

Abstract

1 **Objectives:** Reflective functioning (RF) impairments, characterized by the inability to
2 understand behaviors in terms of mental states, have been linked to different psychological
3 problems. However, the mechanisms through which RF impairments are linked to conduct
4 problems need further investigation. The present study aims to explore, using network
5 analyses, how different RF impairments relate to specific conduct problems manifestations,
6 and to examine the role played by hyperactivity/ inattention, emotional, and peer problems in
7 these relationships, in a sample of 1664 Spanish adolescents from the general population.

8 **Method:** We estimated a graphical LASSO network connecting different RF impairments
9 and the different conduct, emotional, peers, and hyperactivity/inattention problems. We
10 examined the most central nodes in the network and the shortest paths between RF
11 impairments and conduct problems manifestations. Next, we computed directed acyclic
12 graphs (DAG) in order to gain insight about the possible directions of the prediction between
13 the variables. **Results:** Shortest path analyses and DAG suggest direct connections between
14 RF impairments and conduct problems, but also that impulsivity, depressed mood, and bully
15 victimization play a mediating role in these relationships. DAG indicates that RF
16 impairments lead to different psychological difficulties. **Conclusions:** The findings suggest
17 different pathways connecting RF impairments and conduct problems. The results find echo
18 in the mentalization-based theory highlighting that emotion dysregulations, such as anger
19 proneness, play an important role in connection RF impairments and different conduct
20 problems. RF impairments appear to be a transdiagnostic process associated with different
21 psychological difficulties, representing an important target in detection and intervention
22 strategies.

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Introduction

26 Adolescence represents a period of transition, crucial for the development of
27 psychological processes such as the ability to link mental states to behaviors, or mentalizing
28 (Blakemore, 2008; Brizio, Gabbatore, Tirassa, & Bosco, 2015). The capacity to mentalize has
29 been researched in terms of *reflective functioning* (RF) abilities, which are dedicated to the
30 perception and comprehension of mental contents in self and others, leading to social
31 cognitive inferences that are crucial to apprehend the interpersonal and social world (Badoud
32 et al., 2017; Fonagy, Gergely, Jurist, & Target, 2002). The development of psychological and
33 behavioral problems, such as conduct problems often exacerbate during adolescence (Giedd
34 et al. 2008; Moffitt 1993). Conduct problems entail a heterogeneous category of
35 manifestations, including behavioral manifestations such as aggression, rule breaking,
36 defiance, but also aspects related to impulsivity and irritability, representing one of the most
37 prevalent and treatment resistant problem in child and adolescent psychiatry (National
38 Institute for Health and Clinical Excellence, 2013).

39 Several authors postulate that conduct problems arise as a failure of the RF capacities
40 to regulate high arousal and impulsivity (Bateman, Bolton, & Fonagy, 2013; Fonagy, 2004).
41 By allowing the emergence of alternative explanations for our own and others' behavior
42 through reflective perspective-taking, RF has been hypothesized to help regulate behavioral
43 impulsivity (Bateman 2012). Acknowledging that mental states are relevant to understanding
44 oneself and others and that they have an impact on behaviors allows for a better self-
45 regulation and a greater sense of agency (Fonagy & Luyten, 2017). Several studies have
46 already investigated RF capacities of individuals presenting conduct problems and antisocial
47 behaviors, documenting decreased RF capacities in these populations (Levinson & Fonagy,
48 2004; Möller, Falkenström, Mattias, & Holmqvist, 2014; Taubner, White, Zimmerman,
49 Fonagy, & Nolte, 2012; Taubner, White, Zimmermann, Fonagy, & Nolte, 2013).

50 Despite these studies investigating RF and conduct problems, there are still important
51 gaps in the literature. First, there are very few studies that have examined the relationships
52 between RF and conduct problems during adolescence in the general population (Chow,
53 Nolte, Cohen, Fearon, & Shmueli-Goetz, 2017; Ha, Sharp, & Goodyer, 2011; Taubner et al.,
54 2012). From a dimensional perspective on mental health and illness, the same processes that
55 are implicated in the normative development also underlie psychopathological manifestations
56 (Cuthbert 2014). Moreover, clinical symptoms can be placed on a continuum with subclinical
57 manifestations, both from a phenomenological point of view, as well as longitudinally (Van
58 Os 2013). Thus, the investigation of the interactions between psychological processes and
59 subclinical manifestations in general population samples, where these relationships are not
60 blurred by the unfolding of psychopathology, is crucial for the understanding of the
61 emergence of clinical, more severe manifestations.

62 In addition to the scarcity of studies examining RF and conduct problems in typically
63 developing adolescents, the majority of investigations focus solely on one domain of
64 psychological problems, for example conduct problems, and fail to take into account the
65 importance of other co-occurring psychological difficulties. In isolated fashion, previous
66 studies have stressed the significance of roles played by internalizing problems such as
67 anxiety and depression (Colder et al. 2018; Granic 2014; Hodgins et al. 2011; Kofler et al.
68 2017; Martinez-Ferrer and Stattin 2016), hyperactivity and inattention (Erskine et al. 2016;
69 Mordre et al. 2011; Philipp et al. 2017; Storebø and Simonsen 2016), and interpersonal
70 difficulties (Espelage et al. 2017; White and Kistner 2011) in the emergence and maintenance
71 of conduct problems. Moreover, Chow et al. (2017) suggested that the internalizing problems
72 play an important role in the relationship between RF impairments and conduct problems.
73 Furthermore, the majority of the studies focus on the RF capacities and conduct disorder as
74 unitary constructs. However, each one of these constructs entails a series of components that

75 are likely to entertain bidirectional interactions within and between components (Bernstein et
76 al. 2017). For example, RF is a multidimensional construct, encompassing inferences about
77 cognitive and affective mental states in oneself and in the others (Fonagy & Luyten, 2009).
78 In the same vein, psychological difficulties can be broken down into component
79 manifestations, each yielding its own influence at the affective, cognitive or behavioral
80 levels. For example, conduct problems entail behavioral manifestations, such as opposition,
81 aggression, rule breaking, but also affective components such as irritability and anger. The
82 investigation of the relationships between the different components of the psychological
83 process and psychological difficulties might inform about the complex dynamics that
84 underlie mental health and illness, thereby helping identify therapeutic targets for specific
85 clinical profiles.

