HHS Public Access

Author manuscript

J Res Adolesc. Author manuscript; available in PMC 2022 December 01.

Published in final edited form as:

J Res Adolesc. 2021 December ; 31(4): 870–888. doi:10.1111/jora.12641.

We Know Even More Things: A Decade Review of Parenting Research

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Abstract

In this article, we highlight the important ideas that have emerged from research on parenting and adolescent development over the past decade. Beginning with research on authoritative parenting, we examine key elements of this parenting style and its influence across diverse contexts and populations. We turn our attention to four topics that have generated much research in the past decade: (1) how parenting contributes to adolescent peer and romantic relationships; (2) the impact of parenting on adolescent brain development; (3) gene-environment interactions in parenting research; and (4) parents' involvement in adolescents' social media use. We discuss contemporary challenges and ways parents can promote healthy development. We consider the integration of research, practice, and policy that best supports parents and adolescents.

Keywords

Parenting; Adolescent; Decade in Review

No area of inquiry in developmental science has received as much interest and attention as the importance of parenting in child development. The influence of the parent-adolescent relationship, in particular, has consistently been part of the developmental literature, and numerous popular books, articles, and websites are aimed at helping parents successfully raise healthy and happy teenagers. This has been the case for decades, and remains true today.

In 2001, Laurence Steinberg gave a Presidential Address for the Society for Research on Adolescence entitled *We Know Some Things: Parent-Adolescent Relationships in Retrospect and Prospect*. His address was later published in the Journal of Research on Adolescence (JRA; Steinberg, 2001) and remains one of the most cited paper in the journal's history. Looking back on two decades of research on parenting since the publication of this paper, it is clear that much of what Steinberg argued has continued to be confirmed

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through research on parenting, adolescent development, and youth adjustment across a multitude of studies using various research methods and diverse samples around the globe. Importantly, parenting research has also had an impact on policies related to youth behavior and development (e.g., Mirman, Albert, Jacobsohn, & Winston, 2012) and has been utilized successfully in parent education programs and popular books on parenting teens.

In this paper, we briefly summarize research that confirms and expands the knowledge base on parenting adolescents since the 1990s, and extend our review to include new directions in research on parenting across the last decade. We discuss how the concepts and practices associated with authoritative parenting have stood the test of time, and how authoritative parenting has been deconstructed to further understand its important components and how the effects of authoritative parenting may vary across contexts. We highlight new directions in parenting research that have burgeoned over the last decade, including the neuroscience and genetics of parenting. We also discuss research on the role of parenting in adolescents' peer relationships, and important work on how parents impact adolescents' social media and technology use. We end the paper with a discussion of current parenting challenges, in light of the COVID-19 Pandemic and with the historical unrest regarding racial relations in the United States, and discuss potential new directions and applications of research on parenting adolescents in general.

The Parent-Adolescent Relationship

Steinberg's 2001 review focused on two primary themes: 1) how family relationships change during adolescence and 2) the impact of the parent-adolescent relationship on adolescent development and mental health. He concluded that adolescence is a time of renegotiation between parents and adolescents, particularly during early adolescence, and that most teens report a positive relationship with their parents during this transformation.

As we note, relationship difficulties are likely due to renegotiations concerning autonomy, and such changes are often more difficult for parents than adolescents. Indeed, the work of Judith Smetana (Smetana & Asquith, 1994; Rote & Smetana, 2016) illustrates that much of the conflict between parents and adolescents is due to different beliefs and expectations about behavior; adolescents tend to value personal choice and autonomy whereas parents value safety and responsibility, and adherence to social conventions. For example, when parents and adolescents argue about a teen's messy room a parent may worry that they have raised a disorganized, irresponsible and lazy child (a rejection of values), whereas a teen thinks a messy room is no big deal, and that it is a personal choice. Such differences in expectations and beliefs can add to the intensity of conflict. Current research supports the importance of both *autonomy* and *connectedness* in parent-adolescent relationships, and adolescents fare better when they are close and connected with their families and openly communicate about conflicts (Inguglia, Ingoglia, Liga, Coco, & Cricchio, 2015).

Another important theme that has continued to persist in parenting research is the bi-directional nature of the parent-adolescent relationship. Prior to 2000, much of the research on parenting focused on the parent as actor, influencing the adolescent's development (e.g., through parenting styles and parenting practices). Implied in this line of inquiry has been the

notion of the parent as the driver of the relationship, particularly among younger youth and children. Not surprisingly, research over the past two decades indicates that both the parent and adolescent bring qualities to the relationship (Morris, Cui, & Steinberg, 2013), and that it is the *relationship*, rather than parenting behaviors per se, that has the greatest impact on adolescent development (Darling & Steinberg, 1993; Branje, 2018). In addition, numerous studies have found that parents' mental health, stress, and personality affect parenting and the parent-child relationship (Mackler et al., 2015; Van Loon, Van de Ven, Van Doesum, Witteman, & Hosman, 2014; Xerxa et al., 2020) and, as well, that adolescents' personality or temperament and mental health (e.g., internalized distress, antisocial behavior) also affect the quality of the relationship (Achtergarde, Postert, Wessing, Romer, & Müller, 2015; Withers, Cooper, Rayburn, & McWey 2016).

The Power of Authoritative Parenting

In the 1970s, based on observations of preschool children and their families, Diana Baumrind identified parenting styles associated with differential child outcomes. The style she found related to the most positive outcomes, across domains, she labeled as authoritative (Baumrind, 1971). Authoritative parents are warm and supportive and involved in their children's lives, but they also encourage autonomy, engage in firm and consistent discipline, and have developmentally appropriate expectations. In the 1990s Steinberg and colleagues applied Baumrind's parenting styles to the study of adolescents, and expanded her definition of authoritative parenting to include parents' encouragement of adolescents' own beliefs and opinions, and the avoidance of psychological control (i.e., manipulative control that utilizes strategies such as guilt induction and love withdrawal in an attempt to control children's emotions, behaviors, and beliefs; McNeely & Barber, 2010; Silk, Morris, Kanaya, & Steinberg 2003; Steinberg, 2005).

