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## Changes in perspective: parenting and well-being of adolescents in daily life

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# General introduction

*“The journey of a thousand miles begins with one step”*

Lao Tzu



Adolescence is an important developmental period, broadly ranging from 10 years onwards until the early twenties, characterized by changes at the biological, cognitive, psychological, and social level (Dahl et al., 2018). Hall (1904), being the first to discuss adolescence as a distinctive period, already mentioned that mood disruptions are an important key aspect of adolescence, which has been supported by research. Adolescents generally experience more extremes of mood, more mood swings, and more frequent episodes of depressed mood (Arnett, 1999). These mood swings have been identified as precursor for the development of internalizing problems (Maciejewski et al., 2014). During adolescence, the prevalence of mental health disorders increases substantially with mood disorders being one of the most prevalent (Kessler et al., 2005). Worldwide more than 13% of adolescents between the ages of 10 and 19 are diagnosed with a mental disorder, with 40% of these youth experiencing anxiety and depression (Polanczyk et al., 2015; UNICEF, 2021). An early onset of disorders during adolescence has been associated with higher recurrence rates (Curry et al., 2011) and adverse psychosocial outcomes in adulthood (e.g., Clayborne et al., 2019). Despite the importance of early recognition and treatment, it can take several years before adolescents with a mental disorder reach out and receive treatment (Raven et al., 2017). In the Netherlands, the youth mental health care has been under a lot of pressure for years and the increasing requests for help and lack of capacity to handle these requests resulted in waiting lists that became even longer during the COVID-19 pandemic. To reduce the number of adolescents who need help from (specialized) youth mental health organizations it is therefore essential to focus on early detection and prevention of mental health problems by targeting modifiable factors that can foster adolescent mental well-being.

Parenting is one promising malleable factor to investigate since parents and the parent-adolescent relationship are essential for adolescent well-being (e.g., Bronfenbrenner & Morris, 2006; Sameroff, 2010). Despite decades of research on parenting, which indicate that warm and supportive parenting fosters adolescent well-being (e.g., Khaleque, 2013; Pinquart, 2017; Steinberg & Silk, 2002), translating these findings to the everyday lives of individual families remains a challenge. The dynamic process between parenting and adolescent well-being takes place in the daily flow of life within a family. Previous studies have not assessed the family dynamics at this level and hence it is still an open question whether previous findings represent actual processes in daily life. Therefore, in this dissertation, the aim is to gain insight into parenting processes in relation to affective well-being of adolescents in daily life to contribute to a better understanding of the day-to-day and moment-to-moment family dynamics. Ultimately, these insights may have important implications for prevention and clinical interventions for youth with depression.

### **The need to zoom in to parenting of adolescents in daily life**

According to the ecological models of human development (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2006; Sameroff, 2010), which still dominate the field, the parent-adolescent relationship is considered to be one of the most proximal and important for adolescent development and well-being. Hall (1904) already described this relation as being characterized by increases in conflicts. Throughout the last century, research has shown that generally in early adolescence (10-13 years) the amount of conflict between parents and adolescents indeed increases (Meeus, 2018) and conflict intensity rises in middle adolescence (14-17 years; De Goede et al., 2009). Importantly, this is not the case for all adolescents to the same extent (Smetana & Rote, 2019). Since the transformation of the parent-

adolescent relationship revolves around themes of identity and autonomy (Laursen & Collins, 2009; Steinberg & Silk, 2002), conflicts with parents can be seen as normative and even functional, as a way to renegotiate the parent-adolescent relationship into becoming more egalitarian over time (Branje, 2018; Branje et al., 2012). This is a bidirectional process influencing the behavior of both adolescents and parents and their mutual interactions (e.g., Bronfenbrenner & Morris, 2006).

