Mentalization and Dissociation after Adverse Childhood Experiences

Jolana Wagner-Skacel
Medical University Graz

David Riedl (✉ david.riedl@i-med.ac.at)
Medical University Innsbruck

Hanna Kampling
Universitätsklinikum Gießen und Marburg

Astrid Lampe
Medical University Innsbruck

Research Article

Wagner-Skacel J.[1,] Riedl D.[2+], Kampling H.[3], Lampe A.[2]

[1] Department of Medical Psychology and Psychotherapy, Medical University Graz, Austria

[2] Department of Psychiatry and Psychotherapeutic Medicine, Medical University Innsbruck, Austria

[3] Department of Psychosomatic and Psychotherapy, Medical University Giessen and Marburg, Germany

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[±]Corresponding Author: PhD. Riedl David

Department of Psychiatry and Psychotherapeutic Medicine, Medical University Innsbruck, Austria

Tel:+43/512/504/26128

E-mail: David.riedl@tirol-kliniken.at

Abstract

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Background: Impairment of mentalization may impact coping strategies, regulation of affect and stress. So far, little is known about the influence of impaired mentalization on dissociation in patients with adverse childhood experiences (ACEs). The aim of this study is to assess the relationship between ACEs, mentalizing and dissociation in adult individuals.

Methods: Sixty-seven patients with ACEs completed the Mentalization Questionnaire (MZQ), the Essener Trauma Inventory (ETI) and the Brief Symptom Inventory-18 (BSI-18). The SPSS PROCESS macro tool was applied to test if mentalization mediated the relationship of ACEs and dissociation.

Results: ACEs were significantly associated with higher dissociation (β=.42, p<.001) and lower mentalization (β=-.49, p<.001). When mentalization was added to the model as a predictor, the association of ACEs with dissociation was no longer significant (β=.11, p=.31) and a statistically significant indirect effect was found (β=.32, 95% CI: .16-.47). The overall explained variance of dissociation notably improved after inclusion of mentalization (17.5% to 49.1%). Thus, the results indicated that the association of ACEs on dissociation was fully mediated by mentalization.

Conclusion: Our results suggest that ACEs are associated with lower mentalization and higher dissociation. Lower mentalization was also associated with worse depression, anxiety, somatization and PTSD symptoms. These findings underline the increasing importance of early treatment of individuals affected by ACDs with a focus to foster the development of mentalization.

Introduction

Dissociation is a mental process which allows an individual to tolerate distressed events by splitting off highly incoherent or overwhelming thoughts, memories and feelings (1). A disruption is a disconnection in the integration of consciousness, memory, identity, emotion, perception, body representation, motor control and behavior. It affects all areas of personality functioning and of the integration of self (2). The dissociative process could be understood as a primary response to stress related with morphological alterations in the brain and is linked with enhanced amygdala response to emotional cues and cognitive control (2; 3). There is considerable evidence in the relationship between childhood abuse or neglect and dissociation symptoms in adulthood (4) with significantly predicted higher dissociation scores in an earlier age of onset, a longer duration of abuse and parental abuse (5). Chronic exposure to a stressful environment may lead to several alterations (5). In the psychodynamic theory, the experience of childhood trauma has been assumed to play a crucial role in the etiology of psychiatric disorders and hence show somatic diseases epigenetic modifications of the glucocorticoid receptor gene on the stress response in several studies with individuals with childhood abuse (6). Childhood abuse is regarded as an event so intense that it is impossible for the victim to integrate this experience on a symbolic level and thus fosters a pathological active formation of personality structure and affective forces (6).

Thus, it is reasonable that such adverse childhood experiences (ACEs) might hinder the development of good mentalizing abilities. Mentalizing is defined as the process by which we make sense of each other and ourselves with forming beliefs about mental states of those with whom we interact and our own (7). Mentalization is a dynamic multifaceted ability that has particular salience in the context of attachment relationship (8) Attachment trauma results in an increased amygdala response to salient stimuli (9). For the child who is exposed to violence and abuse, there is hardly any opportunity to reflect on their own inner world as they are forced to concentrate exclusively on the external traumatic world (10).

