



A Measurement Model of Media Parenting: Differences Across Parent and Child Reports and Youth Age and Sex

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Accepted: 7 January 2022

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Abstract

For youth raised in the Digital Age, online risks such as cyberbullying and sexting have become increasingly problematic. Since digital media is primarily consumed at home, parents play an important role in mitigating these risks; parents can teach children about online dangers, regulate the amount of time spent online, and, to some extent, curate the online content children see. The present study evaluated the psychometric properties of a four-factor media parenting measurement model introduced by Livingstone et al. (2011) across self-reports of a U.S. sample of parents ($M_{\text{age}} = 38.5$) and children (ages 10–14; $M_{\text{age}} = 11.8$). To identify meaningful group differences, latent mean comparisons were evaluated across youth age and gender. Confirmatory Factor Analysis results provided good fit to the data for the four-factor media parenting model based on both parent [$\chi^2(201, n = 306) = 384.407$; $\text{RMSEA}_{(.046-.063)} = .055$; $\text{CFI} = .958$; $\text{TLI/NNFI} = .951$; $\text{SRMR} = .050$] and child report [$\chi^2(203, n = 306) = 378.033$; $\text{RMSEA}_{(.045-.061)} = .053$; $\text{CFI} = .942$; $\text{TLI/NNFI} = .934$; $\text{SRMR} = .060$]. The final latent parenting factors included: Active Mediation, Monitoring, Technology Control, and Restrictive Mediation. Latent mean comparisons revealed that parents of girls reported higher levels of Monitoring than parents of boys, whereas girls reported higher levels of parental Restriction than boys. Similarly, older children and their parents reported lower Restriction than younger children and their parents. Overall, latent mean differences identified between media parenting domains may be important for youth outcomes and provide support for their inclusion as distinct factors in predictive models.

Keywords Media parenting, confirmatory factor analysis · Structural equation modeling · Parent/child reporting · Informant discrepancy · Measurement invariance · Sex differences · Developmental differences

Introduction

America's youth are growing up in a technology-saturated world where they are constantly connected to each other through the internet on personal digital devices (Anderson & Jiang, 2018). A 2018 Pew Research Center survey found

that 95% of American teens either own or have access to a smartphone and 45% report being online “almost constantly” (Anderson & Jiang, 2018). Like most innovation, the benefits of advancing technology (e.g., globalization, education, interpersonal connection; Lenhart et al., 2010; Wright et al., 2001) come with potential disadvantages (e.g., increased access to mature content and influences, unsupervised social connection with strangers, and the opportunity to engage in online risk behaviors; Symons et al., 2020). Parents have the primary responsibility for management of youth media and technological risks, yet relatively little is known about how parents manage youth media access and interaction with media in the home.

Per socialization theory, parents serve as the primary means of teaching children how to function in society and, increasingly, on the internet (Symons et al., 2020). Included in Symons et al.'s conceptualization of socialization is *parental mediation theory*, whereby parents use a variety of strategies to mitigate the negative effects of media on their children (Clark, 2011; Symons et al., 2020). This idea

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became particularly prominent with regards to traditional media use (Clark, 2011; Dorr et al., 1989; Lin & Atkin, 1989; Valkenburg et al., 1999) and typically includes components of the following five domains: 1) Active Mediation (i.e., discussing media content with children); 2) Restrictive Mediation (i.e., setting rules and restrictions on what media can be consumed, for how long, and/or where); 3) Co-viewing or Co-using (i.e., joint participation in a media activity, such as watching TV together); 4) Monitoring (i.e., checking on children's media use, either overtly or covertly, after use); and 5) Technology Control (i.e., using technology to limit media time or content; e.g., Valkenburg et al., 1999).

While emerging research suggests that media parenting is important for youth outcomes, relatively little work has been done to provide psychometric support for the constructs listed above. We also lack consensus on who should be reporting on media parenting behaviors; do parents or children provide more accurate and meaningful interpretation? Moreover, evidence suggests media parenting changes as youth age, as is developmentally appropriate (Padilla-Walker et al., 2012). Research on general parenting has identified differences in parenting behaviors based on child gender, but there is less clarity on whether that applies to media parenting (Morawska, 2020). Additional work is needed to determine the invariance of these constructs across developmental transitions and gender. Subsequently, the present manuscript focuses on assessment of media parenting measurement model fit based on parent and child report as well as invariance across child age (younger vs older) and gender.

Research Foundations of Media Parenting

Alongside the rise of television and personalized media devices in the home came the need to distinguish between general and media-specific parenting practices. Despite conceptual similarities and a strong statistical relationship, media parenting and general parenting behaviors are distinct (Eastin et al., 2006; Sanders et al., 2016; Tanski et al., 2010); parents who are adept at general adaptive parenting are not always able to translate such practices to technology-based parenting. That said, features of the parent-child relationship (e.g., warmth) have been argued to establish the context for media-specific parenting behaviors and may be more important than the parenting practices themselves in deterring online risks like cyberbullying (Elsaesser et al., 2017). These findings underscore the idea that general adaptive parenting is associated with media parenting but may exert differential influence on youth media behaviors.

Research has established media parenting, separate from general parenting, as an important intervening factor on youth risk behavior; parental mediation of media use has been associated with decreased alcohol and marijuana consumption (Cox et al., 2018), aggression (Nathanson, 1999;

Padilla-Walker et al., 2020), risky sexual behavior (Bersamin et al., 2008), cyberbullying perpetration (Elsaesser et al., 2017), cyberbullying victimization (Elsaesser et al., 2017), and other risk behaviors. For example, a 2019 meta-analysis (Chen & Shi, 2019) found that Restrictive Mediation was related to decreased screen time, while Active Mediation and Co-viewing were most effectively employed for reducing risk behavior. This holds with the idea that children are more able to resist negative media effects when they have developed skills to critically engage with the material (Warren et al., 2002).

Although most traditional parental media mediation behaviors still have obvious application with personalized media devices, the changing media landscape warrants re-evaluation of the original media parenting scales that were primarily focused on media such as traditional television and movie content. For example, parents Co-use/Co-view traditional media, such as television, much more frequently than video games or individual devices like smartphones or tablets (Livingstone & Helsper, 2008). Given that youth are spending increasing time with streamed media content (Rideout & Robb, 2019), parenting within internet-based contexts seems to be rising in importance. Despite growing literature on the various media parenting domains, research is still in its nascent phases for evaluation of the validity and reliability of measures, particularly with regards to modern media contexts and technology.