86 A novel method allowing the investigation of the relationships between different
87 components of psychological processes and difficulties makes use of network analyses. The
88 network approach to psychopathology conceptualizes mental disorders as dynamic, complex
89 systems of symptoms and psychological processes interacting in mutually reinforcing loops,
90 which inherently define a psychopathological disorder (Borsboom 2015). From a statistical
91 standpoint, network analyses allow the investigation of the connections (edges) between a
92 series of variables (nodes). In essence, network analyses provide an informative way to
93 describe the complex relationships between a varied set of key variables, focusing on the
94 local interactions and determining the role played by each node in the network (Borsboom
95 and Cramer 2013; McElroy et al. 2018).

96 In this context, the goal of the present study is to address some of the above-
97 mentioned limitations regarding the study of RF impairments and conduct problems during
98 adolescence. For this purpose, we aim to use network analyses in order to explore the
99 relationships between the different components of RF impairments, such as lack of emotional

100 and self-awareness and inability to regulate high arousal, and different conduct problems
101 manifestations, such as anger proneness, stealing, being involved into fights, and opposition,
102 in a sample of adolescents from the general population. Critically, we are interested in the
103 role played by manifestations of other psychological difficulties in these relationships. We
104 aim to focus on the psychological manifestations that were previously related to conduct
105 problems, more precisely hyperactivity and inattention, emotional problems, such as
106 depressed mood, anxiety, nervousness and somatic complains, and peer problems, such as
107 bully victimization, lack of friends and withdrawn. For this purpose, we conducted a series of
108 network analyses. First, in order to identify the network structure and to identify the central
109 nodes in the network we estimated a non-directed, weighted network composed by RF
110 impairments and different psychological difficulties. Secondly, in order to explore the
111 connections between RF impairments and conduct problems and to identify the
112 manifestations of other psychological difficulties that might play a role in connecting these
113 two domains, we estimated shortest paths between these two domains. Finally, we estimated
114 an acyclic directed network, in order to explore the directionality of these relationships.

115 **Method**

116 **Participants**

117 Stratified random cluster sampling was conducted at the classroom level, in an
118 approximate population of 15000 students selected from La Rioja, Spain. The students
119 belonged to different public and charter Secondary Schools and Professional Training
120 Centers, as well as to different socio-economic levels. The layers were created as a function
121 of the geographical zone and the educational stage.

122 The initial sample consisted of 1881 students, from 34 schools and 98 classrooms
123 participated in the study. Eliminating those participants who presented a high score on the

124 Oviedo Infrequency Response Scale (more than 3 points) ($n=104$), an age older than 19
125 ($n=170$) or incomplete questionnaires ($n=30$). A final sample of 1664 Spanish adolescents
126 (882 females) from the general population took part in this study, aged between 14 and 19
127 (mean age 16.11, $SD=1.36$). Nationality distribution of the participants was as follows:
128 89.9% Spanish, 3.7% Latin American (Bolivia, Argentina, Colombia, and Ecuador), 2.4%
129 Romanian, 1% Moroccan, 0.7% Pakistani, 0.7% Portuguese, and 2% other nationalities.

130 **Instruments**

131 Reflective functioning questionnaire (RFQ; Fonagy et al., 2016) is an 8-item
132 questionnaire investigating the ability to link mental states to behaviors. The items are rated
133 from 1 (totally disagree) to 7 (totally agree) and they were rescored based on the procedure
134 described by the authors, on a scale from 0 to 3 (for detail, see Fonagy et al., 2016). Since we
135 are interested in the risk factors for different psychological problems, only the 6 items
136 measuring the uncertainty about mental states subscale were used. High score on the
137 uncertainty about mental states (RFQu) represent a lack of knowledge about mental states
138 and impairments in linking mental states to behaviors. Spanish translation, following the
139 international guidelines for tests adaptations (Muñiz et al. 2013) of RFQ was used in the
140 present study.

141 Strength and difficulties questionnaire (SDQ; Goodman, 2001) is a self-report
142 questionnaire widely used for the assessment of different emotional and behavioral problems
143 related to mental health in adolescents. The SDQ is made up of a total of 25 items rated 0
144 (not true), 1 (somewhat true), 2 (certainty true). These items are distributed in five subscales:
145 conduct problems, hyperactivity/inattention, emotional problems, peer problems, and pro-
146 social behaviors. The first four subscales yield a score reflecting the totality of difficulties.
147 Given our specific research questions, the present analyses used the four subscales regrouped
148 into this total score. The validated Spanish version of the SDQ was used in the present study

149 (Ortuño-Sierra, Chocarro, Fonseca-Pedrero, Riba, & Muñiz, 2015; Ortuño-Sierra, Aritio-
150 Solana, & Fonseca-Pedrero, 2018).

151 **Procedure**

152 The research was approved by the Educational Government of La Rioja and the
153 Ethical Committee of Clinical Research of La Rioja (CEICLAR). The tests were
154 administered collectively, through personal computers, in groups of 10 to 30 students, during
155 normal school hours and in a classroom specially prepared for this purpose. Administration
156 took place under the supervision of the researchers trained in a standard protocol. No
157 incentive was provided for participation. For subjects under 18, parents were asked to provide
158 a written informed consent in order for their child to participate in the study. Participants
159 were informed of the confidentiality of their responses and of the voluntary nature of the
160 study.

161 **Analysis**

162 **General network estimation**

163 The details of network analysis were documented in-depth elsewhere (Epskamp et al.
164 2012, 2016). Graphical LASSO (Least Absolute Shrinkage and Selection Operator) models
165 were estimated using the *bootnet* package in *R* (Epskamp et al. 2017). Each item of the RFQu
166 subscale and the items of SDQ conduct problems, hyperactivity /inattention, emotional and
167 peer problems subscales represent a node in the network. The edges connecting the nodes
168 represent partial correlations between the items, controlling for all the other variables in the
169 network. For the layout, the Fruchterman-Reingold algorithm was used, placing the strongly
170 connected nodes closer to each other and the least connected nodes far apart (Epskamp et al.
171 2012). Blue edges represent positive partial correlations, whereas red edges represent
172 negative partial correlations. The width of the edge indicates the strength of the relationships

173 between the variables. L1-regularization was used in order to control for false-positive
174 relationships. The model estimation uses Extend Bayesian Information Criterion setting a
175 sparsity gamma parameter, which in our analyses was set the default value of 0.5. In addition,
176 only the edges above 0.03 were included in the visual representation of the network.

