.

No significant difference was found in the self-compassion variable between the pre-test and the post-test in the experimental group (see Table 3).

Table 3. Pre-test and post-test for the experimental group in self-compassion

Experimental group		*n*	*M*	*SD*	*t*	*p*	Cohen´s *d*
Self-compassion	Pre-test	32	3.64	0.83	0.09	.93	.02
	Post-test	32	3.62	0.98			

Note: C = control group; E = experimental group; n = number of participants; M = mean; SD = standard deviation; p = statistical significance.

Following the intervention, the experimental group reached a significantly lower level of self-criticism than the control group (see Table 4).

In the self-criticism variable, the control group did not manifest a significant difference between the pre-test and the post-test (see Table 5).

Table 4. Pre-test a post-test for the experimental and the control group in self-criticism

Groups		*n*	*M*	*SD*	*t*	*p*	Cohen´s *d*
Self-criticism	Pre-test C	31	2.76	0.64	0.51	.61	.13
	Pre-test E	32	2.86	0.93			
Self-criticism	Post-test C	31	2.60	0.63	-2.02	.05	.51
	Post-test E	32	2.27	0.67			

Note: C = control group; E = experimental group; n = number of participants; M = mean; SD = standard deviation; p = statistical significance.

Table 5. Pre-test and post-test for the control group in self-criticism

Control group		*n*	*M*	*SD*	*t*	*p*	Cohen´s *d*
Self-criticism	Pre-test	31	2.76	0.64	0.97	.33	.25
	Post-test	31	2.60	0.63			

Note: C = control group; E = experimental group; n = number of participants; M = mean; SD = standard deviation; p = statistical significance.

Following the intervention, the experimental group scored significantly lower than in the pre-test in the self-criticism variable (see Table 6).

Table 6. Pre-test and post-test for the experimental group in self-criticism

Experimental group		*n*	*M*	*SD*	*t*	*p*	Cohen´s *d*
Self-criticism	Pre-test	32	2.86	0.93	2.92	.01	.73
	Post-test	32	2.27	0.67			

Note: C = control group; E = experimental group; n = number of participants; M = mean; SD = standard deviation; p = statistical significance.

Discussion

Narcissism is associated with aggression, anxiety and depression (Dodge & Coie, 1987). Since a self-compassionate attitude and a kind approach to oneself result in an improved well-being and psychological health of every individual, protecting us from feelings of failure and frustration, depression and burnout, we have decided in our research to determine if it is possible to increase self-compassion and, at the same time, decrease self-criticism in people with increased level of narcissism. We expected that, following the EFT-SCP intervention, participants in the experimental group will score significantly higher in self-compassion than participants in the control group. Analyzing our data, we found that, following the intervention, the experimental group scored significantly higher in self-compassion than the control group, thus confirming our expectations. We based this hypothesis on the results of a study by Bluth and Eisenlohr-Moul (2016), presenting findings concerning an 8-week self-compassion intervention, which proved to be very effective. Similarly, a study by Smeets and colleagues (2014) showed a 3-week intervention aimed at self-compassion leading to increased well-being and substantially greater mindfulness, optimism, self-efficacy and self-compassion itself. In our research study the increase in self-compassion in participants was reached through a 14-day online training aimed at emotions of self-compassion and self-protection (Halamová, 2018).

For individuals with traits of narcissism the process of forgiving oneself is simpler (Fisher & Exline, 2006). That is the reason why we expected that participants with a higher level of narcissism would score higher, following an intervention with exercises focused on the area of forgiving oneself. Contrary to these expectations, we found that following the intervention in the participants from the experimental group there was not difference between pre-test and post-test in self-compassion. Neff (2003b) claims that non pathological narcissism indicates a low self-compassion based on feelings of superiority over others. Moreover, that feelings of isolation or exaggerated self-identification, associated with self-compassion, are characteristic for some types of narcissism.

In addition to the experimental group, which took part in the intervention and showed significant differences in the self-compassion level between pre-test and post-test, we decided to map the level of self-compassion in the control group, which did not take part in the intervention. Analyzing our data, we found that the control group reached a higher score in self-compassion in the pre-test than in the post-test. Since we did not send any exercises to the control group in the 14-day period of intervention, neither did we try to influence them in any other way, we assume that the different scores in the pre- and post-test in self-compassion were not the result of our influence but, rather, the personal answers of the participants could have been affected by various factors in their everyday lives.

The experimental group reached a lower score in self-criticism after the intervention than did the control group, which is what we expected. The content of the intervention exercises often focuses on self-reflection, imagining being one's own self-critic or giving feedback to one's own behavior and reactions in the past.

The study aimed to test the effectiveness of the intervention in reducing the level of self-criticism in participants with non-clinical narcissism. The results show a significant decrease in the level of self-criticism and these results are consistent with Halamová (2017) and Halamová et al. (2019). Such interventions, which support mindfulness and self-compassion and help reduce an exaggerated critical view of oneself, have the potential to improve psychological functioning of the participants in several areas, such as decreasing stress and increasing resilience as well as the ability to value one's own self.