Psychometric Properties of Media Parenting Measures

Bybee et al. (1982) first discussed the psychometric properties of a media parenting scale in the context of television use, using Principal Components Analysis to identify three parenting domains: Restrictive Guidance (i.e., restrictions on amount and content of media viewed), Evaluative Guidance (i.e., parenting behaviors aimed at helping the child "evaluate the meaning, morality and characterization of television programs"), and Unfocused Guidance (i.e., watching television with the child, encouraging certain programs, and talking about the content). In the decades that followed, multiple research groups (e.g., Valkenburg et al., 1999; Austin et al., 1993; Dorr et al., 1989; Van den Voort et al., 1992) across fields (e.g., communications, psychology, public health, and marketing) have undertaken research on the topic. In the process, additional/alternative domains such as Active Mediation (i.e., active discussion of television content), Co-viewing (i.e., watching media together with children), and Instructive Mediation (i.e., discussing, explaining, and teaching around television content) emerged, with often overlapping component behaviors or themes. For this and other reasons, a shared understanding of the term "mediation" and the domains within is lacking (Nathanson, 2001). Nathanson (2001) endeavored to synthesize the extant research, identifying Active Mediation, Restriction, and Co-viewing as

three primary media parenting domains. Active Mediation encompasses behaviors described in Instructive Mediation and Evaluative Guidance above and is marked by engagement with youth about media, with the goal of building their ability to assess media independently and decrease susceptibility to mature content. Although Active Mediation often occurs while parents Co-view content with their children, it is not necessary for Co-viewing and is thus distinct. Examples of Active Mediation might include explaining why a character got sick when drinking alcohol; Restrictive Mediation might include setting a rule in the home that the television cannot be used after 9 in the evening; Co-viewing might be employed by watching a television show with the child. This three-dimensional classification predominates today.

While providing a valuable framework, limitations exist in the use of television-specific domains for new digital/social media. Traditional media, or broadcast media, is typically created by a production company or otherwise external source and consumed passively. Conversely, new digital/social media is both passively consumed and actively engaged with, as individuals can create their own content and consume the content of peers and companies alike (Chassiakos et al., 2016). If considered in the context of social learning theory (Bandura, 1986), this has implications for how the content is processed; for example, peer content will likely be interpreted and internalized differently than content that is industry-derived and then broadcast. Accordingly, Eastin et al. (2006) adapted Valkenburg et al.'s (1999) media parenting domains to be more applicable to modern technology, adding Technological Mediation to account for the use of tracking software to monitor internet use (per Greenberg et al., 2001). Livingstone et al. (2011) also assessed technical mediation in addition to previously defined domains (e.g., Active Mediation of child's internet use, Active Mediation of child's internet safety, Monitoring, Restriction), aiming to capture parenting behaviors specific to modern media and technology. A subset of these domains and items were used in the present study.

Despite laying conceptual groundwork, research on the topic of parental mediation broadly lacks psychometric support; a 2013 meta-analysis of studies on media parenting found that only 20.7% of studies provided information on the psychometrics of outcome and exposure measures (Jago et al., 2013). In order to address this gap, researchers have more recently employed structural equation modeling techniques, thus enabling assessment of model fit and structure. Nikken and Jansz (2014) identified a five-factor media parenting model with youth aged 2 – 12 years including Co-use, Active Mediation, Restrictive Mediation, Supervision, and Technical Safety Guidance, with the latter two domains more specific to modern media. Ho et al. (2019) tested a four-factor model of parental mediation specific to social media including Active, Restrictive, Non-intrusive

Inspection, and Authoritarian Surveillance. Model fit for these constructs were acceptable and promising for the forward progression of a media parenting construct. That being said, Ho et al.'s (2019) work is focused on social media rather than media on the whole, and Nikken and Jansz's (2014) findings are almost a decade old and focused on a younger population rather than adolescents who use online media more heavily. Both are centered on populations in their respective countries (Singapore and Denmark). Thus, although suggestive of reliable domains, these findings highlight the need for confirmation of a reliable media parenting measure that is applicable to the changing media landscape in the United States. These findings also underscore the question others have asked of whether previously established domains are relevant, or if we should be developing a new construct rather than modifying an existing construct (e.g., Eastin et al., 2006; Nikken & Jansz, 2003). The present study addresses these questions by testing a measurement model of media parenting behaviors, adapted from those of Livingstone et al. (2011), in a covariance model to assess for relationships across domains. This measure has been tested by others utilizing all five original scales and binary response options (Dürager & Sonck, 2014) and has been found to associate significantly with youth outcomes (e.g., parental risk perception, children's online skills, children's online opportunities, and children's online risks; Livingstone et al., 2017). Adaptations made in the present study address the suggestions of previous researchers to utilize ordinal scales (Dürager & Sonck, 2014) as well as the need to continually update measures to apply to the current media landscape. The present study also extends use of the measure, which was developed with a European sample, to a nationally representative United States sample of middle school-aged youth and their parents. Finally, this study also offers a comparison of parent and child report, which few studies have done with media parenting behaviors.

Media Parenting Across Age and Gender

Previous research has identified trends in media parenting between younger and older children. For example, the developmental trajectory of media parenting appears to mirror that of general parenting, whereby parents become less restrictive as their youth age (e.g., Lin & Atkin, 1989; Padilla-Walker et al., 2012; Rideout et al., 2010). The increased use of mobile devices also lends itself to less parental supervision and monitoring both inside and outside of the home (Kerr et al., 2010). Similarly, research has found that Active Mediation decreases with youth age (Beyens & Valkenburg, 2019; Padilla-Walker et al., 2012; Warren, 2017), although earlier research with traditional forms of media did not find this to be the case (Bybee et al., 1982; Van der Voort et al., 1992). Developmental trends are less clear for Co-viewing;

although some researchers have found evidence of decreased Co-viewing over time (Austin et al., 1999; Warren et al., 2002), others have posited that Co-viewing increases with youth age (Dorr et al., 1989), potentially due to converging media interests (Gentile et al., 2012). Overall, tapering of mediation with youth age is expected; if parents are adapting to children's need for monitoring and supervision in balance with children's need to develop skills around autonomy and independence, media parenting *should* show developmental differences in reliable and predictable trends.

Research on gender differences in media parenting is relatively scarce and difficult to synthesize due to contradictory findings and different contexts. A 2020 meta-analysis of general parenting literature identified gender differences in parenting (Morawska, 2020), but, to date, there is no consensus on whether this occurs with media parenting. Early research suggested that there was no difference in Active Mediation or Co-viewing based on child gender (Bybee et al., 1982; Valkenburg et al., 1999; Van der Voort et al., 1992). Eastin (2006) found similar results for Interpretive Mediation between males and female children but identified gender differences for Co-viewing, content and time restrictions. Lin and Atkin (1989) found that parents of males were more likely to set rules on VCR-usage (e.g., when, how often, with whom, and what they could watch) than parents of females, although in a literature review, Nathanson (2001) did not identify notable gender differences in parental Restriction. Given these discrepancies, further exploration of parental media mediation between genders, particularly in the context of new media, is warranted.