177 **Network inference**

178 In order to explore the importance of each node in the network, we estimated
179 centrality indices: the *strength of the connections*- the sum of connections that a single node
180 has with the other nodes; the *betweenness*- the number of times a node lies on the path
181 between any two nodes; the *closeness* - the average distance from a node to all the other
182 nodes (Epskamp et al. 2012). We also computed the *predictability* of each node, defined as
183 the shared variance of a node with all the other nodes with which it is connected. In the
184 visualization of the networks, the circles around the nodes can be interpreted as the R^2 (the
185 explained variance of the node). The predictability was computed using the *mgm* package
186 (Haslbeck and Fried 2017). In order to investigate in detail the connections between the
187 RFQu and the SDQ subscales, we estimated the networks illustrating the *shortest paths*
188 between each items of the RFQu and the SDQ subscales. The shortest paths represent the
189 minimum number of steps from a node to another node. It can be interpreted as all the
190 possible pathways between a set of nodes, and it allows the identification of the nodes
191 mediating their relationship (Isvoranu et al. 2016).

192 **Directed acyclic graph (DAG)**

193 The DAG is a directed, noncircular (an arrow can go only in one direction, not
194 returning to the same node) and un-weighted network. The DAG is based on a Bayesian
195 approach, giving information about the potential causal relationships between the nodes. For
196 the estimation of the DAG, we used the approach and scripts published by McNally, Mair,

197 Mugno, and Riemann (2017), using the hill-climbing algorithm from the R package *bnlearn*
198 (Scutari 2009). The hill-climbing algorithm creates random models by adding and removing
199 the edges and reversing the direction until the best fit is obtained. The final network resulted
200 by averaging 1000 bootstrapped networks. The edges that appeared in 85% of the networks
201 were retained in the final DAG. For the direction of the edges, we retained the relationships
202 that appeared in at least 50% of the networks. The thickness of the edges represents the
203 probability of direction presented in the graph. Further information about the analysis can be
204 found elsewhere (Jones et al. 2017; McNally et al. 2017).

205 **Network stability**

206 Network stability and accuracy were estimated using the bootstrapping analysis
207 implemented in the *bootnet* package in R (Epskamp et al. 2017). We calculated the
208 confidence intervals (CI) around the edges weights and the stability analysis using person
209 drop strategy, based on 1000 bootstrapped samples. The outputs of this analysis are presented
210 in the Supplementary Materials.

211 **Results**

212 **Estimated network structure**

213 The names and descriptive statistics for each item included in the network are
214 presented in Table 1. The estimated network is presented in Figure 1. The results indicate that
215 items within each subscale were more closely associated with each other than with items of
216 other subscales. The mean edge weight within the dimensions was 0.12, the most strongly
217 connected subscales being hyperactivity/inattention subscale (edge weight 0.15) and
218 emotional problems (edge weight 0.14). The mean edge weight between the subscales was
219 0.02, the most strongly connected subscales being conduct problems and peer problems (edge
220 weight 0.028), RFQu and emotional problems (edge weight 0.026), RFQu and conduct

221 problems (edge weight 0.024). Table S1 in the Supplementary Material presents the number
222 of connections within and between subscales and the mean edge weight for the connections.

223 -----Insert table 1-----

224 -----Insert figure 1-----

225 Regarding the relationships between RFQu items and conduct problems SDQ items,
226 the most connected nodes are difficulties to regulate high arousal (RFQu4) and anger
227 proneness (SDQ5)- edge weight 0.16, strong feeling impairing clear thinking (RFQu8) and
228 anger proneness (SDQ5)- edge weight 0.09, lack of self-awareness (RFQu6) and fighting
229 (SDQ12)- edge weight 0.08. Regarding the relationships between conduct problems and the
230 items of the other SDQ subscales, the most connected nodes were being accused of lying and
231 cheating (SDQ18) and bully victimization (SDQ19)- edge weight 0.27, opposition (SDQ7)
232 and impulsivity (SDQ21)- edge weight 0.17, and anger proneness (SDQ5) and impulsivity
233 (SDQ21)- edge weight 0.14.

234 The most central nodes in the network are depressed mood (SDQ13), lack of self-
235 awareness (RFQu6), and anger proneness (SDQ5). The mean predictability of the nodes in
236 the network is 24.47%, ranged from 0.65% for the node lack of friends (SDQ11) to 47% for
237 hyperactivity (SDQ2). This means that on average, 24% of the variance of the nodes in the
238 network was explained by all the other nodes. Figure S2 in the Supplementary Material
239 presents the centrality indices as z-score for all the nodes.

240 **Shortest paths**

241 We further constructed the networks representing the shortest paths between the
242 RFQu items and the items of conduct problem subscale of SDQ. The results of the shortest
243 paths analysis suggest that certain RFQu items, such as lack of self-awareness, lack of
244 emotional awareness and emotional dysregulation in high arousal situations (RFQu4, RFQu6,
245 RFQu7, RFQu8) are directly connected to behavioral problems items, such as anger

246 proneness, being accused of lying and cheating, being involved in fights, and disobeying
247 (SDQ5, SDQ7, SDQ18, SDQ12). Moreover, some paths pass through items from
248 hyperactivity/ inattention, emotional and peer problems subscales. More precisely, the
249 relationships between RFQu items and being accused of lying and cheating (SDQ18) and
250 oppositional behavior (SDQ7) are mediated by impulsivity (SDQ21), depressed mood
251 (SDQ13) and bully victimization (SDQ19).

252 -----Insert figure 2-----

253 **Directed acyclic graph (DAG)**

254 Figure 4 presents the estimated DAG. Each arrow indicates the probability of the
255 direction of the relationship between the nodes. Thus, thick arrows appear in a larger number
256 of bootstrapped networks. First, we can observe that the nodes with higher predictability are
257 placed at the top of the network. We can observe that lack of self-awareness (RFQu2) is
258 placed at the top of the network, representing predictors for several other items. More
259 precisely, lack of self-awareness (RFQu2) predicts the other RFQu nodes, such as strong
260 feeling clouding the thinking and lack of emotional awareness (RFQu8, RFQu7), as well as
261 depressed mood (SDQ13). The DAG suggests that RFQu items predict conduct problems
262 directly and via other nodes. Direct connections are presented between difficulties in
263 regulating high arousal (RFQu4) and anger proneness (SDQ5), lack of self-awareness
264 (RFQu6) and lying and cheating (SDQ18). Inattention and impulsivity (SDQ15, SDQ25,
265 SDQ21), depressed mood (SDQ13), and bully victimization (SDQ19) play a mediating role
266 between the lack of self-awareness and opposition (SDQ7), and respectively being accused of
267 lying and cheating (SDQ18).

268 -----Insert figure 3-----

269 **Network stability**

270 Stability analyses indicate that the networks are accurately estimated, with moderate
271 confidence intervals around the edge weights. All the stability coefficients for centrality
272 estimates surpass the threshold for moderate stability (0.25) (Epskamp, Borsboom, & Fried,
273 2017). Details are available in the Supplementary Material.

