Patterns, Predictors, and Outcomes of Paternal Activation Parenting

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Extant research on paternal caregiving in early childhood has typically relied on traditional caregiving dimensions derived from research and theory on mothers. However, some have argued that fathers play a unique role in promoting children's experiences and relationships with individuals outside of the security provided by attachment relationships through activation parenting (AP). AP includes behaviors that challenge children to approach novel situations, explore their environments, and take physical and socioemotional risks, through a balance of encouragement and limit-setting. Whereas components of AP have been linked to children's self-regulation (SR) skills, comprehensive measures of AP and, importantly, longitudinal research on Black and Latinx families from low socioeconomic backgrounds are lacking. These limitations greatly constrain our understanding of the potential benefits of paternal AP for children's emerging SR. Thus, the overall goal of the present study was to test associations between paternal AP (age 3), paternal characteristics (age 2), and children's SR skills (ages 4 and 5) in a sample of low-income, ethnically diverse fathers. Participating fathers (N = 171; 9% Black, 47% white, 11% other/unknown racial group, 32% missing; 8% Latinx, 61% not Latinx, 30% missing; mean household income = $25,145) and their children (51% female and 49% male) were drawn from the Early Steps Multisite Study. Dyads participated in clean-up and teaching tasks at age 3, which were coded using a novel AP coding system. Hypothesized predictors of AP were collected at age 2 and included father-reported depressive symptoms and sociodemographic characteristics collected via interviews with the primary caregiver (mostly biological mothers): income-to-needs

ratio, paternal education, and paternal race/ethnicity. Child SR was assessed via maternal and paternal reports at ages 2, 4, and 5, as well as via behavioral tasks at age 5. Although a multilevel latent factor for AP in the clean-up and teaching tasks demonstrated excellent fit, AP was not found to be associated with child SR (either directly or moderated by child characteristics) and was not significantly associated with paternal characteristics. Despite the null findings, the present study has important implications for conceptualizing and measuring AP in diverse samples of caregivers, including fathers.

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Preface

The Early Steps Multisite Study, from which the data for the current project were drawn, was supported by grant R01 DA016110 from the National Institute on Drug Abuse (NIDA; PIs: Drs. Daniel S. Shaw, Thomas J. Dishion, Melvin N. Wilson).

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1.0 Introduction

Approximately three-quarters of children live with their fathers, both globally (United Nations, 2017) and within the United States (U.S. Census Bureau, 2017). Furthermore, fathers are generally moderately to highly involved in caring for their young children (National Center for Health Statistics [NCHS], 2015-2017; Pattnaik, 2013). Even when fathers do not live with their children, they often are involved in childrearing. For instance, in a nationally representative survey of American adults (NCHS, 2015-2017), approximately half of non-residential fathers of children under age 5 reported engaging in basic caregiving activities (e.g., feeding, bathing, and praising) and playing with their child at least once a week (compared to at least three-quarters of residential fathers). However, research on paternal caregiving has historically lagged behind similar research on maternal caregiving (Cabrera et al., 2018; Feldman & Shaw, 2021).

The discrepancy between research on maternal versus paternal caregiving is particularly detrimental to our understanding of the developmental periods encompassing early childhood (i.e., infancy, toddlerhood, and preschool period) based on the greater salience caregivers play in shaping children's socioemotional development relative to peers and other adults later in childhood (Lamb et al., 1999). Although developmental research on paternal caregiving has blossomed in recent decades, much of the initial work relied on models derived from conceptualizations and empirical validations of maternal caregiving (Cabrera et al., 2018), with the exception of research on paternal involvement in the fields of sociology and family studies (e.g., Lamb et al., 1986). As a consequence, much of the existing theoretical conceptualizations of caregiving suggest that fathers and mothers parent in ways that are more similar than different, such as by emphasizing the importance of warmth and contingent responsiveness in early childhood (Ainsworth, 1979)

and having open communication and providing structure thereafter (Baumrind, 1966). Accordingly, there is widespread support for similarities in maternal and paternal caregiving across childhood (Fagan et al., 2014). However, when caregiving domains are expanded beyond traditional maternal behaviors, important differences emerge.

1.1 Expanding Our Conceptualization of Fatherhood

Research and theory on fathers and fatherhood have typically centered on white, socioeconomically privileged, biological fathers who live with both their child and child's biological mother (Strier & Perez-Vaisvidovsky, 2021). In reality, the identities and experiences of fathers are more diverse than has been the focus of existing research. For instance, some children live with and build relationships with "social fathers" – men who are not their biological fathers but rather their mother's romantic partner. In a large study of low-income, ethnically diverse children, preschool-aged children who lived with social fathers showed similar benefits of father engagement as children who lived with biological fathers (Bzostek, 2008). Step-fathers have also been found to be comparably engaged in high-quality caregiving as biological fathers (Adamsons et al., 2007). In addition, many fathers who are non-residential (i.e., do not live with their children) engage regularly with their children (Cheadle et al., 2010; National Center for Health Statistics (NCHS), 2015) and benefit their children's development (meta-analysis: Adamsons & Johnson, 2013), combatting stereotypes of disengaged, "deadbeat dads." Thus, when researching fathers and their families, it is important to broaden our conceptualization of who fathers are – expanding our definitions to include fathers who may not be biologically related or live with their children.

1.2 Opening Children to the World

As discussed in Feldman and Shaw (2021), both evolutionary and sociocultural perspectives argue that fathers play an important role in supporting children's "openness to the world," defined as children's experiences and relationships with individuals outside of the security provided by attachment relationships (Le Camus, 2001; Paquette, 2004b; Tamis-LeMonda, 2004). Fathers may open their children to the world by socializing them to explore their environment, approach novel situations, and take risks independently and comfortably. Much of the literature on paternal behaviors that open children to the world has emphasized an evolutionary perspective. For instance, Paquette (2004a, 2004b) and Möller et al. (2013) both argued that traditional parental divisions of labor evolved from young children requiring an extensive amount of maternal care and attention, based on their early-developing brains and vulnerable bodies. Thus, fathers adapted to hunt and protect while mothers cared for their children. Per this argument, fathers support children in managing their external environments (i.e., opening to the world), whereas mothers help maintain children's internal environments (e.g., feeding and soothing; Bögels & Perotti, 2011). However, the evolutionary argument for paternal behaviors has received criticism for drawing extreme contrasts between maternal and paternal caregiving, with little overlap or consideration for individual differences (Roggman, 2004; Tamis-LeMonda, 2004). Furthermore, it is likely that social learning and gender role socialization shape gendered caregiving roles, including fathers' behaviors that encourage exploration (Möller et al., 2015; Tamis-LeMonda, 2004).

Implicit with the emphasis on exploration, paternal-centric perspectives postulate that the goals of paternal caregiving may differ from the goals of maternal caregiving. Despite showing some convergence in emphasizing socioemotionally and physically challenging behaviors, the

new generation of theoretical models on paternal caregiving demonstrate important differences. Some theorists emphasize challenging parenting behavior (i.e., encouragement of exploration and risk-taking, socioemotional challenges, and rough-and-tumble play; Majdandžić et al., 2016). Others focus on the balance between pushing children's socioemotional boundaries and setting limits, coupled with the consideration of children's own styles of interacting with their environments (i.e., the activation relationship; Paquette, 2004b). The vast majority of these underlying constructs may be subsumed more broadly into the domain of *activation parenting* (AP, Volling et al., 2019; previously called *activative caregiving* by Stevenson and Crnic, 2013), defined as "a combination of stimulation, destabilization, and limit-setting" (Stevenson & Crnic, 2013, p. 775). Fathers who exhibit frequent and high-quality AP behaviors challenge children to approach novel situations, explore their environments, and take physical and socioemotional risks through a balance of encouragement and limit-setting.

AP is related to other domains of paternal caregiving, most notably warmth, sensitivity, and control, reflecting the important overlap between traditional caregiving styles and specific caregiving practices (Darling & Steinberg, 1993). However, AP is novel and complementary to more traditional domains of caregiving because it includes behaviors that specifically function to challenge and destabilize the child. For instance, a father who exhibits high levels of warmth and sensitivity, as well as moderate levels of control, *may* also exhibit high-quality AP behaviors if he also challenges his child. Conversely, a father who attempts to challenge his child but lacks warmth or sensitivity in the process may overstimulate or scare his child because of the lack of concomitant responsivity. Similarly, although fathers may set limits across a variety of contexts (e.g., time spent watching TV, number of sweets permitted, and time-outs), limit-setting that is specific to AP only occurs in the context of engaging in activating, challenging behaviors (e.g., redirecting a child who

becomes too aggressive during rough-and-tumble play). Thus, although traditional domains of caregiving may influence the quality of paternal AP behaviors, they are sufficiently independent, albeit related, to the behaviors and goals of AP.

1.3 Operationalizing Activation Parenting (AP)

As described in Feldman & Shaw (2021), AP primarily comprises two domains of literature: the activation relationship and challenging parenting behavior (CPB; see Figure 1). Both the activation relationship (Paquette, 2004b) and CPB (Majdandžić et al., 2016) include rough-and-tumble play (RTP) in their conceptualizations. There are also studies that do not explicitly fall under these domains but still include components of AP. Thus, the following section defines and discusses RTP, the activation relationship, CPB, and additional relevant literature, concluding with an integration of theories around the common construct of AP.

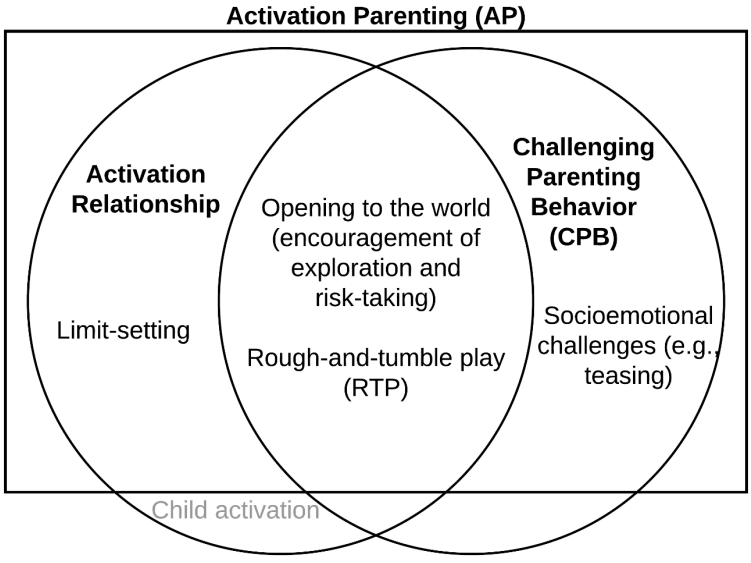

Figure 1 Relations between the father-child activation relationship, challenging parenting behavior, and the broader construct of activation parenting (Feldman & Shaw, 2021)

1.3.1 Rough-and-Tumble Play (RTP)

RTP (also known as *playfighting* or *major physical play*; Pellis & Pellis, 2017; Roopnarine et al., 1992) is defined as behaviors that appear aggressive (e.g., chasing or wrestling) but are performed in a playful, non-aggressive manner (Pellegrini, 2002; Smith & StGeorge, 2022). RTP is a subtype of physical play, which is broadly defined as playful activities that include moderate to vigorous levels of physical activity (Pellegrini & Smith, 1998). However, physical play includes two types of play that fall outside of RTP: rhythmic stereotypies and exercise play. Rhythmic stereotypies are defined as gross motor movements that infants typically produce, sometimes with the assistance of a caregiver, often without serving a specific function (e.g., kicking or body rocking). In the toddler and preschool years, exercise play emerges – which is characterized by gross locomotor movement in the context of play (e.g., playing tag or running; Pellegrini & Smith, 1998; Smith, 2009). Unlike RTP, both rhythmic stereotypies and exercise play are not by definition social in nature – children can engage in these types of physical play on their own – and are not characterized by behaviors that appear to be aggressive.

As discussed in Pellegrini (2002), RTP is distinct from physical aggression in four important ways. First, RTP is typically less physically harmful than aggressive behaviors (e.g., punching) and is typically accompanied by positive rather than negative affect, which is often displayed during bouts of aggression. Second, RTP is often followed by other cooperative social behaviors, whereas aggression typically is not. Third, during RTP the person with the "upper hand" often switches through taking turns, usually by stronger or larger players occasionally allowing

weaker or smaller players to be dominant. Finally, RTP is more likely to occur in open spaces whereas aggression can occur anywhere.

Although initial research on RTP was largely conducted with human and non-human peers (e.g., Pellegrini, 1989; Pellis & Pellis, 2017; Smith & Lewis, 1985), RTP plays a unique role within the human caregiver-child relationship because caregivers have the strength and size to set limits on the intensity of RTP (Flanders et al., 2009). In general, high quality RTP is characterized by high levels of paternal warmth and moderate levels of control which, together, ensure the child wants to stay engaged and has sufficient opportunity to have the upper hand to enjoy the interaction without having too much control and thus facing threats to safety or hyperarousal (Anderson et al., 2017; Flanders et al., 2009; Paquette, 2004a).

When considering the role of father-child RTP in early childhood, some argue that RTP cannot occur until the child can engage reciprocally (i.e., late infancy/toddlerhood; StGeorge & Freeman, 2017). However, forms of caregiver-directed RTP do exist in early infancy (Amodia-Bidakowska et al., 2020), which is more developmentally appropriate beginning later in infancy and the toddler period. RTP in infancy does not include changes in dominance but does include other salient features (e.g., tossing a child into the air in a playful manner).

1.3.1.1 Measurement of RTP

Measures of RTP tend to fall into one of three categories: frequency, duration, and quality (Amodia-Bidakowska et al., 2020; StGeorge & Freeman, 2017). Frequency and duration of RTP have typically been measured via father-report (Fliek et al., 2015; MacDonald & Parke, 1986; Paquette et al., 2003; StGeorge et al., 2015), although naturalistic observations (Mascaro et al., 2017; Paquette et al., 2022; Rendina & Dickerscheid, 1976; Roopnarine et al., 1992; Sun & Roopnarine, 1996) and semi-structured observations (Crawley & Sherrod, 1984; MacDonald &

Parke, 1984) have also been used. Conversely, RTP quality has been measured exclusively through observation. Quality of RTP is typically coded as the amount and intensity that the father engages the child attentively, playfully, and sensitively, while balancing who has the upper hand (Fletcher et al., 2012; Paquette et al., 2022).

1.3.2 The Activation Relationship

Partially based off the balance between stimulation and dominance during RTP, the activation relationship is defined as the emotional bond between the caregiver and child that permits the child to feel safe and empowered to take both physical and social risks, as well as explore their environment (Paquette, 2004a, 2004b). Although the activation relationship has some similarities to the attachment relationship (i.e., both emphasize the dual need for a child to remain proximate to the caregiver and explore the environment in the caregiver's presence), overall the activation relationship is more readily conceived as a complement to the attachment relationship (Bowlby, 1999). In fact, the activation relationship was initially conceptualized as a form of child-father attachment that is distinct from Bowlby's (1999) definition of attachment (Paquette, 2004b). Through the lens of attachment theory, caregivers serve as both a secure base for exploration and a safe haven for comfort, engaging in behaviors that are sensitive and responsive to the child's cues of both distress and desire for exploration. Some attachment researchers have argued that child-father attachment relationships are more heavily characterized by fathers serving as a secure base for exploration, compared to child-mother attachment relationships (Grossmann & Grossmann, 2020). However, when operationalizing and measuring attachment, the same classifications are used for both fathers and mothers, which minimize qualitative differences in child-father versus child-mother attachment relationships. Further, children and fathers form

attachment relationships that are similar in structure and function as child-mother attachment relationships, with unique outcomes for child socioemotional outcomes that are similar in effect size to child-mother attachment relationships (meta-analysis: Deneault et al., 2021). Thus, the activation relationship expands beyond the attachment relationship. The activation relationship uniquely conceptualizes how caregivers may take the initiative to encourage child exploration and engagement in risky behaviors (i.e., beyond typical exploration), rather than how they serve as a secure base and sensitively respond to the child's own exploration behaviors in the attachment relationship. Because of the distinction between the emphasis on encouraging exploration and risk-taking versus sensitive responsiveness, it is perhaps not surprising that the quality of a father-child dyad's attachment relationship has been found to be independent from their activation relationship, as evidenced by a lack of significant relations between attachment and activation classifications within parent-child dyads (Dumont & Paquette, 2013; Paquette & Bigras, 2010). It is important to note that the concept of an internal working model has not been integrated into the activation relationship theory, as it has with attachment theory. Although it goes beyond the scope of the current study, it is both possible and likely that children may develop separate internal working models relating to activation relating to risky and novel situations, which may future explain the lack of relation between attachment and activation relationships.

Similar to how sensitivity and responsiveness have been theorized to promote attachment (Ainsworth, 1979), certain caregiving behaviors have been proposed to promote activation. In Paquette's (2004a, 2004b) original conceptualization of activation, RTP was heavily emphasized as a mechanism that promotes the father-child activation relationship. However, behaviors that open the child to the world (i.e., encouragement of exploration and risk-taking) and limit-setting during interactions beyond RTP also contribute (Paquette & Bigras, 2010). As with balancing

dominance during RTP, limit-setting is an important component because it prevents a child from becoming *too* activated, which may pose immediate safety risks and prevent the child from learning how to safely take risks in the future. Further, consistent with the longstanding literature on child effects on caregiver behavior (e.g., Bell, 1968), it is likely that characteristics of the child (e.g., temperament and gender) also contribute to the quality of the father-child activation relationship (Paquette & Bigras, 2010). However, as currently operationalized and assessed, the construct of AP has been limited to paternal contributions to the activation relationship (e.g., RTP, opening to the world behaviors, and limit-setting).

1.3.2.1 Measurement of the Activation Relationship

The frequency of paternal contributions to the activation relationship has been assessed through self-report measures of behaviors that open the child to the world (e.g., introducing the child to a new game, encouraging the child to approach an unknown child; Paquette et al., 2000, 2009) and dyadic observations. The Risky Situation (Paquette & Bigras, 2010) was developed to measure the activation relationship, in a similar way that the Strange Situation (Ainsworth et al., 1978) was designed to elicit child behavior thought to reflect the quality of the parent-infant attachment relationship. During the Risky Situation, children are prompted to take a series of risks that are either social (e.g., interacting with a male stranger) or physical (e.g., climbing down stairs), while being monitored by their caregiver. The caregiver is instructed to comfort the child and ensure safety, but not encourage the child to explore. Thus, a child's level of observed activation during the Risky Situation is theorized to reflect a history of caregiver encouragement of exploration and limit-setting, rather than immediate responses to the caregiver's behaviors. In general, there is some support for significant associations between self-reported and observed

paternal AP behaviors (i.e., stimulation of risk-taking and supervision from a distance) and children's activation levels (Paquette & Bigras, 2010; Paquette & Dumont, 2013).

1.3.3 Challenging Parenting Behavior (CPB)

Largely based off of Paquette's (2004a, 2004b) activation relationship theory and the unique role fathers have been proposed to play in protecting children from the development of anxiety disorders (e.g., Bögels & Phares, 2008), CPB comprises behaviors that promote child "assertiveness, taking chances, and overcoming limits" (Majdandžić et al., 2016, p. 424). Although CPB does not include limit-setting in its conceptualization, CPB broadens the construct of AP beyond the activation relationship by explicitly emphasizing the importance of both physical (i.e., RTP) and socioemotional caregiving behaviors (i.e., social daring, teasing, competition, and challenging modeling; Majdandžić et al., 2016).