Higher-order Models

For the purposes of parsimony, summarizing across domains of media parenting with a higher order construct may prove useful for future research. Indeed, mediation itself can be considered a higher order construct (Nathanson, 2001), and the manner in which specific media parenting behaviors are grouped within is up for debate. In recognition of the various behaviors comprising parental media mediation and the conceptual and behavioral overlap implicit between them, research has explored the possibility of consolidating media parenting behaviors into fewer factors (Livingstone et al., 2017). For example, Livingstone et al. (2017) utilized factor analysis with varimax rotation to identify a two-factor structure: Restrictive and Enabling media parenting. This Enabling or Evaluative factor included Active media parenting (as previously defined), Technology Controls, and Monitoring, while the Restrictive factor remained the same and referred to rules and restrictions on media content and use. Although conceptually this divide between more active engagement and passive rule setting is clear,

the two-factor structure only accounted for 65% of the variance in parent behavior (Livingstone et al., 2017). Furthermore, research has established differential effects of the Evaluative factor's component parts (i.e., Active, Monitoring, and Technology Controls) on outcomes, calling the efficacy of consolidation of media parenting domains into a single factor into question. For example, Campbell and Park (2014) found that parental monitoring was not associated with decreased youth sexting behaviors but frequent family communication was.

Thus, despite demonstrating potential, higher order constructs require further exploration. For the purposes of this study, we label the Enabling/Evaluative factor as described by Livingstone et al. (2017) as "Proactive" media parenting to better reflect the more active behaviors employed by parents using Active Mediation, Monitoring, or Technology Control. These behaviors are marked by parent engagement with child media use either through discussion, checking, or adaptively implementing technology to monitor use or limit media content/time. This is compared to Restrictive Mediation, which is captured by behaviors intended to prevent exposure to mature content and do not assume access to media (e.g., "please specify how restrictive your parents are about having your own social networking profile," with options ranging from "never let me" to "whenever I want").

Discrepancies by Reporter: Parent Versus Child

Although most research to this point has utilized parent report (Nathanson, 2001), it remains unknown whether parents or children are better reporters of media parenting behaviors. Comparative studies have found disagreement between parent and child report measures (Fujioka & Austin, 2002); for example, a study of parent and child report of parental mediation found that reports were correlated but significantly different in value (Beyens & Valkenburg, 2019). These discrepancies could exist for a variety of reasons, including that children may not be privy to the parental mediation strategies being implemented or perceiving them as strategies at all (Buijzen et al., 2008). They may also want to overclaim their independence by downplaying rules placed on them (Greenberg et al., 1972; Lin & Atkin, 1989). Conversely, parents are vulnerable to social desirability bias, thus potentially overstating their use of mediation strategies (Garmendia et al., 2012; Greenberg et al., 1972; Lin & Atkin, 1989). These reporter discrepancies may be reflective of family dynamic and informative for outcomes (Des Los Reyes, 2011); for example, discrepancy in parent and child report of parental monitoring surrounding alcohol behavior was found to be predictive of increased youth alcohol use (Abar et al., 2015).

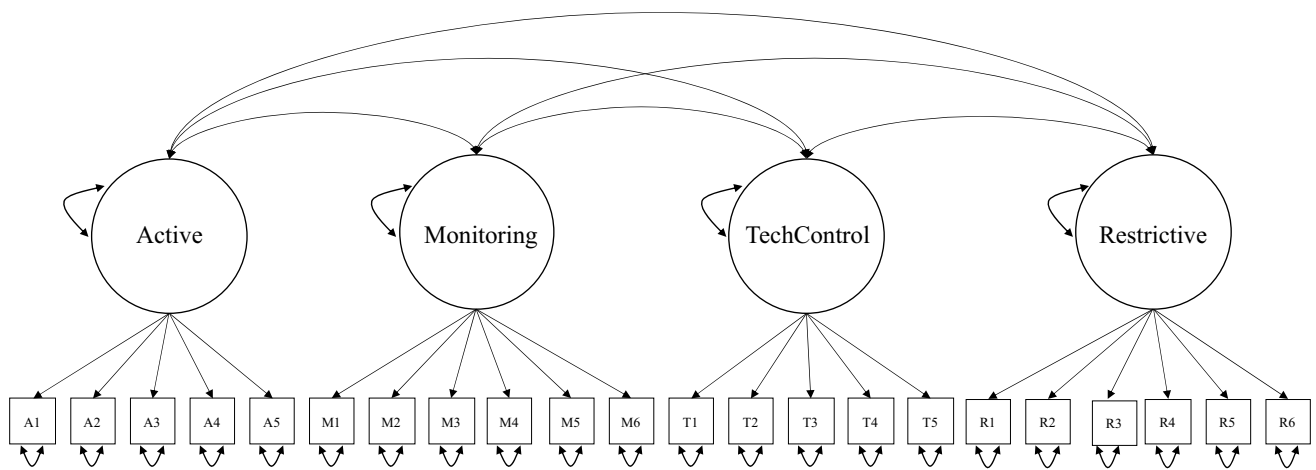


Fig. 1 Hypothesized four-factor measurement model of media parenting behaviors

Present Study

Based on prior support for parenting domains, we hypothesized that a four-factor latent measurement model would provide acceptable fit to the data across both parent and child reporters (Aim 1; Fig. 1). We adapted the domains proposed by Livingstone et al. (2011; 2017) by combining Active Mediation of internet use with Active Mediation of internet safety and trimming less relevant items (e.g., digital safety, which was captured elsewhere in the survey) to reduce participant burden. We included an exploratory aim to test the possibility of a one-factor (general media parenting; Fig. 2) or two-factor (Restrictive and Proactive media parenting; Fig. 3) higher order model. Further, we hypothesized that the final measurement models would be invariant across youth age (10 – 11 years old vs 12 – 14 years old) and

youth gender (male vs female; Aim 2). Once invariance was established, we examined latent mean differences in the four media parenting constructs across groups (Aim 3). Based on developmental theory suggesting that parents relax rules and structure as children age and prior literature suggesting that parents may interact with male and female children differently, we expected to identify latent mean differences in media parenting approaches across youth age and gender.

Method

Participants were 306 parent/child dyads representing all five regions of the United States enrolled in an online survey of parent and child technology use and online experiences. Data included parent report of media management

