Development and Psychopathology (2021), **33**, 184–200
doi:10.1017/S0954579419001688

CAMBRIDGE UNIVERSITY PRESS

Regular Article

Daily parenting of children with cerebral palsy: The role of daily child behavior, parents' daily psychological needs, and mindful parenting

Lisa M. Dieleman[1], Bart Soenens[1], Peter Prinzie[2], Lana De Clercq[3], Els Ortibus[4] and Sarah S.W. De Pauw[3]

[1]Department of Developmental, Personality and Social Psychology, Ghent University, Ghent, Belgium; [2]Department of Psychology, Education & Child Studies, Faculty of Social Sciences, Pedagogical and Educational Sciences, Erasmus University Rotterdam, Rotterdam, The Netherlands; [3]Department of Special Needs Education, Ghent University, Ghent, Belgium and [4]Department of Development and Regeneration, Katholieke Universiteit Leuven, Leuven, Flanders, Belgium

Abstract

The purpose of this study was to advance the current understanding of the daily dynamics that are involved in raising a child with Cerebral Palsy (CP). Specifically, we examined the role of mindful parenting and of day-to-day variation in parents' psychological needs and child behavior in explaining day-to-day variation in parents' autonomy-supportive, psychologically controlling, and responsive parenting behavior. Parents ($N = 58$) of children with CP (Mage = 12.68 years) participated in a 7-day diary study. Multilevel analyses indicated that parents' autonomy-supportive, psychologically controlling, and responsive behaviors fluctuate considerably between days. Further, daily fluctuations in both child behavior and parents' own psychological needs were found to be associated with this daily variability in parenting. In addition, interindividual differences in mindful parenting were associated positively with parents' responsiveness and negatively with psychologically controlling parenting across the week. These findings point towards the changeability of parenting behavior among parents of a child with CP and suggest that interventions targeting parenting behavior in the context of CP will be most effective when taking into account both the parents' and the child's functioning.

Keywords: autonomy support, cerebral palsy, child behavior, diary study, mindful parenting, parenting, psychological control, psychological needs, responsiveness, self-determination theory

(Received 19 January 2019; accepted 11 November 2019)

Cerebral palsy (CP), which is the most common cause of physical disability in childhood, finds its etiology in damage to the immature brain, in the pre-, peri- or postnatal period (Odding, Roebroeck, & Stam, 2006). Its presentation is heterogeneous but mainly affects body movement, posture, and muscle coordination, causing activity and participation limitations. Cerebral palsy can be categorized in different types: spastic CP (characterized by stiff muscles), dyskinetic CP (characterized by involuntary movements), and ataxic CP (characterized by difficulties with coordination and balance). Moreover, many children with CP experience a wide range of comorbidities, such as health issues, pain, communication difficulties, cognitive impairments, sleep disorders, and behavioral problems (Lélis, Cardoso, & Hall, 2016; Novak, Hines, Goldsmith, & Barclay, 2012). For parents, receiving the diagnosis of CP for their child has a profound effect and the parenting process comes along with a multitude of unique and complex challenges and responsibilities (Alaee, Shahboulaghi, Khankeh, & Kermanshahi, 2015; Pousada et al., 2013). These additional difficulties and impairments affect not only the daily functioning and quality of life of the children themselves (e.g., limiting opportunities for social interaction; Majnemer, Shevell, Rosenbaum, Law, & Poulin, 2007; Rosenbaum, 2003) but also those of their parents (Pinquart, 2018; Pousada et al., 2013).

Research has established clearly that the parents of children with CP are at increased risk for experiencing parenting stress (Pinquart, 2018). Uncertainty about the child's developmental progress and future, the intense involvement of multiple health care providers, and the practical and financial constraints that are associated with this condition require continuous adaptations and prolonged efforts on the part of parents (Alaee et al., 2015, Pousada et al., 2013). In turn, the way that these parents adjust to these challenges affects the well-being and psychosocial development of their child with CP. Indeed, recent research has begun to demonstrate the importance of parenting behavior and high-quality parent–child relations for the health and well-being of children with CP (Aran, Shalev, Biran, & Gross-Tsur, 2007; Barfoot, Meredith, Ziviani, & Whittingham, 2017; Cohen, Biran, Aran, & Gross-Tsur, 2008; Ho et al., 2008).

These findings suggest that parental support that targets parenting behavior might be effective in promoting the development

Author for Correspondence: Lisa M. Dieleman, Department of Developmental Personality and Social Psychology, Ghent University, Ghent, Belgium; E-mail: Lisa.Dieleman@UGent.be

Cite this article: Dieleman LM, Soenens B, Prinzie P, De Clercq L, Ortibus E, De Pauw SSW (2021). Daily parenting of children with cerebral palsy: The role of daily child behavior, parents' daily psychological needs, and mindful parenting. *Development and Psychopathology* **33**, 184–200. https://doi.org/10.1017/S0954579419001688

of children with CP. In order to effectively support these parents, it is imperative that we understand which factors affect the way parents behave towards their child with CP. In contrast to the extensive research on antecedents of parenting in the general population, indicating that parenting is a multidetermined phenomenon that is shaped by both parental factors (e.g., parental well-being) and child characteristics (e.g., problem behavior; Belsky & Jaffee, 2006), there is a paucity of research on the antecedents of parenting behavior among parents that are raising a child with CP. Accordingly, the main goal of this study was to advance the understanding of parents' behaviors when raising a child with CP by examining the role of parental and child factors.

The Influence of Parenting on the Development of Children With CP

Parenting behavior plays a substantial role in the psychosocial development of children (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000). In the general parenting literature, three dimensions are increasingly identified as crucial parental resources for optimal child development: high autonomy-supportive parenting, high responsive parenting, and low psychologically controlling parenting (Joussemet, Landry, & Koestner, 2008; Prinzie, Stams, Deković, Reijntjes, & Belsky, 2009). *Autonomy-supportive parenting* promotes the child's volitional functioning and consequently contributes to healthy psychological development (Grolnick, Levitt, & Caruso, 2018; Soenens, Deci, & Vansteenkiste, 2017). Autonomy-supportive parenting entails several facets. A first key element of autonomy-supportive parenting is showing an active interest in the child's mental world (i.e., feelings, interests, and preferences) and taking the child's perspective (Ryan & Deci, 2017). Another important element is encouraging initiative by, for instance, providing choices and allowing independent decision-making (Joussemet et al., 2008). *Responsive parents* enhance the child's emotional and social development by expressing their care and love for their child. Parental responsiveness includes two central elements (Davidov & Grusec, 2006): (a) parents' expression of affection and warmth (e.g., hugging, smiling) and (b) parents' support and care when the child experiences distress (e.g., responding in a kind and comforting way when a child experiences negative emotions). Although autonomy-supportive parenting and responsiveness both require that parents are aware of and attentive to their child's feelings and perspective (Soenens et al., 2017), these two supportive parenting dimensions also have distinct features. While parental warmth is unique to the concept of parental responsiveness, the encouragement of initiative and the provision of choice are unique to the concept of parental autonomy-support. Because both parenting dimensions share some common content but also have distinct features, they are typically positively (but not perfectly) correlated with each other in empirical research (Soenens et al., 2017; Costa, Sireno, Larcan, & Cuzzocrea, 2019). *Psychologically controlling parenting* refers to the use of insidious and manipulative behaviors, such as love-withdrawal and guilt induction, to dominate the child's psychological world. This parenting behavior undermines children's healthy development and increases their risk to develop emotional and behavioral problems (Barber, Stolz, & Olsen, 2005; Pinquart, 2017).

These well-established parenting effects have also been demonstrated among children with CP. For example, Aran et al. (2007) demonstrated that supportive parenting dimensions related more strongly to the quality of life of children and adolescents with CP than other factors did, such as the severity of the CP. Child-reported autonomy-support was related to better mental health, higher self-esteem, fewer social and emotional problems, higher happiness with their physical condition, and better physical functioning. In addition, when youngsters perceived their parent as being responsive rather than rejecting, they also reported a better quality of life. In a study that used the same child-reported parenting dimensions, Cohen et al. (2008) found that rejecting parenting positively predicted an external locus of control (i.e., the perception of not being able to control one's life) in children and adolescents with CP. A third relevant study found that parents' responsiveness, as observed during interactions with their child (aged between 2 and 12 years), related negatively to child behavioral problems and positively to prosocial child behavior (Barfoot et al., 2017). Further, research showed that child-perceived overprotection (i.e., an autonomy-suppressing type of parenting involving excessive protection) related to more anxiety and less happiness (Ho et al., 2008) and to lower self-esteem (Manuel, Balkrishnan, Camacho, Smith, & Koman, 2003) in children, adolescents, and early adults with CP. Overall, the quality of parenting seems to matter for the adjustment of children with CP. However, because most studies to date were cross-sectional in nature, parenting in the context of CP has been studied from a rather static perspective. This is an important shortcoming because recent research indicates that parenting varies substantially on a short-term basis (e.g., Aunola, Tolvanen, Viljaranta, & Nurmi, 2013; Dix, 1991; Mabbe, Soenens, Vansteenkiste, Van der Kaap-Deeder, & Mouratidis, 2018).

Every Day Is Different: Daily Variation in Parenting Behavior

Both from a fundamental perspective and from an applied perspective, it is of essential importance to gain more insight into the parenting behaviors of parents that are raising a child with CP, thereby taking into account the dynamic nature of parenting. A growing literature shows that the way that parents behave towards their child is not set in stone but changes dynamically on a situational and momentary basis (Dix, 1991; Holden & Miller, 1999; Repetti, Reynolds, & Sears, 2015). Several studies, among both parents from general populations (e.g., Aunola et al., 2013; Aunola, Viljaranta, & Tolvanen, 2017; Mabbe, Soenens, et al., 2018; Mabbe, Vansteenkiste, et al. 2018; Van der Kaap-Deeder, Vansteenkiste, Soenens, & Mabbe, 2017; Van der Kaap-Deeder et al., 2019) and parents that were raising a child with a developmental disability (e.g., Dieleman et al., 2018) have consistently shown that the degree to which parents are supportive or more controlling varies considerably from one day to another.

Importantly, these daily variations in parenting have repercussions for children's daily adjustment. Children report more well-being on days when parents are autonomy-supportive, and they report more distress and problem behavior on days when parents use more controlling strategies (Aunola, et al., 2013; Mabbe, Vansteenkiste, et al., 2018; Ng, Kenney-Benson, & Pomerantz, 2004; Van der Kaap-Deeder et al., 2017). Most likely, these associations reflect bidirectional processes, with children's adjustment also affecting parenting (such that more adaptive child behavior evokes more supportive parenting and such that more maladaptive behavior elicits more controlling responses).

Although no research to date has addressed daily variations in parenting behavior among parents of children with CP, it can be expected that there are similar levels of daily variation in the parenting behavior of these parents because they face diverse

https://doi.org/10.1017/S0954579419001688 Published online by Cambridge University Press

challenges on a daily basis (Alaee et al., 2015; Davis et al., 2009; Wittingham, Wee, Sanders, & Boyd, 2013). A dynamic examination of parenting behavior in the context of CP (i.e., an examination at the level of daily, intraindividual associations), allows for greater insight in how child behavior, parental experiences, and parenting are related within families (Keijsers, 2016). Such an examination is also important for practice because this within-family level is precisely the level where parent support or interventions attempt to create change. Therefore, this study attempted to determine why parents' behaviors towards their child with CP differ between days.

Sources of Daily Parenting Behavior: Child and Parent Factors

Parenting is a multidetermined phenomenon that is affected by both child and parent characteristics, and it occurs in specific contexts (Belsky & Jaffee, 2006). Regarding the child characteristics, we focused on the child's behavior and, more specifically, on emotional and behavioral problems and prosocial behavior. Regarding the parent characteristics, in this study we focused on parents' psychological needs and mindful parenting. These factors are increasingly identified as being important determinants of (daily) parenting behavior (e.g., Gouveia, Carona, Canavarro, & Moreira, 2016; Mabbe, Soenens, et al., 2018; Pinquart, 2017).