274 **Discussion**

275 The present study represents the first investigation of the relationships between
276 reflective functioning (RF) impairments and different manifestations describing conduct
277 problems during adolescence, using different network analyses. It also aimed to explore the
278 role played by hyperactivity and inattention, emotional, and peer problems in these
279 relationships. We will our results in light of previous research, and informed by a
280 mentalization-based framework (Fonagy, Gergely, Jurist, & Target, 2002) and their
281 implications for future research and clinical practice.

282 Regarding the general network structure, the results reveal that depressed mood, lack
283 of self-awareness and anger proneness play a central role in the non-directed, weighted
284 network that included the items of the uncertainty about mental states subscale of Reflective
285 Functioning Questionnaire (RFQu) and the items of Strength and Difficulties Questionnaire
286 (SDQ) subscales, appearing to play a critical role in the maintenance of thought-emotion-
287 behavior patterns during adolescence. These results find echo in previous research indicating
288 important bio-psycho-social transformations during adolescence (Brizio et al. 2015). Several
289 studies indicate that hormonal and brain changes (especially in regions associated with
290 emotional, social processing, and impulse control), as well as the social challenges
291 characteristic for this developmental period, might underline dysregulations in emotional
292 control and in self-reflection (Blakemore, 2008; Nelson, Leibenluft, McClure, & Pine, 2005;
293 Vijayakumar, Op de Macks, Shirtcliff, & Pfeifer, 2018). Previous studies have suggested that
294 central nodes in a network might represent possible therapeutic targets, since their activation

295 engenders the activation of all the other connected nodes (Fried et al., 2015; McNally et al.,
296 2017). However this point of view is still debated (Fried et al., 2018); the way in which
297 central nodes from networks estimated at a group-level can be applied to individual
298 interventions needs further exploration, especially by estimating individual networks and
299 evaluating the effectiveness of intervention strategies designed to target central nodes (Fried,
300 2018). Nevertheless, focusing on depressed mood, anger proneness, and lack of self-
301 awareness may help us understand the mechanisms implicated in the emergence and co-
302 occurrence of psychological problems during adolescence.

303 Regarding the relationships between RF impairments and conduct problem
304 manifestations, our results suggest different pathways that connect these two domains. Both
305 the shortest paths analyses and the Directed Acyclic Graph (DAG) highlight the direct paths
306 between lack of self-awareness and emotional dysregulation in high arousal situations, lying
307 and cheating, and anger proneness. These results are in line with previous research suggesting
308 that impairments in self-mentalizing, such as self-awareness and the inability to regulate high
309 emotional arousal are tightly linked to conduct problems (Donahue et al. 2014; Fossati et al.
310 2009; Pond et al. 2012; Rosen 2016). In addition, some studies suggest that improving self-
311 awareness leads to a reduction in externalizing behaviors such as lying, cheating and
312 aggressive behaviors (Bender et al. 2018; Carver 1974; Froming et al. 1998; Scheier et al.
313 1974). The DAG results add evidence to these studies suggesting that RF impairments
314 directly lead to conduct problems.

315 The LASSO network results also indicate that RF impairments describing difficulties
316 in regulating high arousal and anger proneness were the most strongly connected nodes.
317 Anger proneness also seems to represent a connecting node, in both shortest paths analysis
318 and in the DAG, linking RF impairments and the other conduct problem manifestations.
319 These results find echo with the conceptual framework of mentalization theory, which argues

320 that in the cases where RF fails to regulate the high arousal, the individual will often resort to
321 the externalization of the arousal in the form of conduct problems manifestations (Fonagy &
322 Luyten, 2009). The mechanisms through which RF regulates anger are still to be explored.
323 Brotman et al. (2017) suggest that anger results from impairments in reward and threat
324 processing. Self-awareness might impact reward contingency learning by impairing the
325 understanding of the link between the causes and the consequences of the behaviors, leading
326 to an increased frustration in situations when unrealistically a reward is expected. Self-
327 awareness represents a key process for enabling the distinction between self and others
328 (Abbate et al. 2006; Ardelt and Grunwald 2018; Decety and Svetlova 2012). Impairments in
329 RF might generate the rigid certainty that the mental states in others are indistinguishable of
330 our own mental states, leading to distortions in the mentalization of others, well documented
331 in individuals presenting conduct problems (Dodge, Pettit, Bates, & Valente, 1995; Morgado
332 & Vale-Dias, 2013; Newbury-Helps, Feigenbaum, & Fonagy, 2016; Orobio de Castro,
333 Veerman, Koops, Bosch, & Monshouwer, 2002; Smeijers, Rinck, Bulten, Heuvel, & Verkes,
334 2017), which might lead to a hypersensitivity to threat, for example in the form of the hostile
335 attribution style. Additionally, the inability to understand behaviors as underlain by mental
336 states might lead to a disregard for the importance of mental states, such as emotions, and the
337 importance of regulating them. Future studies need to further investigate the mechanisms
338 through which self and other mentalization, anger proneness, and conduct problems
339 manifestations are linked. Nevertheless, our results indicate that RF impairments, such as
340 lack of self-awareness, which are placed at the top of the DAG, might represent intervention
341 targets, since they have a high predictability value for the other nodes in the network.
342 Targeting the RF impairments in intervention strategies might have an impact on conduct
343 problem manifestations by reducing the anger proneness (Bateman et al. 2016).

344 The results also indicate that impulsivity and hyperactivity, depressed mood, and
345 bully victimization mediate some of the relationships between RF impairments and different
346 conduct problems manifestations. First, impulsivity and hyperactivity seem to mediate the
347 relationships between lack of self-awareness and oppositional behaviors. This result comes in
348 the continuity of previous studies indicating that the presence of hyperactivity and inattention
349 symptoms in early childhood predict oppositional behaviors later on in life (Harvey et al.
350 2016). These results might indicate that the lack of self-awareness, when connected to
351 impairments in behavioral and emotional regulation presented in the form of impulsivity and
352 inattention, promotes the expression oppositional behaviors, probably by disrupting family
353 and school functioning (Harvey et al. 2016; Noordermeer et al. 2016). Moreover, our results
354 suggest that depressed mood and bully victimization mediates the relationships between lack
355 of self-awareness and being accused of lying and cheating. Behavior and mood
356 dysregulations have been documented to lead to peer problems such as bully victimization,
357 which was previously identified as a risk factor for the development of conduct problems
358 (Champion et al. 2003; Sigfusdottir et al. 2010; Wong and Schonlau 2013). The relationship
359 between bully victimization and conduct problems might find echo in previous studies
360 suggesting that being a victim of bullying might increase negative emotions and the
361 externalization of these negative emotions might take the form of conduct problems
362 (Sigfusdottir et al. 2010). Future studies need to address the mechanisms through which some
363 of the victims of bullying develop conduct problems and the role of emotional dyregulations in
364 this process.