Based on his review of numerous studies, Steinberg (2001) concluded that the effects of authoritative parenting accumulate over time and increase competence and psychological well-being throughout childhood and adolescence. Moreover, adolescents raised in authoritative homes have better relationships with their parents and are more receptive to their parents' influence because of a positive history of interactions and trust. Steinberg also argued that the benefits of authoritative parenting transcend boundaries of culture, ethnicity, SES, and household composition, and that similar findings have been found in samples of families all over the world. He noted that although certain groups—Blacks, Asian Americans, for example—may not be as negatively affected by other forms of parenting (i.e., authoritarian) but the evidence nonetheless indicated that children from all ethnic groups fared best when parents were authoritative rather than authoritarian or indulgent.

Historically, researchers interested in authoritative parenting have concentrated on its two core elements: warmth and control (sometimes referred to as responsiveness and demandingness) that have been shown to affect adolescent development positively, either separately or jointly. More recent studies support and extend these conclusions, often splitting these basic components of authoritative parenting into subcomponents in order to examine the effects of specific parenting behaviors (Morris et al., 2013). For example, parental monitoring (i.e., awareness of children's behaviors, activities, and friends) has been

further broken down into separate components of knowledge, disclosure, and solicitation. Brown and Bakken (2011) concluded that different strategies for monitoring adolescents' peer relationships may be differentially effective, depending on the unique characteristics of the youth (e.g., age, gender, ethnicity, and risk-taking tendencies). Other examples include emotion socialization (i.e., parents' attempts to teach children about emotions and emotion management), psychological control, and harsh and responsive parenting, all of which are thought to reflect the degree of warmth in the parent's treatment of the teenager.

In general, studies find that these more differentiated components of authoritative parenting are associated with adolescent outcomes in expected directions. For example, emotional support (one component of emotion socialization) is associated with emotion regulation and less symptomatology (Morris et al., 2017). Psychological control and harsh parenting are associated with more mental health problems and lower academic achievement (Pinquart, 2016; Pinquart, 2017). Longitudinal studies find that supportive parent emotion socialization practices, such as emotion coaching, are related to lower levels of adolescent internalizing and externalizing problems and greater emotion regulation abilities compared to unsupportive practices like emotion dismissing behaviors (Breaux et al., 2018; McKee et al., 2020). A recent international study examining parenting practices across nine different countries found similar results, indicating parents with greater irritability were more likely to use harsh parenting which in turn was related to increased adolescent internalizing and externalizing symptoms (Di Guinta et al., 2020).

Steinberg (2001) discussed research indicating that in households with two parents, mothers and fathers typically have similar parenting styles and values, and that having at least one parent who is authoritative is protective (Steinberg et al., 1994). In the past, maternal behavior tended to be the primary focus of research on parent-adolescent relationships. More recent research on fathers, however, specifically indicates that fathers too play an important role in adolescent development. For example, Brouillard and colleagues (2018) found that father-adolescent relationships characterized by less support predicted increased adolescent depressive symptoms one year later. In a study examining the influence of father-adolescent attachment on adolescent self-esteem, results revealed adolescent-perceived positive changes in the attachment relationship were related to increases in girls' self-esteem but not boys' (Keizer et al., 2019). Increasingly, more studies of parenting examine both mothers and fathers, which is an important advance in the field (e.g., Moilanen et al., 2018). However, this is not always done in studies of parenting, likely due to high numbers of single parents and the added difficulty involved in assessing two caregivers. In addition, over the last decade there has been an increased number of studies involving different types of caregivers (e.g., step parents versus biological parents) and how parenting quality and parenting time impact development and adjustment outcomes (see Guzzo, Hemez, & Anderson, 2019; Kalil, Ryan, & Chor, 2014). Other advances over the last two decades include studies of diverse family structures (e.g., same sex parents and parents who have never married) and studies focused on people of color (BIPOC), including Black, Latinx, Asian, and indigenous families (e.g., Coates et al., 2019; Russell et al., 2020). Contemporary studies are also more likely to include multiple methods for assessing the parent-adolescent relationship, including coded observations and psychophysiological methods in addition to self-reports (e.g., Byrd-Craven et al., 2020).

One theme that has received increased attention over the last decade is the influence of parenting throughout young adulthood, into the third decade of life. The journal *Emerging Adulthood* published its first issue in 2013, and this journal regularly publishes articles on the influence of parenting during late adolescence and young adulthood. It is beyond the scope of this paper to review studies of parenting during young adulthood. Nevertheless, research suggests that parenting is still important during this developmental period, and that parents who remain connected and involved with young adults are more likely to have sons and daughters with better adult outcomes (Nelson, 2020; Padilla-Walker & Nelson, 2019).

New Directions Over the Last Decade

In this section, we highlight four areas of parenting research that have expanded during the last decade: (1) the ways in which parents influence adolescent friendships and romantic relationships; (2) the ways in which parenting affects, and is affected by, adolescent brain development; (3) the interactive effects of parenting and genetic factors; and (4) the role of parenting in adolescent use of social media.

In the last Decade in Review published in JRA, Brown and Bakken (2011) contributed a review of parenting and peer research in which they concluded that there are numerous ways in which the parent-child relationship and parenting practices affect adolescent adjustment and social relationships, including through the impact of parenting on relationships with peers and romantic partners. Research on the influence of parents on peer relationships has continued to expand, and a common theme that has stood the test of time is the continued importance of parenting during adolescence, despite increased time spent with peers and powerful peer influence.