We are well aware of the limitations of our study, mainly the limited and, in terms of gender, unbalanced sample. We also consider as a limit fact that mainly individuals motivated to cultivate their selves could be those who persisted until the end of the intervention. For future research, we recommend to verify a long-term effect of the intervention and verify its effect on individuals with clinical narcissism.

Conclusion

We recorded a significant increase in self-compassion in the experimental group compared to the control group. However, in the experimental group we found no difference in the level of self-compassion between the pre-test and post-test. In other words, the self-compassion did not increase in the post-test.

The key finding of our research is that using intervention exercises we were able to decrease the level of self-criticism in the experimental group participants in 14-day EFT-SCP intervention, which is consistent with Halamová (2017). Self-compassion and self-criticism are constructs, which significantly influence psychosocial, physical as well as work functioning of each individual, and affect his/her mental and physical health and well-being. It is, therefore, important to find tools or interventions, which would help lower stress, reduce negative attitudes and views of oneself, possibly increase an individual's resilience and ability to value him/herself. Decreasing self-criticism can be a key step in creating a more positive relationship with oneself.

Compliance with Ethical Standards

Disclosure of potential conflicts of interest

The authors declare that they have no potential conflicts of interests.

Funding

Writing this work was supported by the Vedecká grantová agentúra VEGA under Grant 1/0075/19.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent

Written informed consent was obtained from all individual participants included in the study.

Availability of data and materials

In order to comply with the ethics approvals of the study protocols, data cannot be made accessible through a public repository. However, data are available upon request for researchers who consent to adhering to the ethical regulations for confidential data.

Author Contributions

MB designed research project. KV collected data. KV and MB performed the statistical analysis. Both authors wrote the first draft of the article, interpreted the results, revised the manuscript and read and approved the final manuscript.

Declaration

All individuals listed as authors qualify as authors and have approved the submitted version. Their work is original and is not under consideration by any other journal. They have permission to reproduce any previously published material.

References

Ackerman, R. A., Witt, E. A., Donnellan, M. B., Trzesniewski, K. H., Robins, R. W., & Kashy, D.A. (2011). What does the narcissistic personality inventory really measure? *Assessment*, *18*(1), 67-87.

Ames, D. R., Rose, P., & Anderson, C. P. (2006). The NPI-16 as a short measure of narcissism. *Journal of research in personality*, *40*(4), 440-450.

Babiker, G., & Arnold, L. (1997). *The language of injury: Comprehending self-mutilation*. Wiley-Blackwell.

Blatt, S. J. (1974). Levels of object representation in anaclitic and introjective depression. *The psychoanalytic study of the child*, *29*(1), 107-157.

Blatt, S. J., & Homann, E. (1992). Parent-child interaction in the etiology of dependent and self-critical depression. *Clinical psychology review*, *12*(1), 47-91.

Bluth, K., & Eisenlohr-Moul, T. A. (2017). Response to a mindful self-compassion intervention in teens: A within-person association of mindfulness, self-compassion, and emotional well-being outcomes. *Journal of Adolescence*, *57*, 108-118.

Cox, B. J., Rector, N. A., Bagby, R. M., Swinson, R. P., Levitt, A. J., & Joffe, R. T. (2000). Is self-criticism unique for depression? A comparison with social phobia. *Journal of affective disorders*, *57*(1-3), 223-228.

Dodge, K. A., & Coie, J. D. (1987). Social-information-processing factors in reactive and proactive aggression in children's peer groups. *Journal of Personality and Social Psychology, 53*, 1146–1158.

Fisher, M. L., & Exline, J. J. (2006). Self-forgiveness versus excusing: The roles of remorse, effort, and acceptance of responsibility. *Self and Identity*, *5*(02), 127-146.

Gilbert, P. (2013). *The compassionate mind*. Robinson. London: CPI Group.

Gilbert, P. (2000). Varieties of submissive behavior as forms of social defense: Their evolution and role in depression.

Gilbert, P., & Irons, C. (2004). A pilot exploration of the use of compassionate images in a group of self-critical people. *Memory*, *12*(4), 507-516.

Gilbert, P., Clarke, M., Hempel, S., Miles, J. N. V., & Irons, C. (2004). Criticizing and reassuring oneself: An exploration of forms, styles and reasons in female students. The British Journal of Clinical Psychology, 41, 31-50. doi:10.1348/014466504772812959.

Gilbert, P., & Miles, J. N. (2000). Sensitivity to Social Put-Down: it's relationship to perceptions of social rank, shame, social anxiety, depression, anger and self-other blame. *Personality and individual differences*, *29*(4), 757-774.

Gu, J., Baer, R., Cavanagh, K., Kuyken, W., & Strauss, C. (2020). Development and psychometric properties of the Sussex-Oxford compassion scales (SOCS). *Assessment*, *27*(1), 3-20.

Halamová, J. (2018). *Sebasúcit a sebakritickosť: Tvorba a meranie efektu intervencie.* Bratislava: Univerzita Komenského v Bratislave.

Halamová, J., Heligmanová, M., & Strnádelová, B. (2019). Depresia a efekt krátkodobého online tréningu zameraného na emócie pre sebasúcit a sebaobranu. *Psychoterapie, 13*(3).