365 **Limitations**

366 Some limitations of the present study must be acknowledged. First, our data are cross-
367 sectional, thus we could not imply temporal causality between the variables included in the
368 networks. Moreover, DAG analyses do not permit feedback loops between the nodes. Indeed,

369 it may be the case that a transactional model yields a better fit of how different levels of
370 psychological variables contribute to mental health (McNally et al. 2017). Future studies
371 might investigate the relationships between RF capacities and psychological difficulties using
372 time-series data, which would allow the modeling of feedback loops over time (Jones et al.
373 2017). Finally, our results also indicate that the mean predictability for the network is 24%,
374 suggesting that a large variance of the nodes still remains to be explained. This might indicate
375 that some variables playing an important role in the relationships between RF capacities and
376 psychological difficulties during adolescence might be missing from the network. Previous
377 studies suggested the importance of familial, environmental and biological factors in the
378 development and maintenance of different psychological problems (Alloway et al. 2013).
379 Moreover, previous studies suggest that childhood trauma and parental RF are related to
380 impairments in RF (Benbassat and Priel 2012; Peter Fonagy et al. 2016; Ha et al. 2011;
381 Smaling et al. 2016). Future studies need to investigate how these factors influence the
382 relationships between RF and psychological difficulties during adolescence.

383 **Conclusions**

384 In conclusion, network analyses represent a data-driven approach allowing the
385 investigation of the complex relationships between the different components of psychological
386 processes and different manifestations of psychological difficulties. Our results of our study
387 suggest that RF impairments represent a transdiagnostic process associated with a wide range
388 of psychological difficulties, which might represent an important target in early detection and
389 intervention strategies and to be promoted during adolescence in order to foster resilience
390 against psychopathology (Fonagy & Luyten, 2009). Moreover, the results highlight the direct
391 relationships between RF impairments and conduct problems, as well as the role played by
392 hyperactivity and inattention, depressed mood, and bully victimization in these relationships.

393 Future longitudinal studies are needed in order to gain insight into the temporal interplay
394 between the RF impairments and psychological difficulties.

395 **References**

396 Abbate, C. S., Isgrò, A., Wicklund, R. A., & Boca, S. (2006). A field experiment on
397 perspective-taking, helping, and self-awareness. *Basic and Applied Social Psychology*,
398 28(3), 283–287. doi:10.1207/s15324834basp2803_7

399 Alloway, T. P., Lawrence, A., & Rodger, S. (2013). Antisocial behavior: Exploring
400 behavioral, cognitive, and environmental influences on expulsion. *Applied Cognitive*
401 *Psychology*, 27(4), 520–526. doi:10.1002/acp.2931

402 Ardel, M., & Grunwald, S. (2018). The Importance of Self-Reflection and Awareness for
403 Human Development in Hard Times. *Research in Human Development*, 00(00), 1–13.
404 doi:10.1080/15427609.2018.1489098

405 Badoud, D., Prada, P., Nicastro, R., Germond, C., Luyten, P., Perroud, N., & Debbané, M.
406 (2017). Attachment and reflective functioning in women with borderline personality
407 disorder. *Journal of Personality Disorders*, 31, 1–14.

408 Bateman, A. (2012). Antisocial personality disorder. In A. Bateman & P. Fonagy (Eds.),
409 *Mentalizing in Mental Health Practice* (pp. 289–308). Washington, DC: American
410 Psychiatric Publishing, Inc.

411 Bateman, A., Bolton, R., & Fonagy, P. (2013). Antisocial Personality Disorder: A
412 Mentalizing Framework. *FOCUS: The Journal of Lifelong Learning in Psychiatry*,
413 11(2), 178–186. doi:10.1176/appi.focus.11.2.178

414 Bateman, A., O'Connell, J., Lorenzini, N., Gardner, T., & Fonagy, P. (2016). A randomised
415 controlled trial of mentalization-based treatment versus structured clinical management
416 for patients with comorbid borderline personality disorder and antisocial personality
417 disorder. *BMC Psychiatry*, 16(1), 304. doi:10.1186/s12888-016-1000-9

- 418 Benbassat, N., & Priel, B. (2012). Parenting and adolescent adjustment: The role of parental
419 reflective function. *Journal of Adolescence*, *35*(1), 163–174.
420 doi:10.1016/j.adolescence.2011.03.004
- 421 Bender, J., O'Connor, A. M., & Evans, A. D. (2018). Mirror, mirror on the wall: Increasing
422 young children's honesty through inducing self-awareness. *Journal of Experimental*
423 *Child Psychology*, *167*, 414–422. doi:10.1016/j.jecp.2017.12.001
- 424 Bernstein, E. E., Heeren, A., & McNally, R. J. (2017). Unpacking Rumination and Executive
425 Control: A Network Perspective. *Clinical Psychological Science*, *5*(5), 816–826.
426 doi:10.1177/2167702617702717
- 427 Blakemore, S.-J. (2008). Development of the social brain during adolescence. *Quarterly*
428 *journal of experimental psychology (2006)*, *61*, 40–49.
429 doi:10.1080/17470210701508715
- 430 Borsboom, D. (2015). Problems Attract Problems : A Network Perspective on Mental
431 Disorders. R. Scott & S. Kosslyn (Eds.), *Emerging trends in the social and behavioral*
432 *sciences*. John Wiley & Sons., (1915), 1–15. doi:10.1002/9781118900772
- 433 Borsboom, D., & Cramer, A. O. J. (2013). Network analysis: an integrative approach to the
434 structure of psychopathology. *Annual review of clinical psychology*, *9*, 91–121.
435 doi:10.1146/annurev-clinpsy-050212-185608
- 436 Brizio, A., Gabbatore, I., Tirassa, M., & Bosco, F. M. (2015). “No more a child, not yet an
437 adult”: studying social cognition in adolescence. *Frontiers in Psychology*, *6*(August), 1–
438 12. doi:10.3389/fpsyg.2015.01011
- 439 Carver, C. S. (1974). Facilitation of physical aggression through objective self-awareness.
440 *Journal of Experimental Social Psychology*, *10*(4), 365–370. doi:10.1016/0022-
441 1031(74)90032-8
- 442 Champion, K., Vernberg, E., & Shipman, K. (2003). Nonbullying victims of bullies:

443 Aggression, social skills, and friendship characteristics. *Journal of Applied*
444 *Developmental Psychology*, 24(5), 535–551. doi:10.1016/j.appdev.2003.08.003

445 Chow, C., Nolte, T., Cohen, D., Fearon, P. R. M., & Shmueli-Goetz, Y. (2017). Reflective
446 Functioning and Adolescent Psychological Adaptation : The Validity of the Reflective
447 Functioning Scale – Adolescent Version. *Psychoanalytic Psychology*, 34(4), 404–413.