Another area of research that has received a great deal of attention in the last decade is adolescent brain development, and how parenting affects adolescent brain structure and function. This work has resulted in important definitional issues regarding when adolescence begins and ends, highlighting the fact that the brain is not fully developed until the mid- to late 20s (Arain et al., 2013; Casey, Heller, Gee, & Cohen 2019). As discussed below, numerous studies find that parenting and the parent-adolescent relationship play a role in neurological development (Tan, Oppenheimer, Ladouceur, Butterfield, & Silk, 2020).

A third area on expanding research has examined the ways in which parenting practices interact with genetic variations to influence adolescent outcomes. Genetically informed research has advanced our understanding of children's differential genetic susceptibility in varied family contexts (e.g., Zhang et al., 2015). Research examining epigenetic alterations as a function of parenting are only just emerging but will offer additional insight into the role of parenting and genetic factors in child behavior development.

Finally, there has been an expanse in recent years in studying the role of parenting in adolescents' social media and technology usage. There have been a plethora of conferences, special issues, and popular books aimed at helping researchers and parents navigate the changing landscape of the role of technology in youth development (both positive and negative). It is beyond the scope of this paper to discuss each of these topics in depth, but we

provide some highlights and summaries of the most important findings and discuss future directions in research for each topic.

Parenting and Adolescent Peer Relationships.

Parents remain important influencers of development and adjustment throughout adolescence (Butterfield et al., 2020; Morris, Criss, Silk, & Houltberg, 2017). However, in adolescence, youth spend more time with peers compared to family (Lam, McHale, & Crouter, 2014) and have a need for greater independence. Adolescents are especially attuned to social rewards (Foulkes & Blakemore, 2016; Guyer, Silk, & Nelson, 2016), and the influence of peers on behavior, compared to parents, increases during this developmental period. As a result, parent and peer relational processes interact to influence adolescent functioning throughout adolescence (Brown & Bakken, 2011), and are bi-directional in nature, mutually influencing one another. Parents must be cognizant of their adolescents' relationships with peers and adapt the ways in which they engage with and support the social development of their adolescents (Steinberg & Silk, 2002). Rather than view parents and peers as contrary influences, or debate the relative strengths of each agent, contemporary researchers focus instead on the ways in which these forces interact. In our view, the movement toward looking at parents and peers as interacting forces, rather than competing ones, has been one of the most important advances in parenting research over the past decade.

A number of studies have shed light on aspects of the parent-child relationship that encourage adolescent socioemotional competence. Parenting practices such as providing warmth and praise, giving advice, and encouraging open communication are associated with many positive adolescent outcomes (e.g., improved emotion regulation and self-esteem) that facilitate autonomy (McNeely & Barber, 2010; Morris et al., 2017) and benefit social functioning (McNeely & Barber, 2010). Indeed, adolescents whose mothers exhibit greater emotional responsiveness and empathy tend to have more positive peer relations and experience less loneliness (Buckholdt, Kitzmann, & Cohen, 2016). Similarly, low psychological control and high positive parenting practices are related to decreased instances of relational aggression in adolescents (Kawabata, Alink, Tseng, Van Ijzendoorn, & Crick, 2011; Masud, Ahmad, Cho, & Fakhr, 2019).

Such supportive parenting practices facilitate the process of emotion socialization, which continues throughout adolescence. It should be noted, though, that peers, as well as parents, serve as emotion socializers during adolescence. Cui and colleagues (2020) have demonstrated that in a sample of adolescent girls, peers have an impact on emotion socialization that is unique from that of parents and that can have long-term effects on socioemotional functioning. Their findings suggest that adolescent development of emotion knowledge and management skills are influenced by the practices of both parents and peers. Attachment may also be shaped by parents and peers during adolescence and has implications for social functioning. Adolescents who have a secure attachment with their parents are more likely to demonstrate secure attachments with peers and to have enhanced interpersonal competencies (Gorrese & Ruggieri, 2012). Moreover, recent evidence suggests that parenting practices (e.g., maternal support) as well as peer influences (e.g., peer

collaboration) continue to strengthen a child's secure attachment from adolescence to early adulthood (Allen, Grande, Tan, & Loeb, 2018). The sum of these findings suggests that both parents and peers are instrumental in facilitating socioemotional competence during adolescence.

Beyond general social functioning, the literature has also delineated parenting practices that serve as risk and protective factors for peer-influenced deviant and risky behaviors, which are highly prevalent in adolescent populations (Moffitt, 2007). For instance, monitoring accompanied by warmth results in parents having increased knowledge about their adolescents' peer relationships, which is in turn associated with fewer instances of adolescent delinquency (Brown & Bakken, 2011). Moreover, research indicates that adolescents are more susceptible to deviant peers when parents are permissive and engage in less monitoring (Chung & Steinberg, 2006; Hinnant, Erath, Tu, & El-Sheikh, 2016; Kiesner, Poulin, & Dishion, 2010). Parental monitoring of peer relationships may therefore be especially important for adolescents who have greater tendencies for risk-taking and deviant behaviors (Brown & Bakken, 2011). However, parents who are highly controlling may also increase the risk of adolescent deviance, as adolescents are more likely to interact with deviant peers when their parents prohibit such relationships (Keijsers et al., 2012). Thus, both too little and too much parental control can be a risk factor for peer-influenced deviance, and the level of monitoring appropriate for a certain adolescent may depend on their individual characteristics.

Increased conflict in the parent-adolescent relationship may also increase risk of adolescent deviance (Ehrlich, Dykas, & Cassidy, 2012). In contrast, adolescents who report more emotional closeness and cohesion with their families tend to be less susceptible to negative peer influence (Williams & Anthony, 2015). Communication barriers may also impede parents' abilities to monitor peer relationships. For instance, adolescents may choose not to disclose information about peers to parents. This can be driven by a desire to have more independence and privacy in peer relations but also to prevent parental concern. The literature suggests that parents can encourage more open disclosure from adolescents by maintaining an authoritative style and engaging in effective rule-setting (Brown & Bakken, 2011).

