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ORIGINAL PAPER

Longitudinal Associations of Perceived Media Parenting with Adolescent Mental Health: Mediation by Social Efficacy and Online Risk

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Abstract

Concerns have been rising about links between digital media use and mental health problems among adolescents. Media parenting has been identified as a critical strategy to reducing risk. Although research has found relationships between online risk behaviors such as cyberbullying and overuse to reduced social skills, depression, and anxiety, few studies have examined the protective mechanisms whereby media parenting may promote emotional, psychological, and social well-being. Based on past research, we hypothesized that social efficacy and online risk would mediate the relationship between media parenting and early adolescents' mental health. We recruited parents of 10–14-year-old children nationally via Qualtrics; parents referred their children in fall 2019. The analytic sample included 129 early adolescents who completed the second (spring 2020) or third wave (spring 2021). We conducted path analyses to test the hypotheses. Social efficacy at wave 2 mediated the relationship between active media parenting at wave 1 and youth mental health at wave 3. Restrictive media parenting at wave 1 predicted reductions in online risk taking at wave 2 but was not related to mental health at wave 3. Results imply more than one media parenting strategy may be important to promote healthy online use and mental health.

Keywords Active media parenting · Restrictive media parenting · Social efficacy · Online risks · Mental health

Highlights

- Active media parenting predicted mental health via social efficacy among early adolescents.
- Restrictive media parenting predicted reductions of early adolescents' online risk-taking.
- Both active media parenting and restrictive media parenting play a role in promoting adolescents' healthy online use.

Youth in the U.S. are spending increasing time online. Children 8–12- years-old spend over 5 hours online every day, over and above schoolwork, and adolescents 13–17 spend over 8 hours a day online (Common Sense Media, 2022). The rapid growth of social media platforms and technology use among adolescents provides opportunities for creativity and connection while also introducing a novel forum for risk behaviors (Anderson et al., 2022; Khurana et al., 2015). Online risk behaviors include posting private information publicly, engaging with substance use-related content, meeting strangers, exchanging mature content, and online harassment (Lenhart et al., 2011; Sasson & Mesch, 2014). During early adolescence, online risk behaviors increase, making this developmental period critical for early intervention (Odgers et al., 2022). Studies have indicated that excessive use of screen time interferes with adolescents' social development (Maza et al., 2023; Odgers et al., 2020), and online risk behaviors have been related to depression, anxiety, substance use, sleep

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problems, and psychosomatic symptoms among adolescents (Medrano et al., 2018; Qiu et al., 2023; Temple et al., 2014).

Parents play a crucial role in protecting adolescents from online risk, including mature content and negative online experiences as perpetrators and victims (Cox et al., 2018; Sasson & Mesch, 2014; Khurana et al., 2015). Media parenting refers to parental interventions and interactions with adolescents to promote the educational and social advantages of media use while combatting the negative effects that some content or contact might have on children's attitudes, behavior, or safety (Corcoran et al., 2022b; Livingstone, 2017). However, it remains unclear what type of media parenting is most effective. Two main approaches to media parenting have emerged in the literature: active mediation, which refers to talking with youth about risk and active co-use of media, and restrictive mediation, which refers to establishing house rules and technology control (Steinfeld, 2021). However, which strategy works under which circumstances is largely unknown (Nielsen et al., 2019). Further, we have little understanding of the mechanisms by which media parenting works. In this study, we address this knowledge gap in the literature by investigating potential mediators of the relationship between media parenting styles and online risk among early adolescents across three time points with respect to mental health.

Mental Health and Technology Use in Early Adolescence

During early adolescence, youth engage in dynamic developmental processes including puberty, brain maturation, increased social interactions with peers, and increased risk-taking behaviors as they seek out novel information and experiences (Patton et al., 2016). Increasingly, much of early adolescents' social and risk-taking behavior occurs online, creating an imperative to promote online interactions that support healthy development (Odgars et al., 2022). Recently, the U.S. Surgeon General (2023) and the American Psychological Association (2023) have raised concerns about the influence of digital media on adolescents' mental health, noting links between internalizing behaviors (e.g., depression, anxiety) and digital media use. For example, problematic internet use (e.g., risky, excessive), media multitasking, cyberbullying perpetration and victimization, and exposure to mature sexual content in media are prospectively linked to increases in depression, anxiety, suicidal ideation, and suicide attempts (Anderson et al., 2017; Lai et al., 2023; Gámez-Guadix et al., 2013; Kreski et al., 2021; Ma, 2019). Links between online risk and mental health can be iterative, with a bidirectional effect identified between problematic internet use and depressive symptoms over time (Gámez-Guadix et al., 2013; Lai et al., 2023). Collectively, this research suggests the need to reduce online risk to reduce mental health problems. However, most research on technology use has focused on the negative impacts on adolescent mental health, rather than the emotional, social, and psychological aspects of well-being that indicate healthy development.

Mental health as a state of well-being has been shown to be a distinct construct that correlates with mental health problems (Keyes et al., 2005; Keyes et al., 2006). In the current study, we focus on mental health defined as "a state of well-being in which an individual realizes their own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to their community" (World Health Organization, 2022). Little is known about the ways early adolescents can be guided toward healthy internet use that increases their emotional, social, and psychological well-being.