1.3.3.1 Measurement of CPB

Paternal self-report and observation measures have been used to assess the frequency of CPB. Most commonly, CPB frequency has been assessed via self-report on the Comprehensive Parenting Behavior Questionnaire (CPBQ; Majdandžić et al., 2008), which assesses multiple domains of CPB at developmentally-appropriate levels across childhood: teasing, RTP, encouragement of risk-taking, social daring, competition, and challenging modeling. Observations of parent-child interactions at home and in the laboratory have also been utilized to assess the combined frequency and intensity of CPB, with higher scores indicating more frequent and/or intense CPB (Majdandžić et al., 2016). Both traditional observation procedures (e.g., free play and puzzle tasks; Majdandžić et al., 2014) and CPB-specific procedures (e.g., making the child "fly,"

pretending to drop the child, and swinging the child; Majdandžić et al., 2016) have been used to assess CPB frequency and/or intensity in early childhood.

1.3.4 Other Constructs

Beyond RTP, the activation relationship, and CPB, references to AP behaviors can be found in the broader caregiving literature. For instance, in the injury prevention literature, "prepared adventurers" have been defined as fathers who balance the encouragement of risk-taking with protection with their young children (Brussoni & Olsen, 2011). This distinction closely mirrors the balance between exploration and limit-setting that is central to AP. Furthermore, Hazen et al.'s (2010) description of fathers who engaged in high levels of both frightening and sensitive behaviors mirrors socioemotional challenges to children, which require the father to be sensitive so as to not overstimulate the child. Finally, the constructs of sensitive stimulation and integrated stimulation, which include play behaviors that stimulate or challenge children in a sensitive manner or within a novel or difficult context, respectively, also closely relate to the challenging nature of and goals of AP (StGeorge et al., 2018).

1.3.5 Integrating the Literature into AP

Overall, theory and research on RTP, the activation relationship, and CPB converge on AP. Prior to Feldman and Shaw (2021), there were two notable attempts at integrating components of the AP literature into a broader caregiving construct. First, to assess paternal AP, Stevenson and Crnic (2013) used a latent factor of observed paternal opportunity for interaction, cognitive stimulation, intrusiveness, and low detachment. Similar observational techniques were used to

generate latent profiles of high-AP fathers by Volling et al. (2019) and Lee et al. (2020). Although using previously collected observational data to create latent measures of AP has represented an important first step in advancing our understanding of AP, the codes used in these studies were not designed with AP in mind and consequently refer to broader parenting constructs. Second, in an attempt to create an integrated measure of challenging paternal caregiving that assesses dimensions of AP broader than the Risky Situation (Gaumon & Paquette, 2013) and observations of CPB (Majdandžić et al., 2016), Fliek et al. (2015) created the Parental Play and Care Questionnaire. However, this questionnaire excludes important elements of AP, including teasing and encouragement of risk-taking, and has yet to be modified to encompass these critical elements of AP.

Recently, Olofson and Schoppe-Sullivan (2022) expanded upon prior CPB measures and RTP work to develop the Risky Interaction Support and Challenge Scale (RISCS). The RISCS separately assesses parental challenges to behavioral competence (i.e., encouragement to engage in difficult tasks, such as a novel puzzle) and regulatory competence (i.e., challenges to self-regulation, such as during RTP). It also assesses autonomy allowance, including non-intervention during parent-child interaction, which removes the tendency of other systems to conflate highly sensitive and engaged behaviors with activating behaviors. Although the RISCS also includes a code for overprotection it excludes more situationally-appropriate attempts at limit-setting which, as discussed previously, remains an important component of AP. Thus, existing attempts at measuring AP have been either too broad or too narrow. Ideally, measures of AP would incorporate caregiving behaviors that balance encouraging the child to take socioemotional and physical risks and emphasize a respect for ensuring the child's safety.

1.4 Activation Parenting (AP) and Children's Self-Regulation (SR) Development

Self-regulation (SR) is an individual's ability to control their attention, emotional reactions, and behaviors to meet situational demands, typically in relation to social expectations or their own emotions and desires (Calkins, 2007; Kopp, 1982). SR matures dramatically across early childhood, moving from more external (e.g., caregivers) to internal sources (Calkins, 2007; Kopp, 1982). Children's early SR abilities have been found to be associated with a wide array of positive outcomes, including academic skills, peer relations, and the absence of psychopathology (meta-analysis: Robson et al., 2020). Thus, the wide-ranging implications of SR make it an important outcome to assess (Feldman & Shaw, 2021).

Fathers may promote the development of SR by modeling their own regulated behaviors and sensitively responding to their children's needs, thus providing an external source of regulation to scaffold children's own abilities (Calkins, 2007; Kopp, 1982). These benefits may be heightened with AP, as fathers may support the development of children's self-regulatory abilities by providing opportunities for their child to practice modulating emotions and behaviors during physically and emotionally challenging situations. Accordingly, it has been posited that fathers must exert sufficient control and limit-setting during RTP so that children do not become overstimulated (Carson et al., 1993; Paquette, 2004b), which can be extended to children's needs for appropriate levels of activation across forms of AP (Paquette & Bigras, 2010). Thus, more frequent and higher quality paternal AP in early childhood is expected to be associated with higher levels of subsequent child SR skills (Feldman & Shaw, 2021).

In total, eight studies have been conducted that assess relations between domains of paternal AP and children's SR skills. Cross-sectional studies have found scant support for associations between paternal AP and children's SR skills. Specifically, father-reported frequency

of opening to the world behaviors (e.g., "I encourage my child to persist in the same game if they do not win," "When we go to the park, I let my child do what they want") was not found to be significantly associated with teachers' reports of children's attention skills in a small sample (N = 50) of Brazilian children aged 4 to 6 years (Gomes et al., 2013). In another relatively small sample (N = 57) of majority white families with high socioeconomic status, fathers' observed challenges for children to persist and self-regulate were not found to be associated with mother-reported measures of dysregulation, which included challenges with emotion regulation (Olofson & Schoppe-Sullivan, 2022). Further, in a large sample (N = 634) of racially and ethnically diverse preschool-aged children in the United States, latent measures of paternal AP (based on maternal-centric observation codes: high sensitivity, positive regard, cognitive stimulation; moderate intrusiveness; low detachment and negative regard) were not found to be associated with children's performance on a behavioral SR task (Lee et al., 2020). Finally, in a very small sample (N = 24) of preschool-aged Australian children, higher quality observed RTP was found to be associated with children's performance on one of three SR tasks (StGeorge et al., 2017). These four studies each have their own unique strengths, including the large and diverse sample included in Lee et al. (2020) and the reliance on observational measures of SR in Lee et al. (2020), Olofson and Schoppe-Sullivan, (2022), and StGeorge et al. (2017). However, it is challenging to understand the temporal relations between paternal AP and children's SR skills that would be available through longitudinal research.

Relative to cross-sectional research, extant longitudinal studies have more often found support for associations between diverse measures of paternal AP and children's higher SR skills across early childhood. With the exception of one study conducted in Canada (Flanders et al., 2010), these studies have been conducted in the United States. A couple of studies have either

found nonsignificant associations between early AP and later child emotion regulation skills (N = 25, Anderson et al., 2019) or higher AP to be associated with higher child dysregulation (N = 127, Stevenson & Crnic, 2013). However, several studies using observations of physical components of AP (e.g., RTP; Anderson et al., 2019; N = 33, Flanders et al., 2010) and latent measures of AP based on maternal-centric behavioral codes (e.g., sensitivity, intrusiveness; N = 118, Hazen et al., 2010; Stevenson & Crnic, 2013) have documented positive associations between these varied measures of AP and children's SR skills across observational (Anderson et al., 2019; Hazen et al., 2010; Stevenson & Crnic, 2013), teacher-report (Hazen et al., 2010), and father-report measures (Flanders et al., 2010). Significant longitudinal associations between paternal AP and children's later SR skills have been found when paternal AP was measured as early as 8 months (with follow up assessments at 2 and 7 years; Hazen et al., 2010). Although sample sizes were small to moderate, in many cases significant longitudinal associations between paternal AP and children's SR skills remained after controlling for important covariates, thus providing support for their robustness, including observations of maternal caregiving (Anderson et al., 2019), child sex (Hazen et al., 2010), other measures of paternal caregiving (e.g., alone time spent with child; Flanders et al., 2010), and paternal education (Stevenson & Crnic, 2013).

Although the current literature contributes to the establishment of the unified construct of AP and its associations with child SR, it is important to acknowledge that it has significant limitations that greatly impact the ability to draw broad conclusions about paternal AP (Feldman & Shaw, 2021). First, the samples in which paternal AP and its associations with child SR were studied were largely homogenous, both within and across studies, in terms of race and ethnicity, socioeconomic status, and family structure. For instance, one of the most racially and ethnically diverse samples in which longitudinal associations between paternal AP and child SR has been

tested comprised 62% white, non-Latinx fathers, but only 9% Latinx, 9% Black, 4% Asian, and 6% multiracial fathers (Stevenson & Crnic, 2013). Across studies, most fathers had moderate to high levels of income and education (exception: Lee et al., 2020), with the majority having at least graduated high school. Most fathers were also employed, many full-time. Across all studies, most children lived in two-parent households with a mother and a father. Relatedly, it is likely that fathers who opted to participate in research on their children may have been more involved than fathers who did not participate or were not invited to participate (Davison et al., 2017; Waller & Swisher, 2006). Thus, the generalizability of current literature supporting positive associations between paternal AP and children's SR skills is predominantly limited to white, non-Latinx families from moderate- to high-socioeconomic status backgrounds in the United States. Further, as mentioned previously, samples ranged from small to moderate in size, with two samples including very few father-child dyads ($N = 25$, Anderson et al., 2019; $N = 34$, Flanders et al., 2010), making it critical to replicate these significant findings with a larger sample. These issues are not unique to research on AP or caregiving more broadly but warrant consideration when reviewing AP literature. The current study has the potential to expand our understanding of the construct of AP and its relation to children's SR skills to fathers from racially and ethnically diverse, low-income families in the United States.

Second, although some work has been carried out to create and validate measures of components of AP, standardized observational procedures and coding systems that capture more components of AP need to be designed and validated (Feldman & Shaw, 2021). Moving forward, studies using standardized measures of AP may then permit investigators to conduct more systematic reviews of the literature, including meta-analyses. The development of standardized AP measures would also improve our ability to unpack and identify the critical components of

paternal AP that promote children's SR and related abilities (e.g., rough-and-tumble play versus teasing). The current study addresses this limitation by introducing a novel AP coding system.

1.5 Child Activation, Paternal AP, and SR

Beyond AP, children's own levels of activation (Paquette & Bigras, 2010) may impact their future SR skills. Specifically, children who are *underactivated* (i.e., low levels of exploration or risk-taking) may exhibit poor SR skills because of a lack of opportunity to practice such skills in challenging situations. Conversely, children who are *overactivated* (i.e., high levels of exploration and risk-taking that are potentially dangerous, not responding to paternal limit-setting) may also exhibit poor SR skills because of their unresponsiveness to paternal attempts at external regulation. Children who are *activated* (i.e., exhibiting an optimal level of activation by balancing exploration and risk-taking with responding to paternal limit-setting) are likely to develop better SR skills, relative to children who are under- or overactivated, because they have the appropriate opportunities to engage in challenging, novel situations while receiving external regulation support from their fathers. Theoretically, such paternal support would lead to the child internalizing regulation skills. Child activation levels are likely related to specific dimensions of temperament, including behavioral inhibition and inhibitory control; however, activation is considered distinct from dimensions of temperament because it considers a child's level of engagement with their environment *and* their responses to paternal attempts at encouraging exploration or setting limits. Thus, while child activation should be directly related to later self-regulation skills, this association is likely further enhanced by the amount of encouragement of exploration and limit-setting the father provides.

Nascent literature has found support for theorized associations between child activation and socioemotional outcomes that relate to SR, such as links between underactivation and internalizing problems (N = 49, Gaumon et al., 2016; N = 51, Gaumon & Paquette, 2013), and between overactivation and externalizing problems (N = 44, Paquette et al., 2021). However, prior studies have relied on small samples, cross-sectional designs, and singular, father-reported child outcomes, thus providing relatively weak support for such associations. Further, the interaction between child activation level and paternal caregiving has yet to be assessed as a predictor of children's SR skills. Thus, the present study utilizes an interactional perspective to assess the moderation of child activation on relations between paternal AP and children's SR skills.

1.6 Potential Predictors of Paternal AP

Based on the important implications paternal AP may have for children's SR development, it is important to understand factors that may influence paternal AP. Broad theoretical models on caregiving suggest that paternal caregiving behaviors are sensitive to characteristics of the fathers' social environment. Belsky's (1984) process of parenting model, in particular, posits that caregiving behaviors are multiply determined by interrelated characteristics of the parent, child, and social environment which, in turn, influence child adjustment. Updated formulations of Belsky's model propose that socioeconomic factors also contribute to paternal caregiving behaviors (Taraban & Shaw, 2018), which should include AP (Feldman & Shaw, 2021). Within this broad framework, multiple theoretical orientations support associations between paternal income, education, depression, race, and ethnicity in relation to paternal caregiving.

1.6.1 Socioeconomic Factors: Income and Education

Socioeconomic status (SES) is a multifaceted construct that comprises income level, occupational status, and educational background (Hoff et al., 2002). Each of these components are likely to influence paternal caregiving, both on their own and in conjunction with one another (Feldman & Shaw, 2021; Taraban & Shaw, 2018). In particular, the family stress (Masarik & Conger, 2017) and family investment (Bradley & Corwyn, 2002) models propose that paternal caregiving behaviors may be associated with paternal income and education, respectively. The family stress model posits that having economic hardship (e.g., low income, low income-to-needs ratio) may negatively impact caregiving via distress associated with having few resources (Masarik & Conger, 2017). In addition, the family investment model proposes that caregivers who have relatively high levels of socioeconomic resources, including achieving high levels of education, are more able to invest in their children's socioemotional development (Bradley & Corwyn, 2002). Extending these ideas to the realm of paternal AP, fathers with higher family income and education are expected to engage in higher levels of AP, relative to fathers with lower levels of income or education (Feldman & Shaw, 2021).

Extant research lends some support to the family stress and investment models. Higher levels of family income and paternal education have been found to be positively associated with observed supportive paternal caregiving across early childhood (e.g., Cabrera et al., 2007; Carone, Lingiardi, et al., 2020; Volling & Belsky, 1991). Although very few studies have been designed to test associations between components of paternal SES and AP (exceptions: Anderson et al., 2019; Paquette et al., 2000, 2003; StGeorge et al., 2021), by assessing covariates included in existing studies we can begin to understand what relations may exist. Broadly, only a few studies have found support for positive associations between paternal income and/or education and AP, and the

sample sizes of these studies ranged from moderately small to large (*N*s = 64 – 434; income: Carone, Lingiardi, et al., 2020; education: Koltermann et al., 2019; Paquette et al., 2000; Stevenson & Crnic, 2013). Unexpectedly, two additional studies found that income and AP were *inversely* related – such that higher income was associated with lower levels of AP behaviors (Gaumon & Paquette, 2013; Paquette et al., 2000). Conversely, many studies have not found support for significant associations between income or education and paternal AP, as measured by self-reported frequency of AP (Bossardi et al., 2013; Flanders et al., 2009; Paquette et al., 2003), observed quality of RTP (education: Anderson et al., 2017, 2019; StGeorge et al., 2021; income: Carone, Baiocco, et al., 2020; StGeorge et al., 2017, 2021), observed CPB (education: Deneault et al., 2022), or latent measures of AP based on traditional maternal-centric observation codes (Lee et al., 2020). Although the relative dearth of significant findings may imply that AP is not influenced by family income and education, as with most of the literature on AP extant studies have been limited to fairly homogenous samples in terms of race, ethnicity, and SES. Thus, this homogeneity in sample characteristics (i.e., predominantly white and middle to upper-middle class) may not include sufficient variability to identify differences in AP based on SES, perhaps limiting the generalizability of the current findings to our most privileged families (Feldman & Shaw, 2021). The current study aims to expand our understanding of socioeconomic factors related to AP by testing relations in a sample of racially and ethnically diverse fathers with low levels of income and education.

1.6.2 Paternal Depression

Symptoms of depression include sadness, loss of interest in activities, fatigue, and difficulty concentrating (American Psychiatric Association, 2013). Experiencing even a subset of

these symptoms may make it difficult for fathers to interact with their children. Accordingly, empirical work suggests that fathers with depression are likely to show high levels of disengagement and irritability, as well as low levels of activity (Spector, 2006). Thus, it would be expected that fathers with high levels of depressive symptoms would engage in less frequent and intense AP.

Preliminary research on dimensions of paternal emotional distress, including depression, and AP are mixed at best and rely on cross-sectional designs (Feldman & Shaw, 2021). Only one study to date has assessed associations between depressive symptoms and concurrent paternal CPB, finding a lack of support for associations in a racially and ethnically diverse sample of low-income fathers (N = 186; Deneault et al., 2022). More broadly, paternal distress has been found to be negatively associated with frequency of paternal opening to the world behaviors in a representative sample of Canadian families (N = 434, Paquette et al., 2000). Furthermore, in an almost entirely white sample of Italian fathers, paternal rumination has been found to be inversely associated with RTP quality (N = 155, Carone, Baiocco, et al., 2020). However, in the same sample, paternal distress was not associated with RTP quality (Carone, Baiocco, et al., 2020). Similarly, StGeorge et al. (2021) did not find support for associations between RTP quality and paternal distress (N = 64). The mixed pattern of findings may be a result of the conceptual differences between distress and depression. Although experiencing elevated levels of depressive symptoms often is distressing, there are many other factors that may lead to paternal distress beyond depression (e.g., challenging child behaviors or high levels of anxiety). Because paternal depression is specifically theorized to be associated with lower levels of paternal AP, it is possible that measures of paternal distress are too broad to capture symptoms that would more reliably influence AP. Therefore, paternal distress may not be an appropriate proxy measure of paternal

depression. The distinction between distress and depression may also explain the mixed pattern of findings found by Carone and colleagues (2020), where higher levels of rumination, a cognitive style associated with depression, was negatively associated with RTP, whereas broader levels of distress were not. Thus, the present study is the first that examines longitudinal relations between paternal depressive symptoms and AP.

1.6.3 Race and Ethnicity: Black and Latinx Fathers in the United States

Research and theories on fathers have typically centered whiteness at the expense of understanding how fathers from different ethnic and cultural backgrounds parent and build relationships with their children (Strier & Perez-Vaisvidovsky, 2021; Tyrell & Masten, 2021). However, when assessing the caregiving of fathers of color through the framework of theories initially developed with white families, fathers of color have been found to be just as engaged, and sometimes more engaged, than white fathers in infancy (Cabrera et al., 2011; NICHD Early Child Care Research Network, 2000) and toddlerhood (Leavell et al., 2012; NICHD Early Child Care Research Network, 2000). Furthermore, in a large longitudinal study of non-residential, low-income fathers, Black fathers were found to engage in similar levels of caregiving as white fathers and higher levels than Latinx fathers across infancy through middle childhood (Ellerbe et al., 2018). However, research on fathers of color could be much more rich and informative if we strove to understand fathers on their own, rather than through the lens of white parenting constructs (Strier & Perez-Vaisvidovsky, 2021). Thus, an important first step is understanding how our current conceptualizations of caregiving generalize to fathers of color.

As described in Feldman and Shaw (2021), preliminary findings suggest that fathers of color in the United States engage in AP. Although there is a severe paucity of research on racial

or ethnic differences in AP, in a large sample (N = 634) of Black (42%), white (25%), Hispanic (23%), and other racial/ethnic group (11%) fathers, Lee et al. (2020) did not find racial/ethnic differences across groups of high-AP, supportive, and intrusive fathers. Further, racially and ethnically diverse, low-income fathers in the United States have been observed to engage in comparable levels of CPB as higher-income, Dutch fathers (N = 186, Deneault et al., 2022). More broadly, studies with large sample sizes on physical play (which includes but it is not limited to RTP) have found that Black and Latinx fathers engage in more physical play than white, non-Latinx fathers (N = 5089, Cabrera et al., 2011; N = 426, Leavell et al., 2012). Interestingly, in one study, correlates of paternal physical play (i.e., education, hours of work per week, child age, paternal depressive symptoms, marital status, and parental relationship quality) had for the most part, comparable magnitudes of correlations across Black, Latinx, and white (non-Latinx) fathers (Cabrera et al., 2011). Hence, although there is a dearth of literature assessing racial and ethnic differences in AP, research on physical play more broadly suggests that such differences may exist.