Daily child behavior as a predictor of daily parenting behavior

Research among general populations (Pinquart, 2017) and among parents of children with neurodevelopmental disabilities (Gannotti, Oshio, & Handwerker, 2013) has convincingly established that child behavior strongly influences (daily) parenting behavior. Maladaptive child behavior, and externalizing child behavior in particular, has been shown to evoke more psychologically controlling and less responsive and autonomy-supportive parenting (Grolnick & Apostoleris, 2002; Hipwell et al., 2008; Pinquart, 2017). These findings have also been replicated in studies that have evaluated parenting variation on a daily level. On days that children exhibit more externalizing problem behavior, parents report being more psychologically controlling towards their child (Aunola et al., 2017; Dieleman et al., 2018). Day-to-day variation in internalizing problems has a less consistent association with daily variation in parenting behavior, possibly because some parents provide more comfort when children display more internal distress than usual while other parents respond in more controlling ways (Aunola et al., 2013) or because anxious and withdrawn behavior is less visible and thus less noticed by parents. To date, there have been very few efforts to investigate the effect of behavioral problems on parenting among children with CP. This is unfortunate, as these children are at increased risk for emotional and behavioral problems (Parkes et al., 2008; Vrijmoeth, Monbaliu, Lagast, & Prinzie, 2012). As far as we know, only one study to date showed that conduct problems were related to more dysfunctional interactions between parents and children with CP (Brossard-Racine et al., 2012).

Because a focus on the role of behavioral problems in parenting tells only half the story and offers limited keys to promoting constructive parenting, it is also important to consider the role of positive child behavior. Research in general populations has shown that prosocial child behavior (i.e., intentional actions that are directed at benefiting others such as helping and sharing) is an important precursor of more responsive parenting behavior (Newton, Laible, Carlo, Steele, & McGinley, 2014; Pastorelli et al., 2016). A diary study among parents of children with autism spectrum disorder showed that daily prosocial child behavior related positively to daily autonomy-supportive parenting (Dieleman et al, 2018). In the context of CP, Brossard-Racine et al. (2012) showed that the more prosocial behaviors a child exhibited, the less dissatisfaction parents expressed about the interactions with their child.

In summary, based on diary research in other populations and on the budding parenting research in CP, we hypothesized that examining the contributions of both child behavioral problems and prosocial child behavior would provide insight into the daily fluctuations in parenting behavior of parents that are raising a child with CP.

The role of parents' daily psychological need experiences in daily parenting

Another important source of parenting behavior is the parents' own psychological experience in interacting with the child (Dix, 1991). Recently, studies that are grounded in self-determination theory (Deci & Ryan, 2000), a macro-theory on human socialization that is applied increasingly in research on parenting (Grolnick et al., 2018; Joussemet et al., 2008; Soenens et al., 2017), have shown that parents' daily psychological need-related experiences play a role in how parents interact with their child on a daily basis (Mabbe, Soenens, et al., 2018). According to this theory, people have three basic psychological needs: the need for autonomy (i.e., experiencing self-direction), relatedness (i.e., experiencing reciprocal care), and competence (i.e., feeling effective; Deci & Ryan, 2000). On days that parents experience self-direction, feel closely connected to others, and feel effective in accomplishing their goals, they have more energy available to engage in more responsive and autonomy-supportive parenting (Mabbe, Soenens, et al., 2018; Van der Kaap-Deeder et al., 2019). Conversely, daily frustration of these psychological needs (i.e., experiencing feelings of pressure, social alienation, and failure) renders parents vulnerable to interacting with children in a more psychologically controlling and a less responsive and autonomy-supportive way (Mabbe, Soenens, et al., 2018; Van der Kaap-Deeder et al., 2019). This is because psychological need frustration increases parental stress and erodes parents' psychological availability to attend to children's experiences (Van der Kaap-Deeder et al., 2019). While most of these studies have been conducted among parents of typically developing children, Dieleman et al. (2018) recently showed that these processes apply also to parents of children with autism spectrum disorder.

Whether daily need-related experiences can also account for the daily variability in parenting behavior among parents of children with CP has not yet been examined. Yet, several findings point towards the importance of examining the psychological needs in parents of children with CP. For example, parents of children with CP have reduced opportunities to develop their own interests and to pursue a professional career, which limits satisfaction of their need for autonomy (Davis et al., 2009; Pousada et al., 2013). Further, parents of children with CP also report lower levels of self-mastery (i.e., the extent to which they experience a sense of control over their life), indicating challenges for their feelings of competence (Florian & Findler, 2001). Finally, these parents frequently experience social seclusion and report limited time to spend as a couple, problems that could signal frustration of parents' need for relatedness (Alaee et al., 2015; Florian & Findler, 2001).

https://doi.org/10.1017/S0954579419001688 Published online by Cambridge University Press

In summary, there are indications that raising a child with CP strongly affects parents' need-related experiences. Based on the universality claim of self-determination theory (Deci & Ryan, 2000), which states that psychological needs are important for all individuals, we hypothesized that these need-related experiences would also be relevant to the daily behavior of parents of children with CP. Although this study focused on the role of parents' needs with respect to their parenting behavior, it is important to keep in mind that parenting most likely also affects parents' need-related experiences in a reciprocal fashion (Mabbe, Soenens, et al., 2018). For example, when engaging in more controlling practices (possibly in response to a child's misbehavior), parents are more likely to feel pressured to react harshly (i.e., autonomy frustration), to feel less competent as a parent (i.e., competence frustration), and to experience distance from their child (i.e., relatedness frustration).

Mindful parenting as a source of parenting behavior

In addition to the role of parents' psychological needs, mindful parenting is also increasingly recognized as an important parent factor that shapes parenting behavior. Mindful parenting is the expression of an attitude of mindfulness—an open and receptive awareness of what is happening in the moment within the parent–child relationship or interaction (Brown & Ryan, 2003; Duncan, Coatsworth, & Greenberg, 2009). That is, parents that are high on mindful parenting display an attitude of compassion, acceptance, and awareness during parent–child interactions (Gouveia, et al., 2016). More specifically, these parents listen to their child with full attention, thereby showing high levels of awareness of their own feelings and the child's feelings during the interaction. Mindful parenting also entails the nonjudgmental acceptance of feelings, attributes and behaviors of the self and the child, and the recognition that parenting can be challenging. Furthermore, these parents are capable of identifying their own and their child's emotions without reacting automatically to them. Rather, they are able to effectively regulate their own emotions when interacting with the child, which allows them to respond in a way that is in accordance with their own values and goals. Finally, mindful parenting also includes the expression of empathic concern and the display of an attitude of compassion and forgiveness for themselves and the child (Duncan et al., 2009).

Mindful parenting has been described as a psychological attitude or as a metacognitive stance (reflecting mainly receptive awareness of the parent's own feelings during parent–child interactions) that may influence parenting behavior, meaning the practices and communications that are directed towards the child (Duncan et al., 2009; Townshend, 2016). Research shows that mindful parenting fosters adaptive parenting and protects parents from using dysfunctional parenting strategies (Gouveia et al., 2016; Parent, McKee, Mahon, & Foreh, 2016). More specifically, mindful parenting correlates positively with responsive and autonomy-supportive parenting, whereas it relates negatively to psychologically controlling parenting (Geurtzen, Scholte, Engels, Tak, & van Zundert, 2015). Listening with full attention enables parents to take their child's perspective and to understand the child's feelings better, an ability that is essential for autonomy-supportive parenting (Duncan et al., 2009; Soenens et al., 2017). By being compassionate, mindful parents are able to express more warmth and to attune better to their child's calls for comfort in times of distress (Duncan et al., 2009; Geurtzen et al., 2015). By being aware of and by self-regulating one's emotions when interacting with the child, these parents can refrain from impulsive reactions, including controlling parenting behaviors (Duncan et al., 2009). Instead, these parents are able to halt their first impulsive response, pay attention towards their own and their child's feelings, and react in a more responsive way.

Although there is a lack of research on mindful parenting among parents of children with CP, scholars have called for research on the potential benefits of incorporating mindfulness into parenting interventions for parents of children with a disability, including children with CP (Whittingham, 2014; Whittingham, Sanders, McKinlay, & Boyd, 2016). These scholars hypothesize that parents of children with a disability, who face additional challenges due to the child's disorder, might benefit from applying a mindful attitude in the relationship with their child.

The Present Study

The general purpose of this study was to enhance our understanding of parenting behavior among parents of children with CP. Specifically, this study was directed at understanding the day-to-day variation in autonomy-supportive, responsive, and psychologically controlling parenting behavior by looking at the role of child and parent factors. A first specific objective was to examine the associations between children's daily behaviors (i.e., problem behaviors and prosocial behavior) and daily parenting behavior. We hypothesized that children's problem behavior, especially externalizing problems, would relate to more daily parental psychological control, whereas prosocial child behavior would relate to more daily autonomy-supportive and responsive parenting. Second, we examined the associations between parents' daily need-based experiences (need satisfaction and need frustration) and daily parenting behavior. We expected that daily need frustration would relate positively to daily psychological control and that daily need satisfaction would relate positively to daily autonomy-supportive and responsive parenting. A third objective of this study was to examine the role of mindful parenting. We hypothesized that parents who were generally more mindful about parenting would be more autonomy-supportive, more responsive, and less psychologically controlling across days (relative to parents who were less mindful about parenting).

As the severity of the motor impairments of children with CP can differ greatly, it was deemed important to control statistically for the level of motor impairments when examining these three research questions. This is because, in principle, associations between the child and parent factors and parenting behaviors may be spurious, meaning that they occur due to associations with the child's disability severity as a third variable.

Method

Participants and Procedure

This diary study is part of a broader, on-going, three-wave longitudinal study on parents of children with CP. Parents were first recruited in 2015 through seven Belgian service centers for children with physical disabilities. In order to participate, families had to meet the following inclusion criteria: the child had received a diagnosis of CP and was aged between 4 and 18 years. Initially, 135 parents were recruited and at the second follow-up, two years later, 97 parents participated. At this time, parents were also invited to participate in the present diary study. In total, 74 parents agreed to participate in the diary study, but 16 parents dropped out

https://doi.org/10.1017/S0954579419001688 Published online by Cambridge University Press

(due to time constraints or unexpected events) or failed to participate on more than two consecutive days of the diary week.

The final sample consisted of 58 parents (52 mothers, 5 fathers, and 1 guardian; M_{age} = 43.82 years, SD = 5.01, range = 32.07–51.01) of children with CP (67.2% boys, M_{age} = 12.68 years, SD = 2.83, range = 7.47–19.29). The majority of the children had spastic CP (72.4%), 10.3% of the children had dyskinetic CP, 3.4% had ataxic CP, and 12.1% was diagnosed with a mixed type of CP. Additional demographic information for both parents and children is summarized in Table 1.

In order to explain the study and provide the necessary documents, the parents were visited at home. During the home visit, the parents received information about the study and demographic characteristics were assessed. At that time, the parents also received a paper-and-pencil baseline questionnaire and a personal code to get access to the online diary questionnaire. Due to time constraints, seven parents preferred not to be visited at home and received the information and documents via e-mail and telephone. The parents were asked to answer the questionnaires for seven consecutive days, starting on a Monday. They were asked to report each evening (after their child went to bed, or before going to bed themselves) about their own experiences and behavior and about their child's behavior during the past day. The parents were able to skip a day if they did not have time to fill out the diary, forgot about it, or did not spend time with their child that day (e.g., when the child stayed overnight at school). In total, 7.64% of the data was missing due to these reasons. The online tool registered the date and time when parents filled out the questionnaires. Data that were entered on the wrong day (5.91%) were not included in the analyses. Ten parents (17.2%) preferred to fill out a paper-and-pencil diary questionnaire rather than using the online tool. These parents received an exact copy of the diary questionnaires on paper and were asked to note the date and time for each day. Written informed consent was obtained from all participants. The study received ethical approval from the organizing university's Institutional Review Board.