Romantic relationships are an important component of adolescent social functioning and peer relations, and the literature suggests that parenting practices can have a substantial impact on adolescents' dating experiences. Authoritative parenting strategies and low family conflict may encourage adolescents to use more adaptive communication strategies with romantic partners (e.g., increased problem solving and decreased violence; Xia, Fosco, Lippold, & Feinberg, 2018). Parenting attitudes and practices regarding adolescent romantic relationships are impacted by gender. For instance, mothers tend to encourage sons and daughters to develop intimacy in relationships, while fathers may encourage sons to experiment in their relationships (Shulman, Scharf, & Bohr, 2016). Further, a meta-analysis by Widman and colleagues (2016) revealed that parent communication about sex, particularly from mothers, can promote safer sexual behaviors in adolescents. The effects appear to be stronger for girls, which the authors attribute to parents discussing the negative consequences of unprotected sex with girls more frequently than with boys. Recent research

has also revealed unique effects of parenting on LGBTQ adolescents. Several studies have demonstrated that positive parenting practices such as warmth, acceptance, and support of an adolescents' sexual and gender identity are associated with better socioemotional outcomes, while negative practices such as psychological control are associated with poorer outcomes for these youth (Mills-Koonce Rehder, & McCurdy, 2018; Russell & Fish, 2016). Moreover, studies suggest that LBGTQ parents may have positive effects on youth development (e.g., Fedewa, Black, & Ahn, 2015). Further research is needed, however, on the specific parenting practices that promote the wellbeing of LGBTQ adolescents (Mills-Koonce Rehder & McCurdy, 2018).

As research on peers evolves throughout the next decade, it will be important to determine how various factors (e.g., technology, mental health, culture) may influence the relationship between parenting practices and adolescent social functioning (Brown & Bakken, 2011; Chen, Lee, & Chen, 2018; Odgers & Jensen, 2020; Oldfield, Stevenson, Ortiz, & Haley, 2018). Exploring these potential mediators and moderators will allow for the adaptation and refinement of parent training programs to target adolescent peer relationships and social functioning. Additionally, although there is much emerging evidence regarding the neuroscience of peer relations and parenting (Guyer & Jarcho, 2018), little is known about the neurobiological processes involved in adolescent social relationships at the triadic (adolescent, parent, and peer) level or differential effects of parents versus peers on neurological development. The literature on adolescent romantic relationships contains strong support for the impact of parents on peer relationships, but this is an area in which future studies should continue to explore, specifically the ways in which relationships are impacted by individual characteristics like gender and sexuality.

Parenting and Adolescent Brain Development.

In the last decade, the improvement and proliferation of neuroimaging technology has expanded our understanding of the influence of parenting and parent-child interactions on the developing brain (Morris, Squeglia, Jacobus, & Silk, 2018; Rutherford & Mayes, 2014). These advancements have helped to diminish barriers between neuroscience and developmental science, resulting in innovative interdisciplinary approaches and new perspectives in the study of adolescence. Moreover, adolescence marks a period of rapid neural development and biological changes (Blakemore, 2012; Foulkes & Blakemore, 2018), suggesting neuroimaging research is particularly salient in the pursuit to better understand the mechanisms linking parenting and adolescent adjustment outcomes.

Research in the last decade suggests that parenting and parent-child interactions influence the development of adolescent brain structure (Whittle et al., 2014). For example, a longitudinal study examining maternal behavior and adolescent structural brain development found positive maternal behavior during mother-adolescent interactions was associated with reduced right amygdala volume and thinning of the bilateral orbitofrontal cortex from early to mid-adolescence (Whittle et al., 2014), both of which are associated with lower rates of psychopathology (Whittle et al., 2013; Ducharme et al., 2013). Positive parenting behavior has also been shown to buffer the effects of socioeconomic disadvantage on adolescent brain development, specifically, the amygdala and prefrontal cortex, regions implicated in emotion

reactivity and executive control, respectively (Whittle et al., 2017). Taken together, these findings suggest parenting behaviors likely play an influential role in adolescent structural brain development, specifically in regions associated with social information and emotion processing, self-regulation, and decision-making.

Neuroimaging studies have also begun to uncover the influence of parenting on adolescent brain function. Similar to studies examining brain structure, studies of adolescent brain function suggest that parenting behaviors and parent-adolescent interactions influence adolescent brain networks in ways that affect risk for psychopathology (e.g., Aupperle et al., 2016; Kerr et al., 2019; Lee, Siegle, Dahl, Hooley, & Silk, 2015), furthering our understanding of the underlying mechanisms through which parents shape their adolescent's cognitive and socio-emotional development. In studies examining adolescent brain responses to maternal critical, neutral, and praise statements, for example, typically developing adolescents showed increased activation in brain networks that govern emotion reactivity and decreased activation in regions related to cognitive control and social cognition in response to maternal criticism (Lee et al., 2015). This may suggest that typically developing adolescents fail to recruit cognitive control networks to help them regulate emotion when listening to critical comments from their mothers. Adolescent girls with higher levels of anxiety and depressive symptoms showed a blunted left amygdala response when listening to both maternal criticism and praise and an increased right amygdala response when listening to maternal criticism (Aupperle et al., 2016), indicating greater responsivity to negative parental feedback compared to positive feedback. In contrast, supportive parenting practices have been shown to reduce amygdala activation in adolescents when viewing fearful faces (Romund et al., 2016), suggesting positive parenting practices may lessen the effects of negative emotional stimuli.