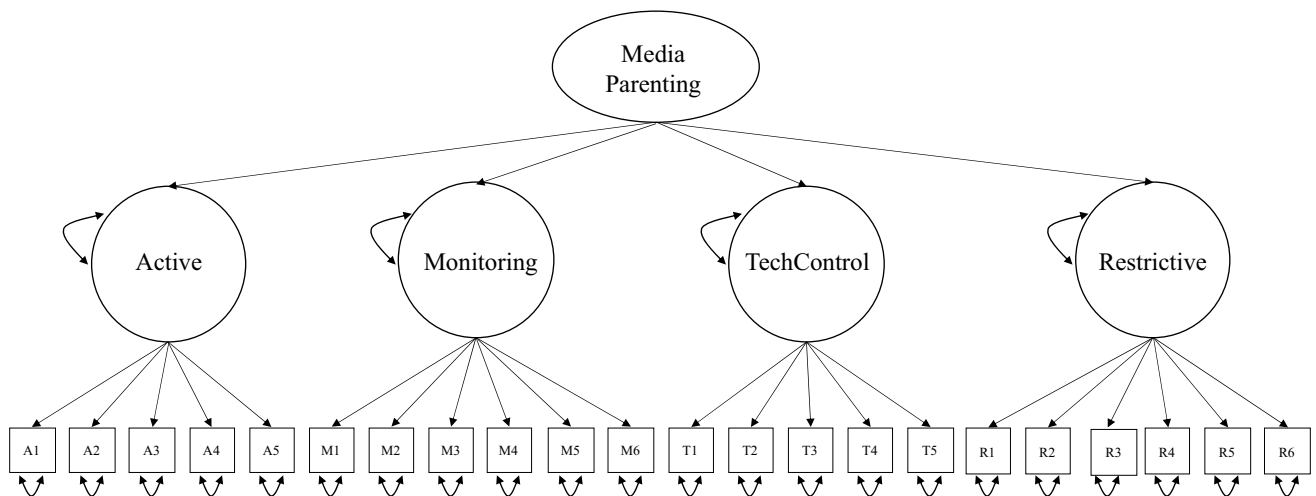


Fig. 2 Exploration of single factor higher order measurement model of media parenting behaviors

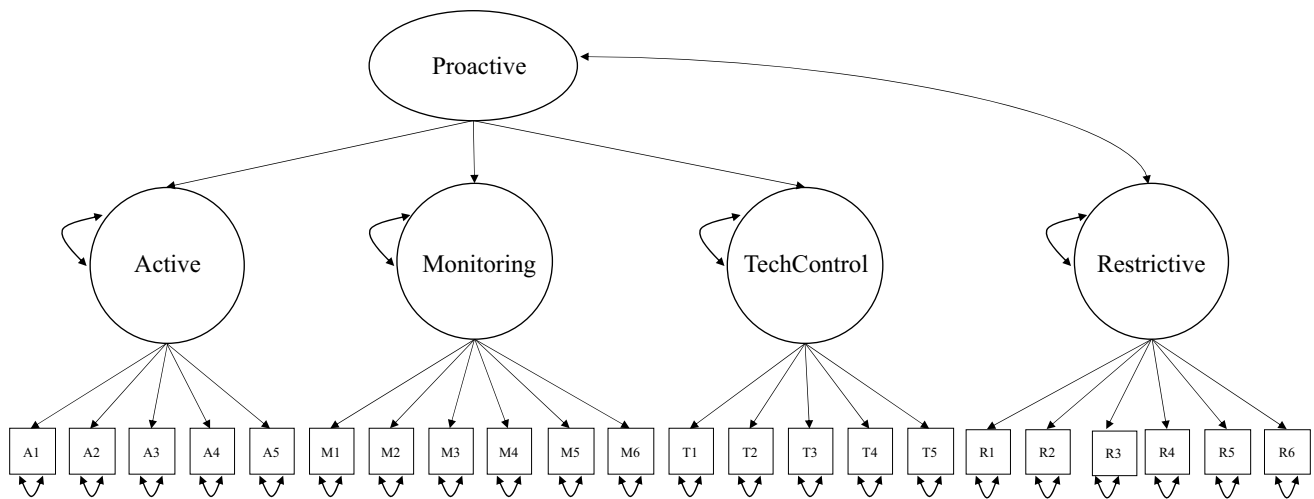


Fig. 3 Exploration of two-factor higher order measurement model of media parenting behaviors

behaviors, youth report of the same, and a variety of youth report measures regarding online and built-world risk behaviors. Parents of 10–14-year-old children were identified and recruited by Qualtrics panel specialists. After completing the initial portion of the survey, parents provided consent for their 10–14-year-old child to participate and were instructed to afford children privacy to complete the survey. Children provided assent for participation.

Of child reporters, 49% were female and 20% minority (primarily Hispanic or Black), with an average age of 11.8 years ($SD=1.23$ years). Of parent reporters, 61% were female, 20% minority (primarily Hispanic or Black), and 71% married or living with a partner, with an average age of 38.5 years ($SD=6.01$ years). Parents indicated that 51% of youth received free or reduced lunch at school (a descriptive proxy for sample socio-economic status; Table 1).

Measures

Parents reported on demographic questions about themselves and their children, including age, gender, race/ethnicity, whether the child receives free or reduced lunch (a socio-economic indicator), and parent marital status (included for sample description). Children also provided demographic information on age, gender, and race/ethnicity, which were compared to parent report for data cleaning purposes.

Parents were asked 22 questions about the frequency of parental mediation strategies that are used in the home based on previous studies by Livingstone et al. (2011; 2017), with Likert-style responses ranging from 1 = Not at All to 5 = Almost All the Time. Children were asked a random selection of 16 of these questions (with language adapted to reflect youth perspective) to reduce burden on child participants. This planned missingness design is described in more detail below. Cronbach's α for the

four mediation scales reflected acceptable to excellent internal consistency (George & Mallery, 2003): 1) *Active Mediation* (5 items; parent report [PR] $\alpha=0.84$; child report [CR] $\alpha=0.77$), including items such as, “Do you or your child’s other parent/caregiver currently talk to your child about what he/she does on the internet?” 2) *Restrictive Mediation* (6 items; PR $\alpha=0.89$; CR $\alpha=0.76$), including items such as, “Please specify the extent to which you or your child’s other parent/caregiver restrict your child from giving out personal information to others on the internet.” 3) *Technology Control* (5 items; PR $\alpha=0.91$; CR $\alpha=0.85$), including items such as “How often do you use parental control technologies to block or filter some types of websites your child visits?” and 4) *Monitoring* (6 items; PR $\alpha=0.99$; CR $\alpha=0.81$), including items such as “Do either you or your child’s other parent/caregiver check which websites your child visited based on his/her internet browsing history?” These questions were reframed for youth participants; for example, the first question in the *Active* domain read “do either of your parents currently talk to you about what you do on the internet?”

Other survey items that were not included in the measurement model but were included in the imputation include parent report of youth access to technology and history of school suspension, as well as child report of digital safety, problem behavior frequency, cyberbullying perpetration and victimization, and social self-efficacy. The parent survey was estimated to take 20 minutes and the child survey 30 minutes.