Emotional processes are linked to cognitive operations and reflective awareness with a language based broad spectrum of complex memory. Cognitive and executive functions are linked to mentalization identity narratives and mindfulness (11). The relation of cognition and emotion with the underlying structure of personality might be important when considering personality functioning and vulnerability. Personality changes can lead to distinct impairments in self and interpersonal function (12). Internalized early adverse experiences lead to corresponding inner working models that obstruct the functional regulation of dissociation. These mental processes might be modified in stressful circumstances and aggravate to difficulties.

It is reasonable to assume that the psychophysiological processes of mentalization may be involved in the dynamic of dissociation with its impact for imagination, our various verbal and conceptual information, our interpersonal and subjective meaning made of perception. Individual differences in the mentalization process with cognitive and emotional response to dissociation and the PTSD symptoms might be critical for both the construction of new management models as well as the development of

59   novel treatment strategies. However, research in this field remains scarce. Thus, the aim of this study

60   was to analyse the relationship between ACEs, mentalizing and dissociation in adult individuals (see

61   Figure 1). We hypothesized that participants with low mentalizing capacities may report more

62   dissociation and emotional loading associated with psychological symptoms (anxiety, depression,

63   somatization). Furthermore, we assume that mentalizing may be a mediator of the relationship between

64   ACEs and dissociation in adulthood.

65   **Materials and Methods**

66   *Sample and procedure*

67   This is a secondary analysis of data collected in a single center cross-sectional telephone-based

68   interview study. Study participants for this study were recruited from a larger sample of a previous

69   study (13). In this previous study, approximately 2,600 general hospital patients were screened for

70   experiences of domestic violence, ACEs, and a range of current physical and mental health problems.

71   Among the previous participants who consented to being contacted for future studies, we identified

72   those with experiences of interpersonal violence and randomly drew an age- and sex-matched control

73   sample who had reported neither domestic violence nor ACEs. Further details on study procedures

74   can be found in the previous publication (14). The study design was in accordance with the Declaration

75   of Helsinki (1964) and its later amendments and was approved by the research ethics committee of the

76   Medical University of Innsbruck (1108/2020).

77   **Measures**

78   *Maltreatment and Abuse Chronology of Exposure Scale (MACE)*

79   Adverse childhood experiences (ACEs) were assessed with the German version of the *Maltreatment*

80   *and Abuse Chronology of Exposure Scale* (MACE) (15). It consists of 75 items that retrospectively

81   assess the severity of exposure to ten types of maltreatment during each year of childhood and

82   adolescence up to age 18. For each year separately, participants are asked to endorse whether

83   maltreatment occurred during that particular year of their life or not. Thus, onset and cumulative

84   exposure are measured. The MACE provides an overall severity score and multiplicity score (number

85   of types of maltreatment experienced) and has good test-retest reliability and validity (15).

86   *Essener Trauma Inventory (ETI)*

87   To assess trauma-related symptoms, the symptom list of the Essener Trauma Inventory (ETI) was

88   used. The symptom list of the ETI consists of 23 items rated on a four-point Likert scale. A total score

89   (range: 0 to 69) and four subscales (dissociation; intrusion; avoidance; hyperarousal) can be

90   calculated, with higher values indicating more distress. Values >16 on the ETI total score indicate a

91   notable distress level and values >27 a clinically relevant level of PTSD symptoms. Good internal

92 consistency and validity have been reported for the total score and for the four subscales (16). An
93 excellent internal consistency (α=.93) for the ETI-total score was found in our sample.

94 *Brief Symptom Inventory (BSI)*

95 Psychological distress was assessed with the Brief Symptom Inventory (BSI-18), consisting of 18
96 items rated on a four-point Likert scale (from "not at all" to "very often"). A total score and three
97 subscale scores (depression, anxiety, somatization) can be calculated. Good reliability and validity for
98 the subscales and total score have been reported. In our sample, excellent internal consistency was
99 found for the BSI total score (α = .92) as well as for the anxiety (α = .80) and depression (α = .85)
100 subscales.

101 *Mentalization Questionnaire (MZQ)*

102 German version of the Mentalization Questionnaire (MZQ) was used to assess the participants self-
103 rated mentalizing (17). It consists of 15 items rated on a 5-point Likert scale (from "totally disagree"
104 to "totally agree"). A total score can be calculated with higher score indicating robust and lower scores
105 impaired mentalizing (17). Good internal consistency and validity has been reported for the total score
106 of the MZQ (17).