Emerging evidence suggests that the sex of the adolescent may moderate neurobiological sensitivity to both positive and negative parental influences resulting in different outcomes (Tan et al., 2020). For example, Chaplin and colleagues (2019) found that negative maternal behaviors (e.g., critical or mocking statements, harsh vocal tone) observed during a parent-adolescent interaction were differentially associated with brain activation in adolescent boys and girls when completing an fMRI emotion-eliciting task. In adolescent girls, negative maternal behavior predicted increased activation in the right anterior cingulate cortex in response to negative emotional stimuli; in boys, negative behavior predicted blunted activation in the bilateral anterior insula and left anterior cingulate cortex, regions associated with both emotion processing and regulation. For girls, increased activation in these regions was associated with greater substance use and depressive symptoms (Chaplin et al., 2019), suggesting that brain pathways linking parenting behavior to adolescent substance use and psychopathology may vary by sex. In a longitudinal study, decreased activation over time in the ventral striatum (a brain region involved in reward processing) of adolescents mediated the relationship between positive parent-adolescent interactions and risk-taking behavior, such that more positive interactions were related to decreased ventral striatal activity which in turn was related to less risk-taking (Qu, Fuligni, Galvan, & Telzer, 2015). Collectively, these findings support the premise that positive and negative parenting behaviors influence adolescents' cognitive and emotion-related neurocircuitry in ways that have important

implications for adolescent adjustment, although much more research is needed to explain differential pathways of influence.

Given the importance of understanding adolescent devlopment in the context of the parent-adolescent relationship (Morris et al., 2017), recent advances within the field of functional neuroimaging have provided new methods (e.g., concurrent fMRI) for exploring parent-child interactions using ecologically valid paradigms. For example, a study by Kerr and colleagues (2020) examined brain activation in parent-adolescent dyads completing an error processing task while undergoing simultaneous fMRI. Results indicated that positive parenting was associated with increased activation in the parent's ventromedial prefrontal cortex - a region involved in empathetic responding - when the adolescent made an error. Further, both parents and adolescents showed increased activation in regions associated with emotion regulation and processing during the task (Kerr et al., 2020). Using the same sample and experimental design, Cosgrove and colleagues (2019) found parents who showed decreased activity in the medial prefrontal cortex and posterior cingulate cortex in response to their adolescent's error had adolescents with greater symptoms of depression and anxiety. Moreover, adolescents who showed increased activation in the anterior insula when their parent made an error had parents with greater symptoms of anxiety (Cosgrove et al., 2019), suggesting parent and child mental health symptomatology may influence emotion-related neurocircuitry in the dyadic context. Research utilizing these novel neuroimaging technologies provides greater insight into the dynamic, reciprocal nature of parent-adolescent relationships and captures the dyadic aspect of the relationships in which social and emotional skills develop.

Genetic and Epigentic Influences.

In addition to the great advances in neuroimaging technology in the last decade, advances in, and increases in the accessibility of, genetic and epigenetic methods has led to a growth of studies examining interactions between parenting variables and genetic variations. Gene-environment interactions refer to the differing ways in which genotypes can interact with environmental factors to produce varying outcomes which may be especially important in child development given variations in parenting styles and behaviors (Chhangur et al., 2015). It is important to note that in general, parenting research is correlational in nature and causality is difficult to determine. Much of the findings discussed thus far could be explained by passive gene-environment correlations. Moreover, specific genetic variations may serve as vulnerabilities when adolescents are exposed to maladaptive environmental contexts, such as negative parenting practices, and genetic variability may account for differential susceptibility to contextual influences (Hankin et al., 2011; Zhang et al., 2015).

For example, Chhangur and colleagues (2015) found that adolescents carrying the A2A2 variant of the dopamine receptor gene DRD2, implicated in increased adolescent aggression, were more likely to engage in delinquent behavior when exposed to low parental support. In another study examining the interaction between parenting behavior and the DRD2 dopamine receptor gene, researchers found carriers of the A1 variant, compared to the A2A2 carriers, were more vulnerable to high levels of negative parenting, resulting in greater depressive symptoms, but experienced fewer depressive symptoms when experiencing low

levels of negative parenting (Zhang et al., 2015). Multiple studies examining positive parenting behavior and the serotonin transporter (5-HTTLPR) gene found adolescent girls who were homozygous carriers of the short alleles showed low levels of positive affect in unsupportive parenting environments but high levels of positive affect in supportive parenting environments (Hankin et al., 2011). Studies have shown individuals carrying the short allele variation have greater amygdala activation when presented with negative emotional stimuli (Canli, Ferri, & Duman, 2009). Therefore, these adolescents may be particularly sensitive to parenting behaviors perhaps, in part, due to differences in activation of the amygdala.

Although studies of gene-environment interactions based on a single gene can be informative in that they offer insight into the ways in which differential genetic susceptibility (Belsky, 1997) and parenting practices may jointly affect adolescent outcomes, it is important to note their limitations. While discoveries of single-gene disorders have been made, the vast majority of disorders are thought to be polygenic (e.g., many genes contributing to a phenotype). Moreover, findings from single-gene approaches have been difficult to replicate possibly due to the difficulty in selecting the correct genetic variants as well as insufficient sample sizes (Crouch & Bodmer, 2020). Thus, there is a need to include larger, more diverse samples when studying gene-environment interactions as well as a greater focus on multiple genes and gene regulatory networks (Boyle, Li, & Pritchard, 2017; McAllister et al., 2017). Genome-wide by environment interaction studies (GWEIS) are one innovative method which allows for the examination of gene-environment interactions on a genome-wide scale compared to traditional gene-environment studies which are typically limited to a smaller number of genetic variants (Dunn et al., 2016). Large-scale genetically informed research designs, such as GWEIS, will serve to increase our understanding of the ways in which various biological pathways interact with environmental factors to influence adolescent development.