Media Parenting

Two main media parenting approaches are active and restrictive mediation (Coyne et al., 2017; Livingstone, 2017). Active, or evaluative, mediation refers to parent-child discussions, including conversations related to both positive and negative sides of media content (Gabrielli et al., 2018; Livingstone, 2017). Also, active mediation contributes to a collaborative process for parents and children to co-create rules regarding media use in the house. Open communication may be more effective than imposing rules to curb online risk (Elsaesser et al., 2017), allowing exchanges between parents and children that lead to consensual resolutions as well as standards of behavior that can translate more flexibly across different devices or online contexts.

Restrictive mediation consists of strategies used by parents to limit and control adolescents' use of the internet (Livingstone, 2017, Khurana et al., 2015). This includes regulation of a child's time spent on the internet and the content they access. Restrictive mediation may include both unilateral rule setting and online monitoring by parents through filtering tools and regular checking of visited websites and emails (Cocoran et al., 2022a, 2022b; Kalmus et al., 2015). The former embeds the established rules for internet use imposed by the parents to the children. The latter constitutes the verification means of such rules by checking up on the child's online activities, covertly or overtly, after use (Livingstone & Bober, 2006). A meta-analysis of media parenting found that restrictive media parenting was effective in early adolescence but less so in late adolescence (Chen & Shi, 2019). Covert parental monitoring has been criticized as infringing upon children's

privacy (Livingstone & Bober, 2006). Online monitoring contrasts with in-person parental monitoring, which is interactive in nature and requires parental conversations and, ideally, youth disclosures (Kerr et al., 2010; Khurana et al., 2015). Overall, however, the processes by which active and restrictive media parenting may affect child outcomes are not well understood.

Media Parenting as a Potential Protective Factor of Mental Health

A large literature demonstrates that effective parenting promotes youth mental health and well-being (Connell et al., 2021; Sandler et al., 2011). However, little is known about the processes by which parent-child interactions affect mental health outcomes in digital contexts. Shutzman & Gershy (2023) found that negative parenting was associated with higher reports of excessive digital media use during the COVID-19 pandemic, which in turn was associated with greater emotional and behavioral problems in youth. However, few studies have examined the processes by which media parenting may have a protective effect on mental health among early adolescents in the digital age. We consider social efficacy and online risk as two potential mediators of this relationship.

Social Efficacy

Social self-efficacy refers to an individual's assessment of their own success in social interactions and relationships (Bandura, 1977). Smith & Betz (2000) defined social self-efficacy as an individual's belief in their ability to perform social tasks and interactions to build and maintain relationships. Bandura identifies social efficacy as a key concept of social cognitive theory, which affects motivation and agentic action (Bandura, 1998). Parent-child trust is related to both self-esteem and social self-efficacy (Babore et al., 2016). Researchers have suggested social media may strengthen social connections and social efficacy (Anderson et al., 2022; Park & Lee, 2013), However, it may also pose a potential threat to healthy development of social skills and functioning (Chan, 2014; Maza et al., 2023). However, to our knowledge, the relationship between media parenting and adolescents' social efficacy has not been examined.

Social Efficacy and Mental Health

A lack of social efficacy is associated with mental health problems. This has been studied in multiple cultures around the world. For example, a longitudinal study following more than 8000 children in Hong Kong created four developmental trajectories from 7-years-old to 13-years-old, consistently associating low social self-efficacy with depression symptoms (Leung et al., 2018). At 11- and 12-years-old, Turkish children who reported lower social self-efficacy had more negative self-statements (Erozkan & Deniz, 2012). A longitudinal study of 390 Italian adolescents ages 11–13 years, 14–16 years, and 18–20 years showed interpersonal social self-efficacy longitudinally predicted better management of negative emotion, preventing depression (Caprara et al., 2010)

In online interactions, the relationship between social self-efficacy and mental health is complicated. Some research findings showed a potential positive relationship between internet use and social efficacy. Australian high school students who used social media more tended to report lower self-esteem and more depressive moods but better social self-concepts (Blomfield & Barber, 2014). Frequent internet use among adolescents has been associated with anxiety and depression but may also lead to increased social connectedness, which is protective against internalizing problems (for a review, see Wu et al., 2016). Mun & Lee (2022) found that parental loneliness, adolescent loneliness, and adolescent social skill deficits are associated with online game addiction, implying that a lack of social self-efficacy is a risk factor. In one study, social efficacy mediated the relationship between parent involvement and positive affect among adolescents (Yap & Baharudin, 2016). These results suggest that the relationship between social efficacy and mental health is context dependent.

Online Risk Behaviors

Another potential mediator of the relationship between media parenting and adolescent mental health is online risk behaviors. For the purposes of this paper, online risk behaviors refer to behaviors that have been associated with maladaptive outcomes or negative repercussions among youth (e.g., Oberst et al., 2017; O'Neil et al., 2011). Online risk behaviors can include cyberbullying, contacting strangers, sexting, and taking security risks (Lenhart et al., 2011). Recent research highlights the need to combine parental mediation strategies to support adolescent self-regulation and reduce risk in the online environment, which may in turn support adolescent mental health (Gabrielli et al., 2018; Helfrich et al., 2020).

