International Journal of Communication 15(2021), 4062–4084 1932–8036/20210005

A Review and Content Validation of 10 Measurement Scales for Parental Mediation of Children's Internet Use

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For the last decade, research has shown inconsistent findings about validity of parental mediation scales for children's Internet use. This inconsistency has manifested itself in at least 10 parental mediation models, which are also inconsistent in contents and definitions, lacking content validity thereof. With the goal of facilitating a consistent framework, this narrative review focuses on the content and factorial validity of 10 measurement scales. A panel of eight experienced researchers in the field of children's online safety/risks assessed the content validity. Based on this assessment, the present review proposes a trichotomy of restrictive-enabling-observant parental mediation and corresponding conceptual definitions for further research.

Keywords: restrictive mediation, enabling mediation, observant mediation, parental mediation, content validity, measurement scale

Parental mediation of children's Internet use is defined as efforts (including child-initiated communications about activities, contents, or time spent) to maximize online opportunities and minimize online risks for their children (Livingstone et al., 2017). A growing body of research aims to identify what and how various parenting styles, practices, or strategies ensure online opportunities and prevent online risks, such as being a victim or perpetrator of cyberbullying (Caivano, Leduc, & Talwar, 2020). To achieve this aim, at least 10 parental mediation models of children's Internet use have been proposed over the last decade (see Australian Office of the eSafety Commissioner, 2018; Dürager & Sonck, 2014; Ergin & Kapçı, 2019; Glatz, Crowe, & Buchanan, 2018; Livingstone & Helsper, 2008; Livingstone et al., 2017; Nikken & Jansz, 2014; Sonck, Nikken, & de Haan, 2013; Symons, Ponnet, Emmery, Walrave, & Heirman, 2017a, 2017b). Nonetheless, no model has been consistently found or applied, and no empirical consensus on parental mediation strategies for children's Internet has been achieved (Caivano et al., 2020). Findings

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about the factor structure of parental mediation strategies are inconsistent, indicating mixed results (Dedkova & Smahel, 2020; Sasson & Mesch, 2019) with no common model (Caivano et al., 2020; Symons et al., 2017a).

Although *restrictive versus enabling* mediation (Livingstone et al., 2017) is more common to all of the distinct models, it has been inconsistently operationalized. For instance, the concept of enabling mediation has been operationalized as active mediation (Ergin & Kapçı, 2019; Glatz et al., 2018), active mediation of Internet safety (Dürager & Sonck, 2014; Livingstone et al., 2017; Sonck et al., 2013), or open parenting style (Australian Office of the eSafety Commissioner, 2018). Moreover, an item (e.g., parents talk to their children about online risks) measuring *active mediation* in one study (Glatz et al., 2018) is used for *open parenting style* in another (Australian Office of the eSafety Commissioner, 2018). Likewise, an item (e.g., parents check their children's personal messages by logging into their email or Facebook accounts) is considered to measure *restrictive mediation* in one study (Glatz et al., 2018), but *active tracking* in another (Symons et al., 2017b). Using different terms or measuring distinct concepts requires differences in their contents (items). Using inconsistent or contradictory terms for the same content is a matter of lack of content and construct validity (i.e., misconceptualization and misoperationalization of parental mediation strategies). As such, research on parental mediation of children's online safety/risks would benefit from conceptual clarity through exploration of what strategies make up parental mediation (Symons et al., 2017a). Such clarity is needed to enhance understanding of what parental strategies increase or decrease a balance between children's online opportunities and risks (Caivano et al., 2020; Livingstone et al., 2017).

With the goal of facilitating a consistent framework, this narrative review focuses on content and factorial validity of the 10 measurement scales of parental strategies for children's Internet use. The accuracy in definitions and factor structure of parental mediation strategies is determined by their content validity, defined as the extent to which a set of items represents the targeted construct (Haynes, Richard, & Kubany, 1995). The lack of content validity (i.e., contents of 10 measurement scales are insufficiently representative of targeted mediation strategies) is likely to be one primary factor hindering construct validation of measurement scales, before other reasons such as demographic characteristics. Following a panel of experts' assessment of content validity of items used in the 10 measurement scales, the present review proposes a simpler model, the trichotomy of restrictive-enabling-observant parental mediation, for future research.

The review consists of three main sections. First, it provides a brief background of research on parental mediation of children's online safety/risks. Next, it elaborates on various issues in the 10 measurement scales, which are associated with sample characteristics (differences in age groups, types of self-reports, country of residence), item generation, contents and number of items, binary versus ordinal data, and methods of statistical analysis. Last, it proposes content validation and conceptual definitions of parental mediation strategies for further research.

Parental Mediation of Children's Online Safety/Risks

In the last 10 years, children's and adolescents' use of the Internet has dramatically evolved in terms of access and safety/risks (McGuire & O'Higgins Norman, 2017). Parental experience with their children's use of the Internet has changed drastically (Staksrud & Ólafsson, 2020). This has complicated

parenting tasks, requiring parents to know what their children are doing both offline and online. To protect children from various risks, parents are expected to assess, guide, monitor, or regulate their children's activities online and offline (Livingstone et al., 2017). Although not every online risk experience is necessarily harmful (Staksrud & Ólafsson, 2020) or deliberately sought after (Staksrud & Livingstone, 2009), parents exert more effort to maximize online opportunities and minimize online risks for their children (Livingstone et al., 2017). To achieve this aim, parents need clear policy advice or guidelines. However, how to categorize various parental mediation strategies into a group of implementable factors is unclear, mainly because of the scarcity of research on construct validation (theoretically and empirically confirmed contents) of measurement scales.