448 Colder, C. R., Frndak, S., Lengua, L. J., Read, J. P., Hawk, L. W., & Wieczorek, W. F.
449 (2018). Internalizing and Externalizing Problem Behavior: a Test of a Latent Variable
450 Interaction Predicting a Two-Part Growth Model of Adolescent Substance Use. *Journal*
451 *of Abnormal Child Psychology*, 46(2), 319–330. doi:10.1007/s10802-017-0277-6

452 Cuthbert, B. N. (2014). The RDoC framework: Facilitating transition from ICD/DSM to
453 dimensional approaches that integrate neuroscience and psychopathology. *World*
454 *Psychiatry*, 13(1), 28–35. doi:10.1002/wps.20087

455 Decety, J., & Svetlova, M. (2012). Putting together phylogenetic and ontogenetic
456 perspectives on empathy. *Developmental Cognitive Neuroscience*, 2(1), 1–24.
457 doi:10.1016/j.dcn.2011.05.003

458 Dodge, K. A., Pettit, G. S., Bates, J. E., & Valente, E. (1995). Social information-processing
459 patterns partially mediate the effect of early physical abuse on later conduct problems.
460 *Journal of abnormal psychology*, 104(4), 632–43. doi:10.1037/0021-843X.104.4.632

461 Donahue, J. J., Goranson, A. C., McClure, K. S., & Van Male, L. M. (2014). Emotion
462 dysregulation, negative affect, and aggression: A moderated, multiple mediator analysis.
463 *Personality and Individual Differences*, 70, 23–28. doi:10.1016/j.paid.2014.06.009

464 Epskamp, S., Borsboom, D., & Fried, E. I. (2016). Estimating Psychological Networks and
465 their Stability: a Tutorial Paper. *arXiv preprint arXiv*, 1–34. doi:10.3758/s13428-017-
466 0862-1

467 Epskamp, S., Borsboom, D., & Fried, E. I. (2017). Estimating psychological networks and

468 their accuracy: A tutorial paper. *Behavior Research Methods*, 1–18.
469 doi:10.3758/s13428-017-0862-1

470 Epskamp, S., Cramer, A. O. J., Waldorp, L. J., Schmittmann, V. D., & Borsboom, D. (2012).
471 qgraph : Network Visualizations of Relationships in Psychometric Data. *Journal of*
472 *Statistical Software*, 48(4), 1–18. <http://www.jstatsoft.org/v48/i04>

473 Erskine, H. E., Norman, R. E., Ferrari, A. J., Chan, G. C. K., Copeland, W. E., Whiteford, H.
474 A., & Scott, J. G. (2016). Long-Term Outcomes of Attention-Deficit/Hyperactivity
475 Disorder and Conduct Disorder: A Systematic Review and Meta-Analysis. *Journal of*
476 *the American Academy of Child and Adolescent Psychiatry*, 55(10), 841–850.
477 doi:10.1016/j.jaac.2016.06.016

478 Espelage, D. L., Van Ryzin, M. J., & Holt, M. K. (2017). Trajectories of Bully Perpetration
479 Across Early Adolescence: Static Risk Factors, Dynamic Covariates, and Longitudinal
480 Outcomes. *Psychology of Violence*, 8(2), 141–150. doi:10.1037/vio0000095

481 Fonagy, P. (2004). The developmental roots of violence in the failure of mentalization. In F.
482 Pfäfflin & G. Adshead (Eds.), *A Matter of Security. The application of Attachment*
483 *Theory to Forensic Psychiatry and Psychotherapy* (pp. 13–56). London, Uk: Jessica
484 Kingsley.

485 Fonagy, P., Gergely, G., Jurist, E., & Target, M. (2002). *Affect regulation, mentalization and*
486 *the development of the self*. New York: Other Press.

487 Fonagy, P., & Luyten, P. (2009). A developmental, mentalization-based approach to the
488 understanding and treatment of borderline personality disorder. *Development and*
489 *psychopathology*, 21(4), 1355–81. doi:10.1017/S0954579409990198

490 Fonagy, P., & Luyten, P. (2017). Conduct problems in youth and the RDoC approach: A
491 developmental, evolutionary-based view. *Clinical Psychology Review*, (January 2016),
492 0–1. doi:10.1016/j.cpr.2017.08.010

493 Fonagy, P., Luyten, P., Moulton-Perkins, A., Lee, Y. W., Warren, F., Howard, S., et al.
494 (2016). Development and validation of a self-report measure of mentalizing: The
495 reflective functioning questionnaire. *PLoS ONE*, *11*(7), 1–28.
496 doi:10.1371/journal.pone.0158678

497 Fossati, A., Acquarini, E., Feeney, J. a, Borroni, S., Grazioli, F., Giarolli, L. E., et al. (2009).
498 Alexithymia and attachment insecurities in impulsive aggression. *Attachment & human*
499 *development*, *11*, 165–182. doi:10.1080/14616730802625235

500 Fried, E. (2018). How to interpret centrality values in network structures (not). [http://psych-](http://psych-networks.com/how-to-not-interpret-centrality-values-in-network-structures/)
501 [networks.com/how-to-not-interpret-centrality-values-in-network-structures/](http://psych-networks.com/how-to-not-interpret-centrality-values-in-network-structures/). Accessed
502 12 October 2018

503 Fried, E. I., Bockting, C., Arjadi, R., Borsboom, D., Amshoff, M., Cramer, O. J., et al.
504 (2015). From loss to loneliness: The relationship between bereavement and depressive
505 symptoms. *Journal of abnormal psychology*, *124*(2), 256–265. doi:10.1037/abn0000028

506 Fried, E. I., Eidhof, M. B., Palic, S., Costantini, G., Huisman-van Dijk, H. M., Bockting, C.
507 L. H., et al. (2018). Replicability and Generalizability of Posttraumatic Stress Disorder
508 (PTSD) Networks: A Cross-Cultural Multisite Study of PTSD Symptoms in Four
509 Trauma Patient Samples. *Clinical Psychological Science*, 216770261774509.
510 doi:10.1177/2167702617745092