Measures

Demographic information

The parents reported about demographic information concerning themselves, such as their date of birth, education, and marital status. They also reported about the child's type of CP and co-occurring disorders (such as epilepsy). In addition, the parents were asked to rate their child's ability to communicate on the Communication Function Classification System (CFCS; Hidecker et al., 2011). The rating of the CFCS is based on the child's effectiveness at sending and receiving information with familiar and unfamiliar people. The CFCS identifies five levels. Children in level I can effectively send and receive information with familiar and unfamiliar partners, and children in level V can seldom effectively send and receive information, even with familiar people.

GMFCS

The child's gross motor function was assessed with the Gross Motor Function Classification System Family Report (GMFCS-FR; Palisano, Rosenbaum, Bartlett, & Livingston, 2008). The GMFCS is a classification system that determines the severity of CP based on the child's functional abilities and need for assistive technology for mobility. Parents had to categorize their child in one of the five levels. Children that are categorized in level I can walk without restrictions but have limitations in more advanced motor skills, and children in level V have very limited motor abilities. The family report of the GMFCS is a reliable method for measuring gross motor function (Morris, Galuppi, & Rosenbaum, 2004).

Mindful parenting

Prior to the diary measurements, the parents completed the Bangor Mindful Parenting Scale (BMPS; Jones, Hastings, Totsika, Keane, & Rhule, 2014), a questionnaire that is used for assessing mindful parenting. The BMPS consists of 15 items, scored on a 5-point scale ranging from "*completely not true*" to "*completely true*," that measures the five underlying aspects of mindfulness that are applied to the parenting role: observing (e.g., "I stay aware of my feelings towards my child"); describing (e.g., "I'm good at finding the words to describe my feelings about my child"); acting with awareness (e.g., "I rush through activities with my child without being really attentive to him/her," reverse scored); nonreactivity (e.g., "In difficult situations with my child I can pause without reacting straight away"); and accepting without judgment (e.g., "I tend to make judgments about whether I am being a good or a bad parent," reverse scored). All items together represent a total score for mindful parenting. The BMPS was developed for measuring mindful parenting among parents of children with autism spectrum disorders (Jones et al., 2014) and has been applied reliably in research among parents of children with diverse disabilities (Lunsky, Robinson, Reid, & Palucka, 2015). Cronbach alpha for this instrument in the present study was .81.

Daily measures

All of the daily measures were based on well-validated general measures that were adapted and shortened to make them suitable for a diary format. All of the scales were scored on a 5-point scale, ranging from 1 (*completely not true*) to 5 (*completely true*). The selection of the daily items was based on their suitability for daily assessment scales and on previous diary studies among parents of typically developing children and children with autism spectrum disorder (Dieleman et al., 2018; Mabbe, Soenens, et al., 2018; Mabbe, Vansteenkiste, et al., 2018; Van der Kaap-Deeder et al., 2017). The internal consistencies of all of the daily instruments are presented in Table 2.

Daily parenting behavior. The parents' use of autonomy-supportive parenting was measured with four items that were adapted from the Autonomy Support Scale of the Perceptions of Parents Scale (POPS; Grolnick, Ryan, & Deci, 1991). These items tap into parents' recognition of the child's perspective (e.g., "Today, I took my son's/daughter's point of view into account") and parents' encouragement of initiative and the provision of choice (e.g., "Today, I allowed my son/daughter to make his/her own plans"). In order to assess the degree to which parents engage in psychologically controlling practices, the parents completed four items of the parent version (Soenens, Vansteenkiste, Luyckx, & Goossens, 2006) of the Psychological Control Scale (PCS; Barber, 1996; e.g., "Today, I was less friendly with my child if he/she did not see things my way"). Four items of the Child Report of Parent Behavior Inventory (CRPBI; Schaefer, 1965; Schludermann & Schludermann, 1988) were selected and adapted to assess daily responsiveness towards the child. The responsiveness scale used in this study included items tapping into both parental warmth (e.g., "Today, I smiled at my son/daughter often") and

https://doi.org/10.1017/S0954579419001688 Published online by Cambridge University Press

Table 1. Sample characteristics ($n = 58$)

	n	(%)
Child characteristics		
Gender		
Boy	39	(67.2)
Girl	19	(32.8)
Type of CP		
Spastic CP	42	(72.4)
Dyskinetic CP	6	(10.3)
Ataxic CP	2	(3.4)
Mixed CP	7	(12.1)
Unknown	1	(1.7)
GMFCS classification		
I	16	(27.6)
II	18	(31.0)
III	9	(15.5)
IV	5	(8.6)
V	10	(17.2)
CFCS classification		
I	26	(44.8)
II	10	(17.2)
III	14	(24.1)
IV	8	(13.8)
V	0	(0)
Comorbid diagnosis		
Epilepsy	17	(29.3)
Autism spectrum disorder	11	(19.0)
Cerebral visual impairment	10	(17.2)
Other[a]	13	(22.4)
Type of education		
Regular primary education	8	(13.8)
Special primary education	20	(43.1)
Regular secondary education	5	(8.6)
Special secondary education	20	(34.5)
Living situation		
Permanent living home	48	(82.8)
Part-time living at home, part-time at school	7	(12.1)
During the week at school, in the weekend at home	2	(3.4)
Permanent living in an institution (except during holidays)	1	(1.7)
Parent characteristics		
Informant		
Mother	52	(89.7)
Father	5	(8.6)
Legal guardian (aunt)	1	(1.7)
Marital status informant		
Married	41	(70.7)
Living with partner	9	(15.5)
Single/divorced/widow	8	(13.7)
Education level informant		
Primary school	1	(1.7)
Secondary school	22	(37.9)
Higher education (bachelor or master degree)	35	(60.3)

Note: [a] Reported by parents. Includes comorbidity with AD(H)D, Specific Learning Disorders; Excludes intellectual disability (IQ <70). Parents could indicate more than one comorbidity. GMFCS = Gross Motor Function Classification System, CFCS = Communication Function Classification System.

parents' responsiveness to distress (e.g., "Today, I made my son/daughter feel better when he/she was upset").

Children's daily problem behavior. Parents filled out four items assessing the child's aggressive behavior (e.g., "Today my son/daughter was aggressive"); three items tapping into rule-breaking (e.g., "Today my son/daughter lied"); three items measuring withdrawn/depressive behavior (e.g., "Today my child preferred to be alone, rather than with others"); and three items tapping into anxious/depressive behavior (e.g., "Today my son/daughter was scared or anxious"). These items were selected, based on their suitability for a diary format, from the Child Behavior Checklist/6-18 (CBCL; Achenbach & Rescorla, 2001). The items for aggressive and rule-breaking behavior were averaged into an overall score for externalizing problems, and the items for withdrawn/depressive and anxious/depressive behavior were averaged into an overall score for internalizing problems.

Children's daily prosocial behavior. Parents filled out three items tapping into their child's prosocial behaviors (e.g., "Today my son/daughter was nice to other people"). Two items were selected from the Prosociality Scale (Caprara, Steca, Zelli, & Capanna, 2005), and one item was selected from the Strengths and Difficulties Questionnaire (SDQ; Goodman, 2001).

Daily psychological need satisfaction and frustration. Parents' daily satisfaction and frustration of their psychological needs for autonomy, relatedness, and competence were measured with 12 items from the Basic Psychological Need Satisfaction and Need Frustration scale (BPNSNF; Chen et al., 2015). The items for assessing autonomy satisfaction (two items, e.g., "Today I felt a sense of choice and freedom in the things I undertook"); relatedness satisfaction (two items, e.g., "Today I felt connected with the people who care about me and who I care about"); and competence satisfaction (two items, e.g., "Today I felt confident that I could do things well") were averaged into a composite score for need satisfaction. The items for assessing autonomy frustration (two items, e.g., "Today I felt forced to do things that I wouldn't choose to do"); relatedness frustration (two items, e.g., "Today I felt excluded from the group that I want to belong to"); and competence frustration (two items, e.g., "Today I felt insecure about my abilities") were aggregated into a composite score for need frustration.

https://doi.org/10.1017/S0954579419001688 Published online by Cambridge University Press

Table 2. Descriptive statistics, internal consistencies, between-person intraclass correlations (ICC), and correlations between the study variables

				Within-level correlations								Between-level correlations								
	M[a]	*SD*[a]	α	ICC	1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9
Daily variables																				
1. Autonomy support	3.36	0.70	.92	.61																
2. Psychological control	1.54	0.37	.69	.42	−.23***							−.16								
3. Responsivity	3.89	0.70	.90	.63	.30***	−.22***						.56***	−.34**							
4. Externalizing child behavior	1.44	0.55	.94	.59	−.25***	.40***	−.22***					−.25*	.50***	-.21						
5. Internalizing child behavior	1.53	0.58	.94	.61	−.13**	.22***	.06	.32***				−.17	.77***	−.36**	.42***					
6. Prosocial child behavior	3.27	0.82	.88	.66	.11*	−.14**	.31***	−.24***	−.20***			.50***	−.48***	.32**	−.41***	−.48***				
7. Parent's need satisfaction	3.82	0.57	.89	.35	.35***	−.21***	.31***	−.21***	−.05	.17***		.63***	−.31**	.67***	−.34**	−.34**	.40***			
8. Parent's need frustration	1.68	0.46	.89	.37	−.08	.22***	−.04	.29***	.26***	−.03	−.25***	−.27*	.51***	−.41***	.42***	.36**	−.41***	−.50***		
General variables																				
9. Mindful parenting	3.78	0.47	–	–	–	–	–	–	–	–	–	.24*	−.48***	.43***	−.35**	−.31**	.22*	.32**	−.39**	
10. GMFCS	2.57	1.42	–	–	–	–	–	–	–	–	–	−.08	−.27*	.28*	−.17	−.25*	−.29*	−.05	−.20	.29*

Note: GMFCS = Gross Motor Function Classification System; [a] Means and standard deviations of the daily variables are based on aggregated scores; *$p < .05$ **$p < .01$ *** $p < .001$.

Plan of Analysis

The diary study design consisted of repeated measurements on seven consecutive days (level 1) nested within 58 parents (level 2). To take the nested structure into account, multilevel analyses were performed by using MLwiN 2.32 (Rasbash, Browne, Healy, Cameron, & Charlton, 2015). In total, there were 13.55% missing values in the dataset. Missing value analyses indicated that the data were missing completely at random (Little's MCAR test: χ^2 (8) = 10.90, p = .21) and were by default treated as structurally missing in MLwiN. The predictors at level 1 (i.e., within-person predictors) were group-mean centered (i.e., centered around the person's mean) and predictors at level 2 (i.e., between-person predictors) were grand-mean centered (i.e., centered around the group mean).

First, we examined whether there was significant variability in the daily variables by estimating the intercept-only models. The intercept-only models allowed for an estimation of intraclass correlations (ICC), which reflect the between-person and the within-person (i.e., day-to-day) variation. In order to examine the intraindividual associations between the day-to-day variation in the child and parent factors (i.e., within-person predictors) and parenting behavior, we first estimated models with daily child behavior and daily needs of the parents as separate predictors of daily parenting behavior. In order to limit the number of parameters in the models, we conducted three different models for each type of parenting behavior. In each model, we controlled for the potential effects of the severity of the motor disorder by including the GMFCS score. First, we examined the role of the child's behavior and parents' psychological needs separately (i.e., respectively Model 1 and 2). Then, we tested a third model including only the significant predictors of Model 1 and Model 2 (i.e., Model 3). When there were multiple daily predictors, we tested for possible interaction effects (i.e., Model 3b). Next, we entered mindful parenting as a between-person predictor in the models (i.e., Model 4). When the slope of the associations between a daily predictor and parenting showed significant levels of variation, cross-level interactions between the within-person and between-person predictors were explored (Hox, 2010). This allowed us to examine whether the daily association between two variables differed between parents with different scores on mindful parenting. Because we had no explicit hypotheses about the interactions between predictors based on the extant literature, the analyses examining interaction effects were explorative in nature.