Media Parenting and Online Risk

Age-appropriate restrictions on media have been recommended to reduce online risk, particularly among early adolescents who are beginning to take risks and are often new to social media (Gabrielli & Tanski, 2020). For

example, restriction of media among early adolescents has been found to reduce exposure to online modeling of alcohol and other substances and sexting (Corcoran et al., 2022a; Cox et al., 2018). Studies have found that restrictive parenting was related to a lower risk of cyberbullying perpetration and victimization (Chng et al., 2014; Legate et al., 2018, Hindjua & Patchin, 2013). However, while restriction has been found to reduce screentime (Chen & Shi, 2019), some studies found an association with greater risk behaviors, perhaps because youth do not have opportunities to practice online discernment (Steinfeld, 2021; Wisniewski et al., 2013; Wright et al., 2017).

Active media parenting appears to be more beneficial than restrictive media parenting under some circumstances, particularly those that involve social interactions. For example, active media parenting has been related to reduced cyberbullying (Steinfeld et al., 2021; Wright et al., 2017), and co-use, a form of active media parenting, has been linked to increased education and communication activities among children (Lee & Chae, 2007). In Shin & Ismail (2014), active media parenting was associated with reduced risk of contacting a stranger but not risk of sharing personal information as many parents lack knowledge of social media sites and internet platforms. In other words, restrictive media parenting appears to be protective when youth were exposed to passive content (e.g., mature sexual content or substance advertising) while active media parenting may prevent more complex social risks.

Online Risk and Mental Health

Online risk behaviors have been identified as a potential factor that undermines youth mental health, underscoring the importance of media parenting as a protective factor. For example, multiple studies have found problematic internet usage was linked with youth mental health problems (De Leo & Wulfert, 2013; Kim et al., 2020; El Asam et al., 2019). In a study of Hong Kong middle school students, depression symptoms were related to both internet gaming disorders and risky online behaviors (Tsui & Cheng, 2021). Sexting or the "sending and receiving of sexual content via the internet or mobile phones" has been found to have serious associations with online victimization as well as adolescent mental health (Gassó et al., 2019). More specifically, when sexting is nonconsensual and forced on youth through peer pressure, a significant impact has been found on mental health as it leads to feelings of guilt, shame, and embarrassment (Lu et al., 2021). While some risk taking online facilitates learning opportunities (Wisniewski et al., 2013), extreme engagement in problematic internet use may interfere with social development and mental health (Jelenchick et al., 2015; Tomczyk & Solecki, 2019).

Both victims and bullies of cyberbullying experience greater levels of depression, anxiety, and stress compared with peers that have never been engaged in cyberbullying (McLoughlin et al., 2019). A meta-analysis found that cyberbullying victimization was associated with self-harm, suicidal ideation, and suicide attempts (Nesi et al., 2021). The nature of the online environment promotes rapid and expansive sharing of content, which tends to persist over time. These qualities of the digital space also provide opportunities for social connectedness among young people (McLoughlin et al., 2019), creating a complex challenge for parents attempting to mediate safe online behavior. Evidence supports the linkage between online risk behaviors and negative outcomes for youth (e.g., Kim et al., 2020; Reed et al., 2016), but the bulk of these studies have been conducted with cross-sectional research designs, limiting the ability to assess the temporal mechanisms and longevity of positive outcomes.

The Current Study

Social Cognitive Theory proposes that people learn from observing others, and the interaction between people and environments shapes human behavior (Bandura, 1998). Improving social interactions and self-regulation via a social cognitive approach is at the heart of many evidence-based parenting programs, shown to reduce risky behaviors, such as substance abuse and anti-social behavior, and improve mental-health outcomes (Patterson et al., 2010; Sandler et al., 2011). Although a social cognitive perspective has been applied to media parenting in past research (Jin & Zhang, 2022; Lampard et al., 2013), this field of study is in an early stage of research, and little is known about the pathways by which media parenting interactions may impact mental health. Low social efficacy is a risk factor for mental health problems among adolescents (e.g., Leung et al., 2018), but parental support of social efficacy online via active media parenting has the potential to support mental health and well-being. Additionally, evidence suggests that both active and restrictive media parenting reduce online risk factors (Chen & Shi, 2019), which have been associated with poor mental health outcomes. However, much of the literature to date on media parenting and youth digital media use has been cross-sectional, which does not allow for a temporal examination of promotive and risk mechanisms. We address gaps in current knowledge and extend the literature by 1) examining positive mental health instead of emotional and behavioral problems, and 2) examining the processes by which media parenting may affect mental health among early adolescents.

We examine processes of risk and protective factors linking perceived parental media parenting, and depressive

symptoms among early adolescents in the disruptive context of the COVID-19 pandemic. We posit the following three hypotheses: a) Perceived active media parenting in Wave 1 (W1) will have a positive relationship with adolescent mental health in Wave 3 (W3), b) Perceived restrictive media parenting in W1 will have a negative relationship with adolescent mental health in Wave 3 (W3), and c) Social efficacy and online risk behaviors in W2, including cyberbullying victimization, will mediate the relationships between perceived media parenting and adolescent mental health. Using longitudinal youth report data is a first step to understanding linkages between perceived media parenting, social efficacy, online risk behaviors and youth mental health over time, which will inform future studies to improve healthy digital media use and adolescent well-being.