1.7 The Present Study

Although fathers engage in behaviors that have been emphasized as important for child development based on research conducted primarily with mothers (e.g., contingent responsivity, warmth; Cabrera et al., 2018; Fagan et al., 2014), evolutionary and sociocultural theories on the role of fathers have generated a novel, paternal-centric construct: activation parenting (AP; Volling et al., 2019). Fathers who engage in AP challenge their children physically (e.g., RTP) and socioemotionally (e.g., teasing), encourage their children to approach novel situations and take risks (Möller et al., 2013; Paquette, 2004b; Stevenson & Crnic, 2013), and balance challenging

behaviors with limit-setting that is sensitive to the child's own arousal to promote safety and self-regulation (Feldman & Shaw, 2021). Whereas components of AP have been linked to children's self-regulation (SR) skills, comprehensive measures of AP and, importantly, longitudinal research on Black and Latinx families from low socioeconomic backgrounds are lacking (Feldman & Shaw, 2021). These limitations greatly constrain our understanding of the potential benefits of paternal AP for children's emerging SR skills. To address these limitations, the present study has three primary aims with associated hypotheses (see Figures 2 and 3):

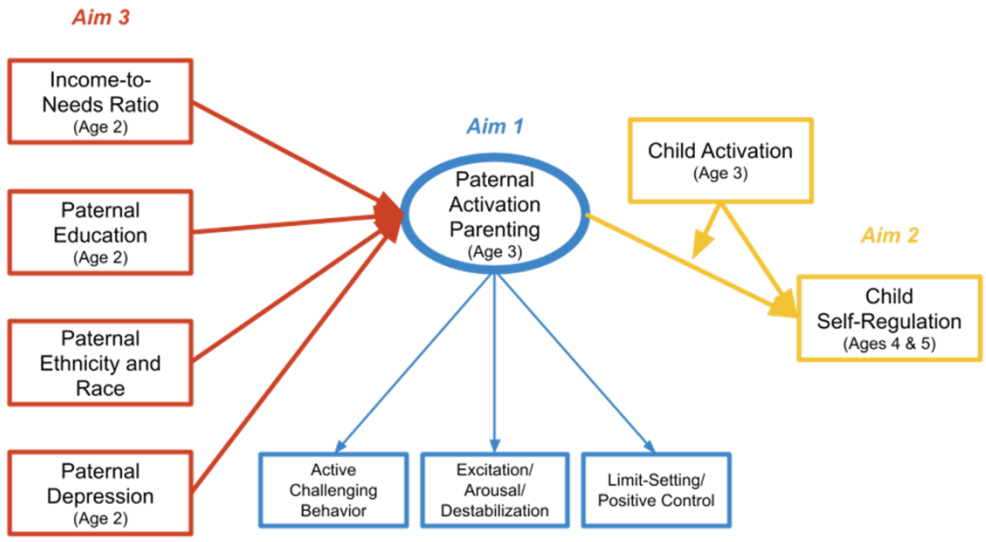

Figure 2 Conceptual model. Aim 1 is represented in blue. Aim 2 is represented in yellow. Aim 3 is represented in red.

Aim 1. The first aim was to validate the use of a novel coding scheme for AP and then generate a latent factor for paternal AP based on father-child clean-up and teaching tasks. Multilevel confirmatory factor analysis (MCFA) was used to generate and later assess paternal AP during clean-up and teaching tasks at the within-person (i.e., task-specific) and between-persons (i.e., individual-specific) levels.

Aim 2a. After validating the novel AP coding system, the second aim was to test unique associations between paternal AP and children's later SR skills. It was hypothesized that higher

levels of paternal AP at child age 3 would be associated with higher child SR at ages 4 and 5 after controlling for age 2 child inhibitory control, paternal supportive parenting, and sociodemographic factors.

Aim 2b. The second part of aim 2 was to test associations between AP during the clean-up and teaching tasks and child SR, which allowed for exploration of whether AP during either of the observation tasks was a stronger predictor of child SR. As the teaching task should elicit more in the way of AP than the clean-up task because the former affords greater opportunities for parent-child exploration, it was hypothesized that AP during the teaching task would be more strongly associated with child SR compared to AP during the clean-up task.

Aim 2c. As part of the second aim, the moderating effect of child activation on associations between paternal AP and children's SR skills was also assessed. It was expected that children who exhibited an optimal level of activation *and* had a father who exhibited high levels of AP at age 3 would have the highest levels of SR at ages 4 and 5 (see Figure 3).

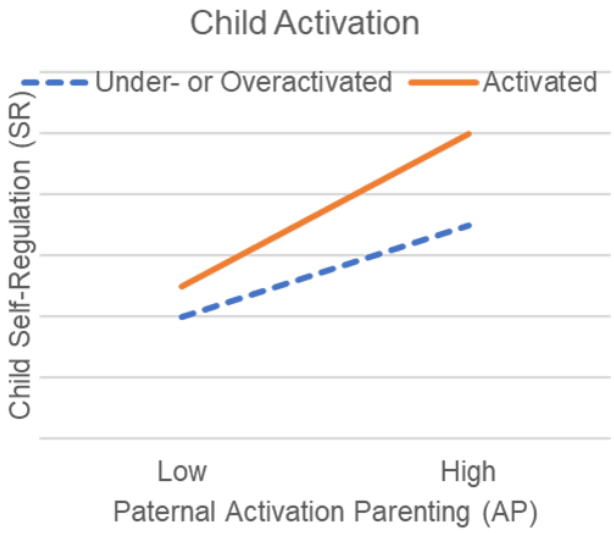

Figure 3 Hypothesized interaction between paternal activation parenting (AP) and child activation level on child self-regulation (SR).

Aim 3. The final and more exploratory aim was to test unique associations between paternal factors and paternal AP. Based on past theory supporting positive associations between indicators of SES and paternal AP, higher family income-to-needs ratio and paternal education were expected to be associated with higher levels of paternal AP. Similarly, higher levels of paternal depressive symptoms were expected to be associated with lower levels of paternal AP. Additionally, based on past research on physical play (Cabrera et al., 2011; Leavell et al., 2012), it was expected that Black and Latinx fathers would exhibit the highest levels of AP in the sample.

2.0 Method

2.1 Participants

Children (N = 171) with participating fathers at age 3 were drawn from the larger cohort of the Early Steps Multisite study (N = 731). The Early Steps Multisite study is a randomized controlled trial designed to test the effectiveness of the Family Check-Up (FCU) intervention for families using Women, Infants, and Children (WIC) Nutritional Supplement centers. Participants were recruited in three diverse communities: Eugene, OR (suburban); Pittsburgh, PA (urban); and Charlottesville, VA (rural; Dishion et al., 2008). In 2002 and 2003, families with a child between ages 2 years 0 months and 2 years 11 months were approached at WIC sites and screened for participation. Families were screened based on risk factors in multiple domains to increase the probability of early-emerging problem behaviors. Thus, WIC participants were invited to participate if families scored at or above one standard deviation on measures of at least two out of three of the following domains: child behavior (conduct problems or high-conflict relationships with adults), family problems (maternal depression, parenting challenges, parental substance use problems, or teen parent status), and/or low socioeconomic status (i.e., low income and educational attainment). To increase parents' motivation for improving their child's behavior and engagement in the FCU, if eligibility criteria were not met for child behavior, scores above the normative mean on the Eyberg Child Behavior Inventory for Intensity or Problem factors (Eyberg & Pincus, 1999) were required. A total of 1,666 families were approached at WIC centers across the three study sites, 879 subsequently met the eligibility criteria, and 731 agreed to participate in the study.

For inclusion in the current study's analytic subsample, "fathers" were defined as primary or alternate caregivers who were listed as "biological father," "adoptive father," "stepfather," or "mother's romantic partner" at age 3. Fathers were not required to live in the same home as the target child, as non-residential paternal involvement has been found to have important relations with child socioemotional development (Adamsons & Johnson, 2013). Most fathers included in the present study were identified as "biological fathers" (n = 140, 82%) and participated as alternate (rather than primary) caregivers at age 3 (n = 161, 94%). Additional sociodemographic information about the analytic subsample can be found in Table 1.

Table 1 Sociodemographic Characteristics of Sample

Variable (Age)		*n* or *M* (*SD*)	% Non-Missing	% *N*
Father education (2)	7th grade or less	1	1%	0.6%
	Associate degree	10	9%	6%
	Bachelor's degree	1	1%	0.6%
	High school/GED	54	47%	32%
	Junior high	4	3%	2%
	Partial college/specialized training	30	26%	18%
	Partial high school	16	14%	9%
	Missing	55		32%
Family annual income (2)		$25,145 ($11,384)		
Income-to-needs (2)		1.25 (0.60)		
Child sex	Female	87	51%	51%
	Male	84	49%	49%
Father residential stability (2 to 4)		0.88 (0.25)		
Father race	Asian	1	1%	0.6%
	Black	16	14%	9%
	Multiracial	11	9%	6%
	Native American	1	1%	0.6%
	Native Hawaiian or Other Pacific Islander	2	2%	1%
	Other	4	3%	2%
	Unknown	1	1%	0.6%
	White	81	69%	47%
	Missing	54		32%
Father ethnicity	Latinx	14	12%	8%
	Not Latinx	104	87%	61%
	Unknown	1	1%	0.6%
	Missing	52		30%
Study site	Charlottesville, VA	22	13%	13%

Variable (Age)		*n* or *M* (*SD*)	% Non-Missing	% *N*
	Eugene, OR	95	56%	56%
	Pittsburgh, PA	54	32%	32%
Intervention group	Control	90	53%	53%
	Intervention (Family Check-Up)	81	47%	47%

Note: One family had missing data for annual income and income-to-needs.

Chi-square tests and *t*-tests were conducted to compare families in the analytic subsample ($N = 171$) to those excluded from the present study ($N = 560$, including 74 fathers). Tests indicated that there were no significant differences in child sex, child ethnicity, intervention group status, age 2 through 4 paternal residential stability, age 2 paternal depressive symptoms, or child self-regulation measures (both parent-reported at ages 2, 4, and 5 and observed at age 5) between the analytic subsample and the excluded group. However, children in the analytic subsample were more likely to be white and less likely to be Black than children excluded from the analyses. Children in the analytic subsample were also more likely to live in Eugene, OR and less likely to live in Charlottesville, VA than children in the excluded group. Families in the analytic sample had significantly higher income-to-needs ratios than those in the excluded group. Finally, fathers in the analytic subsample had higher levels of supportive caregiving at age 2 compared to fathers excluded from the present study. Additional information can be found in Appendix Table 1.

Characteristics of families who participated at the age 5 wave of data collection ($n = 155$, 91%) were compared to those in the analytic subsample who did not. Tests indicated that attrition was largely non-selective. Specifically, the attrited and retained groups did not significantly differ in father race, father ethnicity, intervention group status, paternal education, age 2 paternal depression, age 2 through 4 paternal residential stability, paternal caregiving at ages 2 (supportive parenting) or 3 (AP indicators), age 3 child activation, or age 4 average parent-reported SR scores. However, families were more likely to be in the attrited group if they were from Charlottesville, VA and had a female target child and less likely to be in the attrited group if they were from Pittsburgh, PA. Families in the attrited group also had lower income-to-needs ratios compared to families in the retained group. Children in the attrited group also had lower average parent-reported

SR scores at age 2, compared to children in the retained group. Additional information can be found in Appendix Table 2.

2.2 Procedure

For the current project's study period, children and their caregivers were assessed annually between ages 2 and 5 years. At age 2, caregivers and children participated in a 2.5-hour home visit, during which caregivers completed questionnaires about their current depressive symptoms and their children's current SR skills. Primary caregivers (n = 160, 94% biological mothers) also completed a demographic interview with the home examiner. At ages 2 and 3, children completed videotaped interaction tasks with their fathers. At ages 4 and 5, families participated in a 1.5- to 2-hour home visit, which included measures of children's SR skills based on both caregivers' reports (ages 4 and 5) and performance on behavioral tasks (age 5).

2.3 Measures

2.3.1 Father-Child Interactions

When target children were 2 and 3 years of age, fathers and children completed video-recorded clean-up (5 minutes at age 2, 4 minutes at age 3) and teaching tasks (6 minutes at age 2, 3 minutes at age 3), which were later coded using maternal-centric, molecular codes. The teaching task was purposefully chosen to be difficult to complete independently for a young child to assess

the father's teaching style – children were asked to match and fit together cards with pictures and corresponding words (with alternate caregivers) and plastic cookies halves with pairs of shapes (with primary caregivers).

2.3.1.1 Novel, Father-Derived Observational Codes

A team comprising one master's level research assistant, one bachelor's level research assistant, and two undergraduate research assistants, led by a PhD student with a master's degree, coded the age 3 father-child interaction tapes using an adapted version of the Marbach Coding System for Activation Parenting (Volling et al., 2015). The Marbach Coding System was designed to complement existing, maternal-centric coding systems by evaluating aspects of caregiving that are generally excluded from traditional systems or misrepresented as intrusive or insensitive. The coding system has initially been tested for applicability, clarity, and reliability, but no current papers have been published using the system. The original system generates three global codes: active challenging behavior, excitation/arousal/destabilization, and limit-setting/positive control. These items were coded on a 5-point Likert scale (1 = very low to 5 = very high and consistent) based on frequency, duration, and intensity. An additional code for child activation was developed in the current study and is described in detail below. Fifteen percent of interactions were scored by the coding team leader for reliability. Weighted kappas (Viera & Garrett, 2005) indicated satisfactory agreement for all four codes: .65 for active challenging behavior, .67 for excitation/arousal/destabilization, .78 for limit-setting/positive control, and .80 for child activation. Coder drift was assessed regularly through random reliability checks.

Active challenging behavior comprises behaviors that encourage risk-taking in which the caregiver challenges the child and encourages them to go outside their comfort-zone, at the same time considering the developmental limits of the child's abilities. Active challenging behaviors

can be physical (e.g., RTP) or verbal (e.g., encouraging persistence or initiating competition) in nature. *Excitation/arousal/destabilization* comprises behaviors that actively and sensitively engage the child in excitatory interactions that momentarily arouse the child and activate regulation of physical, cognitive, or emotional processes through either physical (e.g., tickling) or verbal (e.g., teasing) manners. Finally, *limit-setting/positive control* assesses a caregiver's use of firm control that provides guidance and direction that is not harsh or punitive in situations that require caregiver intervention to keep the child safe and/or focus the child on rule-governed behavior. Behaviors may be physical (e.g., blocking a child from climbing a tall item) or verbal (e.g., telling the child to stop climbing).

In addition to the three paternal codes from the Marbach Coding System (Volling et al., 2015), a novel child activation code was used in the present study. *Child activation* refers to a child's level of engagement with their environment *and* their responses to paternal attempts at encouraging exploration or setting limits. Child behavior on both the clean-up and teaching tasks were categorized as underactivated (1), activated (2), or overactivated (3). As with the paternal codes, child activation was coded based on the frequency, duration, and intensity of the child's behaviors. For instance, those coded as underactivated showed low levels of engagement in the clean-up or teaching tasks and gave up quickly when challenged, even with encouragement from their fathers. Children who were underactivated were unlikely to engage in any rough or potentially dangerous behaviors that required paternal limit-setting. Children who were overactivated tended to engage in activities in a rough manner that they did not adjust in response to paternal attempts at limit-setting. Conversely, some were too busy actively exploring other toys that they did not engage in the clean-up or teaching tasks. Finally, children classified as activated engaged in the

activities and persisted when they were challenged. They occasionally engaged in rough behaviors but adapted their behaviors quickly when their fathers set limits.

Most children were classified as activated in both the clean-up (n = 122, 72%) and teaching (n = 134, 79%) tasks. The remaining children were classified as underactivated in the clean-up (n = 26, 15%) and teaching (n = 19, 11%) tasks, or overactivated in the clean-up (n = 21, 12%) and teaching (n = 16, 9%) tasks. Child activation was dichotomized for analyses (0 = under- or overactivated, 1 = activated). In total, 104 children (62%) were activated and 18 (11%) were under- or overactivated across both tasks. A full copy of the coding manual used by the coding team can be found in Appendix B.

In total, 169 clean-up tasks and 169 teaching tasks were coded. One clean-up and one teaching task from two different families were not coded because the father was not visible. One clean-up and one teaching task from two different families were not coded because the father was not audible.

2.3.2 Child Self-Regulation (SR)

Children's SR skills were assessed at ages 2, 4, and 5 using caregiver-report. A battery of SR tasks was also completed at age 5.

2.3.2.1 Caregiver-Report

The 13-item inhibitory control subscale of the Children's Behavior Questionnaire (CBQ; Rothbart et al., 2001) was administered to mothers and fathers during home-based assessments at ages 2, 4, and 5 years. Age 2 ratings were used as a covariate in the analyses, whereas the age 4 and 5 ratings were used as outcome measures. The CBQ is a caregiver-report measure designed to

provide an assessment of multiple dimensions of temperament, including SR abilities, in children 3 to 7 years of age. Respondents rated each item on a 7-point Likert scale ranging from "extremely untrue" to "extremely true". Sample items include "My child can lower his/her voice when asked to do so" and "My child has a hard time following instructions." Subscale scores were calculated by averaging item responses. Higher scores on the CBQ inhibitory control subscale represent higher levels of SR skills. The CBQ has been found to have adequate validity and reliability, including in the present sample ($\alpha_{Father,Age2}$ = .73, $\alpha_{Mother,Age2}$ = .73, $\alpha_{Father,Age4}$ = .84, $\alpha_{Mother,Age4}$ = .77, $\alpha_{Father,Age5}$ = .79, $\alpha_{Mother,Age5}$ = .80). Maternal and paternal reports on the CBQ were modestly correlated across ages (r_{Age2} = .34, $p < .01$, r_{Age4} = .35, $p < .01$, r_{Age5} = .44, $p < .01$). Thus, to simplify analytic models and maximize non-missing data, average scores were calculated for parent-reported SR at ages 2, 4, and 5. In cases that only one parent had completed the CBQ, that parent's rating was used (47 mothers and 4 fathers at age 2, 52 mothers and 4 fathers at age 4, 62 mothers and 6 fathers at age 5).

2.3.2.2 Behavioral Measures

Children were administered the Tower, Wrapped Gift, and Draw-A-Star tasks from Kochanska et al.'s (2000) behavioral battery of effortful control to assess SR at age 5 (Chang et al., 2017). The Tower and Wrapped Gift tasks were videotaped and coded, for which inter-rater reliability ranged from .97 to 1.00. The Draw-A-Star task was coded at the time of the administration.

In the *Tower* task, the child was asked to build a tower using 20 blocks and taking turns with the examiner who was intentionally slow in responding to their turns. Coding reflected the number of blocks placed by the child divided by the total number of blocks placed by the dyad. The mean score was computed across 2 trials (α = .65).

In the *Wrapped Gift* task, the child was instructed to not look at the examiner who made noise wrapping up a gift for the child (60 seconds). Then the examiner left the room to get a bow and the child again was asked to wait without peeking (120 seconds). The child received the gift when the examiner returned. Coding included the latency to first peek (in seconds), the frequency of peeking, and the extent of touching or opening the gift (0 = does not touch, 1 = touches but does not open gift, 2 = touches and opens gift). The extent of touching or opening the gift and the frequency of peeking codes were reversed so that higher scores reflected more advanced SR. A single index for the Wrapped Gift was calculated by standardizing and compositing individual codes (α = .70).

