No adolescent is an island: conceptualizing the family system in adolescent depression with the network approach
Veenman, M.

Citation

Veenman, M. (2026, February 5). *No adolescent is an island: conceptualizing the family system in adolescent depression with the network approach*. Retrieved from https://hdl.handle.net/1887/4291726
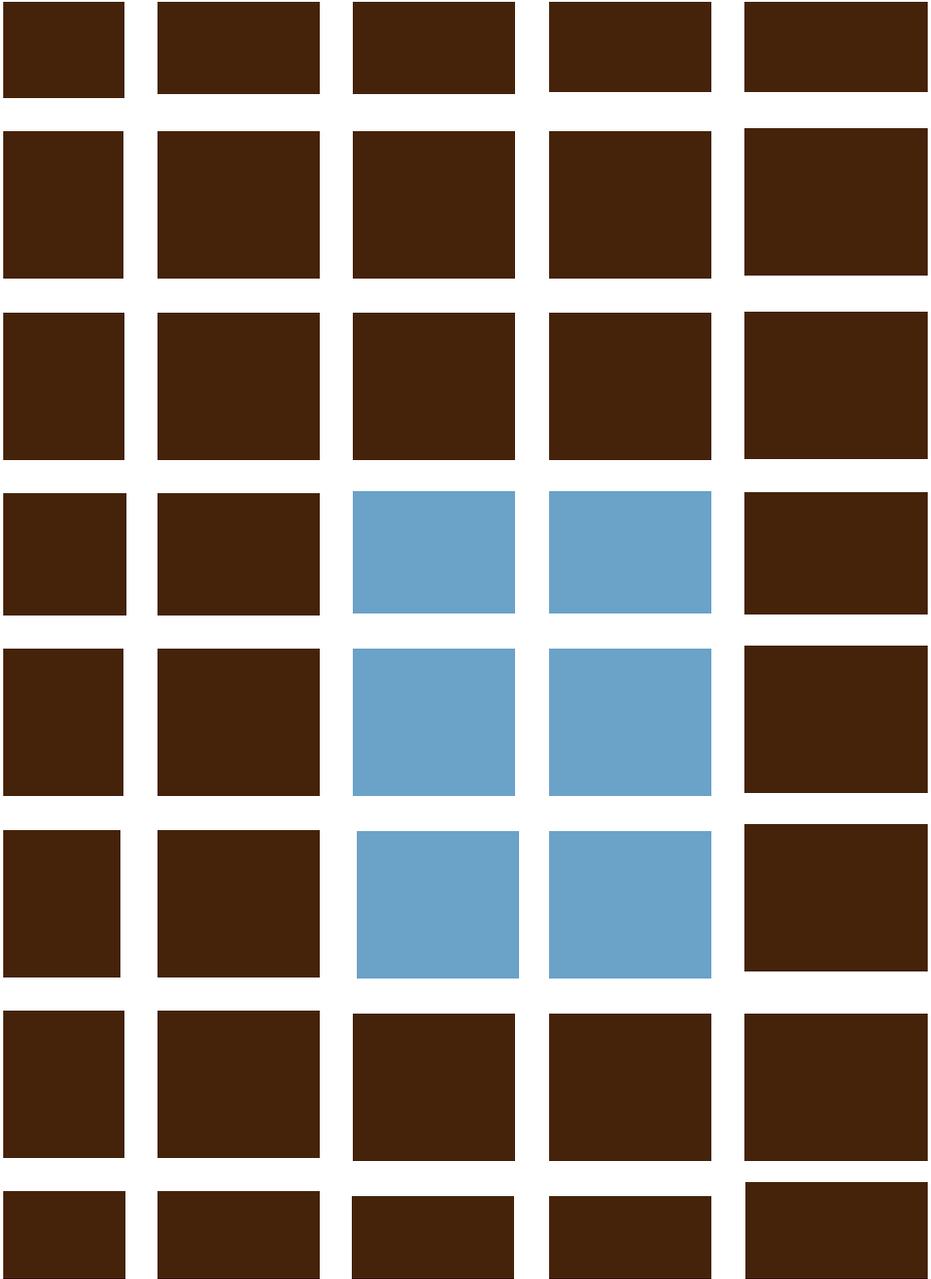
Chapter 6

General discussion

The family system is important for the well-being of adolescents with depression (Shee-ber et al., 1997; Yap et al., 2014). However, methods to best study the mitigatory role of the family system are lacking. The aims of this dissertation were 1) to obtain more insight into the family system in adolescent depression by 2) evaluating the use of the network approach to elucidate how affect states of family members are related, how parental behavior is involved, and while examining family heterogeneity.