107 **Statistical procedure**

108 Sample characteristics and distribution of mentalization are presented by descriptive statistics.
109 Differences in mentalization, trauma-related symptoms (ETI subscales) between patients with and
110 without ACEs were investigated with independent sample t-tests. Associations of mentalization with
111 dissociation, trauma-related symptoms (ETI subscales), and psychological distress (BSI subscales)
112 were assessed by calculation of Pearson correlation coefficients. Effect sizes of $r > 0.1$ and $d > 0.2$
113 were considered small, while $r > 0.3$ and $d > 0.5$ indicated a medium, and $r > 0.5$ and $d > 0.8$ a large
114 effect, respectively.

115 To investigate if mentalization mediates the association between ACEs and dissociation, the SPSS
116 PROCESS macro tool based on the mediation method with 10,000 bootstrap bias-corrected 95%
117 confidence intervals (CI) was used as recommended by Hayes (18). In this approach, the indirect effect
118 (i.e., the mediation) is statistically significant if the bootstrapped 95% CI does not include the value
119 zero. Direct and indirect effects are presented as standardized coefficients. R^2 represents the explained
120 variance of the variable and is presented in percentage values. A priori sample size calculations indicated
121 that a sample of n=68 patients should be large enough to detect associations of medium effect size
122 (f^2=0.15; α=.05; 1-β=0.8) in a multiple regression setting with two predictors. Sample size calculations

123 was performed with G*Power (v3.1) and statistical analyses with IBM SPSS (v22.0). P-values <.05

124 (two-sided) were considered statistically significant.

125
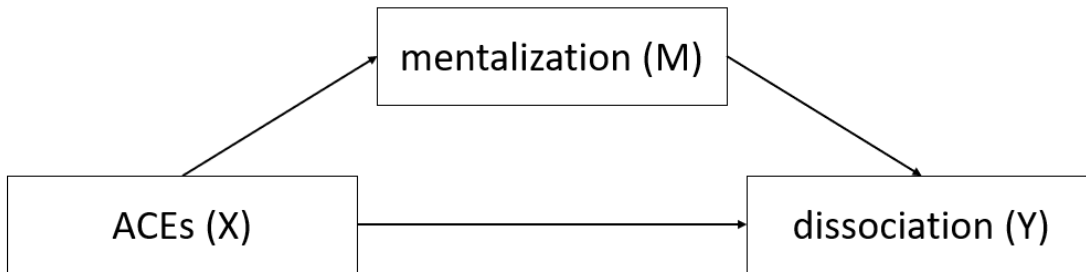
127 *Figure 1: Theoretical model of the moderating effect of mentalization on the relationship of ACEs and dissociation*

128

Results

130 A total of 102 participants were contacted between April 14th and 30th 2020, of which 67 (65.7%)

131 agreed to take part in the study. Reasons for non-participation were lack of interest (60.0%), lack of

132 time (22.9%), grave physical or mental health problems (8.6%), language barrier (2.9%), not wanting

133 to conduct a phone interview (2.9%) or immediately hanging up (2.9%) (see Table 1). Participants

134 and non-participants did not statistically differ in regard to previously assessed overall number of

135 ACEs (2.0 vs. 2.7), domestic violence (6.9 vs. 6.3 points), age (48.5 vs. 43.4 years), or sex (female:

136 65.7% vs. 76.1%) (all p>.05).

137 Mean age of the participants was 48.5 years, the majority was female (76.1%), living with their partner

138 or family (62.7%) and about two thirds of the sample had children.

139

140

Table 1:

	mean / n	(SD / %)
Age (years)	48.5	(13.6)
Gender		
Male	16	(23.9%)
Female	51	(76.1%)
Relationship status		
single	16	(23.9%)
married / long-term relationship	40	(59.7%)
widowed	3	(4.5%)
divorced / separated	8	(11.9%)
Living situation		
living alone	20	(29.9%)
living with partner / family	42	(62.7%)
living with family of origin	4	(6.0%)
living in shared apartment	1	(1.5%)

Parenthood	44	(65.7%)
missing data	1	(1.5%)
Social class		
Lower class / working class	12	(17.9%)
Middle class	45	(67.2%)
Upper class	10	(14.9%)

141

Association of mentalization with ACEs, dissociation, PTSD symptoms and psychological distress

143 Among the included patients, n=37 patients (55.2%) reported no ACEs, while the remaining n=30
144 (43.3%) reported one or more forms of ACEs. Patients with ACEs showed a significantly decreased
145 ability of mentalization with a large effect size (4.1 vs. 3.4 points; t=4.2; p<.001; d=1.05) and higher
146 dissociation scores with a medium effect size (4.4 vs. 1.8 points; t=3.0; p=.005; d=0.75).