Even though developing a sense of self and becoming more autonomous are thus key developmental tasks for adolescents, the parent-adolescent relationship and parenting remains essential for adolescents' development and well-being (Steinberg & Silk, 2002). Numerous studies have empirically supported this and showed that a parent-adolescent relationship characterized by warmth and support fosters adolescent well-being, while parental control, hostility, and conflict negatively impact adolescents' well-being (e.g., Khaleque, 2013; Pinquart, 2017; Weymouth et al., 2016). Several empirical studies and reviews have also suggested that negative parenting may be a proximal cause of adolescent mental health problems (e.g., Pinquart, 2017; Sameroff, 2000). Moreover, this is also a transactional (i.e., bidirectional) process (Sameroff, 2010), with adolescents influencing the interactions and parents' behavior.

Notwithstanding the valuable insights these studies provided, the ecological validity and generalizability of these findings to the everyday lives of the individual families has been questioned. The majority of conclusions has been based on studies focusing on long time-intervals (i.e., years) and stable characteristics of families on average, while families are not alike nor stable over time (Boele et al., 2020; Keijsers & van Roekel, 2018). Ecological momentary assessment (EMA; Stone & Shiffman, 1994) provides the opportunity to zoom in to the parenting processes on a momentary (at this moment) and daily (at the end of the day) basis and assess changes in parenting within families. In the current dissertation, I aim to examine these momentary and daily fluctuations of parenting and investigate whether these relate to adolescent well-being using EMA.

### **Ecological momentary assessment**

Ecological momentary assessment (EMA) – also known as the experience sampling method (ESM) or ambulatory assessment (AA) – is a research method in which participants receive multiple brief questionnaires throughout a day in the context of daily life. These assessments concern questions on for instance whereabouts, thoughts, feelings, and behaviors at that moment. The first studies using this method to examine parenting and adolescent well-being were already conducted in the 1980s with the use of paper-and-pencil questionnaires (Larson & Richards, 1991). Due to technological development and the common availability of smartphones, it nowadays has become more accessible and easier to use EMA in research. Several applications have been developed that can be installed on the smartphones of participants with push notifications alerting participants to complete a questionnaire. Using EMA to examine daily life processes such as parenting and adolescent well-being has several advantages. Most importantly, it enables researchers to gain information about both content and its context (Hektner & Csikszentmihalyi, 2002) in an ecologically valid way (Trull & Ebner-Priemer, 2009), with reduced recall bias (Schwarz, 2007). When using the classical questionnaires participants are asked to report retrospectively (e.g., about the last weeks, months or year) on their thoughts, feelings, and behaviors, which can be biased by for instance their current mood or most recent experience. Moreover, EMA allows for capturing the momentary daily life dynamic processes

by assessing certain phenomena on a short time-scale (Hektner & Csikszentmihalyi, 2002). For instance, feelings can be assessed every hour or multiple times per day for several consecutive days. These repeated assessments also enable zooming in to more person-specific or family-specific processes (Keijsers & van Roekel, 2018).

Although the increased availability of easy-to-use applications has made EMA research booming throughout the past years, not many studies have yet used this method to examine parenting in daily life and only few EMA studies assessed momentary parent-adolescent interactions (for review see Keijsers et al., 2022). With the current dissertation, I want to contribute to this new line of research in order to support families and foster adolescent well-being. Below, I will first outline what is currently known about parenting and adolescent well-being before addressing the gaps in parenting research in more detail and discussing how I aim to take some first steps in gaining a better understanding of the everyday lives of families.

### **Operationalization of parenting**

Parenting, encompassing a wide range of thoughts, actions, and feelings related to raising children (Bornstein, 2015), has been studied extensively. Generally, two approaches of classifying parenting behavior have been adopted in the literature: a dimensional approach focusing on parenting dimensions and a categorical approach that combines dimensions into parenting styles (Maccoby & Martin, 1983; Pinquart, 2017). The dimensional approach distinguishes two broad dimensions, namely parental responsiveness and parental demandingness. Parental responsiveness refers to the degree parents are sensitive to the emotional and developmental needs and demands of their child and encompasses both sensitive behaviors such as being warm, supportive, and nurturing, as well as insensitive behaviors such as criticism and rejection (e.g., Maccoby & Martin, 1983). Parental demandingness refers to different forms of parental control, such as behavioral and psychological control (e.g., Maccoby & Martin, 1983; Pinquart, 2017). The categorical approach uses these two dimensions to distinguish four parenting styles. Originally, the following four have been defined: an authoritative style (high responsiveness and demandingness), an authoritarian style (low responsiveness and high demandingness), a permissive style (high responsiveness and low demandingness), and a neglectful style (low responsiveness and demandingness) (Baumrind, 1966; Maccoby & Martin, 1983). Both parenting dimensions as parenting styles have been related to adolescent well-being, concurrently but also (bidirectional) over time (e.g., Pinquart, 2017).