The family system revisited

After introducing the family as a multiperspective system connected to the network approach, *Chapter 2* explained the multiperspectivity of the family in adolescent psychopathology in greater detail by illustrating three perspectives that are applied throughout the dissertation: 1) the within-family, 2) the between-family, and 3) the time perspective. Using examples of adolescent depression severity and parenting be-havior, the chapter showed that it is important to consider these perspectives for three reasons. First, because the perspectives of adolescents and their parents on relevant family topics, such as adolescent depression severity and parenting behaviors, differ greatly. Second, differences between families indicate that group data do not always translate to individual families. Third, mental health problems and families are dy-namic. By studying how family dynamics evolve from moment to moment or from day to day, we could obtain important insights for clinical practice. Ignoring the three perspectives can lead to misunderstandings and false conclusions about family systems in adolescent depression.

In the chapters that followed, three different network models were applied to study various aspects of the family system in adolescent depression. In line with theories on the family system (Bowen, 1966; Bronfenbrenner, 1977, 1986), the networks showed that the behaviors and well-being of adolescents and their parents were interrelated in three ways.

1. Adolescent and parent affect

Chapter 3 evaluated the use of a multilevel network for longitudinal data (i.e., mlVAR; Bringmann et al., 2013) to investigate the temporal interrelatedness of adolescent and parent affect states, such as parental and adolescent sadness, irritation, happiness, and relaxation, in daily life (i.e., the family affect system). This was based on the control samples of the RE-PAIR study. In line with previous studies showing the interrelatedness between the affect states of adolescents and parents (Almeida et al.,

1999; Bodner et al., 2018; Larson & Almeida, 1999; Larson & Richards, 1994), we found relations over time between adolescents, mothers, and fathers (i.e., families of adolescents without a depression diagnosis). The temporal network showed how father irritation predicted mother and adolescent irritation on the next measurement occasion, and how adolescent irritation predicted mother irritation. The contemporaneous network showed mainly relations between affect states within family members, except for the positive relation between mother and father relaxation, indicating that mothers reported more relaxation when fathers reported more relaxation. Moreover, the multilevel networks also showed differences between families (i.e., between- families perspectives). While the relation between adolescent and parent irritation was also found in some individual family networks, the relation differed in strength between families or was absent for other families.

2. Parental criticism, warmth, and adolescent affect

While *Chapter 3* showed that some affect states between family members are related, it remained unclear a) how adolescent-parent interaction, such as parenting behavior, is related to affect states of adolescents and b) if families of adolescents with depression follow the same trend as families of adolescents without a depression diagnosis. That is why *Chapter 4* investigated with cross-sectional networks how adolescent-parent interaction, in specific parental criticism and warmth, were related to adolescent affect while exploring differences between adolescents with depression and adolescents without depression and their parents. To obtain more insight into the adolescent perspective on adolescent-parent contact, we estimated a second cross-sectional network showing how adolescent-reported parenting behavior was related to adolescent affect directly after adolescent-parent contact.

Parent and adolescent-reported parental criticism was positively related, and this was also the case for warmth. Adolescent affect was mainly associated with adolescent-reported parenting behavior and less with parent-reported parenting behavior. In line with previous studies (e.g., Arslan et al., 2024; Bai et al., 2017), we found that adolescent-reported parental warmth was positively related to adolescent positive affect (i.e., happiness and relaxation), while adolescent-reported parental criticism was related to adolescent negative affect (i.e., sadness and irritation). This indicates that adolescents report more positive affect when they perceive their parents as warm and less critical, and more negative affect when they perceive their parents as more critical. Only in the depression sample, and in contrast with the previous studies, parent-reported parental warmth was positively related to adolescent sadness, indicating that

adolescents report more sadness when parents report more parental warmth, or vice versa, that parents report being more warm on days that adolescents report feeling more sad. This underlines the idea that the relation between parenting behavior and adolescent affect could be different in families of adolescents with depression compared to families of adolescents without a depression diagnosis.