In the *Draw-A-Star* task, the child was asked to draw a star on a picture of a star, staying between the lines. The task involved three trials: baseline, slow (i.e., the child was instructed to draw as slowly as possible), and fast (i.e., the child was instructed to draw as fast as possible). Each trial was coded for the number of seconds to completion and the number of errors that occurred (i.e., the child crossed borders in drawing the star). The difference in time in seconds between the slow trial and the fast trial, and the average number of errors (reversed) were standardized and aggregated (α = .39).

Scores for the Tower, Wrapped Gift, and Draw-A-Star were used to construct a latent factor of child SR, which has previously demonstrated predictive validity to later child social functioning at school-age (Chang et al., 2015, 2017).

2.3.3 Predictors of Paternal Activation Parenting

Primary caregivers' reports of annual family income, household size, paternal education, and paternal race and ethnicity were collected during the age 2 demographic interview. As

described in the Analytic Plan, weighted effects codes were estimated for binary variables to allow for comparisons against sample means. Income-to-needs ratios were calculated by dividing the family's annual income by the federal poverty threshold for the family's household size at the year of data collection (determined annually by the Department of Health and Human Services). Thus, a lower income-to-needs score reflects higher levels of economic strain.

Paternal depressive symptoms were assessed via the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977), a 20-item self-report scale designed to measure depressive symptoms in the past week. Each item is rated on a 4-point scale ranging from "rarely or none of the time" to "most or all of the time." Higher summed scores on the CES-D represent higher levels of depressive symptoms. The CES-D had adequate internal consistency in the present study's analytic subsample of fathers (α = .85).

2.3.4 Covariates

Child sex, study site, intervention group, paternal residential stability/residence, and age 2 supportive caregiving were included as covariates in analyses. As described in the Analytic Plan, weighted effects codes were estimated for binary variables to allow for comparisons against sample means. Paternal residential stability was defined as the percent of time that the father was living in the home (i.e., number of assessments the father was reported as living in the home) between child ages 2 and 4 years (Feldman et al., 2020). For the model assessing age 2 predictors of paternal AP, paternal residence at age 2 (0 = did not live with child, 1 = lived with child) was included as a covariate, rather than residential stability.

2.3.4.1 Age 2 Supportive Caregiving

Observations of father-child clean-up and teaching tasks at age 2 were previously coded second-by-second by a team of 24 undergraduates led by an experienced trainer, using the Relationship Process Code (RPC; Jabson et al., 2004). Coders were trained to a kappa criterion of .70, and coder drift was addressed through regular, random reliability checks. Disagreements were resolved by consensus. Two variables have previously been derived from the RPC, using mother-child interaction data: positive reinforcement and engaged interaction (Feldman et al., 2021). The first score, *positive reinforcement*, was derived as the proportional duration of time in seconds that the caregiver spent prompting and reinforcing their child's positive behavior, across all observed tasks. The variable consists of a summary of the following RPC codes: (a) positive verbal, indicated by verbal support, endearment, or empathy (e.g., "Good job!"); (b) positive physical (e.g., hugging, giving high fives); (c) verbal suggestions and strategic prompts of positive or constructive activities for the child (e.g., "Why don't you take a look at that new truck?"), including nonverbal strategies (e.g., caregiver carries child and sits child amongst researcher's toys); and (d) positive structure, indicated by direct encouragement or guidance of the child's task-related behavior such as providing explicit choices in a request for behavior change (e.g., "Do you want to put the cars away first or the dinosaurs first?") or using imaginative or playful teaching strategies (e.g., singing a clean-up song). The second variable, *engaged interaction*, captures conversation that maintained interaction and engagement by means of questions, answers, and explanations about routine matters (i.e., unrelated to task), conversation about the past or present, verbal acknowledgment of another's statement, agreements or disagreements with another's statement, good-natured jokes, teasing, and teaching unrelated to the task. Engaged interaction also includes physical contact that was helpful, neutral, and nonintrusive, such as holding a child back to ensure

the child's safety or holding a child's arm to assist the child with an activity. The final engaged interaction score is the proportional duration of time in seconds that the caregiver spent in engaged, neutral conversation or physical interaction across both the interaction tasks combined.

Possible positive reinforcement scores and engaged interaction scores range from 0 to 1. The two scores were summed to represent the proportion of time that caregivers spent in positive reinforcement (M = 0.05, SD = 0.06) or engaged interaction (M = 0.14, 0.10).

2.4 Data Analysis

Descriptive statistics, bivariate correlations, internal consistencies, and observational data reliabilities (i.e., weighted kappas) were calculated in R Version 4.2.2 (R Core Team, 2022) using the following packages: *tidyverse* (Wickham et al., 2019), *gtsummary* (Sjoberg et al., 2021), and *apaTables* (Stanley & Spence, 2018). Mplus Version 8.9 (Muthén & Muthén, 1998-2023) via *MplusAutomation* (Hallquist & Wiley, 2018) in R was used to address the three primary aims.

To address Aim 1, multilevel confirmatory factor analysis (MCFA; Sadikaj et al., 2021) was used to generate a multilevel latent factor for paternal AP using the paternal AP observational codes from both the clean-up and teaching tasks. MCFA was used rather than traditional confirmatory factor analysis because it allowed for the assessment of paternal AP across the observation tasks at the within-person (i.e., task-specific) and between-persons (i.e., individual-specific) levels. To allow for the estimation of all factor loadings while still permitting model identification, the variance of the AP latent factor at both the between-persons and within-person levels was constrained to 1. First, a fully freed MCFA model was estimated to obtain the factor structure and reliability (using omega statistics) of the multilevel AP latent factor. Next, to assess

between-person model fit, a saturated within-person model was estimated. Similarly, to assess within-person model fit, a saturated between-person model was estimated (Sadikaj et al., 2021). Higher AP scores were expected to reflect fathers who engage in moderate-to-high levels of all three AP components (i.e., active challenging behavior, excitation/arousal/destabilization, and limit-setting/positive control). Strength of factor loadings were compared at the between-persons and within-person levels via comparing model fit of the final MCFA model to models in which different pairs of factor loadings were constrained to equality. Satorra–Bentler *chi*-square difference tests ($p < .05$) were used to compare model fit between the models (Satorra & Bentler, 2010).

To test associations between paternal AP across both the clean-up and teaching tasks and children's SR skills (Aim 2a), the following between-persons outcome variables were regressed on the AP multilevel latent factor in three separate multilevel structural equation models: average parent-reported SR (age 4), average parent-reported SR (age 5), and behavioral SR tasks (age 5; latent factor). The following covariates were included in analyses at the between-persons level: child sex, study site, intervention group, paternal residential stability, age 2 supportive caregiving, and age 2 average parent-reported SR. To simplify the models, variables were only permitted to covary if they were significantly correlated. Prior to assessing age 5 behavioral SR tasks as an outcome, an MCFA was conducted to assess the factor structure of the age 5 latent factor representing observed SR at the between-persons level. As with the MCFA for AP described previously, the variance of the SR latent factor was constrained to 1 and a fully freed MCFA model was estimated to obtain the factor structure and reliability.

To assess whether AP during either of the observation tasks was a stronger predictor of child SR (Aim 2b), a separate single-level structural equation model was estimated. Latent factors

representing AP during the clean-up and teaching tasks were estimated, first alone using confirmatory factor analysis (CFA), then as predictors of the three primary SR outcomes (i.e., average parent-report at ages 4 and 5 and behavioral at age 5). A composite SR score was used for the behavioral tasks at age 5 to reduce the number of latent factors included in the model. The variance of the clean-up and teaching AP latent factors were constrained to 1 for model identification purposes. The same covariates were included as were for Aim 2a and covariates were only allowed to covary if they had significant bivariate correlations.

To assess how the association between paternal AP and child SR varied by child activation (Aim 2c), three similar models with the interaction between paternal AP and child activation (activated versus under-/overactivated) were estimated. To simplify analyses, a composite score for AP was used and child activation was defined as 0 = under- or overactivated in at least one task and 1 = activated in both tasks. Similarly, the interaction between paternal AP and child sex was estimated as a predictor of child SR in three separate exploratory models. For all moderation models, the same covariates were included as were for Aim 2a and covariates were only allowed to covary if they had significant bivariate correlations. Furthermore, in models with child activation included, child activation and paternal AP were allowed to covary. Child activation was also regressed on age 2 parent-reported SR.

To test unique associations between paternal characteristics and AP (Aim 3), the following variables (collected at age 2) were tested as predictors of age 3 paternal AP at the between-persons level: income-to-needs, paternal education, paternal depressive symptoms, paternal race, and paternal ethnicity. Furthermore, the following variables were included as covariates: paternal supportive caregiving (age 2), study site, intervention group, child sex, and paternal residence (age

2; n = 144, 84% of fathers lived with the target child). As with aim 2, only variables that were significantly correlated were permitted to covary within this model.

Model fit was assessed using the *chi*-square test (non-significant *p*-value indicating good fit), comparative fit index (CFI > .90), root mean square error of approximation (RMSEA < .05 for good fit, RMSEA < .08 for acceptable fit), and standardized root mean squared residual (SRMR < .08 for good fit ; Hu & Bentler, 1999; McDonald & Ho, 2002).

To ease interpretation of categorical variables and prevent the use of reference groups as standards by which other groups were compared to (Mayhew & Simonoff, 2015), weighted effect codes were calculated for the following variables: paternal education, paternal race, paternal ethnicity, study site, and child sex. Variables were weighted using *wec* (Nieuwenhuis et al., 2017) in R such that regression coefficients represent the effect of being in a specific group in comparison to the sample mean for the outcome of interest.

3.0 Results

3.1 Descriptive Statistics and Bivariate Correlations

Descriptive statistics for father-child interaction codes, child activation, child SR variables, and paternal depressive symptoms can be found in Table 2. Paired *t*-tests revealed that fathers exhibited significantly higher levels of limit-setting/positive control during the teaching task compared to the clean-up task, $t(166) = 2.62$, $p < .01$. Mean levels of active challenging behavior did not differ between the two tasks, $t(166) = 0.66$, $p = .51$. Similarly, mean levels of excitation/arousal/destabilization did not significantly differ across tasks, $t(166) = 0.58$, $p = .56$. *Chi*-square testing revealed that a larger proportion of children were classified as activated during the teaching task compared to the clean-up task, $\chi^2(1) = 11.49$, $p < .001$.

Table 2 Descriptive Statistics of Primary Study Variables

Variable		Age	Valid *n*	*M* (*SD*) or *n* (%)
Paternal depressive symptoms		2	121	10.34 (8.12)
Paternal supportive parenting		2	88	0.19 (0.14)
Active challenging behavior	Clean-up	3	169	3.48 (1.02)
	Teaching		169	3.53 (1.11)
Excitation/arousal/destabilization	Clean-up	3	169	3.08 (1.10)
	Teaching		169	3.11 (1.08)
Limit-setting/positive control	Clean-up	3	169	3.96 (0.96)
	Teaching		169	4.14 (0.93)
Child activation (0 = under- or overactivated, 1 = activated)	Clean-up	3	169	122 (72%)
	Teaching		169	134 (79%)
Average parent-reported self-regulation		2	171	4.06 (0.72)
		4	162	4.51 (0.75)
		5	154	4.76 (0.81)
Self-regulation behavioral battery	Tower	5	137	1.93 (0.26)
	Wrapped Gift	5	140	0.08 (0.66)
	Draw-A-Star	5	133	-0.09 (0.80)

Bivariate correlations among primary study variables can be found in Table 3. As expected and consistent with Aim 1, paternal AP behaviors were significantly and positively interrelated both within (*r*s = .40 to .68) and across clean-up and teaching tasks (*r* = .23 to .63). Child activation (0 = under- or overactivated, 1 = activated) was positively associated with paternal activation parenting behaviors within each task (*r*s = .16 to .71), with the strongest correlations between child activation and paternal limit-setting/positive control. Child activation during the teaching task was also positively associated with paternal activation parenting in the clean-up task (*r*s = .20 to .40). However, child activation during the clean-up task was only significantly associated with paternal limit-setting/positive control during the teaching task ($r = .29$, $p < .01$), and not with the other two paternal activation parenting behaviors. Child activation was significantly associated across tasks ($r = .28$, $p < .01$).

Unexpectedly, and inconsistent with Aim 2a, paternal activation parenting behaviors were generally not associated with child SR at ages 4 or 5 (|*r*s| = .00 to .12). The only exception was that paternal limit-setting/positive control during the clean-up task was positively associated with child performance on the Tower task at age 5 ($r = .18$, $p < .05$). Limit-setting/positive control during the teaching task was also positively associated with child performance on the Wrapped Gift task at age 5 ($r = .19$, $p < .05$). Child activation had a more consistent pattern of associations with later SR outcomes – children who were activated during the clean-up task had higher average parent-reported SR scores at ages 4 and 5, as well as performed better on all three SR tasks at age 5 (*r*s = .18 to .31). Children who were activated during the teaching task at age 3 had higher average parent-rated SR at age 5 ($r = .18$, $p < .05$) and performed better on the Wrapped Gift task at age 5 ($r = .17$, $p < .05$). Associations between average parent-reported child SR at age 2 and paternal AP behaviors were also generally non-significant. However, children with lower SR at age 2 had

fathers who engaged in higher levels of excitation/arousal/destabilization during the clean-up task at age 3 (r = -.16, p < .05).

In general, there were only a few significant associations between paternal factors and components of AP, which was inconsistent with Aim 3. There were no significant associations between income-to-needs or paternal education and components of paternal AP at age 3, which was unexpected. Furthermore, paternal depressive symptoms at age 2 were generally not associated with AP at age 3, except for a negative association between depressive symptoms and active challenging behavior during the teaching task (r = -.20, p < .05), which was in the expected direction. With the exception of Black fathers engaging in lower levels of limit-setting/positive control compared to fathers overall in the sample (r = -.20, p < .05), there were no other differences in AP by father race. This significant difference was in the unexpected direction. Finally, Latinx fathers engaged in higher levels of excitation/arousal/destabilization in both tasks relative to fathers in the overall sample (r = .19, p < .05), which was consistent with Aim 3. There were no other differences by ethnicity in AP.

Turning to associations between covariates and AP/child activation, only a few significant associations emerged. Female children were less likely to be activated during the teaching task, relative to male children (r = -.20, p < .01). Fathers in Pittsburgh exhibited lower levels of limit-setting/positive control during the clean-up task relative to fathers in the study across sites (r = -.18, p < .05). Furthermore, fathers who exhibited higher levels of supportive parenting at age 2 exhibited higher levels of excitation/arousal/destabilization across both tasks (rs = .30-.32, p < .05) and higher levels of limit-setting/positive control during the clean-up task (r = .25, p < .05). There were no differences in AP or child activation by paternal residential stability (ages 2 through 4) or intervention status.

Table 3 Bivariate Correlations Between Primary Study Variables

Variable (Age in Years)	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Income-to-needs (2)													
2. Father education = HS (2)	.09												
3. Father education > HS (2)	.13	**.69****											
4. Child sex = female	-.13	-.09	-.06										
5. Father race = Black	-.02	.15	.08	.04									
6. Father race = white	.08	**.21***	**.29****	.03	**.56****								
7. Father ethnicity = Latinx	-.06	.15	**.21***	-.02	**.41****	**.53****							
8. Site = Charlottesville, VA	-.05	.01	-.12	-.03	**.34****	-.01	.07						
9. Site = Pittsburgh, PA	.15	.09	.16	-.02	**.43****	**.21***	**.21***	**.26****					
10. Group = intervention	-.07	-.07	-.02	-.02	-.06	.00	.07	-.03	-.05				
11. Father residential stability (2-4)	**.23****	.10	.18	.11	-.01	**.18***	-.10	.04	-.11	.11			
12. Father depression (2)	-.14	-.14	-.14	.00	.12	.00	.00	**.23***	.06	**.19***	-.17		
13. Father supportive parenting (2)	**.28****	-.07	.03	.06	-.13	.02	-.10	-.13	**-.31****	-.05	.10	-.08	
<u>Clean-Up Task (3)</u>													
14. Father ACB	-.02	.06	.04	-.02	-.06	.13	.12	-.02	-.09	-.10	-.01	.10	.12
15. Father EAD	-.06	.03	.01	.04	-.06	.00	**.19***	-.10	-.15	.00	-.14	-.02	**.32****
16. Father LS/PC	-.11	.06	.10	.00	**-.20***	.03	.15	-.09	**-.18***	.00	.06	-.04	**.25***
17. Child activated = yes	-.12	-.02	.08	-.08	-.07	-.05	-.10	-.06	.03	.01	.01	-.01	.13
<u>Teaching Task (3)</u>													
18. Father ACB	.10	.13	.12	-.06	.02	.12	.13	.05	-.03	-.09	.05	**-.20***	.04
19. Father EAD	.04	.07	.06	-.04	.06	.15	**.19***	.03	-.11	.05	.08	-.08	**.30****
20. Father LS/PC	.04	.09	.15	-.14	-.06	.11	.11	-.03	-.12	.03	.03	-.04	.06
21. Child activated = yes	.05	.12	.18	**-.20****	.05	.08	.02	.03	.03	-.10	.01	-.11	-.01
<u>Child Self-Regulation</u>													
22. Average parent-report (2)	.00	-.04	-.06	-.13	-.11	**-.30****	**-.30****	-.06	-.10	-.10	.02	-.14	.17
23. Average parent-report (4)	.13	.10	.07	**-.20***	-.05	**-.31****	**-.31****	-.03	-.10	.04	.12	.00	.05
24. Average parent-report (5)	.08	-.03	-.02	-.15	-.07	**-.21***	**-.27****	-.05	**-.17***	-.01	.15	.01	.12
25. Tower (5)	-.11	-.03	-.01	-.12	**-.33****	-.06	-.02	**-.30****	-.10	.11	-.11	.04	.01
26. Wrapped Gift (5)	**.17***	.06	.14	-.11	-.06	.09	-.12	-.13	-.06	.02	**.20***	-.01	.21
27. Draw-A-Star (5)	-.07	.02	.14	-.06	-.10	-.02	-.07	**-.19***	-.14	-.05	.03	-.06	-.02

Note: HS = high school. ACB = active challenging behavior. EAD = excitation/arousal/destabilization. LS/PC = limit-setting/positive control. * $p < .05$. ** $p < .01$.

Table 3 Bivariate Correlations Between Primary Study Variables

Variable (Age in Years)	14	15	16	17	18	19	20	21	22	23	24	25	26
Clean-Up Task (3)													
14. Father ACB													
15. Father EAD	**.68****												
16. Father LS/PC	**.47****	**.44****											
17. Child activated = yes	**.24****	**.16***	**.59****										
Teaching Task (3)													
18. Father ACB	**.51****	**.42****	**.25****	.08									
19. Father EAD	**.53****	**.63****	**.23****	-.05	**.65****								
20. Father LS/PC	**.33****	**.29****	**.53****	**.29****	**.55****	**.40****							
21. Child activated = yes	**.24****	**.20****	**.40****	**.28****	**.38****	**.28****	**.71****						
Child Self-Regulation													
22. Average parent-report (2)	-.02	**-.16***	.02	**.19***	.01	-.07	.10	.14					
23. Average parent-report (4)	-.09	-.11	-.03	**.21****	.00	-.08	.08	.10	**.46****				
24. Average parent-report (5)	.07	-.08	.06	**.31****	.03	.00	.08	**.18***	**.54****	**.69****			
25. Tower (5)	.12	.11	**.18***	**.18***	-.04	.06	-.01	-.02	.00	.06	.11		
26. Wrapped Gift (5)	-.09	-.04	.07	**.20***	.08	.06	**.19***	**.17***	.01	**.24****	**.20***	**.33****	
27. Draw-A-Star (5)	.02	.03	.11	**.25****	.00	.10	.10	.14	.13	.13	**.28****	**.32****	**.29****

Note: ACB = active challenging behavior. EAD = excitation/arousal/destabilization. LS/PC = limit-setting/positive control. * $p < .05$. ** $p < .01$.