Though more often studied in animal models, emerging research suggests epigenetic processes (e.g., DNA modifications that do not change the DNA but can alter gene expression) occur in humans and may have a significant impact on behavioral, emotional, and physical health outcomes (Zannas & West, 2014). Environmental influences (e.g., social interactions and stress) can initiate epigenetic changes, such as DNA methylation, that alter the extent to which various genes are expressed (Turecki & Meaney, 2016). Research suggests certain epigenetic changes, specifically DNA methylation, are associated with adolescent depression and anxiety (Bortoluzzi et al., 2018; Dempster et al., 2014). Using a longitudinal study design, Bortoluzzi and colleagues (2018) found that adolescents with a persistent anxiety disorder had higher levels of genome-wide DNA methylation compared to healthy control adolescents. Dempster and colleagues (2014) found differences in the variability of genome-wide DNA methylation in adolescent twins discordant for depression, such that levels of DNA methylation were more variable for the twin with depression compared to the unaffected twin. Thus, epigenetic alterations may be another biological mechanism underlying the relationship between parenting behavior and adolescent psychopathology. Research examining this association in humans, however, is extremely sparse. Two studies examining genome-wide epigenetic alterations found DNA methylation mediated the impact of parenting on young adult health and psychosocial

adjustment, such that protective parenting was related to lower levels of genome-wide DNA methylation which in turn was related to better health and more positive psychosocial adjustment (Beach et al., 2016; Naumova et al., 2016).

Though limited, emerging research is attempting to bridge our knowledge of both biology and behavior to better understand the influence of parenting and parent-adolescent interactions on adolescent adjustment outcomes. For example, the Adolescent Brain Cognitive Development (ABCD) Study is a 10-year longitudinal study assessing mental, physical, and emotional health, substance use, environmental variables (i.e., family, school, culture), genetic and other biological variables, and structural and functional brain development in a sample of over 11,000 adolescents (Jernigan, Brown, & Dowling, 2018). In the coming decade, large-scale, longitudinal studies, similar to the ABCD study, will serve to enhance our understanding of the risk and resilience processes that occur over the course of development to impact adolescent and young adult outcomes and contribute to the creation of effective prevention and intervention programs (Morris, Squeglia, Jacobus, & Silk, 2018). Moreover, large, multi-site studies will continue to have meaningful implications for policy reform and development in areas such as substance use, mental health, and education (Volkow et al., 2018).

Social Media and Parenting Adolescents.

Over the past 10 years, the ways in adolescents' social relationships are formed and maintained have changed vastly due to the presence of social media (we use this term to refer to all modern electronic means of communicating with others, including texting as well as the use of popular social media platforms such as Instagram and Snapchat). More than 75 percent of adolescents use social media (Lenhart, 2015), with a majority of these youth likely using it daily (Barry, Sidoti, Briggs, Reiter, & Lindsey, 2017). Adolescents use social media to communicate with friends via texting and apps like WhatsApp and to share content (e.g., pictures and videos) with others via Snapchat, Instagram, Facebook, etc. (Lenhart, 2015). As a result, social media provides adolescents with the means for near-constant social interaction. This level of connectedness may be beneficial for many adolescents' social development and mental health (Barry et al., 2017; Khan et al., 2016). On the other hand, research has indicated that adolescents who frequently use social media are more likely to experience mental health problems and sleep disruptions (Woods & Scott, 2016). Further, adolescents who predominantly rely on social media for socializing instead of in-person interactions may have a lower self-concept than those with active face-to-face social lives (Khan, Gagné, Yang, & Shapka, 2016). It should be noted, however, that recent reviews and empirical studies with large sample sizes have indicated that the effects of social media on adolescent well-being are very small (Odgers & Jensen, 2020; Orben & Przybylski, 2019). Despite this, popular media reports have stoked parents' fears about the potential negative outcomes of social media use, and parents often have questions about the best ways to monitor and regulate their teenagers' use of smartphones and social media.

Many parents report that they are not well-informed about their children's online activities. Parents face difficulties in monitoring adolescents' use of social media (Erickson et al., 2015), particularly on personal devices such as cell phones and laptops (Blackwell,

Gardiner, & Schoenebeck, 2016). This allows adolescents to function rather autonomously online (Erickson et al., 2015). As a result, many parents instate rules in attempt to control their adolescent's use of technology. Common themes of these rules include time limits for daily use, restrictions during certain contexts (e.g., no use during mealtimes or after bedtime), and prohibition of certain activities (e.g., no viewing or sharing violent and racy content; Hiniker, Schoenebeck, & Kientz, 2016). Such rules have been shown to promote adolescents' safety online and to reduce the amount of time they spend using technology. However, these rules can be difficult for parents to consistently enforce, and some literature has even identified the monitoring and regulation of children's technology use as parents' "third shift," after work and domestic activities (Ammari, Kumar, Lampe, & Schoenebeck, 2015). It can also be difficult for parents to regulate screen time when adolescents need to use technology for school responsibilities (e.g., completing homework and collaborating with peers; Blackwell et al., 2016). Further, adolescents tend to view technology-related rules as too restrictive and believe they should have more independence in deciding how to use technology (Erickson et al., 2015; Hiniker et al., 2016). Thus, negotiating boundaries for social media use is likely a common source of conflict in parent-adolescent relationships.

Such negotiations are complicated by the fact that parents are frequent users of social media themselves. Social media may actually serve as a beneficial resource for parents. Indeed, the literature suggests that many mothers turn to social media for parenting advice and support (Morris, 2014). Parents can also monitor their child's physical whereabouts, driving, and screen time using apps such as Life 360 (www.life360.com). However, certain aspects of parents' online activity can add to tensions in the parent-adolescent relationship. For instance, parents may feel guilty when using social media around their children (Blackwell et al., 2016). Additionally, some adolescents report feeling frustrated when their parents do not follow the established household rules for technology (e.g., using phones during mealtime). Adolescents also have concerns about their parents sharing information about them on social media without their consent (Hiniker et al., 2016). These findings suggest that, similar to adolescent social media use, there are common themes in the expectations for parents' use of technology. Therefore, the actions of both parties on social media can lead to tensions and conflict.