In line with a general focus in the field on parenting dimensions instead of styles (Smetana, 2017), this dissertation will focus on two aspects of parenting, parental warmth and parental criticism, that are both related to the important development task of developing a strong sense of self and identity during adolescence as proposed in the work of Erikson (1968). Previous studies have shown that warm and supportive parenting behavior contributes to the development of a positive self-view, while parental criticism and rejection induces more negative self-views (McCranie & Bass, 1984). These in turn may increase vulnerability to depression (Garber & Flynn, 2001). Parental warmth or support is conceptualized as showing acceptance, emotional closeness, and positive involvement toward the adolescent (Gladstone & Parker, 2005) and parental criticism as expressing negativity, dissatisfaction or less responsiveness to the adolescent (Harris & Howard, 1984).

### Parent-adolescent discrepancies of parenting

The current knowledge on parenting is mostly based on the perception of one family member, usually the adolescent, while adolescents and parents may perceive or interpret parenting behavior differently. That is, a parent may for example think that he or she is supporting their adolescent, while the adolescent might perceive it as being too overprotective, or a parent may think he or she is 'just' asking a question, whereas an adolescent perceives it as criticism. Since differences between adolescents and parents can yield valuable information (De Los Reyes & Ohannessian, 2016) several multi-informant studies, including adolescent and parent reports of parenting, have been conducted the past years on these discrepancies. Results of meta-analyses have shown that parents generally are more positive about their own parenting than adolescents, with convergence between adolescent and parent reports being quite low (De Haan et al., 2018; Hou et al., 2020; Korelitz & Garber, 2016). How to interpret these discrepancies between adolescent and parent reports of parenting remains a topic for debate, however. These differences may indicate a normative process with adolescence developing an individual identity (Bowen, 1978; Grotevant & Cooper, 1986) and starting to re-evaluate family relationships (Smetana et al., 2006), which may lead to different perceptions. Discrepancies may also indicate dysfunctional family dynamics (De Los Reyes et al., 2019) or signal a misfit between adolescents' needs and parents' demands (Eccles et al., 1993; Lerner et al., 1986), possibly negatively impacting adolescents' and parents' well-being (e.g., De Los Reyes, 2011). Another factor that may play a role in the discrepancies is that adolescents' and parents' affect may influence the reports on parenting of parents and adolescents.

In relation to *differences* between adolescent and parent reports of parenting, some studies have already examined the link between discrepancies and adolescent well-being. Overall, differences between adolescents' and parents' reports of parenting were related to poorer adolescent well-being (Hou et al., 2020). Especially when adolescents were more negative about parenting behavior than parents, adolescents reported lower well-being (Hou et al., 2020; Rote & Smetana, 2016). Due to the use of interaction scores between adolescents' and parents' perception of parenting instead of difference scores, some studies were able to additionally examine overlap (i.e., congruence) between these reports. Results showed that congruence of negative perceptions of parenting were related to more adolescent maladjustment (Hou et al., 2020; Van Petegem et al., 2019). In line with ideas that the perspectives, behaviors, and affective states of family members interact and influence each other (Cox & Paley, 1997; Minuchin, 1985), it has been suggested that the discrepancies between adolescents' and parents perception can also undermine parents' well-being (De Los Reyes et al., 2019), but this has not yet been examined. Therefore, in this dissertation, adolescents' and parents' perception of parenting and discrepancies between them in daily life will be assessed and linked to both adolescents' and parents' affect.