Halamová, J., Kanovský, M., & Pacúchová, M. (2017). Robust psychometric analysis and factor structure of the forms of self-criticizing/attacking and self-reasuring scale. *Ceskoslovenska Psychologie*, *61*(4).

Halamová, J., & Kanovský, M. (2017). Sebasúcit a sebakritickosť: Psychometrická analýza meracích nástrojov [Self-criticism and self-blame: Psychometric analysis of measuring instruments]. *Bratislava, Slovakia: Univerzita Komenského v Bratislave*.

Halamová, J., Kanovský, M., Varšová, K., & Kupeli, N. (2018). Randomised controlled trial of the new short-term online emotion focused training for self-compassion and self-protection in a nonclinical sample. *Current psychology*, 1-11.

Kealy, D., Tsai, M., & Ogrodniczuk, J. S. (2012). Depressive tendencies and pathological narcissism among psychiatric outpatients. *Psychiatry Research*, *196*(1), 157-159.

Kohut, H., & Wolf, E. S. (1978). The disorders of the self and their treatment: An outline. *International Journal of Psycho-Analysis*, *59*, 413-425.

Kramer, U., Pascual-Leone, A., Rohde, K. B., & Sachse, R. (2018). The role of shame and self-compassion in psychotherapy for narcissistic personality disorder: An exploratory study. *Clinical psychology & psychotherapy*, *25*(2), 272-282.

Krizan, Z., & Bushman, B. J. (2011). Better than my loved ones: Social comparison tendencies among narcissists. *Personality and Individual Differences*, *50*(2), 212-216.

Lerman, S. F., Rudich, Z., Brill, S., Shalev, H., & Shahar, G. (2015). Longitudinal associations between depression, anxiety, pain, and pain-related disability in chronic pain patients. *Psychosomatic medicine*, *77*(3), 333-341.

Morf, C. C., & Rhodewalt, F. (2001). Unraveling the paradoxes of narcissism: A dynamic self-regulatory processing model. *Psychological inquiry*, *12*(4), 177-196.

Neff, K. D. (2003). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and identity*, *2*(2), 85-101.

Neff, K. D. (2011). Self-compassion, self-esteem, and well-being. *Social and personality psychology compass*, *5*(1), 1-12.

Neff, K. D. (2012). The science of self-compassion. *Compassion and wisdom in psychotherapy*, *1*, 79-92.

Neff, K. D., & Vonk, R. (2009). Self-compassion versus global self-esteem: Two different ways of relating to oneself. *Journal of personality*, *77*(1), 23-50.

Raskin, R., & Terry, H. (1988). A principal-components analysis of the Narcissistic Personality Inventory and further evidence of its construct validity. *Journal of personality and social psychology*, *54*(5), 890.

Rosen, C., Tiet, Q., Cavella, S., Finney, J., & Lee, T. (2005). Chronic PTSD patients' functioning before and after the September 11 attacks. *Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies*, *18*(6), 781-784.

Smeets, E., Neff, K., Alberts, H., & Peters, M. (2014). Meeting suffering with kindness: Effects of a brief self-compassion intervention for female college students. *Journal of clinical psychology*, *70*(9), 794-807.

Teasdale, J. D., & Cox, S. G. (2001). Dysphoria: Self-devaluative and affective components in recovered depressed patients and never depressed controls. *Psychological Medicine*, *31*(7), 1311-1316.

INSTRUCTIONS TO AUTHORS

Manuscript preparation.

Manuscripts should not exceed 50 pages, must be prepared according to the *Publication Manual of the American Psychological Association,* 7th edition, and must be typed double-spaced throughout including the cover sheet, abstract and keywords, text, references, and tables/figures. Articles should be written in English. All articles should include an English abstract of no more than 250 words. Manuscripts are submitted for blind review; therefore, the author's name, degree, and affiliation should appear on the cover sheet only, which should also include the article title and the complete mailing address and telephone number of the corresponding author.

Submitting the manuscript.

Manuscripts can be currently submitted using the Journal's electronic submission system, using: https://www.ejmanager.com/my/jebp/. The corresponding author will receive a confirmation e-mail once a manuscript number has been assigned. For manuscript-related inquiries, please also contact the Editor (jebp@psychology.ro).
The corresponding author should provide a cover letter confirming that the manuscript is not being concurrently reviewed by another journal. The opinions and statements published are the responsibility of the authors, and such opinions and statements do not necessary represent the policies of IIAS of PAMH or the views of the editor. By submitting a manuscript, the authors agree that the copyright for their article is transferred to the IIAS of PAMH, if and when the article is accepted for publication.

Subscriptions.

Regular institutions rate 200 Euro per year (USA and EU), or 100 Euro per year (Developing Countries, Central and Eastern Europe). Individuals may subscribe at a one-year rate of 40 Euro per year (USA and EU) or 20 Euro per year (Developing Countries, Central and Eastern Europe). For more information, please contact the editor.

JOURNAL OF EVIDENCE-BASED PSYCHOTHERAPIES

Volume XXII

CONTENTS

Number 1

ISSN 2360 – 0853
ISSN-L 2360 – 0853