The literature has revealed a variety of ways in which parents can reduce conflict regarding social media as well as aid their adolescent children in adaptively using them. First, utilizing media to create shared positive experiences for parents and adolescents may increase feelings of closeness and bonding. For example, social media can be used to help parents and adolescents stay in touch when they are not physically together (Williams & Merten, 2011). Also, co-using social technologies (e.g., playing video games together) has been linked to increased family connectedness (Padilla-Walker, Coyne, & Fraser, 2012). Co-use may also have the added benefit of providing parents with a better understanding of the activities their children are engaging in online.

Second, when creating rules for social media use, parents should discuss with adolescents about why the rules are necessary and how they will be implemented. Involving youth in such conversations likely decreases feelings of their autonomy being restricted and increases the probability that they will comply with parental expectations. To further help with this, it

should be made clear that parents are expected to follow certain technology-related rules as well (Hiniker et al., 2016).

Lastly, parents should both preventatively and reactively monitor adolescents' social media use. Preventative strategies include creating rules at the outset of social media use and being involved with the creation of social media accounts. These strategies help to establish the expectations for how an adolescent should be using social media. Reactive strategies include reviewing the adolescents' activity on social media and having discussions with the adolescent about the potential consequences of their online actions. This allows the parent to monitor the adolescents' adherence to the established rules for social media use and to guide their adolescent in learning how to use social media adaptively. Discussion about appropriate versus inappropriate technology use helps adolescents engage in critical thinking while consuming online media (Fikkers et al., 2017). Therefore, the utilization of preventative and reactive strategies is the recommended method for parents to monitor adolescent social media use (Wisniewski, Jia, Xu, Rosson, & Carroll, 2015).

Parenting Adolescents in 2020 and Beyond

The COVID-19 Global Pandemic.

The challenges presented by the COVID-19 pandemic will continue to impact current and future generations for many years. Older children and adolescents are at a developmental stage in which they are more likely to comprehend the implications of such a large-scale disaster, including the impact the pandemic will have on their futures (Masten & Motti-Stefanidi, 2020). Already, research findings suggest adolescents and young adults are reporting higher levels of anxiety, depression, and hopelessness during the pandemic than they had before (Shanahan et al., 2020; Zhou et al., 2020). Moreover, Zhou and colleagues (2020) found rates of internalizing symptoms increased with grade-level as adolescents faced unpredictable futures.

Although worrisome, these findings come as no surprise, as nearly all facets of life for adolescents have changed dramatically since the beginning of the pandemic. These upended structures and routines will likely have a significant impact on adolescent development, and children and adolescents already experiencing high levels of psychosocial risk are particularly vulnerable to the negative effects of the pandemic (Stark, White, Rotter, & Basu 2020). Further, the Centers for Disease Control and Prevention report that racial and ethnic minorities have been, and continue to be, disproportionately affected by the pandemic -- a result of systematic and social inequities (Stokes et al., 2020). The pandemic has highlighted these long-standing and pervasive disparities and underscores the need for research informed policy to build better health equity. Research examining the effects of other large-scale natural disasters on adolescent resilience highlight the positive adaptations communities, families, and individuals may adopt to overcome significant adversity (Masten & Motti-Stefanidi, 2020). Future research will begin to uncover the effects of this global pandemic on development as well as enhance our understanding of resilience-promoting processes that may prove critical in the face of future crises (Dvorsky, Breaux, & Becker, 2020).

Nevertheless, as developmental scientists we do know some things that parents can do to help adolescents during this difficult time (Ratliff, Morris, Hubbs-Tait, & Hays-Grudo, 2020). Parents need to communicate risks with adolescents and share accurate, up to date information. They must also balance autonomy and control. Setting clear, reasonable limits for behavior is particularly important for safety and health, but parents must understand adolescents' need for social interaction. As much as possible, parents should be encouraged to provide and promote opportunities for safe interaction that is outdoors, socially distanced, and protected by face masks when appropriate. Parents can also help adolescents keep schedules and set goals, which is particularly important when they are in virtual schooling settings. Parents also need to be understanding and empathic, as this is a very difficult time for adolescents, given that many rites of passage (prom, graduation ceremonies) look very different or are not taking pace. Parents can acknowledge such disappointment and allow teens some space to grieve. At the same time, it is essential to stay connected. This can be done through family meals, movie or game nights (Ratliff et al., 2020). If everyone is home, there is more time for such activities.

Talking to Teens About Racial Injustice.

Racism and racial injustices and inequalities are deeply embedded throughout American society and the world, as institutional policies and practices serve to perpetuate racial inequity. Parenting adolescents in the context of heightened awareness of racism, racial identity, and multiculturalism has been a crucial topic of research in the past decade (see Hussong, Jones, & Jensen, 2018; Thomann & Suyemoto, 2018; Whitaker & Snell, 2016. Research in the U.S. suggests White parents are far less likely to talk to their children and adolescents about racial discrimination compared to other racial groups due to feelings of discomfort or to avoid worrying their children (Hamm, 2001; Zucker & Patterson, 2018). Rather than overtly address these issues, White parents are also more likely to take a "color-blind" stance with the assumption that this will lead their child to hold less racially biased views; however, research suggests color-blind socialization practices actually limit children's understanding of racism and racial bias (Bartoli et al., 2016).

It is beyond the scope of this review to discuss all the ways in which parenting can influence racial attitudes, discrimination, and racial socialization. However, there is ample research indicating that parenting approaches that include explicit discussions about racism and its widespread effects reduce racial bias (Hughes, Bigler, & Levy, 2007). Moreover, Hughes, Fisher, and Cabrera (2020) have proposed an approach for parenting that is intended to raise children's awareness of racial issues as well as work to dismantle pervasive systems of racial injustice and inequality. The approach, Intentional Parenting for Equity and Justice, or IPEJ, provides guiding principles for parents when talking to children about racism, including an awareness and reflection of the parent's own racial beliefs, exposing children to diversity, and actively discussing racism and instances of racial injustice and inequities (Hughes, Fisher, & Cabrera, 2020). Rather than avoiding discussing these issues, IPEJ stresses the importance of recognizing instances of racism and talking about them with children and adolescents.