### Addressing the gaps of parenting research

Notwithstanding the wealth of information these abovementioned studies have provided and contributed to our understanding of parenting and its relation to adolescent well-being, the ecological validity of these findings has increasingly been questioned. More specifically, at least five concerns arise when interpreting previous work using retrospective methods, which will be addressed in this dissertation: 1) the focus on macro time-intervals; 2) the focus on associations at the between-person

level; 3) the focus on mothers; 4) the lack of taking into account heterogeneity; 5) the impact of adolescent depression.

### ***Dynamic processes at the micro-level***

With respect to the time scale of previous studies, according to the dynamic systems theories (e.g., De Ruiter et al., 2019; Kunnen et al., 2019; Smith & Thelen, 2003) processes can happen on multiple time scales, from specific behaviors (i.e., sighing, nodding the head) during an interaction to more macro changes in parenting related to developmental transformations across years (i.e., parent-adolescent relationship becoming more egalitarian). Most parenting studies to date have used cross-sectional or longitudinal designs with macro time-intervals and classical retrospective self-report measures, which resulted in insights about patterns and developments over longer periods of time. As the parent-adolescent relationship is gradually shaped by each single interaction (Hinde, 1976; Keijsers et al., 2022), investigating the short-term dynamics is essential to get a more complete understanding of the family processes.

To do so, one could rely on observational studies, which are considered the gold standard for assessing these fine-grained dynamics between parents and adolescents. Yet in this method, the focus is on seconds or minutes and ecological validity can be questioned. Parent-adolescent interactions in the lab are videotaped and their behavior is coded afterwards by independent observers. This should provide more objective data of short-term dynamic processes and rule out self-report bias. Although it has been indicated that these observations reflect natural behavior relative well (Gardner, 2000; McKee et al., 2013) and may grasp *subtle* affective and behavioral aspects of parenting that parents or adolescents themselves would not (be able to) report, the natural context in which these interactions occur is missing (Trull & Ebner-Priemer, 2009), as well as the frequency of these behaviors in daily life. Moreover, the subjective experiences of adolescents and parents are not taken into account, while each individual interprets behavior in its own way based on previous experiences and interactions (Hinde, 1976; Scheepers, 2021). There are, however – as already argued earlier in this chapter and as I will also outline below – ecological methods such as EMA that overcome these limitations and are also suited to assess short-term dynamics between parents and adolescents.

### ***Within-person processes***

With respect to the level of investigating associations between parenting and adolescent well-being, most previous studies have assessed the between-person level (i.e., average). By doing so, estimates relate to differences between families and do not contain information about the within-person level (i.e., individual) (Hamaker, 2012; Keijsers, 2016). The findings of these studies do not provide insights into how parenting and parent-adolescent interactions can fluctuate over time (i.e., days) within a family or person (Darling & Steinberg, 1993; Keijsers & van Roekel, 2018). Recent studies indeed showed that findings at the between-person level are not always similar to results at the within-person level (Hamaker et al., 2015; Keijsers, 2016), also known as a Simpson's paradox (Kievit et al., 2013). Evidence for this has for instance been provided in a study on parental autonomy support and adolescents' social anxiety (Nelemans et al., 2020). Results showed that, at the between-person level, mothers of adolescents with more social anxiety symptoms reported *lower levels* of autonomy support compared to mothers of adolescents with lower social anxiety symptoms. However, at the



within-person level, mothers reported *higher levels* of autonomy support at times when adolescents reported higher levels of social anxiety symptoms. A recent systematic review found that, to date, 46 studies examined the within-person fluctuations in parenting and adolescent adaptation, with only ten studies assessing parenting at the daily level (at the end of the day; Boele et al., 2020). Thus, crucial information on the dynamic and person-specific processes at the level where the actual parenting takes place, the daily flow of life, is missing.