3. Parental worry and self-efficacy

To obtain more information on the experience of parents of adolescents with depression, *Chapters 4* and *5* investigated two understudied concepts related to adolescent depression, namely parental worry and self-efficacy. The chapters found that parents of adolescents with depression reported more parental worry, but not less self-efficacy, compared to parents of adolescents without depression. Parental worry was higher and self-efficacy was lower in a group of actively help-seeking parents (i.e., Samen Sterk compared to the RE-PAIR sample). Furthermore, *Chapter 4* showed that parental worry was positively related to adolescent sadness, suggesting that parents reported being more worried when adolescents reported feeling more sad. In line with previous studies (e.g., Bedin & Sarriera, 2014; Giannakopoulos et al., 2009; Videon, 2005), this suggests that the well-being of parents is affected by adolescent depression. Further, *Chapters 4* and *5* showed that parental worry was positively related to parental criticism, suggesting that parents express more criticism when they are more concerned about their child. Parental self-efficacy was positively associated with parental warmth and negatively to parental criticism, indicating that parents report more warmth and less criticism when they feel more parental self-efficacious.

The reasons for parental worry and self-efficacy studied in *Chapter 5* further illustrate the interrelatedness within a family. Using a mixed-method approach that combined scale, multiple choice, and open-ended responses from parents of adolescents with depression, networks based on thematic analyses showed the frequency and co-occurrence of the selected reasons for parental worry and self-efficacy. The frequency networks showed that adolescent behavior (e.g., lack of activities), adolescent well-being (e.g., negative adolescent mood), family interactions (e.g., partner support, family atmosphere including siblings) and parenting behavior (e.g., doubts about the best parenting strategy) were the main reasons for parental worry and self-efficacy. Fathers and mothers within a family reported different reasons for their worry and self-efficacy, underlying the relevance of assessing the perspectives of both fathers and mothers.

From network to system

As a proof of concept, this dissertation evaluated the use of the network approach by applying three network models that enable studying the family system in adolescent depression and the interrelatedness between adolescents and their parents, while considering the within-family, between-families, and time perspective. By including variables from adolescents and parents within the same network, multilevel and cross-sectional networks provided insight into the relation between adolescents and parents, considering the within-family perspective. Multilevel networks also account for the between-family and time perspective by estimating family-level and temporal networks. In addition, networks can be used to visualize the perspective of one person, such as the perspective of parents on reasons for parental worry and self-efficacy (i.e., *Chapter 5*), which can be insightful for clinical practice (e.g., Andreasson et al., 2023).

Despite the added value of network approaches to elucidate family dynamics, we must acknowledge that network models have limitations. First, as explained in detail in *Chapters 3* and *4*, the complexity of family data (e.g., combining data of multiple individuals) makes it challenging to meet the assumptions of network models (i.e., multivariate normality, stationarity, and equal timespans). In addition, family data usually contains more missing data because the data of individual family members, with potential missing data on different occasions, need to be matched (explained in *Chapter 3*). With fewer observations, it becomes more difficult to obtain stable network findings (Epskamp & Fried, 2018b; Mansueto et al., 2023). Even if the assumptions of the network model are met with enough observations, the interpretation of the networks can be criticized. The reliability of temporal relations has been questioned and is complicated to evaluate (Mansueto et al., 2023). In addition, because contemporaneous networks are estimated on the residuals of temporal networks, contemporaneous networks could entail relations that are not captured by the assessed temporal time scale, and, therefore, it is unclear if contemporaneous relations exactly entail associations at the same measurement moment or relations faster than assessed by the time scale. Finally, Hoekstra et al. (2023) pointed out that individual differences or variations found by the networks could be the result of methods used to assess individual variation (e.g., visual inspection of differences in individual Graphical VAR networks) rather than actual individual variation, thus questioning the interpretation of differences between families illustrated by the networks. Due to the mismatch between the assumptions of network models and the complexity of family data, we could question whether network models are equipped for family data. Or, if family data are

6

most suitable for network models. These complications in the application to family data and interpretation of network models indicate that future studies are needed to investigate whether the network approach could move the field of family psychopathology forward. We propose three directions for the network approach to study family psychopathology.