Methods

Participants

This study is a secondary data analysis; the data came from a national longitudinal online survey of parent and child technology use and online experience across three waves (fall 2019, spring 2020, and spring 2021). The purpose of the original study was to examine the relationship of parent-child relationships and media parenting with cyberbullying and other online risks. Published studies established the validity of the measures and examined the relationship between media parenting and sexting and cyberbullying (Corcoran et al., 2022b). Participants were 129 pre-adolescents and early adolescents ages 10–14 (M age = 11.8 years-old, $SD = 1.23$); 49% identified as female and youth reported the following racial/ethnic identities: Asian (4.8%), Black (13.3%), Hispanic (7.2%), White (65.1%), mixed or another race/ethnicity (9.6%). Parents' average annual income was \$54,622.60, (SD = \$54,438.42), and 37.1% of parents reported having a 4-year degree or more. The sample was distributed similarly compared to the national population in the Northeastern, Southern, and Mideastern regions (for each analysis, $p > 0.05$), though we found a lower proportion of participants in the West compared to the national estimates (X^2 (1, $N = 331{,}449{,}384$) = 9.67, $p < 0.01$); U.S. Census Bureau, 2021).

Procedures

Participants were recruited via Qualtrics, an online survey platform that specializes in corporate and academic research. Qualtrics networks with partners to reach respondents, invites participants on market research panels who opt-in to invitations to participate in surveys, and securely stores survey data (McBride et al., 2021). In the current study, parents of 10–14-year-old children across the U.S. were invited to participate in the fall of 2019. Parents completed a screening to determine eligibility and then provided consent for their 10–14-year-old child to answer survey questions. Parents were instructed to provide their children privacy, and children then provided online assent for participation before completing the survey. When participants entered the study via Qualtrics, they received the amount agreed upon to complete the survey (~\$2.50).

Parents from the original Qualtrics sample ($N = 321$ participants) were invited by email to participate with their child in the second wave (spring 2020) and third wave (spring 2021) of the study. They received \$30 and children received \$15 in the form of a gift card as compensation in follow-up waves. Then, duplicate cases and those who incorrectly answered attention check questions or had demographic inconsistencies were removed from the sample. The analytic sample for the current study consisted of the youth that participated in at least 2 of the 3 waves, totaling 129. This sample size can reliably detect effect sizes between 0.10–0.20 in structural equation models and path analyses (Little, 2013). Additionally, our model meets the recommendation to have at least 5 per estimated parameter to protect against overfitting and increase generalizability (Bentler & Chou, 1987). However, we acknowledge the limitations of a small sample size, including, potential lack of generalizability, and discuss this further in the limitations section below. This study was approved by the University of Florida Institutional Review Board (IRB201900909).

Measures

Mental health was measured by the Adolescent Mental Health Continuum ($\alpha = 0.74$), which was validated in a sample of youth ages 12–18 years. Scales include 14-items about emotional, psychological, and social well-being rated on a 6-point scale ranging from: 1 = never to 6 = every day (Keyes, 2006), for example, "How often did you feel interested in life?" and "How often did you feel that the way our society works made sense to you?" Self-efficacy was measured by the Self-Efficacy Questionnaire for Children (SEQ-C), validated among early adolescents (Muris, 2001, Xie et al., 2023). The SEQ-C, an 8-item scale, measured social efficacy ($\alpha = 0.90$) on a 5-point scale ranging from 1 = not at all to 5 = very well. Example items include, "How well can you become friends with other children?" and "How well can you tell about a funny event to a group of children?" Online risk was measured by the Pew Institute additive scale from the 2011 Teens and Digital Citizenship Survey, which includes 14 items representing various online risk behaviors ($\alpha = 0.73$; Lenhart et al., 2011). Cyberbullying victimization was measured by 11 items on a 6-point

scale ranging from: 1 = never to 6–20 times or more (α = 0.95; Farrell et al., 2018). Example items include "Have you ever been contacted by a stranger online that had no connection to you or any of your friends?" and "Have you ever sent a sexually suggestive nude or nearly nude photo or video of yourself to someone else online?"

Parental perceived media strategies were measured by youth reports. Past research has documented differences between parent and child reports, and evidence suggests that child report tends to be more accurate than parent report (Padilla-Walker et al., 2016; Paulson, 1994). We used active parenting and restrictive parenting to measure this construct. We selected these scales for their brevity and evidence of their reliability and validity (Livingstone & Helsper, 2008; Corcoran et al., 2022a, 2022b). Perceived active parenting (child report, α = 0.77) was a 5-item scale representing active teaching and discussion about online behavior, e.g., "Do either of your parents…talk to you about what you do on the Internet." Youth responded on a 5-point scale: 1 = not at all to 5 = almost all the time. Restrictive parenting (child report α = 0.76) was a 6-item scale representing the level of permission or supervision parents have regarding online behaviors. Youth were instructed, "For each of the following situations, please specify how restrictive your parent(s) usually are," and given situations such as "upload photos, videos or music to share with others." Youth responded on a 5-point scale: 1 = never to 5 = whenever I want; we reverse coded responses. Demographic variables included gender (male = 0, female = 1), race (coded as Black, Latinx, White and another race), age, parental education, and income.