3.2 Aim 1 Results: Multilevel Confirmatory Factor Analysis for Activation Parenting (AP)

To address the first aim, multilevel confirmatory factor analysis (MCFA) was used to assess a multilevel latent factor representing AP across the clean-up and teaching tasks. In the initial, fully freed model, the residual variance for active challenging behavior at the between-persons level was negative, indicating a Heywood case (i.e., a parameter outside of possible boundaries). To address this issue, the variance of active challenging behavior was constrained to 0 at the between-persons levels (Kline, 2011). All other parameters were fully freed. The adjusted model showed excellent model fit: χ^2 (1) = .03, p > .87; RMSEA = .00; CFI = 1.00; $SRMR_{Within}/SRMR_{Between}$ = .00/.00. All variables positively and significantly loaded onto the AP latent factor at both levels. Standardized and unstandardized factor loadings are reported in Table 4. Reliability was adequate at the within-person (ω = .71) and between-persons (ω = .86) levels. Next, a saturated within-person model was estimated and indicated excellent fit at the between-person level: χ^2 (1) = .03, p > .87; RMSEA = .00; CFI = 1.00. The saturated between-person model did not have relevant fit statistics because it was fully saturated.

Table 4 AP MCFA Parameters

	Within-Person		Between-Persons		
Parameter	**Unstnd. (*SE*)**	**Stnd.**	**Unstnd. (*SE*)**	**Stnd.**	***ICC***
Active challenging behavior	.55 (.08)	.75	.76 (.06)	1.00	.51
Excitation/arousal/destabilization	.40 (.07)	.61	.71 (.08)	.82	.63
Limit-setting/positive control	.42 (.06)	.64	.37 (.08)	.55	.52

Note: Unstnd. = unstandardized factor loadings. *SE* = standard error. Stnd. = standardized factor loadings. *ICC* = intraclass correlation coefficient.

Strength of factor loadings were assessed by constraining pairs of loadings to equality and comparing model fit to the full MCFA model. Satorra-Bentler *chi*-square difference tests revealed only one significant difference in factor loadings: at the between-persons level, the factor loading for active challenging behavior was significantly stronger than the factor loading for limit-setting/positive control. All other AP indicators loaded equally onto AP at the between-persons and within-person levels.

Table 5 Model Fit Comparison for Constrained vs. Freed Factor Loadngs

	Within-Person		**Between-Persons**	
Factor Loading Comparison	**$\Delta\chi^2$ (*df* = 1)**	***p*-value**	**$\Delta\chi^2$ (*df* = 1)**	***p*-value**
Active challenging behavior vs. limit-setting/positive control	1.64	.20	**25.14**	**< .001**
Excitation/arousal/destabilization vs. limit-setting/positive control	2.95	.09	0.37	.54
Active challenging behavior vs. excitation/arousal/destabilization	2.95	.09	0.37	.54

3.3 Aim 2 Results: Direct and Moderated Relations Between Activation Parenting (AP) and Child Self-Regulation (SR)

3.3.1 Direct Relations Between AP and SR in a Multilevel Framework

Three separate models were estimated to assess longitudinal relations between paternal AP and child SR (Table 6). In the first model, average parent-reported SR at age 4 was included as the outcome. Model fit was good: χ^2 (42) = 60.75, p = .03; RMSEA = .04; CFI = .94; $SRMR_{Within}/SRMR_{Between}$ = .002/.08. In the second model, average parent-reported SR at age 5 was included as the outcome. Model fit was good in this model as well: χ^2 (42) = 61.30, p = .03;

RMSEA = .04; CFI = .95; $SRMR_{Within}/SRMR_{Between}$ = .002/.08. Unexpectedly, AP was not significantly associated with average parent-reported SR at ages 4 or 5.

Finally, a latent factor representing observed SR at age 5 was assessed as the outcome. Prior to running this model, an MCFA was conducted to assess the factor structure of the age 5 latent factor representing observed SR at the between-persons level. The latent factor was fully saturated, and therefore did not generate relevant fit statistics. All variables positively and significantly loaded onto the SR latent factor at the between-persons level (Table 7). Reliability was adequate at the between-person level (ω = .55). The final longitudinal model had good model fit: χ^2 (62) = 85.95, p = .02; RMSEA = .03; CFI = .93; $SRMR_{Within}/SRMR_{Between}$ = .002/.08. Consistent with the prior two models, AP was not significantly associated with observed SR at age 5.

Table 6 Between-Persons Longitudinal Relations between AP and SR

	Average Parent-Report SR (4)			Average Parent-Report SR (5)			Observed SR (5)		
Parameter	**Unstnd. (SE)**	**Stnd.**	***p***	**Unstnd. (SE)**	**Stnd.**	***p***	**Unstnd. (SE)**	**Stnd.**	***p***
Predictors of SR									
Activation parenting (3)	-0.05 (0.06)	-.06	.40	0.02 (0.06)	.03	.72	0.05 (0.16)	.05	.75
Parent-reported SR (2)	**0.45 (0.08)**	**.44**	**<.001**	**0.59 (0.08)**	**.53**	**<.001**	0.10 (0.16)	.06	.52
Father supportive parenting (2)	-0.31 (0.47)	-.06	.51	-0.03 (0.42)	-.01	.95	0.73 (1.33)	.09	.58
Site = Charlottesville, VA	-0.02 (0.17)	-.01	.92	-0.16 (0.18)	-.08	.37	**-1.17 (0.52)**	**-.41**	**.02**
Site = Pittsburgh, PA	-0.07 (0.09)	-.07	.40	-0.09 (0.09)	-.08	.28	-0.01 (0.22)	-.01	.96
Group = intervention	0.09 (0.10)	.06	.38	0.04 (0.11)	.03	.68	0.12 (0.25)	.05	.65
Child sex = male	**-0.12 (0.05)**	**-.16**	**.03**	-0.09 (0.06)	-.11	.10	-0.24 (0.13)	-.21	.06
Father residential stability (2-4)	0.33 (0.25)	.11	.19	0.38 (0.24)	.12	.12	0.30 (1.03)	.07	.77
Covariances									
Father supportive parenting (2) with Charlottesville, VA	-0.01 (0.01)	-.11	.33	-0.01 (0.01)	-.10	.35	-0.01 (0.01)	-.09	.40
Father supportive parenting (2) with Pittsburgh, PA	**-0.03 (0.01)**	**-.32**	**<.001**	**-0.03 (0.01)**	**-.32**	**<.001**	**-0.03 (0.01)**	**-.32**	**<.001**
Charlottesville, VA with Pittsburgh, PA	**0.07 (0.01)**	**.26**	**<.001**	**0.07 (0.01)**	**.26**	**<.001**	**0.07 (0.01)**	**.26**	**<.001**

Note: Unstnd. = unstandardized parameter. Stnd. = standardized parameter.

Table 7 SR MCFA Parameters

	Between-Persons		
Parameter	**Unstnd. (SE)**	**Stnd.**	***p***
Tower	**0.16 (0.06)**	**.63**	**.003**
Wrapped Gift	**0.38 (0.12)**	**.57**	**.002**
Draw-A-Star	**0.44 (0.14)**	**.54**	**.002**

Note: Unstnd. = unstandardized factor loadings. Stnd. = standardized factor loadings.

3.3.2 Task-Level Associations between AP and SR

To assess relations between paternal AP at the task-level and child SR, latent factors for AP during the clean-up and teaching tasks were estimated using confirmatory factor analysis (CFA; Table 8). Model fit was excellent: χ^2 (5) = 10.07, p = .07; RMSEA = .08; CFI = .99; SRMR = .05. Factor loadings were positive and significant (p < .001). Furthermore, AP indicators and factors during the clean-up and teaching tasks were strongly associated, with the exception of a lack of association between active challenging behaviors across the two tasks.

Table 8 Task-Level AP CFA Parameters

Parameter	Unstnd. (SE)	Stnd.	*p*
Clean-up AP latent factor			
Active challenging behavior	**0.91 (0.07)**	**.90**	**<.001**
Excitation/arousal/destabilization	**0.79 (0.09)**	**.74**	**<.001**
Limit-setting/positive control	**0.53 (0.53)**	**.55**	**<.001**
Teaching AP latent factor			
Active challenging behavior	**1.00 (0.08)**	**.91**	**<.001**
Excitation/arousal/destabilization	**0.78 (0.07)**	**.72**	**<.001**
Limit-setting/positive control	**0.59 (0.07)**	**.62**	**<.001**
Associations between latent factors/indicators			
Latent factors	**0.66 (0.07)**	**.66**	**<.001**
Active challenging behavior	-0.03 (0.08)	-.17	.65
Excitation/arousal/destabilization	**0.29 (0.08)**	**.53**	**<.001**
Limit-setting/positive control	**0.33 (0.06)**	**.55**	**<.001**

Note: Unstnd. = unstandardized factor loadings and covariances. Stnd. = standardized factor loadings and covariances.

Three separate structural equation models were estimated to assess longitudinal relations between latent factors representing paternal AP in the clean-up and teaching tasks and child SR (Table 9). In the first model, average parent-reported SR at age 4 was included as the outcome. Model fit was adequate: χ^2 (69) = 103.82, p < .01; RMSEA = .05; CFI = .93; SRMR = .08. In the second model, average parent-reported SR at age 5 was included as the outcome. Model fit was

adequate: χ^2 (69) = 100.23, $p < .01$; RMSEA = .05; CFI = .94; SRMR = .08. In the final model, a composite score representing observed SR at age 5 was assessed as the outcome. Model fit was adequate: χ^2 (69) = 106.13, $p < .01$; RMSEA = .06; CFI = .92; SRMR = .08. Unexpectedly, AP during the clean-up and teaching tasks was not significantly associated with SR in any of the models (i.e., parent-reported at 4 or 5, observed at 5).

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Table 9 Task-Level Longitudinal Relations between AP and SR

	Average Parent-Report SR (4)			Average Parent-Report SR (5)			Observed SR (5)		
Parameter	**Unstnd. (SE)**	**Stnd.**	***p***	**Unstnd. (SE)**	**Stnd.**	***p***	**Unstnd. (SE)**	**Stnd.**	***p***
Predictors of SR									
Clean-up AP (3)	-0.06 (0.09)	-.07	.53	0.04 (0.09)	.05	.63	-0.06 (0.07)	-.15	.35
Teaching AP (3)	0.01 (0.09)	.01	.90	-0.02 (0.09)	-.02	.85	0.07 (0.06)	.16	.27
Parent-reported SR (2)	**0.45 (0.08)**	**.44**	**<.001**	**0.59 (0.08)**	**.53**	**<.001**	0.03 (0.05)	.05	.49
Father supportive parenting (2)	-0.32 (0.47)	-.06	.50	-0.04 (0.42)	-.01	.92	0.30 (0.39)	.10	.45
Site = Charlottesville, VA	-0.02 (0.17)	-.01	.90	-0.15 (0.18)	-.08	.39	**-0.34 (0.14)**	**-.31**	**.02**
Site = Pittsburgh, PA	-0.07 (0.09)	-.07	.39	-0.09 (0.09)	-.08	.28	-0.01 (0.06)	-.02	.88
Group = intervention	0.09 (0.10)	.06	.39	0.05 (0.11)	.03	.66	-0.02 (0.07)	-.03	.77
Child sex = male	**-0.12 (0.05)**	**-.15**	**.03**	-0.09 (0.06)	-.11	.10	-0.06 (0.03)	-.13	.09
Father residential stability (2-4)	0.33 (0.26)	.11	.21	0.39 (0.24)	.12	.11	0.06 (0.13)	.04	.65
Covariances									
Father supportive parenting (2) with Charlottesville, VA	-0.01 (0.01)	-.11	.33	-0.01 (0.01)	-.11	.35	-0.01 (0.01)	-.09	.39
Father supportive parenting (2) with Pittsburgh, PA	**-0.03 (0.01)**	**-.32**	**<.001**	**-0.03 (0.01)**	**-.32**	**<.001**	**-0.03 (0.01)**	**-.33**	**<.001**
Charlottesville, VA with Pittsburgh, PA	**0.07 (0.01)**	**.26**	**<.001**	**0.07 (0.01)**	**.26**	**<.001**	**0.07 (0.01)**	**.26**	**<.001**

Note: Unstnd. = unstandardized parameter. Stnd. = standardized parameter.

3.3.3 Moderation of Relations between AP and SR by Child Activation

Three separate models were estimated to assess if child activation moderated longitudinal relations between a composite representing AP and child SR (i.e., parent-report at age 4, parent-report at age 5, and observed at age 5; Table 10). Model fit was adequate for the parent-report (age 4) model: χ^2 (38) = 51.77, p = .07; RMSEA = .05; CFI = .93; SRMR = .07. Model fit was similarly adequate for the parent-report (age 5) model: χ^2 (38) = 51.70, p = .07; RMSEA = .05; CFI = .94; SRMR = .07. Model fit was also adequate for the observed SR (age 5) model: χ^2 (58) = 75.56, p = .06; RMSEA = .04; CFI = .92; SRMR = .07. Child activation was significantly associated with SR at age 5 (both parent-report and observed), but not at age 4, such that activated children had higher SR skills. Unexpectedly, child activation did not moderate relations between paternal AP and child SR across any of the models. As model fit was adequate across the three models, each moderation model was recomputed with all covariates removed for which the pattern of results remained the same. These alternate models were fully saturated and therefore did not generate relevant fit statistics.

Table 10 Longitudinal Relations between AP and SR, Moderated by Child Activation

	Average Parent-Report SR (4)			Average Parent-Report SR (5)			Observed SR (5)		
Parameter	**Unstnd. (SE)**	**Stnd.**	***p***	**Unstnd. (SE)**	**Stnd.**	***p***	**Unstnd. (SE)**	**Stnd.**	***p***
Predictors of SR									
AP (3)	-0.20 (0.12)	-.21	.09	-0.18 (0.11)	-.17	.12	-0.55 (0.50)	-.34	.27
Child activation = activated (3)	0.24 (0.12)	.15	.06	**0.34 (0.14)**	**.20**	**.01**	**0.95 (0.37)**	**.36**	**.01**
AP (3) x Child activation = activated (3)	0.17 (0.17)	.13	.30	0.20 (0.16)	.13	.22	0.83 (0.60)	.36	.17
Parent-reported SR (2)	**0.45 (0.09)**	**.43**	**<.001**	**0.57 (0.08)**	**.51**	**<.001**	0.15 (0.19)	.08	.45
Father supportive parenting (2)	-0.32 (0.44)	-.06	.48	-0.07 (0.38)	-.01	.86	-0.33 (1.32)	-.04	.80
Site = Charlottesville, VA	0.00 (0.16)	.00	.99	-0.12 (0.16)	-.06	.44	**-1.15 (0.53)**	**-.36**	**.03**
Site = Pittsburgh, PA	-0.10 (0.08)	-.09	.24	-0.14 (0.09)	-.12	.09	-0.18 (0.23)	-.10	.43
Group = intervention	0.12 (0.10)	.08	.23	0.08 (0.11)	.05	.44	0.13 (0.24)	.05	.60
Child sex = male	-0.10 (0.05)	-.13	.05	-0.06 (0.06)	-.07	.27	-0.18 (0.13)	-.14	.18
Father residential stability (2-4)	0.33 (0.24)	.11	.16	0.37 (0.22)	.12	.10	0.62 (0.81)	.13	.45
Parent-reported SR (2) → Child activation = activated (3)	**0.09 (0.05)**	**.13**	**.048**	**0.09 (0.05)**	**.13**	**.048**	**0.09 (0.05)**	**.13**	**.046**
Covariances									
AP (3) with Child activation = activated (3)	**0.15 (0.03)**	**.41**	**<.001**	**0.15 (0.03)**	**.40**	**<.001**	**0.15 (0.03)**	**.41**	**<.001**
Father supportive parenting (2) with Charlottesville, VA	0.00 (0.01)	-.11	.33	0.00 (0.01)	-.11	.34	0.00 (0.01)	-.10	.35
Father supportive parenting (2) with Pittsburgh, PA	**-0.03 (0.01)**	**-.32**	**<.001**	**-0.03 (0.01)**	**-.32**	**<.001**	**-0.03 (0.01)**	**-.32**	**<.001**
Charlottesville, VA with Pittsburgh, PA	**0.07 (0.01)**	**.26**	**<.001**	**0.07 (0.01)**	**.26**	**<.001**	**0.07 (0.01)**	**.26**	**<.001**

Note: Unstnd. = unstandardized parameter. Stnd. = standardized parameter.

3.3.4 Moderation of Relations between AP and SR by Child Sex

Three separate models were estimated to assess if child sex moderated longitudinal relations between a composite representing AP and child SR (i.e., parent-report at age 4, parent-report at age 5, and observed at age 5; Table 11). Model fit was good for the parent-report (age 4) model: χ^2 (25) = 27.54, p = .33; RMSEA = .02; CFI = .93; SRMR = .06. Model fit was similarly good in the parent-report (age 5) model: χ^2 (25) = 27.47, p = .33; RMSEA = .02; CFI = .95; SRMR = .06. Model fit was adequate in the observed SR (age 5) model: χ^2 (43) = 49.05, p = .24; RMSEA = .03; CFI = .83; SRMR = .06. Although female children had higher parent-reported SR scores at age 4, differences in SR by child sex were not evident at age 5. Furthermore, child sex did not significantly moderate relations between paternal AP and child SR across all three models.

Table 11 Longitudinal Relations between AP and SR, Moderated by Child Sex

	Average Parent-Report SR (4)			Average Parent-Report SR (5)			Observed SR (5)		
Parameter	**Unstnd. (SE)**	**Stnd.**	***p***	**Unstnd. (SE)**	**Stnd.**	***p***	**Unstnd. (SE)**	**Stnd.**	***p***
Predictors of SR									
AP (3)	-0.04 (0.06)	-.04	.51	0.02 (0.07)	.02	.80	0.12 (0.18)	.08	.49
Child sex = male	**-0.12 (0.05)**	**-.15**	**.03**	-0.09 (0.06)	-.11	.11	-0.23 (0.13)	-.20	.07
AP (3) x Child sex = male	-0.07 (0.06)	-.07	.28	-0.05 (0.07)	-.05	.44	0.00 (0.18)	.00	.99
Parent-reported SR (2)	**0.46 (0.08)**	**.45**	**<.001**	**0.60 (0.08)**	**.53**	**<.001**	0.11 (0.16)	.07	.49
Father supportive parenting (2)	-0.32 (0.47)	-.06	.50	-0.04 (0.41)	-.01	.93	0.54 (1.39)	.06	.70
Site = Charlottesville, VA	-0.01 (0.17)	-.01	.96	-0.16 (0.18)	-.08	.37	**-1.173 (0.52)**	**-.41**	**.03**
Site = Pittsburgh, PA	-0.07 (0.09)	-.07	.38	-0.09 (0.09)	-.08	.28	-0.01 (0.22)	-.01	.96
Group = intervention	0.10 (0.10)	.07	.31	0.05 (0.11)	.03	.64	0.11 (0.24)	.05	.64
Father residential stability (2-4)	0.29 (0.26)	.10	.26	0.34 (0.24)	.11	.16	0.30 (0.99)	.07	.76
Covariances									
Father supportive parenting (2) with Charlottesville, VA	-0.01 (0.01)	-.11	.34	-0.01 (0.01)	-.10	.36	-0.01 (0.01)	-.09	.39
Father supportive parenting (2) with Pittsburgh, PA	**-0.03 (0.01)**	**-.32**	**<.001**	**-0.03 (0.01)**	**-.32**	**<.001**	**-0.03 (0.01)**	**-.32**	**<.001**
Charlottesville, VA with Pittsburgh, PA	**0.07 (0.01)**	**.26**	**<.001**	**0.07 (0.01)**	**.26**	**<.001**	**0.07 (0.01)**	**.26**	**<.001**

Note: Unstnd. = unstandardized parameter. Stnd. = standardized parameter.