511 Froming, W. J., Nasby, W., & McManus, J. (1998). Prosocial Self-Schemas, Self-Awareness,
512 and Children’s Prosocial Behavior. *Journal of Personality and Social Psychology*, *75*(3),
513 766–777. doi:10.1037/0022-3514.75.3.766

514 Giedd, J. N., Keshavan, M., & Paus, T. (2008). Why do many psychiatric disorders emerge
515 during adolescence? *Nature Reviews Neuroscience*, *9*(12), 947–957.
516 doi:10.1038/nrn2513.Why

517 Goodman, R. (2001). Psychometric properties of the strengths and difficulties questionnaire.

518 *Journal of the American Academy of Child and Adolescent Psychiatry*, 40(11), 1337–
519 1345. doi:10.1097/00004583-200111000-00015

520 Granic, I. (2014). The role of anxiety in the development, maintenance, and treatment of
521 childhood aggression. *Development and psychopathology*, 26(4 Pt 2), 1515–30.
522 doi:10.1017/S0954579414001175

523 Ha, C., Sharp, C., & Goodyer, I. (2011). The role of child and parental mentalizing for the
524 development of conduct problems over time. *European Child and Adolescent*
525 *Psychiatry*, 20(6), 291–300. doi:10.1007/s00787-011-0174-4

526 Harvey, E. A., Breaux, R. P., & Lugo-candelas, C. I. (2016). Early Development of
527 Comorbidity Between Symptoms of Attention-Deficit / Hyperactivity Disorder (ADHD
528) and Oppositional Defiant Disorder (ODD), 125(2), 154–167.

529 Haslbeck, J. M. B., & Fried, E. I. (2017). How predictable are symptoms in
530 psychopathological networks ? A reanalysis of 18 published datasets, 1–10.
531 doi:10.1017/S0033291717001258

532 Hodgins, S., Barbareschi, G., & Larsson, A. (2011). Adolescents with conduct disorder: Does
533 anxiety make a difference? *Journal of Forensic Psychiatry and Psychology*, 22(5), 669–
534 691. doi:10.1080/14789949.2011.617539

535 Isvoranu, A.-M., van Borkulo, C. D., Boyette, L.-L., Wigman, J. T. W., Vinkers, C. H., &
536 Borsboom, D. (2016). A Network Approach to Psychosis: Pathways Between Childhood
537 Trauma and Psychotic Symptoms. *Schizophrenia Bulletin*, sbw055.
538 doi:10.1093/schbul/sbw055

539 Jones, P. J., Mair, P., Riemann, B. C., Mugno, B. L., & McNally, R. J. (2017). A network
540 perspective on comorbid depression in adolescents with obsessive-compulsive disorder.
541 *Journal of Anxiety Disorders*, 53(September 2017), 1–8.
542 doi:10.1016/j.janxdis.2017.09.008

- 543 Kofler, M., McCart, M., Zajac, K., Ruggiero, K., Sauders, B., & Kilpatrick, D. (2017).
544 Depression and Delinquency Covariation in an Accelerated Longitudinal Sample of
545 Adolescents. *Journal of Consulting and Clinical Psychology, 155*(1), 3–12.
546 doi:10.1007/s10549-015-3663-1.Progestin
- 547 Levinson, A., & Fonagy, P. (2004). Offending and Attachment: The Relationship between
548 Interpersonal Awareness and Offending in a Prison Population with Psychiatric Disorder
549 Alice Levinson and Peter Fonagy UCL (University College London), Gower Street,
550 London, WC1E 6BT. *Canadian Journal of Psychoanalysis, 12*(2), 225–251.
- 551 Martinez-Ferrer, B., & Stattin, H. (2016). A Mutual Hostility Explanation for the Co-
552 Occurrence of Delinquency and Depressive Mood in Adolescence. *Journal of Abnormal*
553 *Child Psychology, 1*–14. doi:10.1007/s10802-016-0245-6
- 554 McElroy, E., Shevlin, M., Murphy, J., & McBride, O. (2018). Co-occurring internalizing and
555 externalizing psychopathology in childhood and adolescence: a network approach.
556 *European Child and Adolescent Psychiatry, (0123456789)*, 1–9. doi:10.1007/s00787-
557 018-1128-x
- 558 McNally, R. J., Mair, P., Mugno, B. L., & Riemann, B. C. (2017). Comorbid obsessive-
559 compulsive disorder and depression: A Bayesian network approach. *Psychological*
560 *Medicine, 1*–11. doi:10.1017/S0033291716003287
- 561 Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: a
562 developmental taxonomy. *Psychological review, 100*(4), 674–701.
- 563 Möller, C., Falkenström, F., Mattias, H. L., & Holmqvist, R. (2014). Mentalizing in young
564 offenders. *Psychoanalytic Psychology, 31*, 84–99. doi:10.1037/a0035555
- 565 Mordre, M., Groholt, B., Kjelsberg, E., Sandstad, B., & Myhre, A. M. (2011). The impact of
566 ADHD and conduct disorder in childhood on adult delinquency: A 30 years follow-up
567 study using official crime records. *BMC Psychiatry, 11*, 57. doi:10.1186/1471-244X-11-

568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592

57

Morgado, A. M., & Vale-Dias, M. D. L. (2013). The antisocial phenomenon in adolescence: What is literature telling us? *Aggression and Violent Behavior, 18*(4), 436–443. doi:10.1016/j.avb.2013.05.004

Muñiz, J., Elosua, P., & Hambleton, R. K. (2013). Directrices para la traducción y adaptación de los tests: segunda edición [International Test Commission Guidelines for test translation and adaptation: Second edition]. *Psicothema, 25*, 151–157.

Nelson, E. E., Leibenluft, E., McClure, E. B., & Pine, D. S. (2005). The social re-orientation of adolescence: A neuroscience perspective on the process and its relation to psychopathology. *Psychological Medicine, 35*(2), 163–174. doi:10.1017/S0033291704003915

Newbury-Helps, J., Feigenbaum, J., & Fonagy, P. (2016). Offenders with antisocial personality disorder display more Impairments in mentalizing. *Journal of personality disorders, 30*(246), 1–24.