1. Toward a formal theory

Psychology has been facing a theory crisis (Eronen & Bringmann, 2021; Oberauer & Lewandowsky, 2019) as empirical findings are found to be challenging to replicate and translate to explanations of psychological phenomena. Deriving predictions from verbal theories, theories that *describe* psychological phenomena by language and which dictate the field of psychology, are complex (Haslbeck et al., 2022), which makes theories challenging to test and refute (Bringmann & Eronen, 2018). To overcome the theory crisis in psychology, psychology needs formal theories that are defined by computational models and are therefore more straightforward to evaluate (Borsboom et al., 2021b; Haslbeck et al., 2022; Fried, 2020; Robinaugh et al., 2020; Oberauer & Lewandowsky, 2019). Network theory started as a general theory for psychopathology, stating that there is not one latent cause for psychopathology, but that symptoms are causally interconnected (Borsboom, 2017; Borsboom & Cramer, 2013; Cramer & Borsboom, 2015; Cramer et al., 2010; Fried & Cramer, 2017), and has been developed into formal network theories for specific disorders (Borsboom et al., 2022), such as the network theory of panic disorder that entails a computational model to explain panic attacks, their heterogeneity, and the onset of a disorder, while including individual differences (Robinaugh et al., 2024).

To assess whether the network approach could help the field of family psychopathology progress, we should investigate the possibilities of a formal network theory in addition to network models. As explained in *Chapter 1*, the concept of the interconnectedness of network theory aligns well with the family system theories. As in network theory, the family cannot be understood by looking individually at family members. The relation between family members matters (e.g., Bowen, 1966). The network theory and the family theories have both been compared to an ecosystem in that network theory focuses on the interrelation between symptoms, leaving space for environmental factors (i.e., the external field in Borsboom, 2017). In contrast, family theories focus on the environment and the interrelation within families (Bronfenbrenner, 1986). Therefore, network theory may complement existing family theories to describe adolescent psychopathology. When investigating the potential of combining

network theory and family system theories, we propose to work on a formal network theory of the family system in adolescent depression. In practice, this means experts in the field need to specify the core components of the family system in adolescent depression to define a prototype theory. The long way to a formal network family system theory will provide more insight into family systems in adolescent depression.

2. A mixed-method approach

Further, we argue that focusing only on network estimations based on questionnaire data will not provide sufficient information to advance the field of family psychopathology. As psychometric network models are mostly descriptive (Borsboom et al., 2022), more studies are necessary to provide insight into the directionality of within-family relations. Combining networks with different types of information would provide more insight into the family dynamics of adolescent depression than focusing on a single measurement method. We suggest three other ways to collect information in addition to questionnaire data.

One way to provide more insight into family dynamics would be to combine the network approach with psychological experiments. As part of the NSMD consortium, Freund et al. (2022; 2023) and Nadinda et al. (2024a; 2024b) are evaluating the combination of experimental and network studies for emotional memory and somatic symptoms, respectively. Regarding family studies, one could think of combining family experiments, such as those done by Nimphy et al. (2024) investigating parent-to-child fear transmission in a social interaction task, with a network comparison between conditions. However, there are ethical constraints to experiments in clinical psychology and adolescent depression in particular, therefore, a second possibility to get more information on the causal dynamics of family systems in adolescent depression would be to combine the network approach with observational lab tasks. In observational laboratory tasks, as those included in the RE-PAIR study, families participate in parent-child interaction tasks such as the problem-solving task (Davis et al., 2000; Wentholt et al., 2025). An example of a combination of the network approach with observational laboratory tasks is provided by Bodner et al. (2018). In their study, family interaction tasks were coded, and the relations between affect states of adolescents and their parents were estimated using a network. To verify the relations that we found between affect and parenting behaviors (*Chapters 4*), we could use coded observational laboratory tasks and estimate networks based on the coded data on adolescent-parent interactions.