147 Mentalization and dissociation were highly significant correlated with a large effect size (r=-.70,
148 p<.001). Additionally, significant associations with large effect sizes could be observed between
149 mentalization and all three PTSD-subscales (intrusion: r=-.53; avoidance: r=-.70; hyperarousal: r=-.60;
150 all p<.001) as well as with depression (r=-.64; p<.001) and anxiety (r=-.64; P<.001). The association of
151 mentalization and somatization was also statistically significant with a medium effect size (r=-.46,
152 p<.001).

Mentalization as mediator between ACEs and dissociation

154 To test the association of ACEs, mentalization and dissociation, a mediation analysis was conducted. In
155 a first step, the direct association of ACEs on dissociation was tested. ACEs were significantly
156 associated with dissociation (β=.42, p<.001) and predicted 17.5% of its variance. In a second step,
157 mentalization was added to the model as mediator between ACEs and dissociation. Higher ACE values
158 were associated with lower mentalization scores (β=-.49, p<.001) and predicted 23.7% of its variance.
159 While mentalization was significantly associated with dissociation (β=-.64, p<.001), the association of
160 ACEs with dissociation was no longer significant (β=.11, p=.31) and the indirect effect was statistically
161 significant (β=.32, 95% CI: .16 - .47). The explained variance of dissociation notably increased to 49.1%

162   when mentalization was included as mediator in the model. Thus, the data indicated that the association

163   of ACEs on dissociation was fully mediated by mentalization. See also figure 2.

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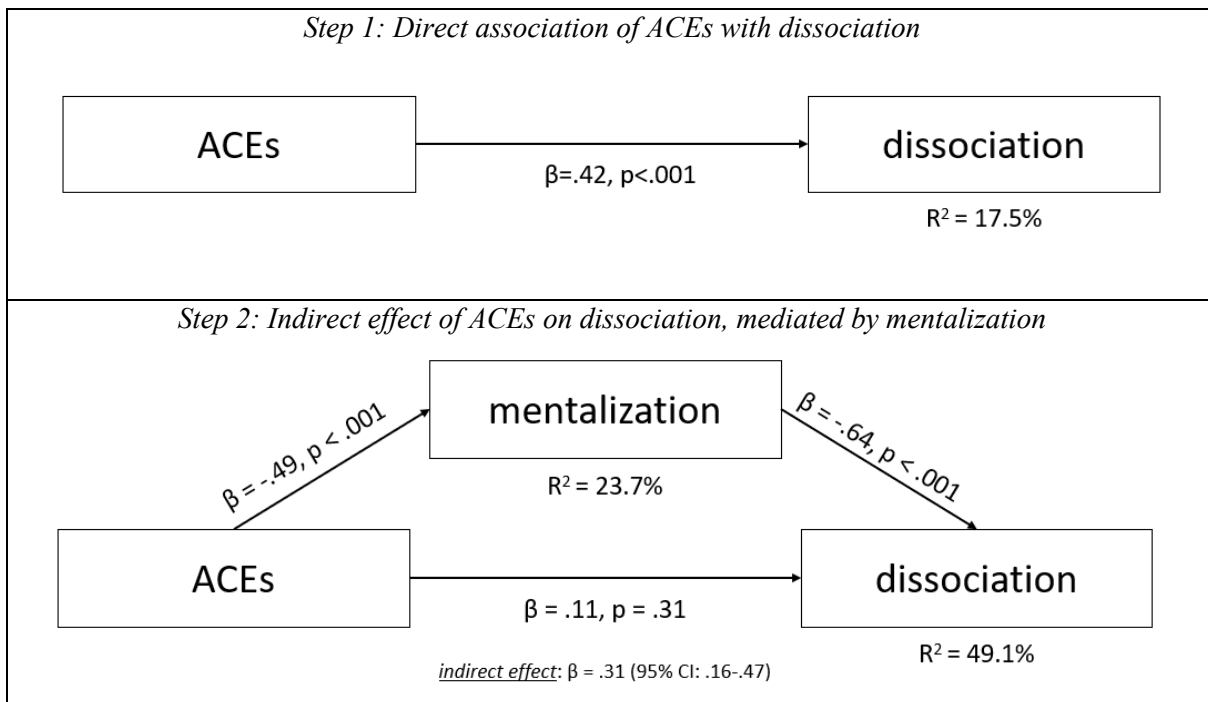
165   *Figure 2: Mediation analysis of the direct and indirect association of ACEs with dissociation, mediated by mentalization.*
166   *ACEs = Adverse childhood experiences, β = standardized coefficient; R2= explained variance of the variable*