Procedure

Data Analytic Plan

We utilized confirmatory factor analyses (CFA) within a structural equation modeling framework using *Mplus* 8.4 (Muthén &

Table 1 Sample Descriptives

Variable	n	%	<i>M</i>	<i>SD</i>
Youth Age	–	–	11.8	1.2
10	57	18.6		
11	71	23.1		
12	81	26.4		
13	71	23.1		
14	26	8.5		
Parent Age	–	–	38.5	6.0
Youth Gender				
Male	155	50.7		
Female	151	49.2		
Parent Gender				
Male	120	39.2		
Female	186	60.8		
Youth Race/Ethnicity				
Black or African American	35	11.4		
White or Caucasian	214	69.9		
Hispanic/Latino	27	8.8		
Other	30	9.9		
Parent Race/Ethnicity				
Black or African American	39	12.7		
White or Caucasian	220	71.9		
Hispanic/Latino	21	6.9		
Other	47	8.5		
Parent Marital Status				
Divorced or Separated	40	13.1		
Married	189	61.8		
Never Married	40	13.1		
Widowed	8	2.6		
Living Together Not Married	29	9.4		

Muthén, 2017) to evaluate the four-factor and higher-order latent measurement models across parent and child reports. Maximum likelihood estimation was utilized. Models were identified via variance standardization. Indicator loadings were evaluated for statistical significance at the $p < 0.001$ level. Model fit was estimated using guidelines set forth by Little (2013), with the root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR) less than 0.08, and comparative fit index (CFI) and Tucker–Lewis index or non-normed fit index (TLI/NNFI) above 0.90.

In order to reduce test-taking burden on child participants, the child portion of the survey utilized a planned missingness design whereby each child was randomized to receive two thirds of the questions in each parent mediation scale. This approach was justified according to the findings of Little and Rhemtulla (2013) as well as Jia et al. (2014). Planned missingness designs enable researchers to interpret missing data as MCAR due to the completely random nature of assignment, which, in turn, mitigates risk of estimation bias (Little et al., 2013). Although

the absence of responses decreases power, multiple imputation is one of the two modern missing data estimation techniques that restores missing power without biasing point estimates (Johnson & Young, 2011; Little et al., 2013). Regardless of planned missingness, total missingness for any given item did not exceed 33%. Multiple imputation was used to estimate these values. There was no missingness on parent items. Invariance testing was employed to determine measurement equivalence across child gender and age (10–11 and 12–14) for both parent and child report. Following the guidelines set forth by Byrne (2013), configural invariance was first established by comparing groups without constraints. Then, factor loadings of each group were constrained to equality to assess metric (or weak) invariance. Finally, intercept means were constrained to equality for scalar (or strong) invariance. If model fit of each iteration is significantly worsened from the configural model, as determined by a significant Chi Square Difference Test or a decrease in CFI or TLI values of more than 0.01, then invariance is not supported (Cheung & Rensvold, 2002). Once scalar invariance is

established, latent mean comparisons can be made. Independent samples T-Tests were conducted to compare parent and child report of media parenting behaviors.

Results

Measurement Model Fit

For the parent-report model, all indicator factor loadings for Active, Monitoring, Technology Control and Restrictive Mediation were statistically significant at the $p < 0.001$ level. Modification indices were evaluated, and, in conjunction with theoretical rational, the following residuals were then freed to correlate: 1) Monitoring indicators: “Do either you or your child's other parent/caregiver check your child’s profile on a social network or online community?” and “Do either you or your child's other parent/caregiver check which friends or contacts your child adds to his/her social networking profile?”; 2) Technology Control indicators: “How often do you use parental control technologies to block or filter some types of websites your child visits?” and “How often do you use parental control technologies to keep track of the websites your child visits?” Following the freeing of these two residuals, CFA using maximum likelihood estimation demonstrated adequate fit in the overall sample $\chi^2(df=201)=384.407$; $RMSEA_{(0.046-0.063)}=0.055$; $CFI=0.958$; $TLI/NNFI=0.951$; $SRMR=0.050$ (see Fig. 4).

For the child-report model, all factor loadings for Active, Monitoring, Technology Control and Restrictive Mediation were statistically significant at the $p < 0.001$ level. CFA demonstrated adequate fit in the overall sample $\chi^2(df=203)=378.033$; $RMSEA_{(0.045-0.061)}=0.053$;

$CFI=0.942$; $TLI/NNFI=0.934$; $SRMR=0.060$ (see Fig. 5). No indicator residuals were freed in the child model.

Inter-rater bivariate correlations (between parents and children; r) ranged from 0.41—0.80, which is interpretable as medium to large effect sizes per Cohen (1988; see Table 2) and $p < 0.001$. Active Mediation items were least correlated between reporters (0.414—0.632, $n=5$), followed by Monitoring (0.545—0.614, $n=6$). Restriction and Technology Control were most correlated (0.600—0.807, $n=6$; 0.658—0.734, $n=5$). Within both parent and child models, Active Mediation, Monitoring and Technology Control were all significantly positively related to each other, while Restrictive Mediation was only significantly related to Active Mediation (see Figs. 4 and 5).

Higher-order Models

Two possible high order models were assessed: an overarching media-parenting factor and a two-factor model with Restrictive and Active Mediation (comprising Active, Technology Control and Monitoring, similar to the Enabling factor defined by Livingstone et al., 2017). Both iterations had very similar model fit, which did not provide significant improvement over the four-factor model and, in fact, were slightly worse: PR $\chi^2(df=203)=397.171$; $RMSEA_{(0.048-0.064)}=0.056$; $CFI=0.955$; $TLI/NNFI=0.949$; $SRMR=0.061$; CR $\chi^2(df=205)=388.537$; $RMSEA_{(0.046-0.062)}=0.054$; $CFI=0.939$; $TLI/NNFI=0.931$; $SRMR=0.066$. While model fit indices were acceptable for the higher order constructs, reductions at this level may obscure important cross-scale differences. Thus, the four-factor model was the final model used for invariance tests, below.

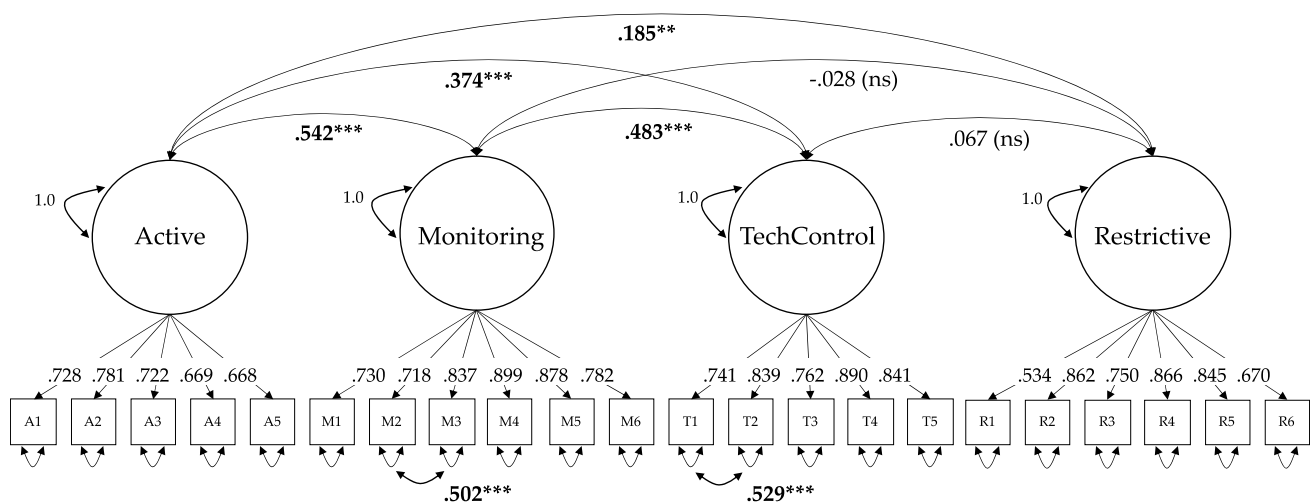


Fig. 4 Parent Report – Final four-factor measurement model of media parenting behaviors with standardized loadings, factor covariances, correlated residuals, and residual error values. ***Indicates significance at $p < .001$; ns = non-significant