Analysis Plan

We conducted descriptive statistics and conducted path analysis in Mplus 8.4. Because the hypothesized model was fully saturated, we compared Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) to the trimmed model. A lower AIC and BIC indicates better model fit (Fitzmaurice et al., 2008). Next, we removed nonsignificant pathways and evaluated the trimmed model using goodness of fit criteria. We evaluated model fit according to the following guidelines: a nonsignificant $\chi 2$ indicates good fit with the data; RMSEA values 0.08 or less and CFI and TLI values more than 0.90 indicate adequate fit; RMSEA values 0.05 or less and CFI and TLI values more than 0.95 indicate good fit (Hu & Bentler, 1999). Except for planned, randomized missing data at each wave (Corcoran et al., 2022b; Little & Rhemtulla, 2013), there was very little missing data at each wave (<1–2%). However, the retention rate from W1–W2 was 32%, and W2–W3 was 75%. No differences were found in demographic patterns by retention patterns, except youth in suburban areas and whose parents reported a college degree were less likely to participate in W2 compared to W1, and older youth were less likely to participate in W3 compared to W2. Missing data were addressed using full-information maximum likelihood (FIML), which estimates the parameters based on existing information, and is appropriate for addressing both planned random missingness and missing at random data (McNight et al., 2007; Little & Rhemtulla, 2013). We utilized bootstrapping with 1000 resamples to estimate standard errors and bias-corrected confidence intervals for coefficients in the path analyses. All reported parameter estimates in the path analyses below are based on bootstrapped standard errors and confidence intervals.

Results

In fall 2019 (W1), youth reported average mental health of 4.72 on a 6-point scale ($SD = 0.84$), 4.66 ($SD = 0.87$) in spring of 2020 (W2), and 4.57 ($SD = 0.93$) in spring of 2021 (W3). A paired t-test indicated a significant decrease in mental health between W1 and W3: $t(68) = 2.35$, $p = 0.02$ with a Hedges g of 0.282, indicating a small effect size. Both active media parenting at W1 and social efficacy at W2 were positively correlated with child mental health at W3 (see Table 1). We found a significant negative correlation between restrictive media parenting at W1 and online risk at W2 and a significant negative correlation between online risk at W2 and mental health at W3.

First, we examined a model with only W1 active and restrictive media parenting and W3 mental health, which demonstrated that W1 active media parenting significantly predicted W3 mental health (β = 0.18, $p < 0.05$, 95% CI [0.01, 0.35]). No other relationships were significant. Because this model without mediators was just-identified, model fit indices were not available. Next, we tested a model with all hypothesized paths as shown in Fig. 1. Active media parenting in W1 predicted higher social efficacy in W2 ($\beta = 0.36$, SE = 0.06, $p < 0.000$, 95% CI [0.24, 0.49]), which then predicted better mental health in W3 ($\beta = 0.22$, SE = 0.09, $p < 0.05$, 95% CI [0.05, 0.39]). The direct positive path from Wave 1 active media parenting to Wave 3 mental health was not significant ($\beta = 0.11$, SE = 0.09, $p = 0.25$, 95% CI [−0.08, 0.29]). Restrictive media parenting in W1 significantly predicted fewer online risk-taking behaviors in W2 ($\beta = -0.20$, SE = 0.10, $p < 0.05$, 95% CI [−0.39, −0.02]), which significantly predicted mental health in W3 ($\beta = -0.20$, SE = 0.10, $p < 0.05$, 95% CI [−0.39, −0.00]). In W2, online risk-taking behaviors were not associated with social efficacy ($\beta = -0.19$, SE = 0.12, $p = 0.11$, 95% CI [−0.41, 0.04]) but were positively associated with cybervictimization ($\beta = 0.43$, SE = 0.14,

Table 1 Descriptive statistics and correlations between variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. Mental Health W3	—											
2. Social Efficacy	0.28**											
2. Cyberbullying Victimization	−0.03	—										
3. Online Risk Taking	−0.19*	0.45***	—									
4. Active Media Parenting	0.18*	−0.05	−0.02	—								
5. Restrictive Media Parenting	0.01	−0.13	−0.20*	0.12	—							
6. Child Age	−0.10	0.02	0.14	−0.13	0.27**	—						
7. Child Gender[a]	0.07	−0.23*	−0.03	0.09	−0.10	−0.27**	—					
8. Household Income	0.04	−0.09	−0.16[a]	0.12	0.07	−0.05	−0.03	—				
9. Black	0.06	0.10	0.21	0.16	0.08	0.02	−0.05	−0.14	—			
10. Latino/a	0.21*	0.09	−0.08	0.02	−0.14	−0.11	−0.01	−0.13	−0.10	—		
11. White	−0.07	−0.16	−0.05	−0.28**	−0.02	0.11	−0.04	−0.01	−0.59**	−0.35**	—	
12. Another race	−0.11	0.06	−0.11	0.22*	0.05	−0.10	0.11	0.26**	−0.16	−0.10	−0.54**	—
M	4.60	1.26	2.54	4.14	2.74	11.67	1.52	54156.06	0.15	0.05	0.72	0.28
SD	0.71	0.56	1.79	0.77	1.00	1.13	0.50	51823.12	0.36	0.23	0.45	0.45