167

Discussion/Conclusion

169   The aim of our study was to assess the relationship between ACEs, mentalizing and dissociation in

170   adult individuals. In our sample, there was a clear association of ACEs with dissociative symptoms.

171   However, the direct association of ACEs on dissociation was not longer statistically significant when

172   mentalization was added to the model as a mediator of said relationship.

173   In accordance with previous literature, we found a significant association between dissociative

174   symptoms and mentalization, which can be understood as an adaptation process to a traumatic

175   environment (19)with disruption of biobehavioral mechanism related to self and identity.

176   Dysfunctional and maladaptive coping strategies influencing the stress response with a stress

177   depending changes from controlled to an automatic mentalizing process (20). According to

178   psychodynamic theory, a patient with a lower structural integration based on maladaptive early

179   attachment experiences shows symptom intensification and a lower therapy response (21). A stress-

180   dependent switching model from explicit to implicit mentalizing is based on increasing emotional

181   involvements in order to regulate personal stress arousal in the interaction with the attachment system.

182   A broad range of research show that ACEs can be considered as a transdiagnostic factor with

183   implications in a variety of emotional and functional disorders and problems (22). The impact of

traumatic experience plays a key role in the regulation of distress based on the attachment system (23)
with subsequent problems in mentalizing. Social embedded stress response may enforce the pathway
between dissociation and mentalization in patients with attachment insecurity. This theory is supported
by recent a recent study, which showed that attachment insecurity in combination with lower
mentalizing mediated the link between childhood trauma and PTSD symptoms in adults who had
experienced childhood neglect and abuse (24). Early maltreatment may increase the risk for the
development of attachment insecurity with long-lasting effects. The development of mentalizing is
thought to be fostered by secure attachment relationship with a process of contingent mirroring of
child's affects and subjective emotional experiences. This mental representation is important for
strategies to regulate stress and to communicate with the self and the other. There is emerging
evidence to indicate mentalizing failure in individuals with adverse childhood experiences, including
lower emotional understanding and delyed onset of theory of mind (25). Sharp et al describe a social-
cognitive model of PTSD and attachment insecurity with impaired mentalizing abilities mediated
associations with dissociative experiences (26). Individuals with lower mentalizing predict
dissociation after exposure to childhood trauma (24). There may be a link between related mentalizing
process early maltreatment and later posttraumatic symptoms such as dissociative experience.
Childhood trauma engendering dissociative mental representations as a protective function to
minimize the fear of shame and guilty. The mentalizing ability with its interpretations of the mental
states of self and the others could lead to a damping of this social-cognitive model of PTSD and
dissociative experiences. Social embedded mentalizing may influence important aspects of individual
function.

Our data also demonstrate that lower mentalization was associated with higher depression, anxiety and
somatization as well as PTSD symptoms (avoidance, hyperarousal, intrusions). Depression and
depressive symptoms with impairments in interpersonally transmitted information may be highly
linked to mentalizing abilities based on developmental aspects of attachment and social relationships.
A few empirical studies reported associations linking change in interpersonal functioning and
attachment security with change in depressive symptoms (27). Relevant early developmental
epigenetic modification of gene expression influences behavioral and emotional patterns in patients
with depressive symptoms (28). This biobehavioral mechanism involved in problems related to self
and identity should be a part of social capacity treatments. Interpersonal therapy focusing on helping
patients to create or renew social contacts and social support may benefit from better mentalizing (29).
Mentalization with its linkages to attachment theory offers possibilities for understanding the
dynamics of depression with differences between severe, chronic and milder or an episodic course
(30). Functional domains, which are often impaired in patients with ACEs, include personality
structure, affective, cognitive and self-regulatory resources as well as the quality of the self-other
representation (29). These functional domains are important for the dynamic interplay of meaningful

220 relationships. Functional domains with relevance for the therapeutic relationship and treatment
221 outcome as somatization and anxiety.