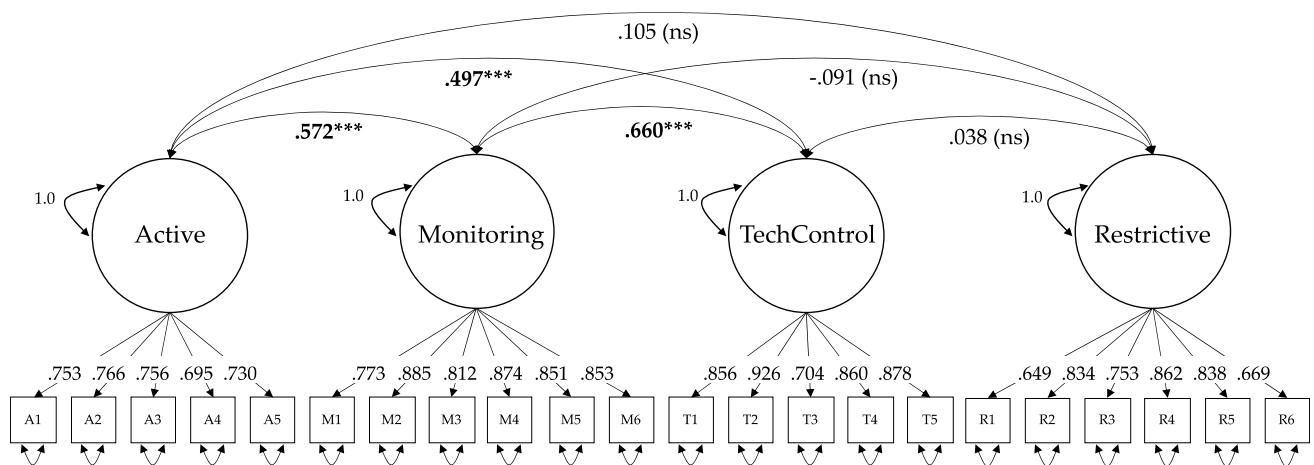


Fig. 5 Child Report – Final four-factor measurement model of media parenting behaviors with standardized loadings, factor covariances, and residual error values. All factor loadings are significant at $p < .001$. *** $p < .001$; ns = non-significant

Group Invariance Testing across Child Age and Gender

The first step of invariance, configural, was assessed by separately testing the measurement models of younger and older

children for parent and child report, with both achieving good to acceptable model fit per standards outlined above: PR $\chi^2(df=402) = 705.064$; RMSEA_(0.062–0.079) = 0.070; CFI = 0.932; TLI/NNFI = 0.922; SRMR = 0.062; CR $\chi^2(df=406) = 823.667$; RMSEA_(0.074–0.090) = 0.082;

Table 2 Correlations Between Parent and Child Report of Media Parenting Behaviors

		Correlation	n
<i>Active</i>			
A1	Talk about internet activity	0.41	243
A2	Explain why some websites good or bad	0.47	245
A3	Suggest ways to use the internet safely	0.51	244
A4	Suggest ways to behave towards other people online	0.63	245
A5	Provide help when something bothers child on the internet	0.46	246
<i>Monitoring</i>			
M1	Websites visited based on browsing history	0.59	201
M2	Profile on social media	0.60	204
M3	Friends on social media	0.55	206
M4	Messages on email or instant messaging account	0.61	202
M5	Texts or photo messages on cell phone	0.58	203
M6	Apps installed on cell phone	0.56	202
<i>Technology Control</i>			
T1	Block or filter websites	0.73	241
T2	Track websites visited	0.69	245
T3	Limit time on the internet	0.66	243
T4	Monitor text or photo messaging activities from cell phone	0.66	246
T5	Monitor what apps are installed or used on cell phone	0.72	243
<i>Restrictive</i>			
R1	Give out personal information to others on the internet	0.60	208
R2	Upload photos, videos or music to share with others	0.73	203
R3	Download music or films on the internet	0.67	203
R4	Have a social media profile	0.78	203
R5	Use instant messaging	0.75	199
R6	Have cell phone	0.81	203

All factor loadings significant at $p < .001$

CFI=0.871; TLI/NNFI=0.854; SRMR=0.091. A similar model fit and pattern of salient and non-salient factor loadings was observed between groups, allowing us to proceed to test metric invariance. The additional constraints on factor loadings did not result in significantly worse model fit for parent and child models across child age and gender based on the change in χ^2 , CFI, and TLI (see Table 3), thus allowing us to proceed to scalar invariance. Accordingly, scalar invariance also did not significantly worsen model fit for parent or child report (see Table 3).

Invariance testing for males and females was conducted in a similar fashion to that which was described above. Configural invariance was established across male and female models based on parent and child report, indicating a similar factor structure. Both achieved good to acceptable model fit: PR $\chi^2(df=402)=695.870$; $RMSEA_{(0.060-0.078)}=0.069$; CFI=0.934; TLI/NNFI=0.924; SRMR=0.064.; CR $\chi^2(df=406)=730.744$; $RMSEA_{(0.064-0.081)}=0.072$; CFI=0.897; TLI/NNFI=0.883; SRMR=0.080. Metric and full scalar invariance were also established for gender and age models (see Table 3).

Media Parenting Factor Means

Latent mean comparisons indicate that parents of females reported higher levels of Monitoring than parents of males (*Mean Difference (Mdiff)*=0.297, $p<0.05$), whereas female youth reported higher levels of Restriction than male youth

(*Mdiff*=0.273, $p<0.05$). Similarly, older children and their parents reported lower Restriction than younger children (*Mdiff*=0.429, $p<0.01$) and their parents (*Mdiff*=0.382, $p<0.01$; see Table 4) for a comparison of parent and child mean scores). Overall, parents and children reported more Active Mediation than any other technique (PR $M=4.282$; CR $M=4.080$), followed by Monitoring (PR $M=3.703$; CR $M=3.489$), Restriction (PR $M=3.270$; CR $M=3.060$), and Technology Control (PR $M=3.383$; CR $M=3.221$). Two-tailed independent sample T-Tests revealed a significant difference between parent and child report of Active Mediation at $p<0.01$, with parents reporting more Active Mediation than their children overall, $t(610)=3.339$. Non-significant differences were found for reports of Monitoring $t(610)=2.332$, Technology Control $t(610)=2.337$, and Restriction $t(610)=1.527$.