### ***Inclusion of fathers***

Another concern is that, to date, most studies have focused on parenting of only mothers, while it has been suggested that mothers and fathers play a unique role in parenting (e.g., Lamb & Lewis, 2013) with mothers providing generally more warmth and support and fathers more instrumental care (Youniss & Smollar, 1985). This stresses the need to explicitly examine parenting of fathers. Although some studies already showed that parenting of mothers was more supportive and emotion-directed than parenting of fathers (De Goede et al., 2009; Mastrotheodoros et al., 2018), studies that include fathers are still scarce. In line with the family system theories (e.g., Cox & Paley, 1997; Minuchin, 1985) that state that families consist of interrelated subsystems such as the adolescent-mother and adolescent-father relationships, a key objective of this dissertation is to also include fathers and compare parenting of mothers and fathers.

### ***Heterogeneity***

Additionally, previous studies have mainly focused on general processes within a certain group or sample and did not take into account the fact that how parenting and adolescent well-being is related may be very different from person to person (i.e., heterogeneity). Due to the person-specific interactions between personal and contextual influences (e.g., Bronfenbrenner & Morris, 2006; Sameroff, 2010) adolescents may respond in different ways to parenting (e.g., Keijsers et al., 2016; Sameroff, 2010). That is, mental health problems may affect how parental behaviors, such as criticism, affect an adolescent's current mood. Although this heterogeneity has been acknowledged in for instance the differential susceptibility hypothesis (e.g., Pluess & Belsky, 2010), not many studies have investigated this in within-person processes (Boele et al., 2020), especially not in daily life. Most studies that did explicitly assess this heterogeneity found substantial variation between individuals (Boele et al., 2020) and some tried to explain these differences by testing the impact of stable characteristics related to the adolescent (i.e., gender, age), parent (i.e., gender, substance use) or family (i.e., socioeconomic status, family values). These first insights on how parenting may affect adolescents differently demonstrate the need to further investigate heterogeneity in family-specific parenting processes in daily life as well as trying to explain these individual differences.

### ***Impact of adolescent depression***

As depressive symptoms increase during adolescence and mood disorders are one of the most prevalent in adolescents (Kessler et al., 2005), depression is an important factor that may explain these individual differences and affect the association between parenting and affect in daily life. It has been observed that the within-person association between conflicts with parents and adolescent negative mood indeed was stronger for adolescents with more depressive symptoms compared to

adolescents with fewer depressive symptoms (Timmons & Margolin, 2015). However, more research is necessary that assesses positive aspects of parenting and elucidate whether adolescents with more depressive symptoms still benefit from for instance parental support or warmth. Moreover, this previous study (Timmons & Margolin, 2015) was based on a community sample and did not include adolescents with mood disorders. Thus far, no studies have examined the moment-to-moment experiences of parenting in families with adolescents with mood disorders. Although parenting has been consistently related to adolescent depression (Restifo & Bögels, 2009; Yap et al., 2014), the previously mentioned recall bias (Trull & Ebner-Priemer, 2009) may be more substantial in the case of a depression (Platt et al., 2017), with adolescents' perception of parenting being impacted by their low affect. For clinical practice, it is therefore imperative to additionally assess parents' own perception of parenting, thereby gaining more insight into these daily life family dynamics. Thus, a final key objective of this dissertation is to investigate the impact of adolescent depressive symptoms and depression on the experiences of parenting in relation to adolescent well-being in daily life.

To overcome these gaps and study parent-adolescent interactions and parenting with higher ecological validity and lower recall bias, EMA is a suitable method that has only scarcely been used in the field of parenting. Hence, in this dissertation, I will use this method to examine the dynamic and family-specific concepts of parenting (of both mothers and fathers) and parent-adolescent interactions at the micro-level, test individual differences, and investigate these interactions in the context of adolescent depression. By doing so, I aim to better understand the everyday life dynamics, contribute to the development of this fairly new research field, and also elucidate whether previously observed findings based on retrospective reports hold when using a different approach. Ultimately, the aim is to inform parents and clinicians and to provide suggestions for prevention and clinical interventions for adolescents with depression. Below I will outline how the studies in this dissertation will help to tackle these questions and concerns.