Results

Descriptive Statistics and Preliminary Results

The descriptive statistics and correlations between all of the variables are shown in Table 2.

For the descriptive and preliminary analyses, the daily variables were aggregated across the 7 days. To examine the associations between the background variables and the study variables, we conducted a MANCOVA with all study variables as dependent variables. Child gender, the type of CP, parent-reported CFCS score, presence of epilepsy, the informant's educational level, and marital status were included as fixed variables and the child's and informant's ages were entered as covariates. There were no overall multivariate effects for child gender, Wilk λ = .46, F (9, 5) = .64, p = .73; type of CP, Wilk λ = .36, F (18, 10) = .37, p = .97; CFCS level, Wilk λ = .21, F (27, 15) = .40, p = .98; presence of epilepsy, Wilk λ = .65, F (9 ,5) = .29, p = .95, the informant's educational level, Wilk λ = .64, F (9, 5) = .32, p = .94; marital status of the informant, Wilk λ = .31, F (18, 10) = .44, p = .94; child's age, Wilk λ = .55, F (9, 5) = .46, p = .85; or informant's age, Wilk λ = .94, F (9, 5) = .04, p = 1.00. Because none of these demographic variables related to the study variables, we did not control for them in the main analyses.

Day-to-Day Variability

To examine the daily variation in parenting behaviors, we calculated the percentages of variance located at Level 1 (i.e., within-person variation) by creating random intercepts-only models for each of the study variables. The intraclass correlations, reflecting the between-person variance, of all study variables are displayed in Table 2. For autonomy-supportive, psychologically controlling, and responsive parenting, respectively, 61, 42, and 63% of the variance was situated at the between-person level, reflecting differences between participants. As a consequence, 39, 58, and 37% of the respective variances were situated at the within-person level, reflecting daily variability in autonomy-supportive, psychologically controlling, and responsive parenting. For externalizing, internalizing, and prosocial child behavior, respectively, 41, 39, and 34% of the variance was situated at the within-person level. For parents' need satisfaction and frustration, respectively, 65% and 63% of the variance reflected within-person variance. When interpreting these results, it should be taken into account that the within-person variance includes error variance in addition to substantive daily fluctuation. However, the results do indicate that a significant part of the variance is located at the daily level, indicating considerable fluctuations in parenting behavior across the seven days.

The Daily Associations Between Parents' Psychological Needs, Child Behavior, and Parenting Behavior

Next, we examined to what extent daily child behavior (i.e., externalizing problems, internalizing problems, and prosocial behavior) and parents' daily psychological needs experiences (i.e., need satisfaction and need frustration) related to daily parenting behavior. By examining these daily associations, we attempted to explain intraindividual fluctuations within parents (e.g., the question of why a specific parent is more autonomy-supportive on the one day than on the other day). The results for parental autonomy support, psychological control, and responsiveness are presented in Tables 3, 4, and 5, respectively.

Concerning daily autonomy support (Table 3), we found a negative association with daily externalizing child behavior in Model 1, b = -.27, p < .001, and a positive association with daily parental need satisfaction in Model 2, b = .23, p < .01. When both main effects were included together (Model 3a), the effects of both daily externalizing child behavior and daily need satisfaction remained significant, b = -.25, p < .001 and b = .19, p < .01, respectively. There was no significant interaction between both predictors (Model 3b), b = .15, p = .27.

Concerning daily psychological control (Table 4), we found a positive association with daily externalizing child behavior in Model 1, b = .32, p < .001, and with daily parental need frustration in Model 2, b = .15, p < .01. In Model 3a, both associations remained significant when daily externalizing child behavior and daily need frustration were included together as predictors of daily psychological control, b = .32, p < .001 and b = .11, p < .01,

https://doi.org/10.1017/S0954579419001688 Published online by Cambridge University Press

Table 3. Daily autonomy-supportive parenting as a function of daily child behavior, parents' psychological needs, and mindful parenting

	Null model *B* (SE)	Model 1 *B* (*SE*)	Model 2 *B* (*SE*)	Model 3a *B* (*SE*)	Model 3b *B* (*SE*)	Model 4 *B* (*SE*)
Fixed effects						
Overall Intercept	3.36(.09)***	3.36(.09)***	3.34(.09)***	3.34(.09)***	3.35(.09)***	3.36(.09)***
Day level predictors						
Externalizing child behavior		−.27(.08)***		−.25(.07)***	−.24(.07)***	−.24(.07)***
Internalizing child behavior		−.12(.08)				
Prosocial child behavior		.00(.06)				
Parents' need satisfaction			.23(.08)**	.19(.06)**	.19(.06)**	.17(.06)**
Parents' need frustration			−.03(.08)			
Interactions at day level						
Parents' need satisfaction × Externalizing child behavior					.15(.14)	
Person level predictors						
Mindful parenting						.38(.21)†
Control variable						
GMFCS		−.02(.07)	−.03(.07)	−.03(.07)	−.03(.07)	−.06(.07)
Random effects						
u_0	.44(.09)***	.45(.09)***	.45(.09)***	.45(.09)***	.45(.09)***	.49(.09)***
e_0	.28(.02)***	.26(.02)***	.26(.02)***	.25(.02)***	.25(.02)***	.25(.02)***
−2 × loglikelihood	683.40	662.02	668.02	656.11	654.87	614.32

Note: *B* = unstandardized regression coefficient, *SE* = unstandardized standard error, † $p < .10$ *$p < .05$ **$p < .01$ *** $p < .001$.

Table 4. Daily psychologically controlling parenting as a function of daily child behavior, parents' psychological needs, and mindful parenting

	Null model *B* (*SE*)	Model 1 *B*(*SE*)	Model 2 *B* (*SE*)	Model 3a *B*(*SE*)	Model 3b *B*(*SE*)	Model 4 *B*(*SE*)
Fixed effects						
Overall Intercept	1.55(.05)***	1.55(.05)***	1.55(.05)***	1.54(.05)***	1.53(.05)***	1.52(.04)***
Day level predictors						
Externalizing child behavior		.32(.05)***		.32(.05)***	.31(.05)***	.32(.05)***
Internalizing child behavior		.10(.05)				
Prosocial child behavior		−.02(.04)				
Parents' need satisfaction			−.07(.05)			
Parents' need frustration			.15(.06)**	.11(.05)*	.12(.05)**	.12(.05)*
Interactions at day level						
Parents' need frustration × Externalizing child behavior					.21(.09)*	.25(.09)**
Person level predictors						
Mindful parenting						−.28(.10)**
Control variable						
GMFCS		−.07(.03)*	−.07(.03)*	−.07(.03)*	−.07(.03)*	−.04(.03)
Random effects						
u_0	.11(.03)***	.10(.03)***	.10(.02)***	.10(.02)***	.09(.02)***	.08(.02)***
e_0	.15(.01)***	.13(.01)***	.14(.01)***	.13(.01)***	.13(.01)***	.12(.01)
−2 × loglikelihood	434.195	376.53	410.31	374.11	368.12	326.13

Note: *B* = unstandardized regression coefficient, SE =unstandardized standard error, † $p < .10$ *$p < .05$ **$p < .01$ *** $p < .001$.

https://doi.org/10.1017/S0954579419001688 Published online by Cambridge University Press

Table 5. Daily responsive parenting as a function of daily child behavior, parents' psychological needs, and mindful parenting

	Null model	Model 1	Model 2	Model 3a	Model 3b	Model 4
	B (SE)	*B* (*SE*)	*B* (SE)	*B*(*SE*)	*B*(*SE*)	*B* (*SE*)
Fixed effects						
Overall Intercept	3.89(.08)***	3.89(.08)***	3.88(.08)***	3.88(.08)***	3.87(.08)***	3.89(.07)***
Day level predictors						
Externalizing child behavior		−.24(.06)***		−.21(.06)***	−.17(.07)**	−.16(.06)**
Internalizing child behavior		.15(.06)**		.16(.06)**	.11(.07)	.08(.06)
Prosocial child behavior		.13(.05)**		.12(.05)**	.12(.05)**	.13(.16)**
Parents' need satisfaction			.14(.07)*	.12(.05)*	.12(.05)*	.14(.05)**
Parents' need frustration			−.03(.07)			
Interactions at day level						
NS × EXT					.08(.13)	
NS × INT					.13(.12)	
NS × PRO					.01(.12)	
EXT × INT					−.04(.16)	
EXT × PRO					.05(.13)	
INT × PRO					−.42(.14)**	−.21(.13)
Person level predictors						
Mindful parenting						.46(.16)**
Control variable						
GMFCS		.12(.05)*	.12(.05)*	.12(.05)*	.12(.05)*	.08(.05)
Random effects						
u_0 (intercept)	.33(.07)***	.30(.06)***	.30(.06)***	.31(.07)***	.31(.07)***	.28(.06)***
e_0	.19(.02)***	.18(.02)***	.19(.02)***	.17(.01)***	.17(.01)***	.16(.01)***
−2 × loglikelihood	559.39	527.65	545.54	522.59	510.09	467.14

Note: *B* = unstandardized regression coefficient, *SE* = unstandardized standard error, NS = parents' need satisfaction, EXT = Externalizing child behavior, INT = Internalizing child behavior, PRO = Prosocial child behavior; † $p < .10$ *$p < .05$ **$p < .01$ *** $p < .001$.

respectively. In addition, there was a significant interaction effect between these predictors (Model 3b), $b = .21$, $p < .05$. This interaction effect (Figure 1) indicates that parents are especially likely to use psychologically controlling strategies on days when they experience both high levels of need frustration and when the child displays high levels of externalizing behaviors.

Table 5 presents the results concerning daily responsiveness. Daily externalizing child behavior related negatively to daily responsiveness, $b = -.24$, $p < .001$, while daily internalizing child behavior and daily prosocial behavior related positively to daily responsiveness, $b = .15$, $p < .01$ and $b = .13$, $p < .01$, respectively (Model 1). Daily parental need satisfaction also related positively to daily responsiveness, $b = .14$, $p < .05$ (Model 2). All of these daily associations remained significant when all of the significant predictors were included together in one model (Model 3a). In addition, there was a significant daily interaction between internalizing and prosocial child behavior, $b = -.42$, $p < .01$, indicating that parents are most likely to respond in a responsive way on days when their child exhibits high levels of prosocial behavior and low levels of internalizing problem behavior (Model 3b; Figure 2). When accounting for the interactions, the daily association between internalizing child behavior and responsiveness was no longer significant (Model 3b)[1].