3.4 Aim 3 Results: Predictors of Activation Parenting (AP)

To assess longitudinal relations between age 2 family and father characteristics and paternal AP at age 3, AP was regressed on the following variables at the between-persons level within a MSEM framework: income-to-needs, paternal education, paternal depressive symptoms, paternal race, and paternal ethnicity (Table 12). The following variables were included as covariates: paternal supportive caregiving (age 2), study site, intervention group, child sex, and paternal residence (age 2). Model fit was good: χ^2 (79) = 106.35, p = .02; RMSEA = .01; CFI = .98; $SRMR_{Within}/SRMR_{Between}$ = .00/.07. Unexpectedly, there were no significant relations between the hypothesized predictors and AP. There were also no significant relations between any of the covariates and AP.

Table 12 Between-Persons Longitudinal Relations Between Age 2 Predictors and AP

Parameter	Unstnd. (SE)	Stnd.	*p*
Predictors of AP (3)			
Income-to-needs	0.07 (0.15)	.04	.65
Father education = HS	0.08 (0.11)	.10	.45
Father education > HS	-0.03 (0.13)	-.02	.85
Father depression	0.00 (0.01)	.00	.98
Father race = Black	-0.35 (0.30)	-.16	.23
Father race = white	0.10 (0.08)	.17	.22
Father ethnicity = Latinx	0.07 (0.04)	.18	.10
Father supportive parenting	0.47 (0.98)	.06	.63
Site = Charlottesville, VA	0.21 (0.26)	.08	.42
Site = Pittsburgh, PA	-0.15 (0.15)	-.10	.34
Group = intervention	-0.24 (0.17)	-.11	.16
Child sex = male	-0.04 (0.09)	-.04	.64
Father residence	0.03 (0.31)	.01	.93

Parameter	Unstnd. (SE)	Stnd.	*p*
Covariances			
Father supportive parenting with Charlottesville, VA	0.00 (0.01)	.06	.50
Father supportive parenting with Pittsburgh, PA	**-0.03 (0.01)**	**-.29**	**<.001**
Father supportive parenting with income-to-needs	**0.03 (0.01)**	**.33**	**.01**
Charlottesville, VA with Pittsburgh, PA	**0.07 (0.01)**	**.25**	**<.001**
Charlottesville, VA with father depression	**0.69 (0.35)**	**.21**	**.04**
Charlottesville, VA with father race = Black	**0.06 (0.03)**	**.32**	**.02**
Charlottesville, VA with father race = white	-0.01 (0.07)	-.02	.86
Charlottesville, VA with father ethnicity = Latinx	0.11 (.12)	.10	.36
Pittsburgh, PA with father depression	-0.04 (0.38)	-.01	.91
Pittsburgh, PA with father race = Black	**0.15 (0.03)**	**.43**	**<.001**
Pittsburgh, PA with father race = white	**0.27 (0.08)**	**.21**	**<.001**
Pittsburgh, PA with father ethnicity = Latinx	**0.36 (0.11)**	**.19**	**<.001**
Group = intervention with father depression	**0.78 (0.36)**	**.19**	**.03**
Father residence with income-to-needs	**0.05 (0.02)**	**.23**	**.02**
Father residence with father race = Black	0.01 (0.02)	.03	.77
Father residence with father race = white	**0.19 (0.08)**	**.31**	**.02**
Father education = HS with father education > HS	**0.91 (0.18)**	**.69**	**<.001**
Father education = HS with father race = Black	0.07 (0.06)	.11	.27
Father education = HS with father race = white	0.42 (0.26)	.18	.67
Father education = HS with father ethnicity = Latinx	0.52 (0.42)	.15	.22
Father education > HS with father race = Black	0.02 (0.04)	.04	.67
Father education > HS with father race = white	**0.42 (0.20)**	**.23**	**.04**
Father education > HS with father ethnicity = Latinx	0.56 (0.32)	.20	.08
Father race = Black with father race = white	**0.50 (0.10)**	**.57**	**<.001**
Father race = Black with father ethnicity = Latinx	**0.58 (0.15)**	**.43**	**<.001**
Father race = white with father ethnicity = Latinx	**2.73 (0.74)**	**.55**	**<.001**

Note: Unstnd. = unstandardized parameter. Stnd. = standardized parameter.

4.0 Discussion

The present study aimed to assess the construct of activation parenting (AP) and its relation to child self-regulation (SR) skills and paternal characteristics in a sample of low-income fathers and their children. Although support was found for the use of the novel Marbach Coding System for Activation Parenting (Volling et al., 2015), AP was not found to be associated with child SR (either directly or moderated by child characteristics) and was not significantly associated with earlier assessed paternal characteristics. Regardless, the present study is an important step forward for research on paternal AP that can be improved upon in future studies, as discussed in the following sections.

4.1 Coding and Statistically Modeling AP

Support was found for the first aim, which was to validate the Marbach Coding System for Activation Parenting (Volling et al., 2015) and generate a multilevel latent factor for AP across clean-up and teaching tasks. Coders were able to reliably implement the coding system, as evidenced by the adequate magnitudes of weighted kappas for all three paternal AP codes (i.e., active challenging behavior, excitation/arousal/destabilization, and limit-setting/positive control) and the novel child activation code (i.e., .65 to .80 in the present study; Viera & Garrett, 2005).

Multilevel confirmatory factor analysis (MCFA) was successfully used to estimate a multilevel latent factor representing AP. The latent factor was reliable at both the within-person and between-persons levels and had excellent model fit at both levels. At the within-person level,

standardized factor loadings were similarly strong in magnitude, suggesting that the three indicators of paternal AP similarly contributed to AP across the clean-up and teaching tasks for individual fathers. At the between-persons level, the limit-setting/positive control parameter was significantly smaller in magnitude relative to active challenging behavior, but not in relation to excitation/arousal/destabilization. This pattern of findings suggests that active challenging behavior is a stronger indicator of AP across fathers relative to limit-setting/positive control. Furthermore, active challenging behavior and excitation/arousal/destabilization are more conceptually related to one another relative to limit-setting/positive control – the former both emphasize behaviors that challenge and excite the child behaviorally and emotionally, rather than having a focus on safety (i.e., limit-setting). Although theoretically limit-setting/positive control is an important component of AP, it may not be plausible to statistically model AP as a latent factor that includes both challenging and limit-setting behaviors.

Future studies should explore whether the challenging and encouraging aspects of AP (i.e., active challenging behavior and excitation/arousal/destabilization in the present study) are associated with child SR, and whether limit-setting/positive control moderates relations between the challenging aspects of AP and child SR. It is possible that the stimulating aspects of AP are only associated with child SR when fathers also engage in appropriate levels of limit-setting. Similar analyses were conducted by Flanders et al. (2009, 2010), which found that RTP frequency was associated with higher levels of aggression and lower levels of emotion regulation when fathers showed low levels of dominance in play. A similar pattern may be evident and, if supported in future studies, may suggest that limit-setting/positive control is a key ingredient to the effectiveness of paternal challenging and excitatory behaviors in relation to the development of children's SR skills.

Paternal AP behaviors can also be assessed in the context of other caregiving practices (Darling & Steinberg, 1993), including supportiveness, sensitivity, and control. Although paternal AP is a distinct caregiving construct with specific behaviors and characteristics, it likely interacts with other paternal caregiving behaviors to impact children's socioemotional development (Feldman & Shaw, 2021). Extant research supports the notion that paternal AP exists independently of other caregiving constructs, as evidenced by null or weak associations between measures of AP and warmth/supportiveness (Anderson et al., 2019; Carone, Baiocco, et al., 2020; Carone, Lingiardi, et al., 2020; Gaumon & Paquette, 2013; Majdandžić et al., 2016), sensitivity (Carone, Baiocco, et al., 2020; Carone, Lingiardi, et al., 2020; Deneault et al., 2022), overprotection (Fliek et al., 2015; Majdandžić et al., 2016), and control (Gaumon & Paquette, 2013). In the present study, paternal supportive caregiving at 2 years was not significantly associated with AP at age 3 in multivariate models, although some significant but modest correlations emerged between supportive caregiving and components of AP. Future studies should aim to incorporate measures of paternal AP with other more established observational measures of paternal caregiving, such as from the NICHD scales (Cox & Crnic, 2003). Such analyses can further clarify the uniqueness of paternal AP behaviors in promoting child SR and further contextualize what other parenting behaviors relate to or moderate the influence of AP on child adjustment.

4.2 Lack of Relations Between Paternal AP and Child SR

Support was not found for the hypothesis that AP would be significantly associated with child SR, both directly and moderated by child characteristics. The lack of association between

AP and SR was evident across measures of SR (i.e., age 4 parent-reported SR, age 5 parent-reported SR, and age 5 behavioral SR), moderator (i.e., child activation and child sex), and task (i.e., clean-up and teaching). These findings were inconsistent with prior theory (Carson et al., 1993; Feldman & Shaw, 2021; Paquette, 2004b; Paquette & Bigras, 2010) and some longitudinal research (Anderson et al., 2019; Flanders et al., 2010; Hazen et al., 2010; Stevenson & Crnic, 2013) supporting relations between AP and child SR in early childhood. Thus, the present study joins a body of cross-sectional (Gomes et al., 2013; Lee et al., 2020; Olofson & Schoppe-Sullivan, 2022; StGeorge et al., 2017) and longitudinal studies (Anderson et al., 2019; Stevenson & Crnic, 2013) that have found null or mixed support for expected relations between AP and SR.

4.2.1 Lack of Direct Relations between AP and SR

The differences between the present study's sample and prior studies assessing relations between paternal AP and child SR may partially explain the null associations found in the present study. First, with the exception of Lee et al. (2020), who had 634 participating families in their study, the present study is the largest to date to test relations between paternal AP and child SR in early childhood. Prior studies that have found support for relations between paternal AP and SR had smaller sample sizes than the present study, with some as small as 24 to 33 fathers (Anderson et al., 2019; Flanders et al., 2010; StGeorge et al., 2017) and only two with over 100 fathers (Hazen et al., 2010; Stevenson & Crnic, 2013). In such small samples, especially those under 50 families, effects can be driven by a small number of outlier cases. Thus, prior significant findings are not as robust as the null findings in the present study and in Lee et al. (2020), suggesting that paternal AP and child SR may not actually be related. Second, the fathers in the current sample had relatively low levels of household income and education – 92% of participating families were at

or below 200% of the poverty line (as indicated by an income-to-needs ratio being ≤ 2) and only a third of the fathers with education data available achieved education after high school. Despite the current sample's relative homogeneity in terms of SES, mirroring the homogeneity of prior samples, the current sample is noticeably different by including a higher percentage of low-SES and ethnically/racially diverse families than prior work. These sociodemographic factors are quite different from most other samples in which relations between AP and SR have been studied and raises questions about the generalizability of the benefits of paternal AP for child SR beyond socioeconomically privileged samples in early childhood.

Turning to methods, the observational measure of AP used in the present study was novel in its integration of both the challenging and limit-setting components of AP. Although most prior studies testing relations between paternal AP and child SR relied on observational measures of AP, these measures often assessed only RTP (Anderson et al., 2019; Flanders et al., 2010) or used traditional "maternal-centric" measures to approximate challenging behaviors (Hazen et al., 2010; Lee et al., 2020; Stevenson & Crnic, 2013). An element of limit-setting is inherent in both types of coding systems – measures of RTP quality typically include the element of fathers controlling the play and occasionally giving the child the "upper-hand." Latent measures of AP have incorporated measures of father-directed interactions (i.e., directiveness/intrusiveness), which are conceptually related to limit-setting. However, limit-setting was not explicitly included as a component of AP in the aforementioned studies. The closest existing comprehensive measure of AP is the Risky Interaction Support and Challenge Scale (RISCS) coding system, developed by Olofson and Schoppe-Sullivan (2022). The RISCS coding system includes excessive limit-setting (i.e., overprotection) but not a code for behaviorally-warranted limit setting. Thus, the inclusion of limit-setting as a central construct in the present study is a divergence from prior studies. It is

possible that limit-setting is not as central to the SR benefits of AP as previously theorized. It is also plausible that there was not sufficient variability in father or child behavior to properly assess the role of limit-setting as a component of AP. Limit-setting/positive control scores were generally high across both tasks in the present study (44% of fathers in the clean-up task and 32% of fathers in the teaching task received maximum limit-setting/positive control scores). Furthermore, most children did not require much intervention, as evidenced by around 90% of children being activated, and thus likely only requiring modest levels of limit-setting, or underactivated, likely requiring little to no limit-setting. To obtain a larger range of limit-setting behaviors, future studies would benefit from using tasks that elicit riskier behaviors (e.g., a Risk room with stairs, trampolines, tunnels, and other similar toys; Majdandžić et al., 2016) and/or oversampling for children who have high levels of impulsivity and poor inhibitory control.

Another potential reason for the lack of associations between paternal AP and child SR in the present study could be due to the inclusion of earlier child SR as a covariate. Prior studies that have found support for longitudinal relations between paternal AP and child SR did not control for children's earlier SR abilities (Anderson et al., 2019; Flanders et al., 2010; Hazen et al., 2010; Stevenson & Crnic, 2013). In the present study, across models, the most consistent predictor of preschool-age SR was age 2 SR. Of course, one reason for this may be informant bias – average parent-reported SR was used to assess age 2 SR, which was significantly associated with average parent-reported SR at ages 4 and 5. Conversely, age 2 parent-reported SR was not significantly associated with observed child SR at age 5. Even without controlling for age 2 SR in exploratory analyses, the null findings between AP and SR remained across models, suggesting that including earlier SR in the model was not driving null relations in the present study. Thus, the present study's null findings were robust to the inclusion of earlier SR as a covariate.

It is also possible that assessing SR ability as an outcome at one timepoint may be inappropriate in early childhood. SR skills mature dramatically into the preschool years and even into middle childhood (Calkins, 2007). It may be more appropriate to assess rate of growth of SR (e.g., Pacheco et al., 2018), rather than a snapshot of a child's SR skills at one time in development as an outcome. Preliminary analyses with the present study's sample suggest that, after controlling for sociodemographic covariates, paternal AP during the clean-up task was associated with larger growth in parent-reported SR across ages 3 to 7 years. Thus, it is possible that by assessing SR at only two separate time-points, the present study's analyses may have missed out on establishing links between AP and children's SR development in the transition to school-age.

Despite the lack of significant direct relations between AP and SR in the present study, a separate but related study found preliminary support for relations between higher AP and lower child problem behavior in the present study's sample (Feldman, Wilson, et al., 2023). Specifically, AP assessed at child age 3 during the teaching task was found to be associated with lower levels of mother-reported internalizing problems at age 5 and, after controlling for age 2 mother-reported problem behaviors, lower levels of child externalizing problems at age 5. These significant relations were evident after controlling for sociodemographic covariates (i.e., study site, intervention status, income-to-needs ratio, and child sex). Paternal AP during the clean-up task was not significantly associated with either type of child problem behavior. Interestingly, despite assessing different constructs, mother-reported SR, internalizing problems, and externalizing problems were significantly correlated in the present sample, with much stronger relations for externalizing problems and SR (r = -.48 at age 2 and -.49 at age 5, ps < .001) than with internalizing problems (r = -.17 at age 2 and -.28 at age 5, ps < .05). AP may only be associated with more extreme forms of SR, as indicated by clinically significant problem behaviors (e.g., frequent

crying, worrying, bullying, or rule-breaking on the CBCL) rather than less extreme variations in SR development (e.g., difficulty following instructions, lowering voice, or stopping activities on the CBQ). The CBCL-Dysregulation Profile (DP) is believed to tap into clinically significant levels of SR impairment across affective, behavioral, and cognitive domains (Althoff et al., 2010) and may assess general risk for psychopathology, similar to the concept of a *p*-factor (Deutz et al., 2020; Geeraerts et al., 2015). The CBCL-DP comprises the attention problems, aggressive behavior, and anxious-withdrawn scales of the CBCL. Exploratory analyses in the current sample found that paternal AP during the teaching task at age 3 was associated with lower parent-reported CBCL-DP scores at age 5, even after controlling for age 2 dysregulation. Thus, it is possible that paternal AP only prevents against the development of more severe forms of dysregulation, rather than more normative variations in SR development.

4.2.2 Lack of Task-Level Relations Between AP and SR

Support was not found for the hypothesis that AP during the teaching task would be more strongly associated with SR than AP during the clean-up task. Paternal AP during both tasks was not associated with any of the child SR outcomes. However, as noted previously, preliminary results with the present study's sample suggest that the task in which AP was measured may be differentially associated with child adjustment – AP during the teaching task was found to be associated with lower levels of child problem behaviors at age 5, whereas AP during the clean-up task was found to be associated with bigger growth in average parent-reported child SR across ages 3 through 7 years. These task differences are somewhat surprising because of how strongly correlated SR is with child problem behaviors, including in the current study.

The demands of the clean-up and teaching tasks differ in ways that may be relevant for understanding the role AP plays in promoting child adjustment. Relative to the clean-up task, the teaching task is less restrictive in its structure and is less emotionally challenging for children, thus allowing more opportunities for fathers to cognitively challenge their children and promote creativity. By challenging children and providing limit-setting in a learning context, fathers may promote their children's self-confidence (Paquette, 2004b; Paquette & Bigras, 2010), including in the context of risk-taking (Bögels & Phares, 2008; Möller et al., 2013), which may be protective against the development of internalizing problems (Feldman & Shaw, 2021). As discussed previously, AP during the teaching task may support the development of SR during challenging situations which, at its extreme, may protect against the development of psychopathology. Conversely, the clean-up task is more circumscribed and emotionally challenging for both children and parents. The demands of the clean-up task broadly line up with the requirements of inhibitory control – children must suppress the desire to play with toys to do the non-preferred task of cleaning up the toys. It follows that paternal AP behaviors that encourage children to participate and persist in the clean-up task may more strongly relate to SR, relative to the teaching task. Replication of these findings is needed to better understand the pattern of relations between task-level paternal AP and child SR and socioemotional adjustment.

4.2.3 Moderation of Relations Between Paternal AP and SR by Child Activation

Support was not found for the hypothesis that child activation would moderate associations between paternal AP and child SR, such that activated children with fathers high in AP would exhibit the highest levels of SR, relative to under- or overactivated children and/or children with fathers lower in AP. The present study was the first to test child activation as a moderator of

relations between paternal AP and child adjustment. The development of the code for child activation was guided by prior theory (Paquette & Bigras, 2010) and grouped children into one of three categories: underactivated, activated, and overactivated. As paternal AP was hypothesized to have a greater effect on SR for activated, relative to under- or overactivated children, child activation was dichotomized in analyses (i.e., activated vs. under- or overactivated).

The behaviors assessed when coding child activation (i.e., engagement, persistence, and following limit-setting) could be conceptualized as a measure of child SR during challenging situations. Thus, it is unsurprising that activated children had higher levels of SR at ages 2 and 5. However, child activation did not strengthen relations between paternal AP and child SR. In understanding this null finding, it is possible that assessing paternal AP and child activation during the same tasks may have confounded results – paternal AP was at least partially dependent on child behavior during the task, and vice versa. For instance, a child that stayed on task the entire time and provided no opportunities for limit-setting may have elicited different paternal AP behaviors compared to a child who refused to initiate the task or engaged in frequent disruptive behaviors.

Future research should aim to assess child activation as part of a separate task and/or use a parent-reported measure to ensure measures of AP and child activation are independent from one another. It may also be beneficial to refine the present study's child activation code to capture a continuous range of child behaviors, such as by using a 5-point scale (as with the paternal AP behaviors) and/or creating separate codes for integral components of child activation (e.g., approach to task, persistence on task, and response to limit-setting). Such changes would allow for a more nuanced assessment of child activation that may result in capturing greater variability in child behavior. For studies that do not have independent measures of child activation, child temperament measures (e.g., behavioral inhibition, inhibitory control) may be considered as

proxies, although, as discussed previously, child activation and temperament are related but distinct constructs. Specifically, child activation considers both the child's engagement with their environment *and* responses to parental attempts at encouragement and limit-setting.