### **Steps towards filling the gaps concerning parenting processes in daily life**

Larson, as one of the founding fathers of EMA, started using this method to describe adolescents' lived experiences in the daily life context. His studies and others that followed provided some first insights into the patterns and changes in affective states of adolescents (see for an overview Larson, 2019) and their parents (Larson & Richards, 1994). For instance, adolescents tend to experience more extremes of emotions than parents and greater mood disruptions than preadolescents (Larson & Richards, 1994), thereby supporting the claim already made by Hall (1904). Changes in the parent-adolescent relationship were also studied using EMA. For instance, as adolescents get older, they start spending more time with their friends whereas the time spent with families decreases substantially (Larson & Richards, 1991; Larson et al., 1996). As already mentioned, only few studies have yet examined parenting and parent-adolescent interactions in daily life (for reviews see: Boele et al., 2020; Keijsers et al., 2022). Most assessed parenting at the daily level, asking about parental behavior once a day at the end of the day, but not on the momentary level (at this moment). Overall, parenting on a given day was related to adolescent affect, which seems to indicate that the findings based on macro-scale retrospective reports can be generalized to daily life. However, more research is necessary that focuses on both positive and negative aspects of parenting of mothers and fathers as

well as positive and negative affective states in adolescents, at the daily and momentary level, which will be done in the current dissertation (chapter 3, 5, and 6).

Moreover, information on how parents themselves perceive their parenting in daily life is missing and it is still unknown whether the findings on discrepancies between adolescents' and parents' perceptions of parenting and its association with adolescent well-being also generalize to daily life. Previous studies examining these discrepancies mostly used difference scores, however, this approach has been criticized (e.g., De Haan et al., 2018). Using more sophisticated polynomial regression analyses including an interaction term between adolescents' and parents' reports is advised in order to examine whether differences between reports relate to the outcome, in addition to main effects of individual reports (Laird & De Los Reyes, 2013). However, this type of analysis has not yet been applied to a daily diary or EMA study, which will be done in this dissertation. Furthermore, although interrelatedness of parents' and adolescents' affect and behaviors has been proposed theoretically (Minuchin, 1985), ways to additionally include parents' affect as an outcome in these models are still missing. By using a novel hybrid statistical model (Iida et al., 2018), which enables including the individual perceptions and the difference score in one model, I aim to assess how individuals' perceptions of daily parenting and the difference between these relate to both adolescents' and parents' daily affect. Thus, by focusing on the daily discrepancies between adolescent-mother and adolescent-father dyads in relation to both well-being of adolescents and parents I aim to contribute to unravelling daily family dynamics (chapter 5 and 6).

Several other questions remain to be answered. As addressed above few studies have actually tested heterogeneity in the within-person associations between parenting and adolescent well-being in daily life and this will hence also be tested in this dissertation. Moreover, I aim to take some first steps in order to better understand who may benefit from parenting in order to contribute to the tailoring of interventions to the need of individual families (chapter 2 and 3). Family dynamics can become more challenging when an adolescent is experiencing a depression. Theoretically, it has been suggested that adolescents who perceive their parents and their parenting behavior as rejecting or less supportive are more likely to develop a depression (Rohner, 2016; Rohner et al., 2005) for instance by developing depressogenic schemas (Beck, 1967). However, as parents and adolescents influence each other bidirectionally (Coyne, 1976; Rudolph, 2009), adolescent depression also elicits responses from parents. This can either be adaptive, with parents increasing their support (Gottman et al., 1996), but could also result in becoming overprotective (Johnco & Rapee, 2018) or parents may show more criticism or less parental support (Coyne, 1976). To gain more insight into these dynamics I aim to investigate momentary affect and parenting in families with adolescents with a depression (chapter 3) and examine the extent to which the association between parenting and adolescent affect is influenced by adolescent depressive symptoms (chapter 2 and 3). More importantly, this information could possibly guide future interventions. The majority of interventions for adolescent depression (e.g., cognitive behavioral therapy or interpersonal psychotherapy) are still individually based and have received most attention in research, while involvement of parents has been found to contribute to effectiveness of the treatment (Oud et al., 2019).