In summary, the results indicate that parents are more likely to be autonomy-supportive on days when they experience high levels of need satisfaction and when they perceive low levels of externalizing child behavior. Parents rely more on psychologically controlling strategies on days when they experience a lot of need frustration and when they perceive their child as more aggressive or rule-breaking than on other days. Finally, parents are more responsive on days when they score high on need satisfaction

[1]Although we decided to build the models with increasing complexity in order to avoid an overload of simultaneous predictors within a given model, we also ran models including all of the predictors and their interactions simultaneously. These additional analyses can be found in Supplementary file A. The main effects remained largely similar. Only one main effect was no longer significant. That is, daily need frustration did not relate significantly to daily psychological controlling parenting when including all of the predictors simultaneously. In terms of interaction effects, when including all of the predictors simultaneously, the interaction reported in the main analysis, between daily externalizing problems and daily need frustration in the prediction of daily psychological control, $b = .27$, $p < .05$, remained significant. Moreover, three additional interaction effects were found. In the prediction of daily *autonomy support*, we found a significant interaction between daily internalizing problems and daily prosocial behavior, $b = -.50$, $p < .01$. There was also a significant interaction effect between daily need satisfaction and daily need frustration, $b = -.31$, $p < .05$. In the prediction of daily *psychological control*, we found a similar interaction effect between daily need frustration and daily need satisfaction, $b = .19$, $p < .05$.

https://doi.org/10.1017/S0954579419001688 Published online by Cambridge University Press

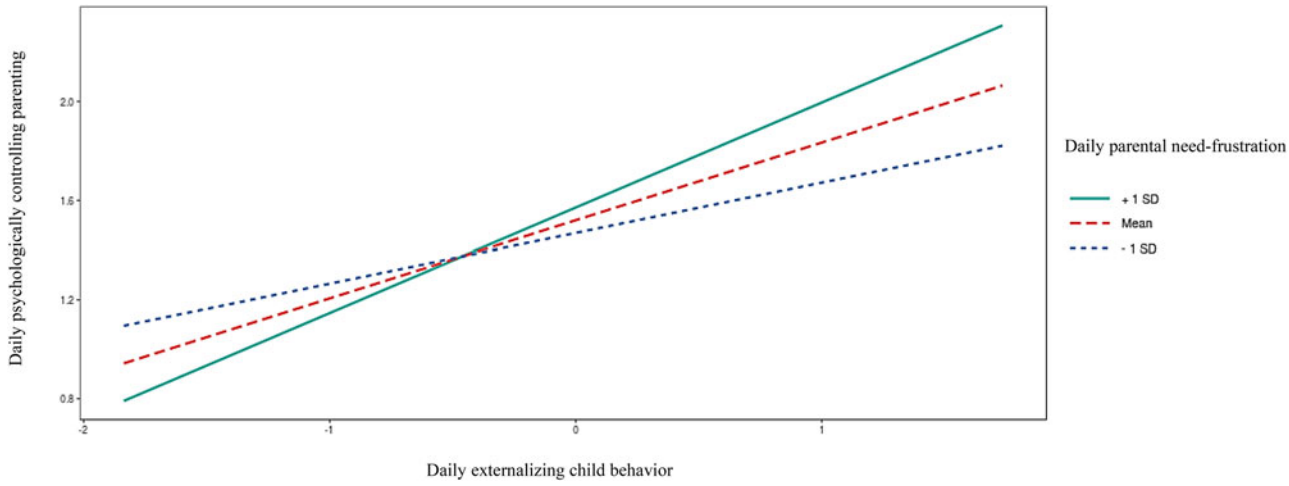

Figure 1. Interaction between daily parental need frustration and daily externalizing child behavior in the prediction of daily psychologically controlling parenting.

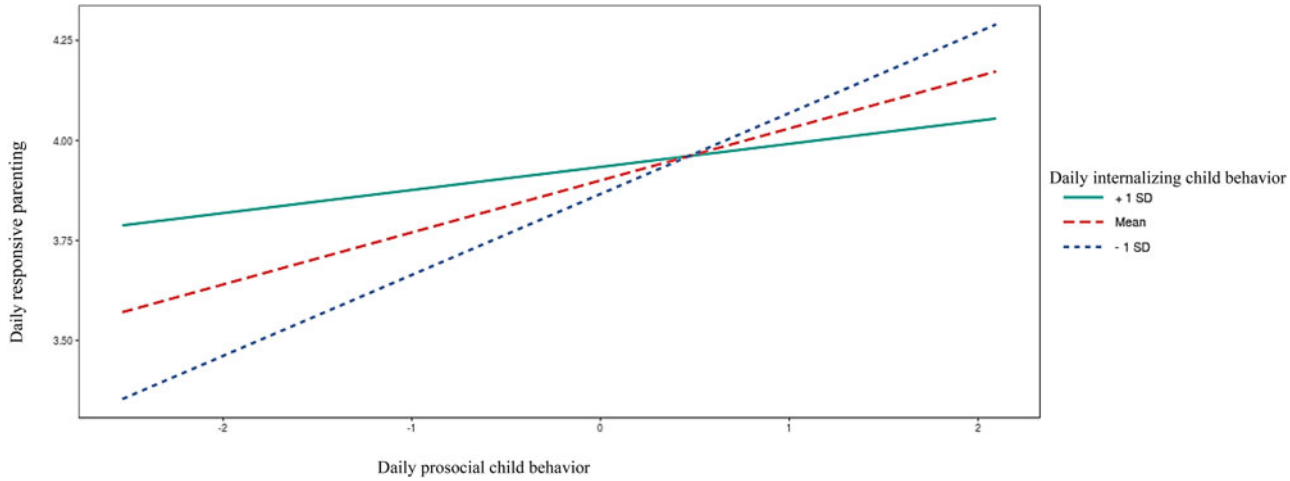

Figure 2. Interaction between daily internalizing child behavior and daily prosocial child behavior in the prediction of daily responsive parenting.

and when their child is perceived as more prosocial and less aggressive or rule-breaking than on other days[2].

The Role of Mindful Parenting

In a final step, parents' general level of mindful parenting was entered into the models (i.e., Model 4). Because this variable is situated at the between-person level, these analyses explain interindividual differences between parents (e.g., the question of why the one parent is more autonomy-supportive than the other parent across the period of a week).

There was no significant association between mindful parenting and autonomy support (Table 3, Model 4), although there was a positive trend, $b = .38$, $p = .06$. Mindful parenting did relate negatively to psychologically controlling parenting, $b = -.28$, $p < .01$, and positively to responsive parenting, $b = .46$, $p < .01$, (Tables 4 and 5, Model 4). The interaction effect of parental need frustration and externalizing child behavior in the prediction of psychologically controlling parenting remained significant after adding mindful parenting to the model (Table 4, Model 4). However, the interaction effect between internalizing child problems and prosocial child behavior in the prediction of responsive parenting did not remain significant when mindful parenting was included as a person-level predictor (Table 5, Model 4). Because there was no significant variation on the slopes of the associations between daily predictors and daily parenting (all $ps > .05$), we did not test for cross-level interactions.

[2]Given that the main analyses focused on within-day associations between variables (without considering the effects of the previous day or without examining whether variables would predict changes to the next day), these analyses do not allow for causal conclusions about the direction of effects between the study variables. In order to examine the direction of effects in greater depth, additional analyses were conducted. These analyses are presented in Supplementary file B. Overall, these analyses suggest that parenting, child behavior, and parents' needs affect each other in a reciprocal fashion within days (see Tables 1–3 in Supplementary file B). Cross-lagged analyses (see Tables 4-6 in Supplementary file B), however, suggest that these effects do not carry over to the next day.

https://doi.org/10.1017/S0954579419001688 Published online by Cambridge University Press

Discussion

The goal of this study was to examine the role of both child and parent factors in parenting behavior among parents of children with CP. By focusing on daily parenting behavior, this study intended to better understand why these parents are able to respond in an autonomy-supportive or responsive way on some days but are more likely to rely on psychologically controlling strategies on other days. The insight into these daily processes is important because it could provide opportunities to target specific factors that are directed towards shaping parenting behavior in interventions for families with children with CP.

The results indicated that parents' autonomy-supportive, responsive, and psychologically controlling behaviors fluctuate considerably throughout the period of a week. More specifically, a third to up to half of the variance in the reports of parenting behavior reflected day-to-day variability (rather than interindividual differences between parents). Moreover, child behavior, parents' psychological needs, and mindful parenting were related in meaningful ways to these daily fluctuations in parenting behavior.

Children's Daily Behaviors in Relation to Daily Parenting

Based on research in general populations, daily child behavior was expected to relate to day-to-day variability in parenting behavior. As hypothesized, daily *externalizing* child behavior was associated negatively with daily supportive parenting and positively with daily controlling parenting. Most likely, these child behaviors drain parents' energy, which is required to be autonomy-supportive and responsive, and cause feelings of stress and agitation, lowering the threshold for responding in a controlling manner (Mackler et al., 2015; Majnemer, Shevell, Law, Poulin, & Rosenbaum, 2012). On the other hand, anxious, withdrawn, and depressive child behavior had a less consistent association with daily parenting behavior. When the different types of child behavior were taken into account, *internalizing* child behavior related positively to responsiveness during the same day. This suggests that parents are more warm and supportive on days that they experience their child as being anxious, withdrawn, or depressed because they want to boost their child's mood and make their child feel better. However, the zero-order within-person correlation between internalizing problems and responsiveness was non-significant. Follow-up analyses showed that daily internalizing problems only relate significantly to daily responsiveness when externalizing problems are accounted for. This finding suggests that parents increase their responsiveness only when children exhibit emotional difficulties (e.g., sadness, anxiousness) without exhibiting aggressive or rule-breaking behavior. As this is the first study to report a positive daily association between internalizing child behavior and parents' responsiveness and because this daily association was not consistently significant across all models, it needs to be replicated and caution is warranted when interpreting this result.

The results concerning *prosocial child behavior* indicate that parents are more responsive towards their child on days when the child is perceived as being more prosocial. Apparently, the child's daily prosocial behavior makes it easier for parents to respond in a warm, supportive, and empathic way towards the child. In contrast to findings that were obtained by Dieleman et al. (2018), who conducted a diary study among parents of children with autism spectrum disorder, prosocial child behavior did not relate to more autonomy-supportive parenting during the same day. To the best of our knowledge, this is the first study to examine these daily associations among parents of children with CP, so more research is needed to better understand why daily prosocial child behavior is associated with parents' responsiveness but not with autonomy support.

Parents' Daily Psychological Needs in Relation to Daily Parenting

As expected based on previous diary studies in other populations (e.g., Dieleman et al., 2018; Mabbe, Soenens, et al., 2018; Mabbe, Vansteenkiste, et al., 2018), the results indicate that parents' psychological needs also are important sources of day-to-day variability in parenting. In line with previous research, the associations between parents' need-related experiences and their parenting behavior can be differentiated into a "bright" and a "dark" pathway (Dieleman et al., 2018; Vansteenkiste & Ryan, 2013). The "bright" pathway indicates that daily need satisfaction relates to more adaptive parenting behavior (i.e., autonomy-supportive and responsive parenting). Daily feelings of self-direction, reciprocal care, and self-efficacy enable parents to promote their child's volitional functioning and to be supportive and warm towards their child. These need-satisfying experiences probably provide parents with the required energy to focus on the child's perspective, attune to the child's needs and pace of development, and support the child with warmth and responsive interactions (Dieleman et al., 2018; Van der Kaap-Deeder et al., 2019). The "dark" pathway, on the other hand, concerns the association between daily need frustration and dysfunctional parenting behavior. This pathway indicates that daily feelings of pressure, social alienation, and personal failure leave parents vulnerable to relying on pressuring behaviors when interacting with their child. The need-frustrating experiences probably cause feelings of stress and agitation among parents, feelings that, in turn, prompt parents to engage in more dysfunctional parenting behaviors (Barfoot et al., 2017; Dieleman et al., 2018, Van der Kaap-Deeder et al., 2019).

The Interplay Among Multiple Factors in Predicting Daily Parenting Behavior

In addition to the main effects of parents' psychological needs and child behavior, this study examined in a more explorative fashion the interplay between the significant daily predictors. There was a significant interaction between parental need frustration and externalizing child behavior, with the combined presence of both factors being related to elevated levels of psychologically controlling parenting. Parents are most prone to rely on psychologically controlling parenting on days when they experience high levels of need frustration and perceive their child as being highly aggressive or rule-breaking at the same time. With high levels of need frustration, parents already have little energy available. When the child then additionally displays difficult behavior, parents' patience probably becomes eroded and their threshold for resorting to pressuring parenting strategies might be surpassed more quickly.

A second significant interaction effect indicated that the association between prosocial behavior and responsiveness depends on the level of internalizing problems. Parents appear to be most responsive on days when their child exhibits much prosocial child behavior and low levels of internalizing problem behaviors. The combined presence of desirable behavior and absence of

https://doi.org/10.1017/S0954579419001688 Published online by Cambridge University Press

internal distress appears to create the optimal conditions for parents to engage in warm and friendly interactions with their child. However, this effect was less consistent, as it was no longer significant when the role of mindful parenting was taken into account.