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

[a]Reference group is male

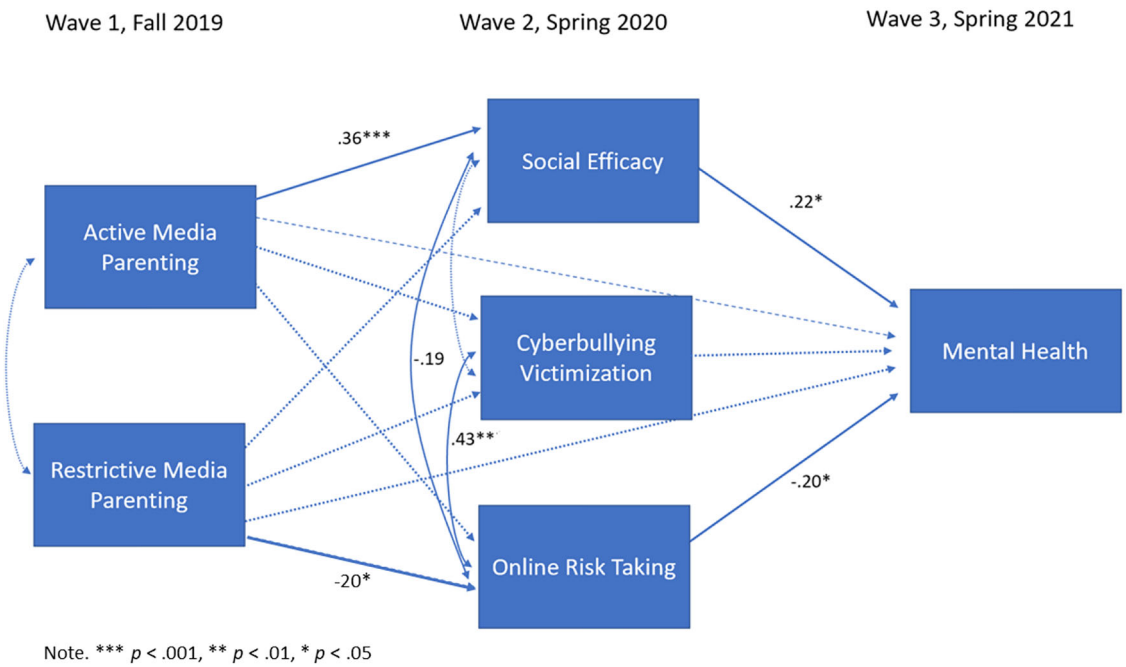

Fig. 1 Results of hypothesized model

$p < 0.01$, 95% CI [0.16, 0.70]). Other paths were not statistically significant. AIC was 1891.921 and BIC was 1969.136. The model showed a better fit to the observed data than the null model ($\chi^2(14) = 73.48$, $p < 0.000$). When demographic variables (gender, race, age, parental education, and income) were added to the model, relationships between variables of interest remained the same. None of the demographic variables were significant.

Finally, we included significant pathways from the full, hypothesized model and removed cyberbullying victimization because the variable was not significantly related to variables in W1 and W3. In the trimmed, final model, active media parenting in W1 positively predicted social efficacy in W2 ($\beta = 0.36$, SE = 0.06, $p < 0.001$, 95% CI [0.24, 0.47]), which is associated with better mental health in W3 ($\beta = 0.22$, SE = 0.08, $p < 0.05$, 95% CI [0.06, 0.38]). This pathway demonstrated full mediation with a significant total effect ($\beta = 0.18$, SE = 0.09, $p < 0.05$), a significant indirect effect ($\beta = 0.08$, SE = 0.03, $p < 0.05$), and a nonsignificant direct effect ($\beta = 0.10$, SE = 0.10, $p = 0.30$). W1 restrictive media parenting negatively predicted W2 online risk-taking behaviors ($\beta = -0.22$, SE = 0.08, $p < 0.01$, 95% CI [−0.40. −0.04]), but online risk-taking did not predict mental health in W3 ($\beta = -0.15$, SE = 0.08, $p = 0.07$, 95% CI [−0.31, 0.01]). In W2, social efficacy and online risk taking were negatively associated ($\beta = -0.19$, SE = 0.129, $p < 0.05$, 95% CI [−0.42, 0.05]). The model had good model fit to the observed data ($\chi^2(3) = 1.11$, $p = 0.77$, CFI = 1.0, RMSEA = 0.00, 90% CI [0.00, 0.10], SRMR = 0.02) and was significantly better than the baseline null model ($\chi^2(9) = 72.90$, $p < 0.000$). The AIC for the trimmed model was 1690.222, BIC was 1738.839: the trimmed model is a better fit than the hypothesized model, and we selected this as the final model because it was more parsimonious. When demographics were added to the second model, relationships between variables of interest remained the same Fig. 2. None of the demographic variables were significant. Additionally, we conducted a robustness check by introducing W1 child mental health to the trimmed model as a predictor for W3 mental health. The model showed a good model fit (CFI = 1.00, TLI = 1.21, RMSEA = 0.00, 90% CI [0.00, 0.07], SRMR = 0.03). In wave 1, active media parenting was associated with child mental health ($\beta = 0.20$, $p < 0.001$), but restrictive media parenting was not ($\beta = -0.04$, $p = 0.67$). The association between W1 and W3 child mental health was not significant ($\beta = -0.15$, $p = 0.12$). Other paths remained the same.

Discussion

The current study examined protective processes by which media parenting may affect mental health in early adolescence. Using a social cognitive lens and aligned with hypotheses, we found that a positive relationship between active media parenting and mental health was mediated by social efficacy over the course of the COVID-19 pandemic. In the final model, restrictive media parenting was not related to social efficacy or mental health but was related to lower reports of online risk taking. Online risk taking was not related to mental health, and evidence of mediation of the relationship between restrictive media parenting and mental health was not found. Together, these results suggest that active media parenting may have a role in promoting mental health, while restrictive media parenting may have a role in reducing online risk.