In addition to the importance of the parent-adolescent relationship for adolescent well-being, the ecological models of human development propose that contextual influences at the macro-level affect adolescent development and the family dynamics (e.g., Bronfenbrenner & Morris, 2006;

Sameroff, 2010). While working on this dissertation, the COVID-19 pandemic created drastic changes to the daily lives of families since measures of social distancing were imposed in society. An important question that was raised was to what extent the COVID-19 pandemic and associated distancing measures influenced affect and parenting in families. I therefore will also examine the impact of the COVID-19 pandemic, as a macro-level influence on daily parenting and momentary well-being of adolescents and parents (chapter 4).

A final more methodological question is how to best measure parent-adolescent interactions. Generally, three types of sampling can be distinguished in EMA: 1) interval-contingent sampling, referring to participants reporting for instance at the end of every hour; 2) event-contingent sampling, referring to participants reporting after a certain event took place (i.e., rating a social interaction); 3) signal-contingent sampling, referring to participants receiving a notification to complete a questionnaire with either fixed, random or semi-random intervals. Parent-adolescent interactions are scattered over a day and random signal-contingent sampling schemes might miss impactful interactions. Asking parents and adolescents to indicate themselves when they interacted (i.e., event-contingent) may be prone to bias. Parents and adolescents may not think about or feel like completing a questionnaire when an interaction was for instance unpleasant. Gaining more objective information on physical proximity of adolescents and parents may therefore be informative which may be an objective marker that characterizes interactions (Gupte & Eliassi-Rad, 2012). By developing and applying a novel method using Bluetooth low energy (BLE) beacons and a smartphone application, I aim to objectively track proximity between adolescents and parents and trigger questionnaires based on this proximity. This not only allows for gaining more insight into frequency and duration (i.e., quantity) of parent-adolescent proximity, but also enables assessing quality of interactions at the moments that these occur (chapter 7).

## **Method**

This dissertation is based on three studies that are briefly introduced below. The majority of studies (chapter 3, 4, 5, 6, and 7) is based on data from the Relations and Emotions in Parent-Adolescent Interaction Research (RE-PAIR). The two other datasets are from the Grumpy or Depressed project (chapter 2) and Family Life Optimizing Well-being (FLOW) study (chapter 6).

### ***RE-PAIR***

RE-PAIR is a Dutch multi-method, two-generation study developed to examine the bidirectional relation between parent-adolescent interactions and adolescent mental well-being by comparing families with an adolescent with a current major depressive disorder or dysthymia to families with an adolescent without psychopathology (see also Van Houtum et al., 2021; Van Houtum et al., 2022; Wever et al., 2021). This study was conducted at the Clinical Psychology Department of Leiden University from 2018 to 2022. In total, 115 families participated in the RE-PAIR study with 80 adolescents without psychopathology and their 153 parents, and 35 adolescents with a depression and their 63 parents.

The full RE-PAIR study consisted of four parts: 1) online questionnaires; 2) a research day at the lab in Leiden; 3) EMA; 4) an Magnetic Resonance Imaging (MRI)-scan session for the adolescent and one or both parent(s). For follow-up purposes, families received an invitation to complete online

questionnaires half a year, one year, and two years after the research day. Additionally, at the start of the COVID-19 pandemic (April 2020), families with an adolescent without psychopathology were invited to participate in a follow-up EMA study to investigate the impact of the pandemic on parenting and affect in both adolescents and parents.

All family members (adolescents, mothers, and fathers) who participated in the RE-PAIR study were invited to participate in the EMA. Participants installed the Ethica application on their own smartphone to fill out the questionnaires and carried around a BLE beacon to track proximity. In total, they received four questionnaires a day for fourteen consecutive days (56 in total) either on a set time (in the morning) or random within a specified time-range. Adolescents reported about parenting of their mothers and fathers separately and parents reported on their own parenting behavior. The current dissertation focusses on RE-PAIR data collected during the EMA and uses questionnaire data for descriptive purposes (chapter 3, 4, 5, 6, and 7).