The Beneficial Influence of Mindful Parenting on Daily Parenting Behavior

Consistent with our expectations, we found that parents who reported that they are generally more mindful during interactions with their child are more responsive than parents who report being less mindful. In addition, mindful parenting related negatively to the use of controlling strategies throughout the week. It is likely that these parents are more aware of their own emotions and of the effects that their parenting behavior can have on their child, which helps them to refrain from pressuring reactions. In contrast to our expectations, mindful parenting did not relate significantly to autonomy support (although there was a positive trend). More research is needed to replicate and understand this nonsignificant association. There might, for instance, be something specific about raising a child with CP that allows less variation in autonomy-supportive parenting.

We initially planned to examine whether mindful parenting would moderate the daily associations between parents' psychological needs, child behavior, and parenting behavior via exploratory analyses. However, this possibility could not be tested because there was no significant variation around the slopes of the associations of parents' needs and child behavior with daily parenting behavior. The relatively small sample size might be responsible for this nonsignificant variation in the strength of the daily associations. Therefore, future research with larger samples is needed to revisit the possibility that mindful parenting is a factor of resilience in the face of need-frustrating parental experiences and problematic child behaviors.

Implications

In addition to advancing the theoretical understanding of parents' behaviors when raising a child with CP, the findings from this study have potentially valuable practical implications. A first practical implication stems from the observation that the way parents behave towards their child with CP changes from day to day. The finding that each parent can deviate from his/her general level of parenting behavior highlights parents' potential to change. When practitioners focus on the dynamic nature of parenting, they avoid the pitfalls that are associated with parent-blaming. Accordingly, parents might become more receptive to support and more positive about their potential to change. For example, instead of directly targeting controlling parenting behavior, it might be beneficial to start by focusing parents' attention on the moments when they are able to be autonomy-supportive or responsive because this might foster parents' belief in their own potential.

Second, the finding that the daily fluctuations in parenting relate to day-to-day variation in parents' psychological needs and in child behavior suggests that interventions that target parenting behavior will be most effective when taking into account both the parent's and the child's functioning. That is, to promote more supportive parenting, it is important that parents are aware of and attend to their own psychological needs. The main focus of support programs for parents of children with CP (e.g., parent-mediated therapy) is often on parenting skills and their benefits for the child. The current findings suggest that the effectiveness of parent support programs could be enhanced by additionally encouraging parents to be sensitive for and take care of their own psychological needs. When parents indicate that they experience little need satisfaction or often experience need frustration, practitioners might help them to identify and invest in life domains or moments in which they experience (or used to experience) psychological freedom and authenticity, reciprocal care, and personal efficacy (specifically within the context of parenting or on a more general level; see Sheldon et al., 2010; Weinstein, Khabbaz, & Legate, 2016 for examples of need-based interventions). Similarly, practitioners might help parents in detecting need-thwarting situations and offer advice about how to reduce the likelihood of encountering these situations. Practitioners might also help to diminish the negative effects of need frustration by promoting effective ways to cope with these need-frustrating experiences. It is also important to keep parents' psychological needs in mind when working together with these parents or when designing parent support or interventions. That is, when parents' psychological needs are supported in their contacts with practitioners, parent support might be more effective (Ryan, Lynch, Vansteenkiste, & Deci, 2011). For example, parents' need for competence might be supported by explicitly recognizing their efforts to adapt to their child's disability-related needs and by acknowledging the parents as the experts of their own child.

Regarding child behavior, it is important for parenting interventions to target the child's externalizing behaviors and—if needed—to try to reduce them by applying specific interventions. For example, practitioners can directly try to diminish the externalizing behavior by searching, together with the parents, for possible triggers of this behavior or by examining the functionality of this behavior for the child (e.g., aggressive behavior as a way to escape a task that is too difficult; Patterson, 1982). In addition, it is important to pay attention to adaptive child behavior in interventions. For example, parents may be advised to attend to their child's prosocial behavior even if the child also engages in problem behaviors. By recognizing and paying more attention to this adaptive behavior, parents might find it easier to respond in a warm and sensitive way towards their child.

Third, the current results also point towards the potential of incorporating mindful parenting into interventions for families with children with CP. Several studies among different populations have already shown that mindful parenting is a skill that can be acquired through practice (e.g., Meppelink, de Bruin, Wanders-Mulder, Vennik, & Bögels, 2016; Ridderinkhof, de Bruin, Blom, & Bögels, 2018). Moreover, mindful parenting training has been shown to decrease parents' use of dysfunctional parenting behavior and to increase parents' adaptive parenting behaviors (Bögels, Hellemans, van Deursen, Römer, & van der Meulen, 2014; Ridderinkhof et al., 2018). Therefore, by teaching parents how to apply an attitude of awareness, acceptance, and compassion in their interactions with their child, parents might become less vulnerable to responding in a psychologically controlling way and be better able to respond in a warm and sensitive way.

Limitations and Future Directions

When interpreting the current results, some limitations need to be taken into account. First, the generalizability of the findings is limited by the sample characteristics. More specifically, the participants were mostly mothers. Research with a more balanced parental gender distribution is needed to examine the

https://doi.org/10.1017/S0954579419001688 Published online by Cambridge University Press

generalization of our findings across parental gender. In addition, the age range of the children with CP was quite broad, including children from middle childhood to late adolescence. Therefore, future research could focus on more specific age groups and examine whether the reported associations remain similar or change across the lifespan of the child. Finally, the relatively small sample size may have created limited variation in the daily associations. Studies with a larger sample size might allow for a better examination of the potential moderating role of mindful parenting and other individual difference variables.

Second, the use of a single-informant study design contributes to shared method variance, affecting the reported daily associations (Williams & Brown, 1994). Therefore, shared method variance could have inflated the reported associations, for example, when parents who experience high levels of need frustration interpret both their child's behavior and their own parenting behavior more negatively. Future research can address this by including multiple informants or by using observational measures.

A third limitation is that the design of this diary study does not allow one to draw causal conclusions about the direction of effects. Therefore, when interpreting these results concerning the daily relations between child behavior, parents' needs, and parenting behavior, it is important to keep in mind that parenting behavior might affect the child's behavior and parents' need-related experiences in addition to child behavior and parents' needs shaping parenting behavior. Theoretical accounts (Bell, 1968; Sameroff & Chandler, 1975) and empirical research (Pinquart, 2017) have established convincingly that child and parenting behavior affect each other bidirectionally. More specifically, behavioral problems elicit more controlling parenting behaviors that, in turn, provoke more behavioral problems (Soenens, Luyckx, Vansteenkiste, Duriez, & Goossens, 2008). Moreover, in addition to autonomy-supportive and responsive parenting behavior eliciting positive child behavior, positive child behavior allows parents to be more autonomy-supportive and responsive (Padilla-Walker, Carlo, Christensen, & Yorgason, 2012). Further, parents' own parenting behavior may also influence their need-related experiences (Deci, La Guardia, Moller, Scheiner, & Ryan 2006; Legate, De Haan, Weinstein, & Ryan, 2013; Mabbe, Soenens, et al., 2018). For example, being autonomy-supportive can create feelings of need satisfaction, whereas using controlling behavior can create feelings of need frustration in the person exhibiting the behavior (Deci et al. 2006; Legate et al. 2013; Mabbe, Soenens, et al., 2018). Most likely then, most of the associations that were demonstrated in this study are inherently reciprocal in nature, with children's behaviors, parents' behaviors, and parents' experiences reinforcing one another mutually in a cascade of effects (see also Supplementary file B for additional analyses addressing the direction of effects in associations between the study variables). In order to address this daily bidirectional interplay, future research could use diary studies with multiple assessments throughout the day (to examine bidirectionality of effects within the day), longitudinal designs (examining bidirectionality across longer periods), or experimental designs (e.g., inducing momentary frustrations of parental needs). Ideally, future research using multiple assessments throughout the day would include separate measures for parental need-based experiences that are encountered during parent–child interactions and for need-based experiences that are obtained outside of the home context (e.g., at work). Such separate measures would allow for a more detailed examination of carry-over effects from work-related experiences to in-home experiences and for a purer assessment of the specific (bidirectional) role of experiences within the parent–child relationship in parenting and child behavior.

A final limitation is that this study focused only on parental experiences and child behaviors as factors involved in parenting behavior without considering the role of social context. In line with the social-contextual model of parenting that was developed by Belsky (1984), extensive research has demonstrated that parenting behaviors are not only shaped by parent and child factors but also by contextual factors such as marital satisfaction, social support, work experiences, and socioeconomic status (Dix, 1991; Grolnick, Weiss, McKenzie, & Wrightman, 1996; Taraban & Shaw, 2018). While financial strain (Bøe, Sivertsen, Heiervang, Goodman, Lundervold, & Hysing, 2014) and social pressure (Wuyts, Chen, Vansteenkiste, & Soenens, 2015) have been found to increase risk for dysfunctional parenting, social support (from partners or from the broader social context) contributes to more adaptive parenting behaviors (Andresen & Telleen, 1992; van Bakel & Riksen-Walraven, 2002). Given the important role of the social context in parenting and parental experiences, an important avenue for future research is to examine also the role of social context among parents of children with CP. Possibly, contextual risk factors further exacerbate the challenges with which these parents are already confronted. Conversely, social support may be even more important for these parents than for parents in the general population. Knowledge about the role of the social context in parenting a child with CP may also inform practice. The effectiveness of interventions that are directed at increasing parenting skills and improving parents' needs-based experience may be short-lived when parents are confronted with adverse social contexts. These parents may need tangible help with their financial situation and with their social network *before* interventions to strengthen their parenting skills and psychological resilience are implemented.

Conclusion

The purpose of this study was to gain insight into the sources of variation in daily parenting behavior among parents of children with CP. The results indicated that parents' autonomy-supportive, psychologically controlling, and responsive behaviors fluctuate considerably across days. These daily fluctuations were associated with day-to-day variability in both parents' own psychological needs and child behavior. In addition, mindful parenting was identified as being an important dispositional predictor of lower psychologically controlling parenting and higher responsiveness. These findings point towards the variability of parenting behavior among parents of children with CP and suggest that parent support needs to take into account both the parents' psychological needs and the child's behavior. Moreover, supporting these parents in applying a mindful attitude during parent–child interactions might strengthen their ability to engage in constructive parenting on a daily basis.

Supplementary Material. The supplementary material for this article can be found at https://doi.org/10.1017/S0954579419001688.

Acknowledgments. The authors wish to thank all of the participating families and the service centers that contributed to this research. Special thanks to Joachim Waterschoot for his help with the data analysis and for updating CaviR (https://watjoa.shinyapps.io/CaviR/) in order to conduct the multilevel interaction plots.

Financial Support. This research was funded by grants from the Marguerite-Marie Delacroix Support Fund (GV/B-202) and the Flemish Research Foundation (FWO) (11X6516N).

References

Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for the ASEBA School-Age Forms & Profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families.