From a social cognitive perspective, youth learn social behaviors by observing role models, and parents and other authority figures serve as salient role models, which strengthens self-efficacy (Bandura, 1977; Bandura 1998). Social self-efficacy includes the confidence in one's ability to start and maintain relationships but also to draw boundaries and voice concerns (Muris, 2001). Capacity for boundary-setting and recognition of concerns is, of course, limited by

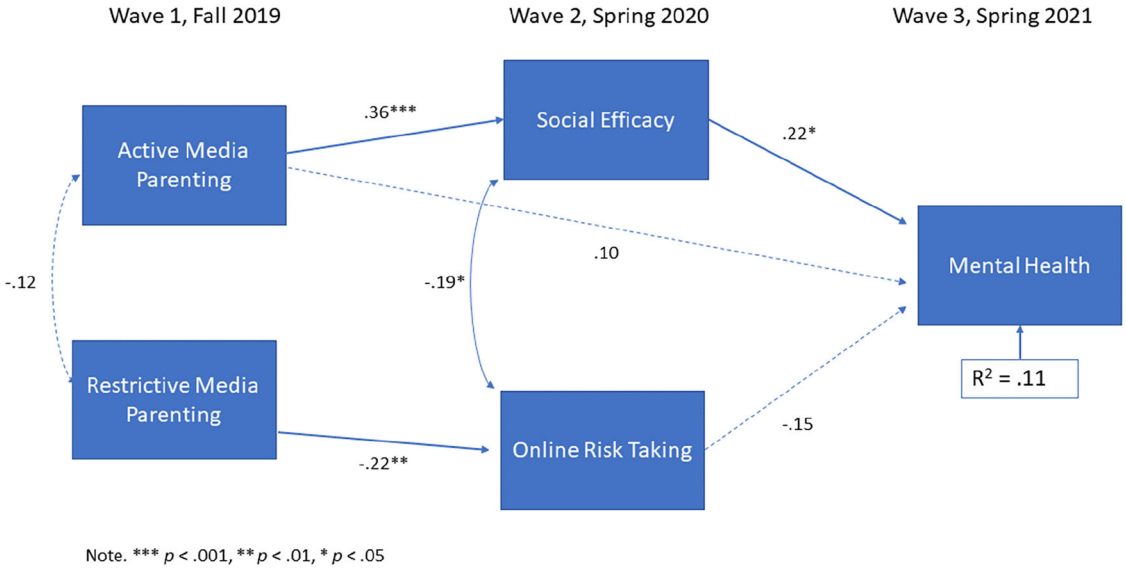

Fig. 2 Results of trimmed model

one's appraisal of risk. Bandura's social cognitive theory implies that when parents discuss their concerns about online risks with their children, they may be modeling risk identification and socially efficacious behaviors to them. Active media parenting may facilitate open discussions and greater self-disclosure (Elsaesser et al., 2017; Kerr et al., 2010). Evidence demonstrates that youth disclosure is the cornerstone for lowering youth risk behaviors (Kerr et al., 2010). Moreover, effective active media parenting could be perceived by youth as a form of social support (e.g., being able to access parents for support when youth encounter something disturbing online). It may offer parents additional opportunities to support positive behaviors demonstrated by youth online (Gabrielli et al., 2018). In turn, perceived social support from family is negatively associated with mental health difficulties (e.g., Noret et al., 2020).

Our findings corroborate several past studies that have documented a relationship between active media parenting and adolescent mental health. Padilla-Walker et al. (2020) found that autonomy-supportive active media parenting monitoring was related to fewer anxiety and depressive symptoms among U.S. 10–20-year-olds. Similarly, Wright & Wachs (2018) reported that active media parenting was related to fewer depressive symptoms a year later among 12–15-year-old adolescents who had been victims of cyberbullying. Moreover, literature shows that involvement from parents and media parenting buffer against media associated risks (Khurana et al., 2015; Chen & Shi, 2019).

To the best of our knowledge, the current study is the first to link active media parenting to social efficacy among adolescents. Our findings align with Schmuck's (2021) results who found a positive relationship between somewhat related constructs, supportive parental communication about digital media use and satisfaction with social relationships four months later among youth in Germany. Beyond the context of media parenting, social efficacy is a known protective factor for mental health resilience. Kim & Cicchetti (2003) found that social self-efficacy was associated with fewer internalizing symptoms among 5–12-year-old, maltreated children. A cross-sectional, population-based study in Norway showed that social efficacy was associated with fewer anxiety symptoms among 14–19-year-olds (Aune et al., 2021). In addition to these studies, our findings suggest that active media parenting may promote adolescent mental health by supporting social efficacy, and this pathway should be further tested.

Restrictive media parenting has been linked to reduction of youth risk behavior (i.e., substance use and sexting, specifically, e.g., Corcoran et al., 2022a) within early adolescence and within specific media contexts (i.e., restriction of youth access to mature media content; e.g., Tanski et al., 2010). In the current study, restrictive media parenting was also linked to a subsequent decrease in youth online risk taking, but no direct association was identified with youth mental health outcomes. While parental restriction can be developmentally appropriate and potentially effective in promoting safer online use for youth, it may be a restrictive parenting style without co-occurring active parenting practices may undermine development of youth autonomy, self-efficacy, and capacity for effective problem-solving within online contexts (Wisniewski et al., 2013; Wright et al., 2017). This may explain in part why restrictive parenting did not lead to more desirable youth mental health outcomes. Alternatively, restriction may be employed in a reactionary way, when parents tend to utilize more restriction with their children who experience more mental health problems, counteracting possible positive influences. Further, use of restrictive parenting alone may represent an overprotective parenting style (Steinfeld, 2021) and may lack the features of parental warmth and positive communication critical for a healthy parent-youth relationship and better youth mental health (Padilla-Walker et al., 2018). These hypothesized explanations for the lack of relationship between parental restriction and mental health outcomes should be examined in future research.

