Abstract

Objectives: Reflective functioning (RF) impairments, characterized by the inability to understand behaviors in terms of mental states, have been linked to different psychological problems. However, the mechanisms through which RF impairments are linked to conduct problems need further investigation. The present study aims to explore, using network analyses, how different RF impairments relate to specific conduct problems manifestations, and to examine the role played by hyperactivity/ inattention, emotional, and peer problems in these relationships, in a sample of 1664 Spanish adolescents from the general population. **Method:** We estimated a graphical LASSO network connecting different RF impairments and the different conduct, emotional, peers, and hyperactivity/inattention problems. We examined the most central nodes in the network and the shortest paths between RF impairments and conduct problems manifestations. Next, we computed directed acyclic graphs (DAG) in order to gain insight about the possible directions of the prediction between the variables. **Results:** Shortest path analyses and DAG suggest direct connections between RF impairments and conduct problems, but also that impulsivity, depressed mood, and bully victimization play a mediating role in these relationships. DAG indicates that RF impairments lead to different psychological difficulties. **Conclusions:** The findings suggest different pathways connecting RF impairments and conduct problems. The results find echo in the mentalization-based theory highlighting that emotion dysregulations, such as anger proneness, play an important role in connection RF impairments and different conduct problems. RF impairments appear to be a transdiagnostic process associated with different psychological difficulties, representing an important target in detection and intervention strategies.

Introduction

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

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

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

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

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

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

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

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

Method

Participants

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

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

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

Instruments

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

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

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

Procedure

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

Analysis

General network estimation

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

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

Network inference

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

Directed acyclic graph (DAG)

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

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

Network stability

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

Results

Estimated network structure

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

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

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

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

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

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

Shortest paths

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

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

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

Directed acyclic graph (DAG)

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

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

Network stability

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

Discussion

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

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

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

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

Limitations

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

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

Conclusions

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

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

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