Alaee, N., Shahboulaghi, F. M., Khankeh, H., & Kermanshahi, S. M. K. (2015). Psychosocial challenges for parents of children with cerebral palsy: A qualitative study. *Journal of Child and Family Studies*, *24*, 2147–2154. doi:10.1007/s10826-014-0016-3

Andresen, P. A., & Telleen, S. L. (1992). The relationship between social support and maternal behaviors and attitudes: A meta-analytic review. *American Journal of Community Psychology*, *20*, 751–774. doi:10.1007/BF01312606

Aran, A., Shalev, R. S., Biran, G., & Gross-Tsur, V. (2007). Parenting style impacts on quality of life in children with cerebral palsy. *The Journal of Pediatrics*, *151*, 56–60.e1. doi:10.1016/j.jpeds.2007.02.011

Aunola, K., Tolvanen, A., Viljaranta, J., & Nurmi, J. (2013). Psychological control in daily parent–child interactions increases children's negative emotions. *Journal of Family Psychology*, *27*, 453–462. doi:10.1037/a0032891

Aunola, K., Viljaranta, J., & Tolvanen, A. (2017). Does daily distress make parents prone to using psychologically controlling parenting? *International Journal of Behavioral Development*, *41*, 405–414. doi:10.1177/0165025416658555

Barber, B. K. (1996). Parental psychological control: Revisiting a neglected construct. *Child Development*, *67*, 3296–3319. doi:https://doi.org/10.1111/j.1467-8624.1996.tb01915.x

Barber, B. K., Stolz, H. E., & Olsen, J. E. (2005). Parental support, psychological control, and behavioral control: Assessing relevance across time, culture, and method. *Monographs of the Society for Research in Child Development*, *70*, 1–147. doi: 10.1111/j.1540-5834.2005.00365.x

Barfoot, J., Meredith, P., Ziviani, J., & Whittingham, K. (2017). Parent–child interactions and children with cerebral palsy: An exploratory study investigating emotional availability, functional ability, and parent distress. *Child: Care, Health and Development*, *43*, 812–822. doi:10.1111/cch.12493

Bell, R.Q. (1968). A reinterpretation of the direction of effects in studies of socialization. *Psychological Review*, *75*, 81–95.

Belsky, J. (1984). The determinants of parenting: A process model. *Child Development*, *55*, 83–96. doi:10.2307/1129836

Belsky, J., & Jaffee, S. (2006). The multiple determinants of parenting. In D. Cicchetti & D. Cohen (Eds.), *Developmental psychopathology: Risk, disorder and adaptation* (pp. 38–85). NY: Wiley.

Bøe, T., Sivertsen, B., Heiervang, E., Heiervang, E., Goodman, R., Lundervold, A. J., & Hysing, M. (2014). Socioeconomic status and child mental health: The role of parental emotional well-being and parenting practices. *Journal of Abnormal Child Psychology*, *42*, 705–715. doi:10.1007/s10802-013-9818-9

Bögels, S. M., Hellemans, J., van Deursen, S., Römer, M., & van der Meulen, R. (2014). Mindful parenting in mental health care: Effects on parental and child psychopathology, parental stress, parenting, coparenting, an marital functioning. *Mindfulness*, *5*, 536–551. doi:10.1007/s12671-013-0209-7

Brossard-Racine, M., Hall, N., Majnemer, A., Shevell, M. I., Law, M., Poulin, C., & Rosenbaum, P. (2012). Behavioural problems in school age children with cerebral palsy. *European Journal of Paediatric Neurology*, *16*, 35–41. doi:10.1016/j.ejpn.2011.10.001

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, *84*, 822–848. doi:10.1037/0022-3514.84.4.822

Caprara, G. V., Steca, P., Zelli, A., & Capanna, C. (2005). A new scale for measuring adults' prosocialness. *European Journal of Psychological Assessment*, *21*, 77–89. doi:10.1027/1015-5759.21.2.77

Chen, B., Vansteenkiste, M., Beyers, W., Boone, L., Deci, E. L., Duriez, … Verstuyf, J. (2015). Basic psychological need satisfaction, need frustration, and need strength across four cultures. *Motivation and Emotion*, *39*, 216–236. doi:10.1007/s11031-014-9450-1

Cohen, E., Biran, G., Aran, A., & Gross-Tsur, V. (2008). Locus of control, perceived parenting style, and anxiety in children with cerebral palsy. *Journal of Developmental and Physical Disabilities*, *20*, 415–423. doi:10.1007/s10882-008-9106-8

Collins, W. A., Maccoby, E. E., Steinberg, L., Hetherington, E. M., & Bornstein, M. H. (2000). Contemporary research on parenting: The case for nature and nurture. *American Psychologist*, *55*, 218–232. doi:10.1037//0003-066X.55.2.218

Costa, S., Sireno, S. A., Larcan, R., & Cuzzocrea, F. (2019). The six dimensions of parenting and adolescent psychological adjustment: The mediating role of psychological needs. *Scandinavian Journal of Psychology*, *60*, 128–137. doi:10.1111/sjop.12507

Davidov, M., & Grusec, J. E. (2006). Untangling the links of parental responsiveness to distress and warmth to child outcomes. *Child Development*, *77*, 44–58. doi:10.1111/j.1467-8624.2006.00855.x

Davis, E., Shelly, A., Waters, E., Boyd, R., Cook, K., & Davern, M. (2009). The impact of caring for a child with cerebral palsy: Quality of life for mothers and fathers. *Child: Care, Health and Development*, *36*, 63–73. doi:10.1111/j.1365-2214.2009.00989.x

Deci, E. L., La Guardia, J. G., Moller, A. C., Scheiner, M. J., & Ryan, R. M. (2006). On the benefits of giving as well as receiving autonomy support: Mutuality in close friendships. *Personality and Social Psychology Bulletin*, *32*, 313–327. doi:10.1177/0146167205282148

Deci, E. L., & Ryan, R.M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*, 227–268. doi:10.1207/S15327965PLI1104_01

Dieleman, L. M., Soenens, B., Vansteenkiste, M., Prinzie, P., Laporte, N., & De Pauw, S. S. W. (2018). Daily sources of autonomy-supportive and controlling parenting in mothers of children with ASD: The role of child behavior and mothers' psychological needs. *Journal of Autism and Developmental Disorders*, *49*, 509–526. doi:10.1007/s10803-018-3726-3

Dix, T. (1991). The affective organization of parenting: Adaptive and maladaptative processes. *Psychological Bulletin*, *110*, 3–25.

Duncan, L. G., Coatsworth, J. D., & Greenberg, M. T. (2009). A model of mindful parenting: Implications for parent–child relationships and prevention research. *Clinical Child and Family Psychology Review*, *12*, 255–270. doi:10.1007/s10567-009-0046-3

Florian, V., & Findler, L. (2001). Mental health and marital adaptation among mothers of children with cerebral palsy. *American Journal of Orthopsychiatry*, *71*, 358–367. doi:10.1037/0002-9432.71.3.358

Gannotti, M., Oshio, T., & Handwerker, W. P. (2013). Caregiver practices of families of children with and without physical disability. *Journal of Developmental and Physical Disabilities*, *25*, 419–435. doi:10.1007/s10882-012-9318-9

Geurtzen, N., Scholte, R. H. J., Engels, R. C. M. E., Tak, Y. R., & van Zundert, R. M. P. (2015). Association between mindful parenting and adolescents' internalizing problems: Non-judgmental acceptance of parenting as core element. *Journal of Child and Family Studies*, *24*, 1117–1128. doi:10.1007/s10826-014-9920-9

Goodman, R. (2001). Psychometric properties of the strengths and difficulties questionnaire. *Journal of the American Academy of child and Adolescent Psychiatry*, *40*, 1337–1345. doi:10.1097/00004583-200111000-00015

Gouveia, M. J., Carona, C., Canavarro, M. C., & Moreira, H. (2016). Self-compassion and dispositional mindfulness are associated with parenting styles and parenting stress: The mediating role of mindful parenting. *Mindfulness*, *7*, 700–712. doi:10.1007/s12671-016-0507-y

Grolnick, W. S., & Apostoleris, N. H. (2002). What makes parents controlling? In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 161–181). Rochester: University of Rochester Press.

Grolnick, W. S., Levitt, M., & Caruso, A. (2018). Adolescent autonomy in context: Facilitating parenting in different cultures, domains, and settings. In B. Soenens, M. Vansteenkiste, & S. van Petegem (Eds.), *Autonomy in adolescent development: Toward conceptual clarity* (pp. 94–13 118). UK: Psychology Press.

Grolnick, W. S., Ryan, R. M., & Deci, E. L. (1991). Inner resources for school-achievement: Motivational mediators of childrens perceptions of their parents. *Journal of Educational Psychology*, *83*, 508–517. doi:0022-0663/91/$3.00

Grolnick, W. S., Weiss, L., McKenzie, L., & Wrightman, J. (1996). Contextual, cognitive, and adolescent factors associated with parenting in adolescence. *Journal of Youth and Adolescence*, *25*, 33–54. doi:10.1007/BF01537379

Hidecker, M.J.C., Paneth, N., Rosenbaum, P.L., Kent, R.D., Lillie, J., Eulenberg, J.B., … Taylor, K. (2011). Developing and validating the Communication Function Classification System (CFCS) for individuals with cerebral palsy, *Developmental Medicine and Child Neurology*. *53*, 704–710. doi:10.1111/j.1469-8749.2011.03996.x

Hipwell, A., Keenan, K., Kasza, K., Loeber, R., Stouthamer-Loeber, M., & Bean, T. (2008). Reciprocal influences between girls' conduct problems and depression, and parental punishment and warmth: A six year prospective analysis. *Journal of Abnormal Child Psychology*, *36*, 663–677. doi:10.1007/s10802-007-9206-4

Ho, S. M., Fung, B. K., Fung, A. S., Chow, S. P., Ip, W. Y., Lee, S. F., … & Ha, K. W. (2008). Overprotection and the psychological states of cerebral palsy patients and their caretakers in Hong Kong: A preliminary report. *Hong Kong Medical Journal*, *14*, 286–291.

Holden, G. W., & Miller, P. C. (1999). Enduring and different: A meta-analysis of the similarity in parents' child rearing. *Psychological Bulletin*, *125*, 223–254. doi:10.1037/0033-2909.125.2.223

Hox, J. J. (2010). *Multilevel analysis. Techniques and applications*. (2nd ed.). New York: Routledge.

Jones, L., Hastings, R. P., Totsika, V., Keane, L., & Rhule, N. (2014). Child behavior problems and parental well-being in families of children with autism: The mediating role of mindfulness and acceptance. *American Journal on Intellectual and Developmental Disabilities*, *119*, 171–185. doi:10.1352/1944-7558-119.2.171

Joussemet, M., Landry, R., & Koestner, R. (2008). A self-determination theory perspective on parenting. *Canadian Psychology*, *49*, 194–200. doi:10.1037/a0012754

Keijsers, L. (2016). Parental monitoring and adolescent problem behaviors: How much do we really know? *International Journal of Behavioral Development*, *40*, 271–281. doi:10.1177/0165025415592515

Legate, N., De Haan, C. R., Weinstein, N., & Ryan, R. M. (2013). Hurting you hurts me too: The psychological costs of complying with ostracism. *Psychological Science*, *24*, 583–588. doi:10.1177/0956797612457951

Lélis, A. L., Cardoso, M.V., & Hall, W. A. (2016). Sleep disorders in children with cerebral palsy: An integrative review. *Sleep Medicine Reviews*, *30*, 63–71. doi:10.1016/j.smrv.2015.11.008.