Generally, active media parenting practices require investment of time and skill development around effective communication (Gabrielli et al., 2018), whereas restrictive media parenting practices may seem more efficient to parents. Restriction in contexts of poor parent-child communication or lack of parenting knowledge about media-related risks may also contribute to lowered youth online self-efficacy (Valkenburg et al., 2013). Restrictive media parenting may be best as a scaffolded style that is tailored to youth capability for risk identification, problem-solving, and help-seeking and likely functions best as an approach to age-appropriately limit youth exposure to passively consumed online risks (e.g., substance use-related market or sexual messaging). The current study implies that active media parenting may promote youth internal resource development, such as social efficacy, and restrictive media parenting may be best suited for online risk reduction.

Flexibility of parenting approaches that enact both restrictive and active parenting techniques and shift towards increased youth autonomy across development are likely optimal to address a range of risks and promote youth social efficacy. Restrictive media parenting alone may undermine a youth's autonomy and development of internal resources that can enable them to navigate the online world in a health promoting way, but active media parenting alone may not fully address online risk behavior that can lead to problematic outcomes for youth (Chen & Shi, 2019). Given that many parents indicate a need for training and support in

media parenting skills (Helfrich et al., 2020), this remains an important area for future research, particularly as youth online behavior relates to youth mental health.

Strengths and Limitations

The strengths of this research are the longitudinal design and the inclusion of mediators to examine the processes by which media parenting may affect youth mental health outcomes. The use of reliable, recently validated media parenting measures is another strength. Nonetheless, limitations must be acknowledged. The small sample size may have contributed to the lack of significance in the pathway from restrictive media parenting to mental health via reduction of online risks. Although we followed existing guidelines on sample size for structural equation models in the current secondary data analysis (Bentler & Chou, 1987; Little, 2013), small samples can introduce bias and may not generalize to the population. To address this, we reported the bootstrapped confidence intervals of our model, which lend confidence to the robustness of the findings. Nonetheless, outcomes should be interpreted with caution due to risks of Type 1 error or overestimation, and further research with larger samples is needed to establish generalizability. Further, the small sample size precluded more rigorous analytic designs such as an autoregressive cross-lag analysis. Replicating this research with a larger sample size would also allow a test of more complicated models, such as those that include both parent and child report or bidirectional effects.

Additionally, although the sample was recruited nationally in the U.S., it cannot be considered representative of the country, as the original sample was lacking in some ethnic racial groups such as American Indians and Latinx youth and lacking in participants from the Western States. Attrition analysis revealed that youth in rural areas, those whose parents had low education, and older youth were less likely to participate longitudinally. While the context of COVID-19 was a contribution to the literature in this study, the pandemic significantly changed the daily patterns of young people, including online use (UNICEF, 2020). Therefore, the outcomes of this study may have been different if it had been conducted without the context of COVID-19. For example, many parents relaxed their restrictions of online use during the pandemic, yet online risks like cyberbullying may have been lower because young people did not have regular in person contact with their peers (Bacher-Hicks et al., 2021; Vaillancourt et al., 2021). Given the influence of the pandemic on the daily lives of young people, the outcomes of this research should be replicated again in the post-pandemic context.

Conclusion

Our findings suggest that media parenting may be a strategy that contributes to adolescent mental health, particularly during early adolescence, a sensitive time for development and a time when excessive screen time predicts lower life satisfaction, particularly for girls (Orben et al., 2022). Although parents are influential role models and most media use occurs at home (Kowalksi et al., 2012), few preventative parent-based interventions have been developed and tested (Doty et al., 2021). As young people begin to increase screen time and establish an online presence in early adolescence, media parenting interventions may be an important strategy to promote healthy online behavior and prevent poor mental health outcomes.

Data Availability

Data is available upon request to the corresponding author.

Author Contributions J.D.: Lead the conceptualization and implementation of the study; wrote part of the introduction, methods, and discussion; integrated sections of the manuscript; reviewed and revised manuscript multiple times. X.M.: Conducted the analysis and wrote the results; contributed to editing and critically reviewed the manuscript. J.G.: Contributed to conceptualization and implementation of the study; wrote parts of the discussion; critically reviewed entire manuscript multiple times. B.F.P.: Participated in data cleaning; wrote parts of the introduction; critically reviewed the manuscript. T.S.N.: Participated in data cleaning; wrote parts of the introduction; critically reviewed the manuscript. L.G.M.: Wrote parts of the discussion; critically reviewed the manuscript. C.R.R.: Wrote parts of the introduction; supported descriptive analysis. critically reviewed the manuscript.

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Compliance with ethical standards

Conflict of Interest The authors declare no competing interest.

Ethics Approval and Consent This study was approved by the Institutional Review Board of the University of Florida and conducted in compliance with ethical standards of the Declaration of Helsinki, including the informed consent of all participants.

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