Discussion

Parents are in a critical position to intervene on youth online risk behavior through media mediation. The present study adds to and synthesizes findings of the small body of research on the psychometric properties of media parenting measures (e.g., Bybee et al., 1982; Ho et al., 2019; Livingstone & Helsper, 2008; Valkenburg et al., 1999, 2013; Van der Voort et al., 1992), supporting the presence of four distinct media parenting factors and the efficacy of both parent and child

Table 3 Fit Indices for Invariance Testing Across Youth Gender and Age (10–11 Years Old Versus 12–14 Years Old)

		χ^2	df	p	$\Delta\chi^2$	df	p	CFI	Δ CFI	TLI/NNFI	Tenable? ^a
Child Report – Gender											
	Configural	730.744	406	0.000	–	–	–	0.897	–	0.883	–
	Weak	743.829	424	0.000	13.085	18	0.786	0.899	0.002	0.890	Yes
	Strong	763.586	442	0.000	19.757	18	0.347	0.898	-0.001	0.894	Yes
Child Report – Age											
	Configural	823.667	406	0.000	–	–	–	0.871	–	0.854	–
	Weak	836.371	424	0.000	12.704	18	0.809	0.873	0.002	0.862	Yes
	Strong	847.893	442	0.000	11.522	18	0.871	0.875	0.002	0.869	Yes
Parent Report – Gender											
	Configural	695.870	402	0.000	–	–	–	0.934	–	0.924	–
	Weak	713.448	420	0.000	17.578	18	0.484	0.934	0.000	0.927	Yes
	Strong	737.978	438	0.000	24.53	18	0.138	0.932	-0.002	0.929	Yes
Parent Report – Age											
	Configural	705.064	402	0.000	–	–	–	0.932	–	0.922	–
	Weak	718.780	420	0.000	13.716	18	0.747	0.933	0.001	0.926	Yes
	Strong	740.662	438	0.000	21.882	18	0.237	0.932	-0.001	0.928	Yes

Weak and Strong Invariance tests evaluated according to Chi Square Difference test and change in CFI. Configural models provide baseline for metric and scalar tests that follow

^aIf Tenable = Yes, invariance is established at that level

Table 4 Results of Latent Mean Comparisons of Parent and Child Reports of Media Parenting Behaviors Across Male (Reference) Versus Female Children and 10–11 Year Olds (Reference) Versus 12–14 Year Olds

Factor	Gender		Age	
	<i>M</i> Difference	<i>p</i>	<i>M</i> Difference	<i>p</i>
Parent				
Active	0.152	0.206	-0.090	0.470
Monitoring	0.257*	0.022	0.033	0.769
Tech Control	-0.024	0.844	0.136	0.268
Restrictive	0.169	0.138	-0.338**	0.004
Child				
Active	0.205	0.105	-0.189	0.168
Monitoring	0.194	0.098	0.061	0.602
Tech Control	0.014	0.903	0.114	0.337
Restrictive	0.256*	0.033	-0.378**	0.002

Latent means for males and younger youth, respectively, were used as reference groups and standardized to have means of zero. Non-equivalence suggests significant latent mean differences

* $p < .05$; ** $p < .01$

report. Construct validity, including convergent and discriminant validity, is well supported by the present study, with individual items loading onto their respective factors similarly to other within-factor items at a significance of $p < 0.001$. Results also indicate differences in parenting across child age and gender, with more Restriction for younger youth, and more Monitoring (parent report) and Restriction (child report) for females. A second aim of this study was to assess the equivalence of measurement models across age and gender for parent and child report of media parenting behaviors, which findings confirmed.

Implications of Measurement Model

Researchers have questioned whether the parenting domains established in the television research are still applicable, or whether the existing domains should be entirely reconsidered in the digital age (e.g., Eastin et al., 2006). Given the present study's identification of well-fitting models and correlated parent–child reports, complete overhaul of the models developed in earlier research (e.g., Bybee et al., 1982; Valkenburg et al., 1999) based on youth TV viewership appears unwarranted. Rather, these measures might best be updated with question content more specific to today's technology usage (e.g., social media; Nikken & Jansz, 2014; and Ho et al., 2019), and refining the more active components of media parenting practices, such as Active, Monitoring, and Technology Control. The domains set forth by Livingstone et al. (2017) make progress towards this goal by removing Co-viewing and incorporating Technology Controls. The present study iterates on such progress via a structural equation modeling approach enabling assessment of model fit and comparison of parent and child reports. Future research may also explore the re-integration of Co-viewing with appropriate adaptations for applicability to traditional

and new media, such as the TECH parenting model proposed by Gabrielli et al. (2018) comprising Talk, Educate, Co-view and House Rules. Included in the Co-view/Co-use domain is guidance specific to new media. Additionally, a gap that needs to be addressed is the potential change in parenting techniques with the emergence of more personalized media devices. For example, monitoring youth television viewership is considerably different than youth Snapchat and Instagram usage, which involve private messages and time-limited content. It is also different than supervision of video games, which is increasingly interactive and immersive (Jiow et al., 2017). At the center of much new media is privacy and, without validated measures of youth media privacy perceptions and behaviors, it is challenging to have a comprehensive understanding of youth media use. An understanding of how media parenting directly relates to youth online behavior, including privacy, will be important in determining whether media parenting is actually effective in the current media environment.

In the present study, Active, Monitoring, and Technology Control factors are positively related across reporters, but only parent report indicated significant associations between Restrictive Mediation and any other constructs, in this case a positive relationship with Active Mediation. In other words, parents tend to employ these behaviors in tandem, and parents who are utilizing Active Mediation techniques are likely to be simultaneously Monitoring, Restricting, and using Technology Control. This supports past research which has argued that the use of multiple forms of mediation in conjunction may be most effective for youth outcomes (Padilla-Walker et al., 2018). More work is needed to assess how different strategies can be combined most effectively. The lack of shared covariance between Restrictive Mediation and Technology Control and Monitoring helps explain the lack of significant improvement by adding a single higher order

media parenting construct. By the same logic, the shared variance between Active, Technology Control, and Monitoring may appear to lend credence to a two-factor Proactive and Restrictive structure. While the two-factor higher order constructs did not provide improvements to model fit, they did offer acceptable model fit. There are a variety of potential reasons for this finding. Some research has suggested that media parenting behaviors are differentially employed in proactive and reactive situations (Wisniewski et al., 2015). Additionally, there is evidence that parenting behaviors may have differential effects on outcomes; autonomy-granting behaviors (such as Active Mediation) lead to better outcomes than autonomy-restricting behaviors (which may include Monitoring and Technology Controls; Ghosh et al. 2018b). When considering employment of higher order constructs within measurement of media parenting, future work should weigh potential benefits (e.g., parsimony of measurement model/constructs) and costs (e.g., loss of specificity across potentially divergent parenting factors). Given the nascent stage of this literature and emerging work on measurement models, it may be important for researchers to present both higher order and lower order models until more consistent relations are established.