4.2.4 Moderation of Relations Between Paternal AP and SR by Child Sex

Although there was not a specific hypothesis related to sex differences in relations between paternal AP and child SR, exploratory analyses were conducted to examine this possibility. No evidence of moderation by child sex for relations between AP and SR was evident. This lack of sex differences is inconsistent with some prior theory. Although paternal AP frequency and quality have not generally found to differ for male and female children (Feldman & Shaw, 2021), some have argued that paternal AP behaviors should have a larger impact on boys' versus girls' adjustment because boys take more risks and are more aggressive than girls (Paquette, 2004b). In other words, boys may have more to gain from AP, especially in terms of limit-setting, because they already engage in more activated behaviors than girls and may be at a higher risk for overactivation. Furthermore, prior research suggests that boys are more sensitive to environmental contexts in early childhood compared to girls (Karreman et al., 2009; Kerr et al., 2004; Shaw et al., 1994). For cisgender children, differences in sensitivity to environmental contexts may also have a sex-linked biological basis, relating to male children's stress-related neural systems developing at a slower pace relative to same-aged female children (Schore, 2017). Child gender or sex have not yet previously been tested as a moderator of relations between paternal AP and child SR, although prior related research did not find support for significant interactions between paternal AP and child gender on child anxiety outcomes (Lazarus et al., 2016). Furthermore, a major limitation of the present study and all extant research on AP and caregiving is the assessment

of differences in AP with boys versus girls rather than assessing child gender on a spectrum, which excludes gender-nonconforming and non-binary children. Additional research is needed to better understand how the full spectrum of gender relates to the impact of paternal AP on child development.

4.3 Lack of Significant Paternal Predictors of AP

Support was not found for the third aim, which was to assess paternal sociodemographic predictors at age 2 of AP at age 3. None of the hypothesized predictors of paternal AP (i.e., income-to-needs, education, depression, or race/ethnicity) were associated with AP. Furthermore, none of the other variables included as covariates were significantly associated with AP (i.e., age 2 supportive parenting, study site, intervention group status, child sex, or paternal residence). These null findings are inconsistent with prior theory suggesting that multiple factors of the early caregiving environment would relate to paternal AP (Belsky, 1984; Feldman & Shaw, 2021; Taraban & Shaw, 2018), including higher income (family stress model; Masarik & Conger, 2017), higher education (family investment model; Bradley & Corwyn, 2002), and lower depressive symptoms (Spector, 2006). Although specific theory does not exist, the lack of differences in AP for Black and Latinx fathers, relative to the average of fathers in the sample, was inconsistent with prior patterns of findings suggesting that Black and Latinx fathers may be more engaged in caregiving than white, non-Latinx fathers, including engaging in more frequent physical play (Cabrera et al., 2011; Leavell et al., 2012; NICHD Early Child Care Research Network, 2000).

The present study adds to a small body of literature of studies that were specifically designed to test associations between paternal AP and SES (Anderson et al., 2019; Deneault et al.,

2022; Paquette et al., 2000, 2003; StGeorge et al., 2021), paternal depressive symptoms/psychological distress (Carone, Lingiardi, et al., 2020; Deneault et al., 2022; Paquette et al., 2000; StGeorge et al., 2021), and paternal race/ethnicity (Deneault et al., 2022; Lee et al., 2020). Of the studies that specifically aimed to test relations between contextual factors and paternal AP, only three found support – higher paternal education (Paquette et al., 2000), lower distress (Paquette et al., 2000), and lower rumination (Carone, Baiocco, et al., 2020) were found to be positively associated with paternal AP. Beyond those significant findings, a small body of work found support for positive associations between income and/or education and paternal AP when assessing these contextual factors as covariates (Carone, Lingiardi, et al., 2020; Deneault et al., 2022; Koltermann et al., 2019; Stevenson & Crnic, 2013). Although the present study's findings were unexpected, they are consistent with many of the null findings published in other studies on associations between AP and SES (Anderson et al., 2017, 2019; Bossardi et al., 2013; Carone, Baiocco, et al., 2020; Flanders et al., 2009; Paquette et al., 2003; StGeorge et al., 2017, 2021), paternal depressive symptoms/distress (Carone, Baiocco, et al., 2020; Deneault et al., 2022; StGeorge et al., 2021), and race/ethnicity (Deneault et al., 2022; Lee et al., 2020). It is possible that these contextual factors are actually not important predictors of AP. However, limitations of prior literature and the present study in regard to sampling for variability in contextual factors may also contribute to null findings.

An overarching reason for the lack of relations with contextual factors in the present study may be the lack of variability of the hypothesized predictors. Although the present study expands upon limitations of the broader AP literature (Feldman & Shaw, 2021) by including racially and ethnically diverse fathers with low levels of income and education, the sample was fairly homogeneous in terms of SES. By not including a range of families with varying levels of income

and education, the same issue emerges from prior research – limiting the range of these SES factors makes it challenging to assess broader patterns of relations between SES and paternal AP. Despite this limitation, the fact that AP was found to be a coherent construct in the present sample suggests that AP may generalize from more privileged samples to more marginalized fathers, as in the present study's sample. Moving forward, to formally test the relations between SES and AP, a sampling design similar to that of Paquette et al. (2003) may be considered – sampling equally across three different levels of income (and/or education, employment status) – although that study also did not find support for relations between SES and paternal AP.

A minority of participating fathers were Black (14% of available data) and/or Latinx (12% of available data), which presented challenges in comparing those groups of fathers to the average AP of the overall sample, which was majority white (69% of available data) and may have led to underpowered analyses. The current study also lacked information on the racial/ethnic identity of almost one-third of the fathers because paternal race/ethnicity was collected via interviews with primary caregivers (mostly biological mothers), further limiting the ability to test AP across groups. Furthermore, such a small portion of the sample were from other racial groups (i.e., Asian, Native American, Native Hawaiian or Other Pacific Islander; all 1-2% of available data) that it was not feasible to assess relations between AP and these other groups. Developing and testing specific theories about the presence of paternal AP across diverse racial and ethnic groups in the United States and globally remains an important future direction both for informing about the generalizability of AP across racial/ethnic groups and to continue to decenter whiteness in developmental research (Strier & Perez-Vaisvidovsky, 2021).

Finally, the distribution of paternal depressive symptoms in the present sample was skewed toward lower levels of symptoms, with only about one-fifth of the present sample at or above the

clinical cut-off for clinical depression (16 on the CES-D; Radloff, 1977). The relatively low levels of depression in the present study's fathers living in predominantly two-parent families are unsurprising – fathers were not recruited on the basis of paternal depression, although maternal depression was one criterion for study eligibility. The rate of depression in the present study is also consistent with prior research on paternal depression (Bergström, 2013; Davé et al., 2010; Ramchandani et al., 2008), including with fathers of young children from low-income backgrounds (Bamishigbin et al., 2017). To more thoroughly test associations between paternal psychopathology, including depression, and AP, it would be ideal for future studies to intentionally recruit samples of fathers showing greater variability in depressive symptoms, including a higher percentage with clinically-elevated scores.

If future studies with greater variability in sample characteristics continue to find a lack of support for associations between SES, depression, and race/ethnicity and AP, it may be that these factors are not actually important for paternal AP. Future studies should also assess additional potential predictors of paternal AP such as fathers' own experiences with AP as children, other domains of psychopathology (e.g., antisocial behaviors), and elements of coparenting (such as AP behaviors of coparents, coparenting relationship quality, and mental health of coparents; Feldman & Shaw, 2021). Additional research on sociodemographic factors related to paternal AP will help further contextualize AP and may guide future intervention targets for modifying paternal AP behaviors.

4.4 Strengths, Limitations, and Future Directions

Strengths of the present study include the use of a novel, observational measure of paternal AP across two different, commonly used parent-child observational tasks. Furthermore, the longitudinal design and inclusion of a relatively large sample of low-income families expanded upon prior literature by testing temporal relations between paternal AP and child SR in a less privileged and more ethnically-racially diverse sample than typically participates in such studies. Finally, the use of multiple measures of SR allowed for the assessment of reliability of findings across ages 4 and 5 years and reporters (i.e., parent-report versus behavioral), which gives further support for the credibility of the null findings.

Despite these strengths, the study also has notable limitations. First, as previously discussed, the sample was fairly homogenous in terms of race, ethnicity, and SES which made it difficult to test how different sociodemographic factors relate to paternal AP. Relatedly, although the present study adds to a small body of work that extends AP to low-income families in the US, the generalizability is still limited. The majority of research conducted on paternal AP has been in samples from Western, educated, industrialized, rich, and democratic (WEIRD; Henrich et al., 2010) samples, with most research on relations between paternal AP and child SR conducted in the United States. A small body of research on paternal RTP suggests that it may be less common in Asian countries (i.e., China, India, Malaysia, and Taiwan; Anderson et al., 2017; Roopnarine et al., 1989, 1990, 1992; Sun & Roopnarine, 1996). Cross-cultural studies are an effective way to test assumptions about the universality of caregiving constructs (Mackey, 1995; Trommsdorff & Kornadt, 2003) and should be designed to test relations between AP and SR across the globe.

Second, the current study only assessed paternal AP in a sample of fathers who were previously or currently in a relationship with the child's mother, which limits our understanding

of how other caregivers, especially mothers, and fathers in other family structures (e.g., two-father households) engage in AP and how non-paternal AP relates to child SR. Although the conclusions drawn from this study are specific to paternal AP, that is only because mothers and other caregivers were not included in the analyses. Despite initial theories about the uniqueness of AP for fathers, prior studies have found that mothers engage in AP behaviors often at levels comparable to those of fathers (Majdandžić et al., 2016; Paquette & Bigras, 2010) and, in one case, at a higher rate than fathers (Lee et al., 2020). Support for relations between maternal AP and child SR has not been found (Lee et al., 2020; Olofson & Schoppe-Sullivan, 2022), which warrants further investigation. The amount of caregiving responsibility that caregivers have may also relate to their engagement in AP and relations with child SR – work with primary caregiver fathers (in either opposite- or same-sex coparenting relationships, or single fathers), mothers, and trans and/or nonbinary caregivers in different family structures can help tease out whether AP is uniquely important for fathers and/or secondary caregivers (Bower-Brown, 2022; Carone & Lingiardi, 2022). It is also important to note that the data used in the present study were collected nearly two decades ago. Norms around fatherhood and the role of the father in diverse family structures are constantly evolving (Altenburger, 2022; Bataille & Hyland, 2022; Offer & Kaplan, 2021), especially in the wake of the COVID-19 pandemic (Petts et al., 2021). Developing new studies of AP with contemporary fathers is also important to evaluate whether or not AP and its effects are unique to today's fathers, relative to other types of caregivers. Furthermore, it is possible that one caregiver's relatively high AP behaviors may compensate for the other caregiver's relatively low AP behaviors, which has previously been found with supportive parenting in families (Feldman, Dolcini-Catania, et al., 2023). However, preliminary results suggest that maternal and paternal AP do not significantly interact to predict children's behavioral adjustment (Deneault et al., 2022),

including SR (Lee et al., 2020). Future studies should strive to include a wider array of caregivers and family structures to better understand AP as a caregiving, rather than fathering, construct.

The third major limitation of the present study relates to the tasks used to assess AP. Clean-up and teaching tasks are commonly used parent-child observation measures in early childhood and have been used extensively to assess traditional domains of parenting (e.g., sensitivity, directiveness, and detachment; Cox & Crnic, 2003). Although there was variability in AP behaviors across both tasks observed in the present study, the nature of these tasks may have precluded the participating fathers from exhibiting more frequent and/or intense types of AP. Unstructured free-play tasks may be more appropriate to measure AP because caregivers have more freedom to structure the interaction in ways that are more similar to daily interactions. However, others have successfully used structured tasks that were developed to specifically elicit AP behaviors (Fletcher et al., 2012; Majdandžić et al., 2016; Paquette & Bigras, 2010). When developing the AP coding system, the Marbach team made recommendations for coding AP. Their overarching recommendation was to use a laboratory space with play areas that emphasize different elements of AP: social challenges (e.g., clean-up task, parent intervention during peer conflict), physical challenges (e.g., RTP game, risky toys – such as balance beam, tunnel), cognitive challenges (e.g., teaching task, risky decision-making task), and competition (e.g., board game; Volling et al., 2015). Future research should continue to assess AP across both structured and unstructured tasks to better understand which AP behaviors are more task-specific (within-persons) versus caregiver-specific (between-persons). Such research may elucidate which tasks to include in AP studies to efficiently capture observed AP behaviors across different domains of AP. As parental behaviors and play quality may vary more by task (e.g., physical versus cognitive game) than by parent gender (Teufl & Ahnert, 2022), studies of AP using a wide array of tasks

with multiple types of caregivers may also address aforementioned challenges with determining the relative importance of AP for fathers versus mothers and other caregivers.

A final limitation relates to the use of a novel coding system to assess AP. The Marbach Coding System (Volling et al., 2015) and the novel child activation code developed in the present study are based on theories related to AP, but these systems are relatively untested. The lack of additional AP measures (e.g., self-report) in the present study prevented from assessing the construct validity of the coded AP observations. However, some support for divergent validity was found in the present study – paternal supportive parenting at age 2 was not strongly associated with AP at age 3. In other words, AP appeared to be a distinct parenting construct in the present sample of fathers. Future studies should include multiple methods for assessing AP, including both novel ones like the Marbach Coding System, and more established measures of components of AP, such as the Comprehensive Parenting Behavior Questionnaire (Majdandžić et al., 2008), the Rough and Tumble Play Quality coding system (Fletcher et al., 2012), or the Risky Situation (Paquette & Bigras, 2010). Such research would allow for more certainty around how the construct of AP is assessed and operationalized across contexts, methods, and measures.

4.5 Implications and Conclusion

Despite the lack of significant findings, the present study has important implications. Notably, support was found for AP as a coherent construct with a coding system that can be learned by both novel and advanced coders. This system was found to work with commonly used observational measures of parent-child interaction, allowing for the use with previously collected data. If future research does find support for relations between AP and child SR, then it will be

important to continue to identify paternal correlates of AP, which may be important for developing interventions to support the greater use of AP. Although AP was not found to be differentially beneficial for under-/overactivated versus activated children in the present study, understanding for whom AP is most beneficial may also inform appropriate targets for future intervention research.

Based on the dyadic nature of relationships, it is important for future studies to assess bidirectional relations between child SR and paternal AP (Feldman & Shaw, 2021). Children with "easier" temperaments (e.g., high surgency and effortful control, and low negative emotionality) tend to evoke more engaged and high-quality caregiving from fathers (Belsky, 1984; Taraban & Shaw, 2018), which may extend to more frequent and higher quality AP. More "difficult" children, such as those with low levels of SR and high levels of problem behavior, may elicit less AP due to paternal concerns about the child becoming overstimulated and engaging in dangerous or disruptive behaviors. Although domains of child temperament have not typically been found to be concurrently associated with AP (e.g., Ahnert et al., 2017; Majdandžić et al., 2018; Rendina & Dickerscheid, 1976), longitudinal designs may be more appropriate to parse out the timing of child effects on paternal AP.

Moving forward, it is critical to continue to assess the generalizability of AP behaviors beyond samples of fathers, including assessing AP with other caregivers, across different types of family structures, and in different sociocultural contexts. Finally, the present study underscores the importance of continuing to include fathers in developmental research.

Appendix A Inclusion and Attrition Analysis Tables

Appendix A.1 Inclusion Analysis

Appendix Table 1 Descriptive Statistics and Comparisons of Study Variables for Included and Excluded Subsamples

Variable		*M* (*SD*) or *n* (% Non-Missing)		Comparison	*p*
		Included (*n* = 171)	Excluded (*n* = 560)		
Income-to-needs (age 2)		1.25 (0.60)	1.06 (0.52)	$t(252) = 3.68$	**< .001**
Child sex	Female	87 (51%)	275 (49%)	$\chi^2(1) = 0.10$	.75
	Male	84 (49%)	285 (51%)		
Child race	Black	29 (17%)	175 (31%)	$\chi^2(5) = 18.48$	**< .01**
	Multiracial	19 (11%)	76 (14%)		
	Native American	2 (1%)	7 (1%)		
	Native Hawaiian/Other Pacific Islander	0 (0%)	1 (0%)		
	Other	10 (6%)	39 (7%)		
	White	108 (64%)	258 (46%)		
Child ethnicity	Latinx	17 (11%)	8 (13%)	$\chi^2(1) = 0.04$	.84
	Not Latinx	140 (89%)	54 (87%)		
Study site	Charlottesville, VA	22 (13%)	166 (30%)	$\chi^2(2) = 36.81$	**< .001**
	Eugene, OR	95 (56%)	176 (31%)		
	Pittsburgh, PA	54 (32%)	218 (39%)		

Variable		*M* (*SD*) or *n* (% Non-Missing)		Comparison	*p*
		Included (*n* = 171)	Excluded (*n* = 560)		
Intervention group	Control	90 (53%)	274 (49%)	$\chi^2(1) = 0.58$	.45
	Intervention (Family Check-Up)	81 (47%)	286 (51%)		
Father residential stability (ages 2 to 4)		0.88 (0.25)	0.87 (0.27)	*t*(103) = 0.19	.85
Father depressive symptoms (age 2)		10.34 (8.12)	9.41 (8.03)	*t*(63) = 0.62	.54
Father supportive parenting (age 2)		0.19 (0.14)	0.12 (0.05)	*t*(52) = 3.49	**< .001**
Child self-regulation	Average parent-report (age 2)	4.06 (0.72)	3.01 (0.77)	*t*(268) = 1.72	.09
	Average parent-report (age 4)	4.51 (0.75)	4.48 (0.76)	*t*(295) = 0.39	.70
	Average parent-report (age 5)	4.76 (0.81)	4.66 (0.84)	*t*(282) = 1.30	.20
	Tower (age 5)	1.93 (0.26)	1.91 (0.47)	*t*(426) = 0.53	.59
	Wrapped Gift (age 5)	0.08 (0.66)	-0.03 (0.75)	*t*(268) = 1.72	.09
	Draw-A-Star (age 5)	-0.09 (0.81)	0.03 (0.81)	*t*(230) = -1.48	.14

Appendix A.2 Attrition Analysis

Appendix Table 2 Descriptive Statistics and Comparisons of Study Variables for Age 5 Retained and Attrited Samples

Variable		*M* (*SD*) or *n* (% Non-Missing)		Comparison	*p*
		Retained (*n* = 155)	Attrited (*n* = 16)		
Income-to-needs (age 2)		1.28 (0.60)	0.94 (0.42)	*t*(22) = 2.89	**< .01**
Father education (age 2)	7th grade or less	1 (1%)	0 (0%)	$\chi^2(6) = 5.86$	.44
	Associate degree	10 (10%)	0 (0%)		

Variable		*M* (*SD*) or *n* (% Non-Missing)		Comparison	*p*
		Retained (*n* = 155)	Attrited (*n* = 16)		
	Bachelor's degree	1 (1%)	0 (0%)		
	High school/GED	49 (47%)	5 (45%)		
	Junior high	3 (3%)	1 (9%)		
	Partial college/specialized training	25 (24%)	5 (45%)		
	Partial high school	16 (15%)	0 (0%)		
Child sex	Female	82 (53%)	5 (31%)	$\chi^2(1) = 1.92$	.17
	Male	73 (47%)	11 (69%)		
Father race	Asian	1 (1%)	0 (0%)	$\chi^2(7) = 10.70$	.15
	Black	14 (13%)	2 (18%)		
	Multiracial	10 (9%)	1 (9%)		
	Native American	1 (1%)	0 (0%)		
	Native Hawaiian/Other Pacific Islander	2 (2%)	0 (0%)		
	Other	4 (4%)	0 (0%)		
	Unknown	0 (0%)	1 (9%)		
	White	74 (70%)	7 (64%)		
Father ethnicity	Latinx	13 (12%)	1 (9%)	$\chi^2(2) = .19$	.91
	Not Latinx	94 (87%)	10 (91%)		
	Unknown	1 (1%)	0 (0%)		
Study site	Charlottesville, VA	16 (10%)	6 (38%)	$\chi^2(2) = 14.05$	**< .001**
	Eugene, OR	85 (55%)	10 (62%)		
	Pittsburgh, PA	54 (35%)	0 (0%)		
Intervention group	Control	84 (54%)	6 (38%)	$\chi^2(1) = 1.02$	.31
	Intervention (Family Check-Up)	71 (46%)	10 (62%)		
Father residential stability (ages 2 to 4)		0.88 (0.26)	0.93 (0.20)	$t(20) = -0.92$	.37
Father depressive symptoms (age 2)		9.79 (7.72)	15.33 (10.21)	$t(12) = -1.82$	.09