Lunsky, Y., Robinson, S., Reid, M., & Palucka, A. (2015). Development of a mindfulness-based coping with stress group for parents of adolescents and adults with developmental disabilities. *Mindfulness*, *6*, 1335–1344. doi:10.3389/fpsyg.2019.00385

Mabbe, E., Soenens, B., Vansteenkiste, M., Van der Kaap-Deeder, J., & Mouratidis, A. (2018). Day-to-day variation in autonomy-supportive and psychologically controlling parenting: The role of parents' daily experiences of need satisfaction and need frustration. *Parenting: Science And Practice*, *18*, 86–109. doi:10.1080/15295192.2018.1444131

Mabbe, E., Vansteenkiste, M., Van der Kaap-Deeder, J., Dieleman, L., Mouratidis, T., & Soenens, B. (2018). The role of child personality in effects of psychologically controlling parenting: An examination at the level of daily fluctuations. *European Journal of Personality*, *32*, 459–479. doi:10.1002/per.2156

Mackler, J. S., Kelleher, R. T., Shanahan, L., Calkins, S. D., Keane, S. P., & O'Brien, M. (2015). Parenting stress, parental reactions, and externalizing behavior from ages 4 to 10. *Journal of Marriage and Family*, *77*, 388–406. doi:10.1111/jomf.12163

Majnemer, A., Shevell, M., Law, M., Poulin, C., & Rosenbaum, P. (2012). Indicators of distress in families of children with cerebral palsy. *Disability & Rehabilitation*, *34*, 1202–1207. doi:10.3109/09638288.2011.638035

Majnemer, A., Shevell, M., Rosenbaum, P., Law, M., & Poulin, C. (2007). Determinants of life quality in school-age children with cerebral palsy. *Journal of Pediatrics*, *151*, 470–475. doi:10.1016/j.jpeds.2007.04.014

Manuel, J. C., Balkrishnan, R., Camacho, F., Smith, B. P., & Koman, L.A. (2003). Factors associated with self-esteem in pre-adolescents and adolescents with cerebral palsy. *Journal of Adolescent Health*, *32*, 456–458. doi:10.1016/S1054-139X(03)00050-8

Meppelink, R., de Bruin, E. I., Wanders-Mulder, F. H., Vennik, C. J., & Bögels, S. M. (2016). Mindful parenting training in child psychiatric settings: Heightened parental mindfulness reduces parents' and children's psychopathology. *Mindfulness*, *7*, 680–689. doi:10.1007/s12671-016-0504-1

Morris, C., Galuppi, B. E., & Rosenbaum, P. L. (2004). Reliability of family report for the Gross Motor Function Classification System, *Developmental Medicine & Child Neurology*, *46*, 455–460. doi:10.1017/s0012162204000751

Newton, E. K., Laible, D., Carlo, G., Steele, J. S., & McGinley, M. (2014). Do sensitive parents foster kind children, or vice versa? Bidirectional influences between children's prosocial behavior and parental sensitivity. *Developmental Psychology*, *50*, 1808–1816. doi:10.1037/a0036495

Ng, F.F., Kenney-Benson, G.A., & Pomerantz, E.M. (2004). Children's achievement moderates the effects of mothers' use of control and autonomy support. *Child Development*, *75*, 764–780. doi:10.1111/j.1467-8624.2004.00705.x

Novak, I., Hines, M., Goldsmith, S., & Barclay, R. (2012). Clinical prognostic messages from a systematic review on cerebral palsy. *Pediatrics*, *130*, e1285–312. doi:10.1542/peds.2012-0924

Odding, E., Roebroeck, M. E., & Stam, H. J. (2006). The epidemiology of cerebral palsy: Incidence, impairments and risk factors. *Disability and Rehabilitation*, *28*, 183–191. doi:10.1080/09638280500158422

Padilla-Walker, L. M., Carlo, G., Christensen, K. J., & Yorgason, J. B. (2012). Bidirectional relations between authoritative parenting and adolescents' prosocial behaviors. *Journal of Research on Adolescence*, *22*, 400–408. doi:10.1111/j.1532-7795.2012.00807.x

Palisano, R. J., Rosenbaum, P., Bartlett, D., & Livingston, M. H. (2008). Content validity of the expanded and revised Gross Motor Function Classification System. *Developmental Medicine & Child Neurology*, *50*, 744–750. doi:10.1111/j.1469-8749.2008.03089.x

Parent, J., McKee, L. G., Mahon, J., & Foreh (2016). The association of parent mindfulness with parenting and youth psychopathology across three developmental stages. *Journal of Abnormal Child Psychology*, *44*, 191–202. doi:10.1007/s10802-015-9978-x

Parkes, J., White-Koning, M., Dickinson, H.O., Thyen, U., Arnaud, C., Beckung, E., … Colver, A. (2008). Psychological problems in children with cerebral palsy: A cross-sectional European study. *Journal of Child Psychology and Psychiatry*, *49*, 405–413. doi:10.1111/j.1469-8749.2011.04014.x

Pastorelli, C., Lansford, J. E., Kanacri, B. P. L., Malone, P. S., Di Giunta, L., Bacchini, D., … Sorbring, E. (2016). Positive parenting and children's prosocial behavior in eight countries. *Journal of Child Psychology and Psychiatry*, *57*, 824–834. doi:10.1111/jcpp.12477

Patterson, G. R. (1982). *Coercive family process*. Castalia Publishing Company.

Pinquart, M. (2017). Associations of parenting dimensions and styles with externalizing problems of children and adolescents: An updated meta-analysis. *Developmental Psychology*, *53*, 873–932. doi:10.1037/dev0000295

Pinquart, M. (2018). Parenting stress in caregivers of children with chronic physical condition: A meta-analysis. *Stress and Health*, *34*, 197–207. doi:10.1002/smi.2780

Pousada, M., Guillamon, N., Hernandez-Encuentra, E., Munoz, E., Redolar, D., Boixados, M., & Gomez-Zuniga, B. (2013). Impact of caring for a child with cerebral palsy on the quality of life of parents: A systematic review of the literature. *Journal of Developmental and Physical Disabilities*, *5*, 545–577. doi:10.1007/s10882-013-9332-6

Prinzie, P., Stams, G. J., Deković, M., Reijntjes, A. H. A., & Belsky, J. (2009). The relation between parent personality and parenting: A meta-analytic review. *Journal of Personality and Social Psychology*, *97*, 351–362. doi:10.1037/a0015823

Rasbash, J., Browne, W., Healy, M., Cameron, B., & Charlton, C. (2015). MlwiN Version 2.32. Centre for Multilevel Modeling, University of Bristol.

Repetti, R. L., Reynolds, B. M., & Sears, M. S. (2015). Families under the microscope: Repeated sampling of perceptions, experiences, biology, and behavior. *Journal of Marriage and Family*, *77*, 126–146. doi:10.1111/jomf.12143

Ridderinkhof, A., de Bruin, E. I., Blom, R., & Bögels, S. M. (2018). Mindfulness-based program for children with autism spectrum disorder and their parents: Direct and long-term improvements. *Mindfulness*, *9*, 773–791. doi:10.1007/s12671-017-0815-x

Rosenbaum, P. (2003). Cerebral palsy: What parents and doctors want to know. *The BMJ*, *326*, 970–974. doi:10.1136/bmj.326.7396.970

Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. New York: Guilford Publications.

Ryan, R. M., Lynch, M. F., Vansteenkiste, M., & Deci, E. L. (2011). Motivation and autonomy in counseling, psychotherapy, and behavior change: A look at theory and practice. *The Counseling Psychologist*, *39*, 193–260. doi:10.1177/0011000009359313

Sameroff, A. J., & Chandler, M. J. (1975). Reproductive risk and the continuum of caretaking casualty. In F. D. Horowitz, M. Hetherington, S. Scarr-Salapatek, & G. Siegal (Eds.), *Review of child research* (Vol. *4*, pp. 187–244). Chicago: University of Chicago Press.

Schaefer, E. S. (1965). Children's reports of parental behavior: An inventory. *Child Development*, *36*, 413–424. doi:10.2307/1126465

Schludermann, E. H., & Schludermann, S. M. (1988). *Children's Report on Parent Behavior (CRPBI-108, CRPBI-30) for Older Children and Adolescents* (Technical Report). Winnipeg, MB, Canada: University of Manitoba, Department of Psychology.

Sheldon, K. M., Abad, N., Ferguson, Y., Gunz, A., Houser-Marko, L., Nichols, C. P., & Lyubomirsky, S. (2010). Persistent pursuit of need-satisfying goals leads to increased happiness: A 6-month experimental longitudinal study. *Motivation and Emotion*, *34*, 39–48. doi:10.1007/s11031-009-9153-1

Soenens, B., Deci, E. L., & Vansteenkiste, M. (2017). How parents contribute to children's psychological health: The critical role of psychological need support. In M. L. Wehmeyer, T. D. Little, S. J. Lopez, K. A. Shogren, & R. Ryan (Eds.), *Handbook on the development of self-determination* (pp. 171–187). New York: Springer.

Soenens, B., Luyckx, K., Vansteenkiste, M., Duriez, B., & Goossens, L. (2008). Clarifying the link between parental psychological control and adolescents' depressive symptoms: Reciprocal versus unidirectional models. *Merrill-Palmer Quarterly Journal of Developmental Psychology*, *54*, 411–444.

Soenens, B., Vansteenkiste, M., Luyckx, K., & Goossens, L. (2006). Parenting and adolescent problem behaviors: An integrated model with adolescent self-disclosure and perceived parental knowledge as intervening variables. *Developmental Psychology*, *42*, 305–318. doi:10.1037/0012-1649.42.2.305

Taraban, L., & Shaw, D. S. (2018). Parenting in context: Revisiting Belsky's classic process of parenting model in early childhood. *Developmental Review*, *48*, 55–81. doi:10.1016/j.dr.2018.03.006

Townshend, K. (2016). Conceptualizing the key processes of mindful parenting and its application to youth mental health. *Australasian Psychiatry*, *24*, 575–577. doi:10.1177/1039856216654392

van Bakel, J. A., & Riksen-Walraven, J. M. (2002). Parenting and development of one-year-olds: Links with parental, contextual, and child characteristics. *Child Development*, *73*, 256–273. doi:10.1111/1467-8624.00404

Van der Kaap-Deeder, J., Soenens, B., Mabbe, E, Dieleman, L. M., Mouratidis, A., Campbell, R., & Vansteenkiste, M., &. (2019). *From daily need experiences to autonomy-supportive and psychologically controlling parenting via psychological availability and stress*. Manuscript submitted for publication.

Van der Kaap-Deeder, J., Vansteenkiste, M., Soenens, B., & Mabbe, E. (2017). Children's daily well-being: The role of mothers', teachers', and siblings' autonomy support and psychological control. *Developmental Psychology*, *53*, 237–251. doi:10.1037/dev0000218

Vansteenkiste, M., & Ryan, R. M. (2013). On psychological growth and vulnerability: Basic psychological need satisfaction and need frustration as a unifying principle. *Journal of Psychotherapy Integration*, *23*, 263–280. doi:10.1037/a0032359

Vrijmoeth, C., Monbaliu, E., Lagast, E., & Prinzie, P. (2012). Behavioral problems in children with motor and intellectual disabilities: Prevalence and associations with maladaptive personality and marital relationship. *Research in Developmental Disabilities*, *33*, 1027–1038. doi:10.1016/j.ridd.2012.01.010

Weinstein, N., Khabbaz, F., & Legate, N. (2016). Enhancing need satisfaction to reduce psychological distress in Syrian refugees. *Journal of Consulting and Clinical Psychology*, *84*, 645–650. doi:10.1037/ccp0000095

Whittingham, K. (2014). Parents of children with disabilities, mindfulness and acceptance: A review and a call for research. *Mindfulness*, *5*, 704–709. doi:10.1007/s12671-013-0224-8

Whittingham, K., Sanders, M. R., McKinlay, L., & Boyd, R. N. (2016). Parenting intervention combined with acceptance and commitment therapy: A trial with families of children with cerebral palsy. *Journal of Pediatric Psychology*, *41*, 531–542. doi:10.1093/jpepsy/jsv118

Williams, L. J., & Brown, B. K. (1994). Method variance in organizational-behavior and human-resources research: Effects on correlations, path coefficients, and hypothesis-testing. *Organizational Behavior And Human Decision Processes*, *57*, 185–209. doi:10.1006/obhd.1994.1011

Wittingham, K., Wee, D., Sanders, M. R., & Boyd, R. (2013). Sorrow, coping and resiliency: Parents of children with cerebral palsy share their experiences. *Disability and Rehabilitation*, *35*, 1447–1452. doi:10.3109/09638288.2012.737081

Wuyts, D., Chen, B., Vansteenkiste, M., & Soenens, B. (2015). Social pressure and unfulfilled dreams among Chinese and Belgian parents: Two roads to controlling parenting via child-invested contingent self-esteem. *Journal of Cross-Cultural Psychology*, *46*, 1150–1168. doi:10.1177/0022022115603125