Noordermeer, S. D. S., Luman, M., & Oosterlaan, J. (2016). A Systematic Review and Meta-analysis of Neuroimaging in Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD) Taking Attention-Deficit Hyperactivity Disorder (ADHD) Into Account. *Neuropsychology Review, 26*(1), 44–72. doi:10.1007/s11065-015-9315-8

Orobio de Castro, B., Veerman, J. W., Koops, W., Bosch, J. D., & Monshouwer, H. J. (2002). Hostile attribution of intent and aggressive behavior: a meta-analysis. *Child development, 73*, 916–934. doi:10.1111/1467-8624.00447

Ortuño-Sierra, J., Aritio-Solana, R., & Fonseca-Pedrero, E. (2018). Mental health difficulties in children and adolescents: The study of the SDQ in the Spanish National Health Survey 2011–2012. *Psychiatry Research, 259*(May 2017), 236–242. doi:10.1016/j.psychres.2017.10.025

593 Ortuño-Sierra, J., Chocarro, E., Fonseca-Pedrero, E., Riba, S. S. I., & Muñiz, J. (2015). The
594 assessment of emotional and Behavioural problems: Internal structure of The Strengths
595 and Difficulties Questionnaire. *International Journal of Clinical and Health Psychology*,
596 *15*(3), 265–273. doi:10.1016/j.ijchp.2015.05.005

597 Philipp, F., Michael, W., Oriana, R., Zinnow, T., Retz, P., & Wolfgang, J. (2017). ADHD
598 modulates the course of delinquency : a 15 - year follow - up study of young
599 incarcerated man. *European Archives of Psychiatry and Clinical Neuroscience*.
600 doi:10.1007/s00406-017-0816-8

601 Pond, R. S., Kashdan, T. B., DeWall, C. N., Savostyanova, A., Lambert, N. M., & Fincham,
602 F. D. (2012). Emotion differentiation moderates aggressive tendencies in angry people:
603 A daily diary analysis. *Emotion*, *12*(2), 326–337. doi:10.1037/a0025762

604 Rosen, B. V. (2016). *Longitudinal relations between emotional awareness and aggression in*
605 *early adolescence: The mediating role of emotion dysregulation. ProQuest Dissertations*
606 *and Theses*. Retrieved from
607 [http://flagship.luc.edu/login?url=http://search.proquest.com/docview/1803253099?accou](http://flagship.luc.edu/login?url=http://search.proquest.com/docview/1803253099?accountid=12163%5Cnhttp://loyola-primos.hosted.exlibrisgroup.com/openurl/01LUC/01LUC_SERVICES?genre=dissertations+&+theses&issn=&title=Longitudinal+relations+between+emotional+)
608 [ntid=12163%5Cnhttp://loyola-](http://loyola-primos.hosted.exlibrisgroup.com/openurl/01LUC/01LUC_SERVICES?genre=dissertations+&+theses&issn=&title=Longitudinal+relations+between+emotional+)
609 [primos.hosted.exlibrisgroup.com/openurl/01LUC/01LUC_SERVICES?genre=dissertatio](http://loyola-primos.hosted.exlibrisgroup.com/openurl/01LUC/01LUC_SERVICES?genre=dissertations+&+theses&issn=&title=Longitudinal+relations+between+emotional+)
610 [ns+&+theses&issn=&title=Longitudinal+relations+between+emotional+](http://loyola-primos.hosted.exlibrisgroup.com/openurl/01LUC/01LUC_SERVICES?genre=dissertations+&+theses&issn=&title=Longitudinal+relations+between+emotional+)

611 Scheier, M. F., Fenigstein, A., & Buss, A. H. (1974). Self-awareness and physical aggression.
612 *Journal of Experimental Social Psychology*, *10*, 264–273. doi:10.1016/0022-
613 1031(74)90072-9

614 Scutari, M. (2009). Learning Bayesian Networks with the bnlearn R Package, *35*(3).
615 doi:10.18637/jss.v035.i03

616 Sigfusdottir, I. D., Gudjonsson, G. H., & Sigurdsson, J. F. (2010). Bullying and delinquency.
617 The mediating role of anger. *Personality and Individual Differences*, *48*(4), 391–396.

618 doi:10.1016/j.paid.2009.10.034

619 Smaling, H. J. A., Huijbregts, S. C. J., van der Heijden, K. B., van Goozen, S. H. M., &
620 Swaab, H. (2016). Maternal reflective functioning as a multidimensional construct:
621 Differential associations with children's temperament and externalizing behavior. *Infant*
622 *Behavior and Development*, *44*, 263–274. doi:10.1016/j.infbeh.2016.06.007

623 Smeijers, D., Rinck, M., Bulten, E., Heuvel, T. Van Den, & Verkes, R. (2017). Generalized
624 Hostile Interpretation Bias Regarding Facial Expressions : Characteristic of Pathological
625 Aggressive Behavior, *43*(December 2016), 386–397. doi:10.1002/ab.21697

626 Storebø, O. J., & Simonsen, E. (2016). The Association Between ADHD and Antisocial
627 Personality Disorder (ASPD): A Review. *Journal of Attention Disorders*, *20*(10), 815–
628 824. doi:10.1177/1087054713512150

629 Taubner, S., White, L. O., Zimmerman, J., Fonagy, P., & Nolte, T. (2012). Mentalization
630 moderates and mediates the link between psychopathy and aggressive behavior in male
631 adolescents. *Journal of the American Psychoanalytic Association*, *60*, 605–612.
632 doi:10.1177/0003065112450148

633 Taubner, S., White, L. O., Zimmermann, J., Fonagy, P., & Nolte, T. (2013). Attachment-
634 Related Mentalization Moderates the Relationship Between Psychopathic Traits and
635 Proactive Aggression in Adolescence. *Journal of Abnormal Child Psychology*, *41*(6),
636 929–938. doi:10.1007/s10802-013-9736-x

637 Van Os, J. (2013). The dynamics of subthreshold psychopathology: Implications for
638 diagnosis and treatment. *American Journal of Psychiatry*, *170*(7), 695–698.
639 doi:10.1176/appi.ajp.2013.13040474

640 Vijayakumar, N., Op de Macks, Z., Shirtcliff, E. A., & Pfeifer, J. H. (2018). Puberty and the
641 human brain: Insights into adolescent development. *Neuroscience and Biobehavioral*
642 *Reviews*, *92*(June), 417–436. doi:10.1016/j.neubiorev.2018.06.004

643 White, B. A., & Kistner, J. A. (2011). Biased self-perceptions, peer rejection, and aggression
644 in children. *Journal of Abnormal Child Psychology*, 39, 645–656. doi:10.1007/s10802-
645 011-9506-6

646 Wong, J. S., & Schonlau, M. (2013). Does Bully Victimization Predict Future Delinquency?:
647 A Propensity Score Matching Approach. *Criminal Justice and Behavior*, 40(11), 1184–
648 1208. doi:10.1177/0093854813503443

649