Variable		*M* (*SD*) or *n* (% Non-Missing)		Comparison	*p*
		Retained (*n* = 155)	Attrited (*n* = 16)		
Father supportive parenting (age 2)		0.19 (0.14)	0.20 (0.11)	$t(11) = -0.26$	.80
Father active challenging behavior (age 3): Clean-up		3.46 (1.03)	3.69 (0.95)	$t(19) = -0.92$	.37
Father active challenging behavior (age 3): Teaching		3.53 (1.11)	3.50 (1.10)	$t(18) = 0.10$	.92
Father excitation/arousal/destabilization (age 3): Clean-up		3.07 (1.10)	3.19 (1.05)	$t(19) = -0.44$	.37
Father excitation/arousal/destabilization (age 3): Teaching		3.11 (1.07)	3.12 (1.20)	$t(18) = -0.04$	.97
Father limit-setting/positive control (age 3): Clean-up		3.92 (0.96)	4.38 (0.89)	$t(19) = -1.93$	.07
Father limit-setting/positive control (age 3): Teaching		4.12 (0.95)	4.31 (0.79)	$t(20) = -0.89$	.39
Child activated (age 3): Clean-up		110 (72%)	12 (75%)	$\chi^2(1) = 0.00$	> .99
Child activated (age 3): Teaching		120 (78%)	14 (88%)	$\chi^2(1) = 0.28$	.60
Child self-regulation	Average parent-report (age 2)	4.09 (0.73)	3.74 (0.57)	$t(20) = 2.28$	**.03**
	Average parent-report (age 4)	4.52 (0.75)	4.40 (0.72)	$t(13) = 0.55$	.59

Appendix B Coding Manual

Dissertation Coding Manual

Adapted from Marbach Coding System for Activation Parenting (Volling, Stevenson, Paquette, & Cabrera, 2015)

Last Updated: 7/20/2022

Active Challenging Behavior (ACB)

Challenging parental behavior refers to the manner in which the parent playfully tests the child's abilities with the goal of pushing the child to the edge of their "zone of proximal development." The types of behaviors that are typical of this code include (a) demanding the child expand their skills and abilities in an encouraging manner that does not overtax the child's abilities; (b) encouraging risk-taking and (c) inviting competition to move to the next level.

The best way to think about this dimension of parenting is to consider Vygotzky's zone of proximal development where there is a place where the child is currently, a place the child can advance to with some help that may be challenging but the next step in development, and a place that is beyond what the child can do even with assistance and guidance that will be met with failure and frustration Challenging behavior involves pushing the child developmentally to the edge of their ZPD. Thus, active challenging behavior encourages risk-taking in which the parent challenges the child and encourages him/her to go outside his/her comfort-zone, at the same time considering the developmental limits of the child's abilities. The parent helps the child to overcome personal limits, to persevere when the child is upset or the activity is challenging, provides effective scaffolding for the child to overcome a personal limit or improve activity performance, or to explore unfamiliar toys/experiences. Children may show frustration as a natural response to approaching the limits of their ZPD. The actively challenging parent is able to alter their behavior in a manner that prevents the child from becoming dysregulated, refusing to persevere, or simply giving up.

Active challenging behaviors (ACB) can be physical, social, or verbal. Examples of physical challenging behavior that encourages risk-taking include providing physical assistance and scaffolding of a task such as building with blocks or other play materials, encouraging children to walk or crawl if they are not quite able to do it by themselves (with proper assistance and safety), exploring new and unfamiliar objects/toys or spaces, or helping a child learn a new physical skill such as learning to ride a bike, hit a ball with a bat, throwing a Frisbee, or any other sort of physical activity. Some of these actions may involve risk-taking, or anxiety on the part of the child as the parent challenges the child to go to the next level, but these actions are not putting the child in danger or demanding the child go beyond their abilities. Instead, the additional encouragement to take some risk moves the child out of their comfort zone and allows them to succeed. An example may help delineate the quality of ACB. Teaching a child to ride a two-wheel bicycle without training wheels can provoke anxiety on the part of a child, but is a skill that most children want to master. Physical assistance is often needed to help the child balance both bike and self as they take off on their initial attempts to steer and balance in a straight line, and no doubt requires multiple attempts over a period of time to master successfully. An ACB parent will be able to evaluate the situation, their children's current abilities and each successful and unsuccessful attempt allowing children to master what they can each time they set off on their own and providing verbal feedback to make the next attempt better. But, the ACB parent is also making sure they are there to catch their children before they fall. In this task, the parent must be able to challenge children to take risks in order to overcome their initial fears and to learn and master a new skill, but this will not occur if children feel unsafe and insecure in their parent's presence and feel a lack of support.

Social active challenging behavior may include inviting and initiating competition as in engaging in challenging physical play or play wrestling, or playing competitive board games that may be challenging the child to learn new rules of engagement and conduct for competition. This type of behavior could

also include encouraging the child to be more confident in new social and/or unfamiliar situations by playing with another child they do not know.

Verbal active challenging behavior includes using directives to get the child to try something new ("Go on, you can climb up high" "Can you show me how to do that?"), using words that are beyond the child's language ability that introduce new terms to the child, and requiring the child to use language to communicate their needs and wants rather than whining or pointing. It also includes conversations that encourage the child to engage and remain engaged in the pursuit of an activity or challenging task that may be frustrating but within the child's abilities to master.

When rating, coders should take into account the frequency, duration, and intensity of the active challenging behavior. Higher ratings may be given if there are multiple, frequent instances of short duration, OR one or two instances of longer duration, OR one intense instance of ACB.

1 = Very low active challenging behavior. Parent displays no or minimal evidence of actively challenging the child to test their limits, explore at a new level, or persevere, even in the face of frustration. Parent may be disengaged from the child or appear uninterested in the activity and what the child is doing OR may be sensitive to the child's signals and needs but not actively challenging. Parent is clearly not focused on encouraging the child to go beyond their comfort zone and to the edge of the ZPD. The child is not asked to explore materials or toys, try new things, expand their skills, take risks, or engage in competition.

2 = Low active challenging behavior. Parent displays only occasional instances (one or two) of active challenging behavior to stimulate the child to expand his/her skills, take risks or engage in competition; parent rarely attempts to engage the child to persevere in an activity.

3 = Moderate or inconsistent active challenging behavior. Parent displays more than occasional active challenging behavior but is inconsistent in their attempts to encourage the child's exploration and development of new skills, risk-taking, competition, and attempts to persevere in a challenging task. Parent may mistime their challenging behavior attempts so that the child experiences some dysregulation. The child is sometimes responsive to the parent's challenges and sometimes not.

4 = High active challenging behavior. Parent exhibits frequent attempts to encourage their child to expand their skills and abilities and to take risks or persist, and may invite competition to achieve these ends. Children are more responsive than unresponsive to parent challenges. The parent keeps the child within the ZPD throughout the episode, although the parent does not consistently push the child to the edge of the ZPD. Parents are clearly attuned to the limits of the child's abilities and how far they can push the child to the next developmental level. This code may also apply when there are only a few but intense instances of active challenging behavior during an episode.

5 = *Very high and consistent active challenging behavior*. Parent displays consistent, high-quality attempts at actively challenging their child to expand their skills and abilities and take risks or persist, and may use competition to achieve these ends. The parent pushes the child to the edge of their ZPD and continually identifies the next challenge to maximize the child's potential for growth. If/when the child becomes frustrated or distressed, the parent is able to smoothly adjust their challenging behavior to prevent the child from becoming dysregulated and maintain the child's engagement in the activity.

Excitation/Arousal/Destabilization (EAD)

Excitation/Arousal/Destabilization (EAD) captures parents who actively and sensitively engage the child in excitatory interactions that momentarily arouse the child and activate the child's regulation of physical, cognitive, or emotional processes. This style of arousal can be best described as "disruptive harmony" in which parents engage in intentional disruptions of parent-child play that momentarily arouse the child's emotion and/or attention, but within the context of a harmonious parent-child interaction. The goal of parental excitation and arousal is to allow the child to learn how to regulate emotional arousal in short-bursts that do not overwhelm the child's capacity to regulate attention and emotion. Sensitive EAD arouses the child and injects unpredictability and/or fun into ongoing activity without redirecting him or her to a new activity. Children of parents with high EAD are allowed to return to the ongoing activity if they make attempts to do so.

Excitation/Arousal/Destabilization (EAD) may also include child-directed behaviors such as tickling, using toys in unusual or novel ways to excite and engage the child, and mild roughhousing. It is important to note that although these acts may momentarily disrupt the child's attention, line of vision, or emotional state, the overall parent-child interaction should still reflect parent-child synchrony, mutual responsiveness, and warmth. For instance, a parent may use a toy in a novel, creative, and unusual way that the child has not seen before (e.g., using a bowl as a drum) that catches the child's attention and makes them laugh. Parent behaviors might include playful teasing that leads to anticipation and eventual laughter (e.g., "I'm gonna getcha"), tickling a child, playing peek-a-boo where the child momentarily shows an astonished look, but then laughs. Because of the structure of the teaching task, only consider the affect and tone used if a father says "I spy" (i.e., saying "I spy" on its own is not considered EAD because it is written on the cards). An example for book-reading might be creating anticipation with sound effects (e.g., growling like a lion) or actions (e.g., using hand to crawl up child's arm like a spider) while reading the story. As another example, a parent may attempt to excite the child with a puppet, making funny sounds and using an animated voice, but the child is unresponsive or the attempts may be mistimed resulting in fussing, resistance, and/or turning away.

In order for EAD to be coded, the teasing, humor, joking or play must not be degrading, demeaning, or exploit the child's weaknesses or real fears. For instance, a parent teasing a child because they are afraid of the dark or a noisy and scary toy, and then calling them names (e.g., you're a fraidy cat) would not qualify as EAD. The use of rough, and/or frightening behaviors that result in fear and distress, although emotionally arousing, also do not constitute EAD. Excitation and arousal produce moments of surprise that draw the child's attention to the parent's actions and result in pleasure or positive interest. This code captures instances in which children may display brief facial expressions of surprise, astonishment, excitement, shock and disbelief or even mild fear and anxiety, but none of these actions should lead to distress, crying, resisting or avoiding the parent.

When making ratings of EAD, take into consideration the frequency, duration, and intensity of the interaction observed. Higher scores can be rated if the parent engages in frequent episodes of EAD, a lengthy bout of a single EAD episode, or an extremely intense episode of high level EAD with sufficient arousal and positive emotion that does not over-arouse and dysregulate the child.

1 = Very low EAD. Parents display no or minimal evidence of EAD. Children display no signs of momentary emotional activation that lead to increased focus on task/activity or opportunities to regulate attention and/or emotion. Parents may be disengaged from the child, unable to attract the

child's attention using the toys or other actions, or simply monitor the child for safety without stimulating the child or helping the child to interact with the environment. A parent at this level may spend a good portion of the segment engaged with the child without generating any novel stimulation, excitation, or arousal.

2 = Low EAD. Parents display occasional signs of EAD that momentarily disrupt the child's attentional focus or emotional state. Parents may exhibit one or two instances or attempts to excite and arouse the child, although some attempts may be ineffective.

3 = Moderate or inconsistent EAD. Parents display more than occasional EAD but are inconsistent in their attempts to excite or arouse the child. Parents may have few to no instances where they overstimulate the child to the point where the child shows signs of negative affect, is resistant to the parent, or attempts to avoid interaction with the parent.

4 = High EAD. Parents display frequent and mostly successful attempts to excite and arouse the child, indicating that parents are sensitively attuned to the child's emotional state and modify their behavior accordingly. The parent may engage in frequent instances of EAD or a small number of extended bouts of EAD. Children are rarely overstimulated or aroused to the point of showing signs of negative affect or where they have difficulty returning to ongoing harmonious interaction.

5 = Very high and consistent levels of EAD. Parents display consistent and successful attempts to excite and arouse the child without emotionally dysregulating the child. Children do not display signs of negative affect, are not resistant to the parent, nor attempt to avoid interaction with the parent. Parents are able to sensitively excite and arouse the child without disrupting the overall harmony and mutual responsiveness of parent-child interaction. The bursts of excitement or arousal are followed by periods of calm or lower intensity interaction that allow the child to recover before the parent attempts to excite or arouse the child again.

Proper Limit-Setting/Positive Control

Proper limit-setting refers to the parent's abilities to forbid behavior that may be unacceptable or potentially harmful (e.g., hitting another). This scale is particularly relevant for tasks that involve some amount of physical or cognitive risk, as in a physical play activity or other goal-directed tasks that require some degree of parental intervention in order for the task to be completed. In setting limits, the parent is (a) providing the rules of conduct for socially acceptable behaviors, (b) providing directives that are intended to protect the child (e.g., watching the child does not slip or fall during an activity), (c) forbidding behaviors that may put the child at risk (e.g., "don't climb on the table"), or (d) setting rules that are intended to ensure the child's continual task-compliance. Positive control reflects the parent's use of firm control that provides guidance and direction that is not harsh or punitive in situations that require parental intervention that keeps the child safe and/or focuses the child on rule-governed behavior.

Parents display proper limit-setting and positive control when they constrain the child's inappropriate behavior or activity, or prevent the child from engaging in rule-breaking or unsafe behavior. Parent behaviors may consist of verbal redirection ("come over here/look at this"), verbal prohibition ("no, don't do that" "stop that" "don't touch that"), raising or modulating voice to gain child's attention, using other directives (e.g., "pick that up," "move away from the door," "leave that alone"). Parents may also remind the child of the rules of conduct during interactions ("What do you say when you knock that over?" "Can you say you're sorry?"). Nonverbal behaviors are also included. These may consist of stern looks, raised eyebrows, shaking one's finger, and vocal utterances such as "uh-uh" or physically restraining the child to prevent the prohibited action (e.g., gently moving the child away, prohibiting the child's hands or movement).

Limit-setting is attuned to the developmental level of the child. It should not be overly harsh, punitive, or controlling to the extent the child is not allowed autonomy and becomes too fearful, inhibited or dependent on the parent. Lack of proper limit-setting can also take the form of lax or ineffective parent behavior at a time when it would seem necessary, such as protecting the child from potential harm or redirecting the child's socially inappropriate behavior.

When making ratings, take into consideration the frequency, duration, and intensity of the interaction observed. Higher scores can be rated if the parent engages in frequent episodes of limit setting and control, a lengthy bout of a single episode, or an extremely intense episode of limit-setting designed to keep the child safe. If the child is mostly on-task, consider a 4 or 5 unless extreme parental behavior indicates otherwise (e.g., frequent yelling, high disengagement).

1 = Very low limit-setting. Parents display no or little proper limit-setting when some control is needed (e.g., child is playing with electrical socket). Parents may be either overly restrictive or overly lax. If parent attempts limit-setting it is ineffective.

2 = Low limit-setting. Parents display occasional signs of proper limit-setting when required, but are predominantly overly restrictive or overly lax in their limit-setting. Parents may engage in one or two minor instances of limit setting, but are mostly disengaged or uninterested. The parent may respond and set limits only when the child's behavior is particularly problematic or harmful to self or others and does not demonstrate proactive guidance or direction to accomplish a task or activity. Parents' limit-setting is only occasionally effective.

3 = Moderate or inconsistent limit-setting. Parents display a moderate amount of limit setting or are inconsistent in either the frequency or appropriateness of their limit-setting behavior. Parents display a few instances (one or two) of effective limit setting but also moments of ineffective limit-setting such that half the time the parent struggles to control the child's behavior. Parental limit-setting is moderately effective at gaining the child's attention and redirecting the child's behavior.

4 = High limit-setting. Parents display a high degree of proper limit-setting and are more consistent than not in setting limits for children or providing proper direction and control. Parent appears mostly attuned to the child's behaviors and emotional state and typically applies appropriate limit-setting in direct proportion to child's behavior and/or misbehavior. Parental limit-setting is mostly effective and results in children refraining from further misbehavior or results in a change in the child's behavior or further progress and persistence on the task.

5 = Very high or consistent limit-setting. Parents display consistent limit-setting that is appropriate to children's actions and behavior. Parental limit-setting is particularly effective at gaining the child's attention and changing the child's behavior when necessary. Parental limit-setting may be frequent but is uniformly appropriate and not harsh or demeaning to the child nor is the child's autonomy inappropriately constrained. Parents are not overcontrolling or unnecessarily punitive in their limit-setting. Limit-setting is consistently effective and used when needed to help the child with an activity, to follow rules, or to maintain the child's safety.

Child Activation

Child activation refers to a child's level of engagement with their environment *and* their responses to paternal attempts at encouraging exploration or setting limits. Children who are *underactivated* engage in low levels of exploration and risk-taking. As described by Paquette & Bigras (2010), they may be "passive and anxious," remain close to their father during the interaction tasks, and wary from engaging in proactive exploratory and risk-taking behavior the father encourages. Conversely, children who are *overactivated* engage in high levels exploration and risk-taking that could be (but does not have to be) potentially dangerous and are largely non-responsive to paternal attempts at setting limits. Finally, children who are *activated* balance exploration and risk-taking with responding to paternal limit-setting. Activated children have been described as confident in exploration (Paquette & Bigras, 2010).

For this code, consider how much the child approaches the clean-up and teaching tasks on their own (i.e., without paternal encouragement to give it a try), how much they persist on the clean-up and teaching tasks, and how often they engage in behaviors that may result in physical injury to themselves, their fathers, or the home visiting equipment (camera, toys). Although it is unlikely that children will engage in dangerous behaviors during the clean-up and teaching tasks, they may still engage in behaviors that require limit-setting, such as throwing or trying to eat toys.

As with the other codes, when making ratings, take into consideration the frequency, duration, and intensity of the child's behaviors. When there is a disconnect between the child's speech and actions, choose the code that most matches the child's actions (e.g., a child who whines and says they do not want to clean up but cleans up anyway would be rated as activated rather than underactivated).

1 = Underactivated. Child is reticent to initiate or engage in activities and may not engage at all, including when the father encourages them to do so. They may repeatedly ask for assistance or reassurance that they are completing the task correctly. They may continue passively play with a toy, rather than trying a new toy or activity. They may quickly give up on a challenging task or say that they cannot do it, including if their father tells them to try on their own without his help.

2 = Activated. Child is engaged in the activities and attempts to complete them on their own, with minimal asking for assistance from their father. They may occasionally require prompting to try something new or a potentially challenging but are quick to respond when prompted by their father. Similarly, they may occasionally engage in dangerous or rough behaviors, such as throwing toys, but quickly adapt their behavior when their father sets limits. They generally persist on activities, even if they become challenging. If their father tells them to engage in new activity or approach a task in a novel way, they comply.

3 = Overactivated. Child may be engaged in activities but in a very rough manner (e.g., throwing toys, bending cards, grabbing objects from father); they frequently do not adjust to when their father asks them to modify their behavior. Conversely, they may be so busily active in exploring other toys or objects to engage in the activities required by the task (i.e., clean-up or teaching tasks), and continue to engage in these "off-task" behaviors despite paternal attempts at limit-setting and redirection.

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