Third, qualitative data, for example, information obtained by diaries, could provide

more insight into daily family life. As shown in *Chapter 5*, we could use qualitative information to obtain more insight into contextual factors of the family system (e.g., the content of conversation of family discussions; Braun & Clarke, 2006). With diary information, we receive more information on the perspective of adolescents on the reasons for an increase in their depression symptoms, for example, or information on the perspective of parents on the triggers of their parenting behaviors. Using a *mixed-method approach* of quantitative network models and qualitative information (Klimstra & Schwab, 2021), a family network could provide the relation between parenting behaviors and adolescent affect, whereas, from qualitative information from diaries, we may learn more about what exactly happened on the day. In this way, combining networks with qualitative information provides more insight into the direction of relations within a family.

3. Clinical applications

The increasing trend of adolescent depression and its major impact on adolescent and adult life emphasizes the importance of improving interventions for adolescent depression (Eckshtain et al., 2020), with a viable role for the family (Van Aswegen et al., 2023). The aim of the NSMD consortium, which this dissertation is part of, is to evaluate whether networks can improve interventions (Roefs et al., 2022). We propose future directions to evaluate the role of the network approach for family interventions.

Future studies should explore how data-based family networks, as estimated in this dissertation, could inform interventions on disruptions in family dynamics or beneficial interactions within families related to adolescent depression, and make clinicians, adolescents, and parents more aware of the relation between feelings, thoughts, and behaviors within families. Based on this dissertation, we provide three examples of how data-based family networks could be applied in family interventions. First, idiographic family networks, for example, estimated during the waiting period before the start of the intervention, could show how parental affect and parenting behavior could impact adolescent affective well-being (*Chapters 3* and *4*). One could evaluate whether such networks could help practitioners become aware of family dynamics related to adolescent well-being and facilitate conversations on family dynamics at the early intervention stage. Second, in the hypothetical situation where adolescent-reported parental criticism instead of parent-reported parental criticism results in more adolescent sadness (*Chapter 4*), practitioners could explore situations where there is a mismatch between adolescent and parent-reported parental criticism, make the adolescent aware of their possible negative interpretation, and provide tools to avoid this

negativity bias (van Houtum, 2023; Janssen et al., 2024a). Third, when family network shows that parental worry is related to more critical behavior towards the child (e.g., *Chapters 4* and *5*), studies could explore if monitoring parental worry during the intervention period could help to alert a parent when their worry is high to avoid parental criticism. In this way, the network is used in interventions to change parenting behavior.

Although previous studies have shown how networks and measures from data-based idiographic networks, such as centrality, could inform interventions (Andreasson et al., 2023; Levinson et al., 2021; Levinson et al., 2022; Schemer et al., 2023), other studies also illustrate its complexity (Bastiaansen et al., 2020). Opinions on which network feature interventions can best focus on differ and depend on the content of the networks. Therefore, a critical question is what variables to include in networks (e.g., symptoms versus contextual factors; Fried & Cramer, 2017; Bringmann & Eronen, 2018). Moreover, as the stability of idiographic networks, and family networks in particular (*Chapter 3*), depend on many observations (Mansueto et al., 2023), the reliability and practicality (e.g., patients' burden) of the networks are important to consider before using the network as informants for interventions. To evaluate whether data-based networks are a valuable tool during interventions for adolescent depression, more applied network studies in clinical practice are necessary. However, we also suggest that studies explore the use of networks representing the perspective of adolescents and their parents that do not require many observations for stable results (e.g., frequency networks from *Chapter 5*). Other potential networks that are not based on models or data but illustrate the perspective of the clinician, client, or client's family can also be used to inform interventions (i.e., *Chapter 2*). For example, family members can each draw what happens during family interactions. The network drawings would provide clinicians with perspectives on the cognition of the client and their family. In addition to adding networks to interventions, future studies could also systematically explore the role of illustrations of the network approach in existing interventions. For example, in family interventions for adolescent depression, such as Attachment-Based Family Therapy (ABFT; Diamond et al., 2002; 2021), drawings that can be considered a network are used to explain how attachment works and to illustrate adolescent-parent interactions. Ideally, we could combine networks from various sources (i.e., multi-informant; De Los Reyes et al., 2015), such as suggested by PREMISE (Burger et al., 2022b), to inform and improve interventions.