222 Somatization refers to psychological stress caused by the perception of physical dysfunctions focusing
223 on body symptoms with strong autonomous mediation (31). Subjective perception, thoughts, emotions
224 and behavior associated with the individual somatic status are sometimes clinically more important than
225 a medical diagnosis (32). The specific weight for the patients' perception is a body-related cognitive
226 ability or competence, justified from a neuroscientific and a health science perspective. Interoceptive
227 awareness and conscious body-related self -regulation seems to be a basic function, which may serve in
228 patients with ACEs as an important homeo-static/allostatic control (33). Subjective representations of
229 illness determine the coping behaviors and consequently the illness outcome. Somatization thus may be
230 viewed as a primary driver for higher perception, symptom reporting, health care use, symptom
231 persistence, and negative treatment outcome (34).

232 Internalized traumatic early experiences may lead to corresponding working models and obstructions
233 in the functional regulation of emotions with less flexibility and more adaptive personality patterns
234 (35). Thus, traumata may not only disrupt the attachment system but also impair mentalizing. There is
235 an inverse relationship between arousal and mentalizing that impairs the capacity to frame and
236 particularly to reframe overwhelming experiences. Overcontrol of emotions such as in the dissociative
237 subtype of PTSD need effective treatments as fostering mentalizing with a top-down regulation (36)
238 and strengthening the individuals capacity to feel and to simultaneously reflect on his or her feelings.
239 The painful feelings as intrusions and hyperarousal merged with shame rise to teleological functioning
240 in which the person increasingly feels that only actions can bring relief (36). Intrusive thoughts in
241 which the individual loses contact with reality can lead to dissociative states to protect against feelings
242 of inner badness and worthlessness. Mentalization may lead to understanding the dynamics associated
243 with a tendency for reenactments as externalization of non-mentalized experiences in relationship to
244 regulate extremely painful feelings.

245 Impaired mentalization in posttraumatic symptoms show more psychological distress and higher
246 symptom perception. Similarly, individuals with ACEs and an insecure attachment style show more
247 psychological stress and higher symptom load. The modulation of primary affective states into cognitive
248 -affective key features is disrupted by attachment trauma with leading to impairments in the capacity
249 for self-regulation and the capacity for accessing the adaptive functioning of the social imaginations in
250 relation to the intersubjective self (37). Understanding my inner world and the world of the other with
251 mentalizing capacities can contribute to the understanding of psychological resilience.

252 We are essentially tied to who or what we consider ourselves to be. The images we make of our selves

253 characterize who or what we are (38).

254 The present study has several strengths and limitations. A major *limitation* is the limited sample size.

255 However, sample size calculations indicated that the sample was sufficiently powered to detect

256 medium effect sizes and results indicated positive findings. As for its *strengths*, to our knowledge, this

257 is the first study to investigate the mediation effect of mentalization in the association between ACEs

258 and dissociation. A second strength is the applied study methodology: in the present study carefully

259 telephone-based structured interviews were conducted by highly trained specialists in psycho-

260 traumatology. This approach was not only chosen to improve the quality of collected data, but also to

261 guarantee safety of this highly vulnerable patient collective and to support affected persons if

262 necessary.

263

264 Conclusion

265 The relationship between ACEs and dissociation is fully mediated by mentalization; this means than

266 the important predictive factor for dissociation is not if you have been abused as a child, but rather

267 how this abuse influenced your mentalization capabilities. We suggest that mentalizing is a helpful

268 transtheoretical and transdiagnostical concept to explain vulnerability to dissociation and its treatment.

269 Additionally, this indicates that early treatment of individuals affected by ACEs with a focus to foster

270 the development of mentalization could prevent from developing dissociative symptoms as an adult.

271 Social embedded treatment strategies with adaptive functioning of social imaginations in relation to

272 inter and intrasubjective capabilities may foster a therapeutic outcome.

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276 **Statements**

277 **Author Contributions**

278 J.W.S. writing-original draft preparation; D.R., conceptualization, investigation, methodology, formal
279 analyses and editing; A.L. conceptualization, supervision; H.K. reading, supervising, all authors have
280 read and agreed to the published version of the manuscript.

281 **Statement of Ethics**

282 The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by
283 the Ethical Committee of the Medical University Innsbruck (1108/2020).

284 **Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

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