### ***Grumpy or Depressed***

Grumpy or Depressed is a Dutch multi-method, longitudinal study aimed to differentiate normative grumpy behavior during puberty from the early signs of depression (Keijsers et al., 2015). This study was conducted at the Department of Adolescence at Utrecht University in 2014 and 2015. The study was composed out of a screening phase ( $N = 573$  adolescents) consisting of questionnaires and a longitudinal study on a subsample ( $N = 244$  adolescents and  $N = 235$  parents) consisting of three waves of both questionnaires as EMA within one school year with 3-month intervals. The current dissertation focusses on the data collected during the longitudinal study (chapter 2).

Adolescents and parents who participated in the longitudinal study received the online questionnaire four weeks before the start EMA and were given seven weeks to complete this. Only adolescents completed the EMA and installed the MyPanel app on their own smartphone. Per wave, they filled out eight questionnaires a day, randomly divided, for seven consecutive days (56 in total).

### ***FLOW***

FLOW is an American multi-informant, multiple timescale study to capture family dynamics in two-parent households (e.g., Fosco & Lydon-Staley, 2019). In total, 150 parent-adolescent dyads participated, with parents being mostly mothers (95.3%). The study was conducted at the Human Development and Family Studies Department at the Pennsylvania State University from 2014 to 2017.

The FLOW study consisted of two parts: 1) online baseline questionnaires; 2) a daily diary protocol. For follow-up purposes, the parent-adolescent dyads received an invitation to complete online questionnaires after 12 months. Both the parent and adolescent completed the daily diaries surveys, which were sent via email at 7PM each night for 21 consecutive nights. The current dissertation includes the daily reports of parenting and affect of both the adolescent and parent (chapter 6).

### **Outline of thesis**

The present dissertation used a multi-informant and multi-method approach to investigate fluctuations in parenting and parent-adolescent interactions in daily life and its associations with fluctuations in adolescent affective well-being at the within-person level.

*Chapter 2* starts by investigating the association between experienced daily parental support and adolescent daily negative mood at the within-person level, based on adolescent reports from the sample of the Grumpy or Depressed project. To add to existing literature, individual differences in this association are tested as well as possible explanatory factors for this heterogeneity.

In *Chapter 3*, we build upon this by including adolescents with a current major depressive disorder or dysthymia to assess whether the within-person association between experienced parenting behavior and adolescent affective well-being during *momentary* parent-adolescent interactions is different for adolescents with a depression compared to adolescents without psychopathology. Moreover, the multi-informant approach enables to investigate differences in momentary affect and parenting between families with adolescents with a depression and families with an adolescent without psychopathology, from adolescents', mothers' and fathers' perspective.

*Chapter 4* examines the impact of the COVID-19 pandemic on momentary affect of adolescents and parents as well as daily parenting behavior from both the perspective of adolescents and parents by comparing EMA during two weeks of the COVID-19 pandemic (April 2020) and a two week baseline period pre-pandemic.

In *Chapter 5*, to gain more insight into adolescent-parent discrepancies in daily life adolescents', mothers, and fathers' perceptions of daily parenting are described and compared. As a next step, multilevel polynomial regression models and response surface analyses are applied to examine the extent to which adolescents' and parents' perceptions and discrepancies between these are related to adolescent daily positive and negative affect.

With the use of novel hybrid models *Chapter 6* extends these findings by including parents' daily affect in addition to adolescents' affect in relation to parent and adolescent perspectives of daily parental warmth and its discrepancies. Investigating this in two samples (FLOW and RE-PAIR) allows for replication of findings across samples of two different cultural contexts. Using the RE-PAIR sample also enables assessing differences between adolescent-mother and adolescent-father dyads.

In *Chapter 7*, the application of an innovative method to objectively assess parent-adolescent physical proximity using BLE beacons and a smartphone application is described. This provides more information on frequency and time spent together between adolescent-mother and adolescent-father dyads. The method is additionally used to trigger questionnaires based on the proximity to gain more insight into quality of parent-adolescent interactions.

In *Chapter 8*, the main results of the studies presented in this dissertation are discussed and put in a broader perspective from a theoretical, methodological, and clinical perspective. Directions for future research are also discussed.

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