Strengths, limitations & future directions

With the network approach, this dissertation showed the interrelatedness within the family system by the relation between adolescent and parent affect, parental criticism and warmth, and parental worry and self-efficacy, while 1) taking into account the adolescent and parent perspective (including fathers), 2) comparing families within and between adolescent depression and control samples, and 3) obtaining more insight into the parental experience by collecting contextual information during a training for parents of adolescents with depression. However, we should be careful with the generalization of the findings to more complicated cases of adolescent depression and other family structures (than one child and two parents). Future studies should include other variables in addition to affect, parenting behavior, parental worry, and self-efficacy that play a role in adolescent-parent interaction and their relation to adolescent affect and depressive symptoms (e.g., family conflict; Yap et al., 2014; Zhang et al., 2022), and consider more complicated cases of adolescent depression (e.g., severe suicidality and major life events). Moreover, there are network models that we have not applied in this dissertation, but that could help to study family systems. For example, GIMME networks could obtain family networks and investigate family heterogeneity differently (Beltz & Gates, 2017; Boele et al., 2024), while with Bayesian networks we could include information from multiple sources (e.g., parents and clinicians) and update the network when there are more family data (Huth et al., 2023; Briganti et al., 2023).

By applying network models to study family systems in adolescent depression, this dissertation opens the way to using the network approach in more domains of family research. With other domains, we refer to other adolescent psychopathology than depression, such as child anxiety and behavioral problems (e.g., Attention Deficit Hyperactivity Disorder or adolescent aggression), and to more complex family situations or changes in family structures, such as parent divorce (e.g., Oldehinkel et al., 2008) or adaptation after the loss of a parent (Van Heijningen et al., 2024). Especially in complicated family cases where the child is at risk at home, it is essential to study how the family plays a role in adolescent mental health. Changes in the family structure could be considered one of the changes that have been argued to possibly impact the network (i.e., defined as an external field in Borsboom, 2017) and that could be studied with, for example, network interventions (Blanken et al., 2019) or control theory (Henry et al., 2022). Moreover, as sibling hostility and sibling depressive symptoms have been related to more depressive symptoms in adolescence (Finan et al., 2018;

Buist et al., 2019), future studies should consider the role siblings play in family systems of adolescent depression, for example, by including the perspective of siblings as nodes to networks. Other variations in family structures, such as blended families and same-sex parents, should also be studied. For example, children of same-sex parents may face additional issues, such as stigma and discrimination, that can affect their mental health (Crouch et al., 2014, 2015; Oberklaid et al., 2017).

The networks in this dissertation emphasize the importance of including the family in studies and interventions for adolescent depression. However, the importance of the family applies to adolescent health in general. Although the family plays a crucial role in adolescent development and treatment (Barber et al., 2005; Pine et al., 2024), and the affective well-being of family members is related to adolescent affective well-being (*Chapter3*), the family is still often overlooked, also in other domains of adolescent psychopathology and in cases of adolescent physical health issues (e.g., Van Gampelaere et al., 2019; Lundgren et al., 2023). We acknowledge that including parents in adolescent interventions is not always possible or desired. Therefore, we encourage accessible family care, such as training for parents (e.g., Samen Sterk). *Chapter 5* taught us that parents appreciate learning more about adolescent depression, sharing their experience with parents in a similar situation, and having someone who listens to their experience as parents. An acknowledgment of the stressful situation of parents by institutions and care providers is desired.

Conclusion

This interdisciplinary dissertation assessed whether we could use the network approach to gain more insight into the family system in adolescent depression. First, when studying the family system, we showed the importance of considering differences within a family, differences between families, and changes over time. Second, we showed how three different network models provide insight into the relations between adolescent and parent affect, parental worry and self-efficacy, and parental criticism and warmth. However, network models alone are not sufficient to obtain more insight into the family system in adolescent depression. Instead, we call for a formal family network theory and mixed-method approaches. This dissertation provides pointers for clinical practice by highlighting the possibilities of using the network approach to gain insight into family dynamics and how parents can improve these dynamics. In conclusion, the networks of this dissertation have shown how adolescents and parents are interrelated in family systems of adolescent depression and that no adolescent is an island.