Conclusions and Implications for Practice and Policy

Much of what Steinberg (2001) summarized regarding the parent-adolescent relationship two decades ago still holds true today. Parenting that is balanced – accepting with clear boundaries; encouraging autonomy with practical limits; displaying warmth with reasonable discipline – continues to predict the best adolescent outcomes in terms of academic success, mental health, emotion regulation, prosocial behavior, social relationships, and more (Criss, Morris, Ponce-Garcia, Cui, & Silk, 2016; King, Vidourek, & Merianos, 2016; Llorca, Richaud, & Malonda, 2017; Padilla-Walker, Carlo, Christensen, & Yorgason, 2012; Piko & Balázs, 2012; Rivers, Mullis, Fortner, & Mullis, 2012).

Parent education programs fostering positive parent-adolescent relationships have also expanded over the last decade (for a review see Morris, Jespersen, Cosgrove, Ratliff, & Kerr, 2020; and Smith et al., 2020). Many of these programs focus on the basics of positive or authoritative parenting (e.g., *Triple P*; Sanders, 2008), while others are more nuanced. For example, *Tuning into Teens* focuses on emotion socialization practices (e.g., emotion coaching) and aims to improve parent-adolescent interactions by enhancing emotion regulation abilities (Havighurst, Kehoe, & Harley, 2015). Another program, *Guiding Good Choices*, aims to teach parents skills to promote communication and bonding with their adolescent in order to reduce risky behaviors (e.g., substance use; Mason et al., 2009). Other programs focus on parents' coping skills and self-care and encourage strategies such as mindful parenting in combination with basic parent training curricula (e.g., Coatsworth et al., 2015). Mindful parenting strategies (e.g., nonjudgmental awareness during parent-child interactions) have been linked to lower rates of adolescent risky behaviors and more positive parent-adolescent relationships (Turpyn & Chaplin, 2016). In sum, parent education programs have been evolving to address more specific aspects of positive parenting practices as the research has developed more refined and evidence-based approaches to promiting effective parenting and positive adolescent outcomes. Moreover, many of these parenting programs have utilized randomized control trials in order to examine potential causal influences of parenting, and this is an important new direction in parenting research.

As discussed previously, parents are a profound influence on adolescent development behavior and should be considered as a potential leverage point in treating and understanding the development of psychopathology. Indeed, many psychiatric disorders onset during adolescence, and the prevalence of subclinical adolescent mental health problems, is alarmingly increasing. It is estimated that during a one-year period, approximately 40 percent of adolescents will experience at least one diagnosable psychiatric disorder (Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012). Additionally, adolescent suicide and self-injury are areas of major concern, as the rates of suicide in adolescent populations have nearly tripled over the past ten years (Curtin & Heron, 2019). Thus, there is a need for the identification of effective prevention and intervention strategies for mitigating adolescent mental health risk. Over the past decade, research has documented that relationships between parenting practices and adolescent psychopathology may be useful in developing such strategies. Several studies have shown that high levels of parental psychological control are associated with increased internalizing and externalizing problems in adolescence (Cui, Morris, Harrist, Larzelere, & Criss, 2015; Lansford, Laird, Pettit, Bates,

& Dodge, 2014). Moreover, positive parenting practices and high levels of warmth appear to function as protective factors against adolescent depression (Gaté et al., 2013), non-suicidal self-injury (Tschan, Schmid, & In-Albon, 2015), and substance use (Calafat, García, Juan, Becoña, & Fernández-Hermida, 2014). Further, the use of authoritative parenting styles can reduce the risk of adolescent suicide by approximately 20 percent (Donath, Graessel, Baier, Bleich, & Hillemacher, 2014). In sum, we argue that youth who are vulnerable to mental health problems can benefit from parents who are supportive, warm, and involved. Moving forward, educating all parents on these practices, using universal and scalable methods, may offer a promising way for preventing the development of adolescent psychopathology.

Steinberg argued in 2001 that much of the information on parenting adolescents in the popular press was misleading, confusing, and erroneous, and while this is still true today, the dissemination of accurate information on parenting has improved during the past two decades. There is more access to information via the internet, programming, and books, but with so much information it is sometimes difficult for parents to know what sources and information are trustworthy. There are also more evidence-based parenting programs (e.g., *Tuning into Teens*, *Guiding Good Choices*, and mindfulness-based parent training), and many of these have undergone rigorous randomized control trials (Morris et al., 2020). However, it is still the case that universal, easily accessible parenting information is not available to many families, and funding for such programs is not prioritized.

As Steinberg said in 2001, we need a public health campaign to educate parents on best practices (Morris et al., 2017). Such campaigns are part of some parenting programs, e.g., *Triple P*, but funding to support such public awareness campaigns (and agreement on what information to include in them) is sorely lacking. It is up to developmental scientists to weigh in here, and integrate policy, programming, and research in order to best serve our youth. Recent efforts of the Society for Research on Child Development (SRCD) and the Society for Research on Adolescents (SRA) have highlighted a need for communicating developmental science to a broader audience, such as including the more effective use of the Internet to disseminate information about healthy family relationships to parents and teenagers. We have the knowledge needed to implement and expand such initiatives. Developmental scientists are clearly building the bridge between research and practice, but it is still not yet completed, and during these unparalleled times, we are walking on the bridge as it is being built. We knew many things about effective parenting 20 years ago. Thanks to the continued growth and increased sophistication of parenting research during the past two decades, we know even more today.

Acknowledgements:

Work on this publication was supported by an Institutional Development Award (IDeA) from the National Institute of General Medical Sciences of the National Institutes of Health under grant number [P20GM109097] and the Adolescent Brain Cognitive Development (ABCD) Study supported by the National Institutes of Health (NIH) [1U01DA050989-01].

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