Reporter Discrepancies

Unique to the present study is a comparison of parent and child report of parental Active Mediation, Restrictive Mediation, Monitoring, and Technology Control through structural equation modeling; historically, researchers will only utilize one reporter depending on their research question or convenience (Nathanson, 2001). Beyens and Valkenburg (2019) undertook a similar task looking at Restrictive and Active Mediation, albeit through correlations and t-tests, finding that parent and child report on the frequency of media parenting are correlated, with parents reporting significantly more Active and Restrictive behaviors than youth. Nikken and Jansz (2006) also found that parent and child report of media parenting with regards to video gaming were highly aligned. Our findings were similar, with moderate to high inter-rater correlations for individual media parenting items, providing support for reliable response patterns between parents and children. In accordance with prior research, parents report higher levels of media parenting than children, particularly in the domain of Active Mediation (Beyens & Valkenburg, 2019). On a factor level, Active Mediation items were least correlated between parent and child reporters and Restrictive and Technology Control were most correlated. This, in conjunction with the significant independent samples t-test between reporters on Active Mediation, is consistent with studies that have shown that, despite parents' perception of active engagement, children are not always interpreting their actions as such (e.g., Valkenburg et al., 2013; Warren, 2020). These comparisons do not,

however, provide evidence for which reporter is more accurate or predictive; future research should explore these questions to support understanding of how media parenting behaviors relate to youth outcomes across parent and child reporters. Also of note, the proportion of fathers taking part in this survey is a higher than average (Phares et al., 2005). This is a relative strength of this study as, historically, fathers have been under-represented in pediatric psychology and clinical child research and, thus, interventions.

Invariance Testing

Structural equation modeling allows us to assess model fit and invariance between males and females and younger and older children, which has not been evaluated in media parenting behaviors to this point. While developmental theory and social constructs related to parenting across youth gender suggests differences in the factor structure may have arisen, our invariance testing suggests that it did not, providing good support for global use of these measures. Alternatively, latent mean differences indicated that both parents and children report different levels of parenting techniques based on child gender and age, with parents of girls reporting Monitoring more than parents of boys, and girls reporting more Restriction than boys. A possible explanation for this difference between parent and child report of Monitoring is that media-specific monitoring is often conducted covertly (Ghosh et al., 2017), so the child may not be aware of the extent to which their parents are monitoring their behaviors. Gender differences may reflect differential socialization patterns by gender, especially given past findings in the built environment that parents monitor girls more than boys (e.g., Doty et al., 2020). Older children and their parents reported less Restriction than younger children and their parents. This age difference in Restrictive Mediation lends credence to study findings, as decreased Restriction with maturity is developmentally appropriate and empirically supported (e.g., Nathanson, 2001).

Latent Mean Comparisons

Scaled scores for each factor reveal that both parents and children are reporting Active Mediation more than the other forms of mediation, followed by Monitoring, Restriction, and Technology Control. This mirrors results found by Padilla-Walker et al. (2018) that Active Mediation was employed more frequently than Restriction and Co-use. Given Active Mediation of youth media use is most strongly related to reducing negative impacts and promoting positive outcomes (Fujioka & Austin, 2003), this finding is heartening. That being said, the potential for social desirability bias for the Active Mediation questions may be higher than that of the other categories. Thus, future studies should seek to

replicate these findings with different measures in order to determine whether Active Mediation is employed most commonly. It has also been argued that the frequency of different parenting behaviors is less important than the parenting *style* they are employed with, which also remains important for future research to explore (e.g., Valkenburg et al., 2013).

The low endorsement of Technology Control may be due, in part, to the impact of such methods on the parent–child relationship; some parental control apps involve the covert monitoring of youth activity, which may compromise trust (Ghosh et al., 2017). There is also the possibility that parents do not feel as tech savvy as their children (Livingstone et al., 2019), affecting their ability to confidently utilize such tools. Accordingly, Ghosh et al. (2018a) found that the more youth and their parents used the internet (e.g., screen time), the more likely parents were to employ Technology Controls. Further, Eastin et al. (2006) identified a relationship between access to technology and screen time. These findings, when taken together, suggest that the less access a family has to technology, the less likely they will be to use Technology Controls. This may also explain the lack of correlation between Technology Control and Restriction, which we may have otherwise expected given the conceptual similarities between them. While access to technology is inherent in Technology Control, access is often removed or limited in Restriction, suggesting that these techniques may be targeting different populations of technology-using youths. Additionally, there may be an element of parental education involved, whereby parents who have the technological savvy and resources to utilize Technology Controls may be different than parents who rely primarily on Restrictive Mediation alone. Future research that includes an evaluation of parental technology knowledge would assist in clarifying these associations.

Limitations

Limitations are also worth noting. Although representing a similar racial/ethnic breakdown to that of the United States on the whole, the present study had lower-than-average Latinx participation (U.S. Census Bureau, 2019). Given the American population, the study cannot generalize to other countries and cultures. Another weakness of the study is that recruitment occurred through participant self-selection into Qualtrics panels rather than through community-, hospital-, or school-based methods. Thus, given Qualtrics' employment of internet-based recruitment, it may be that the sample represents a portion of the population with greater technological savvy. The study also utilized observational self-reported data; future research would benefit from utilization of behavioral observation or triangulation of sources. Furthermore, this research was based on cross-sectional data, and longitudinal exploration would also be valuable to assess whether such techniques are

used in a reactive or proactive fashion, as has been suggested (Wisniewski et al., 2015). Finally, the study reports on the four primary domains of media parenting as identified by prior research as the most important for youth outcomes. That being said, there may be other domains that we did not address that are similarly important, such as Co-view and Co-use.

Conclusion

This study provides evidence for construct validity through well-fitting CFA results for both parent and child measurement models of the media parenting construct. As might have been expected from prior literature, differences in latent mean comparisons across the reporters emerged. Namely, parents reported higher levels of every parenting behavior than children, and parents/youth indicated differential parental employment of mediation strategies for boys and girls and younger and older children. These overall latent mean differences identified between media parenting domains may be important for youth outcomes and provide support for their inclusion as distinct factors in predictive models. Identification of a well-fitting measurement model contributes to a common understanding of media parenting behaviors and enables synchronized assessment of such behaviors' relationship with youth outcomes. Further, although previous research has identified parental mediation as predictive of decreased online and in-person/built world risk (e.g., Bersamin et al., 2008; Cox et al., 2018; Elsaesser et al., 2017; Livingstone & Helsper, 2008; Nathanson, 1999), few have used comprehensive validated measures as predictors of youth outcomes, which would be a worthwhile next step.

Declarations

Conflict of Interest We have no known conflict of interest to disclose.

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