Research on various mediation strategies for children's Internet use has been based on studies focused on television viewing and video gaming, for which Nathanson (1999) and Valkenburg, Krcmar, Peeters, and Marseille (1999) proposed three categories: (a) active or instructive mediation (i.e., explaining and encouraging for proper use), (b) restrictive mediation (i.e., setting rules for children's behavior of television viewing), and (c) coviewing (i.e., parent observing their children's behavior while watching television together, either next to the children or in the same room). To examine the degree to which parents use the same or similar strategies for their children's use of the Internet, Livingstone and Helsper (2008) adapted measurement items from the literature on television viewing. A decade later, Livingstone and associates (2017) argued that the term *active mediation* for television viewing falls short of reflecting the complexity of supporting children's Internet use; therefore, the term *enabling mediation* should be used instead. For instance, active mediation for television viewing requires parent- or child-initiated discussions about media or specific content (e.g., discussing news, the difference between reality and fiction, sports, educational programs, or video games). In contrast, enabling mediation for Internet use, particularly social media, requires discussions not only about how to act online or how to use the Internet safely (avoiding associated risks or harms), but also how to acquire and develop digital literacy skills to increase online safety and benefit from opportunities that the Internet or social media offers (Livingstone et al., 2017).

Livingstone and colleagues (2017) further elaborated that enabling mediation encompasses active mediation of children's Internet use and safety "that might seem restrictive (use of technical controls and parental monitoring) but are better interpreted as building a safe framework precisely so that children's positive uses of the Internet can be encouraged" (p. 98). However, this argument raises a conceptual issue: Is the restrictive mediation not aimed at children's online safety and, in turn, at encouragement of the positive use of the Internet? In other words, is the restrictive mediation not aimed at discouraging or preventing children from experiencing online risks and the negative use of the Internet? If not, in such a conception, enabling and restrictive mediation are not both sides of the same coin. This means that when children's online safety increases (i.e., online safety is *enabled*), the likelihood of experiencing online risks does not necessarily decrease (i.e., online risk is not *restricted*). Such a conceptualization of restrictive mediation requires theoretical and empirical validation, which all the reviewed studies lack. Theoretical justifications and inferential statistical evidence are needed for distinguishing technical controls and parental monitoring, which are essentially related to enabling safe and positive use of the Internet, from restrictive mediation, which involves preventing children from encountering online risks and the negative use of the Internet.

The accuracy in construct validity of the argued distinction between enabling and restrictive mediation strategies has yet to be confirmed (i.e., needing a confirmatory factor analysis [CFA]). Conceptualization and operationalization of the technical monitoring are still contradictory: whether technical monitoring should be considered a form of enabling (Smahel et al., 2020) or restrictive mediation (Glatz et al., 2018) remains unclear. Although more research on parental mediation strategies for children's online safety or Internet use exists, only a few studies have used measurement scales for whether there are distinctively factorable strategies.

Measurement Scales

Research over the last decade has yielded inconsistent findings for whether or not the trichotomy of active, restrictive, and coviewing mediation of children's television viewing is applicable to Internet use (Sasson & Mesch, 2019). At least 10 published studies in English used parental self-reports (either mother alone or mother and father together), with or without children's self-reports, and aimed to come up with a common model of parental mediation strategies for the Internet use. Table 1 shows these studies in chronological order.

Table 1. Ten Studies on Factorial Validation of Parental Mediation Strategies.

Studies	Self-Report	Mediation Strategies	Source of Item Generation	Country
Study 1 (Livingstone & Helsper, 2008)	Parents of children aged 9–17 (*N* = 1,511)	Internet active co-use Interaction restrictions Technical restrictions Monitoring	No explicit report, but some similarity with Staksrud (2005)	United Kingdom
Study 2 (Dürager & Sonck, 2014)	Parents of children aged 9–16 in 25 European countries (*n* = 1,000 parents and *n* =1,000 children per country, except Cyprus *n* = 800)	Active mediation of Internet use Restrictive mediation Active mediation of Internet safety Monitoring Technical mediation	Primarily based on Study 1	Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden, Turkey, United Kingdom
Study 3 (Sonck et al., 2013)	Parents of children aged 9–16 (*N* = 1,004)	Monitoring Restrictive content mediation Active (safety) mediation Restrictive technical mediation	Primarily based on Study 1, but also referred to Valkenburg et al. (1999)	Netherlands
Study 4 (Nikken & Jansz, 2014)	Parents of children aged 2–12 (*N* = 3,675)	Active mediation Co-use mediation Restrictions on general access Restrictions on specific content Supervision	No explicit report	Netherlands

Study 5 (Symons et al., 2017a)	Parents of children aged 13–18 (*N* = 357) and child's self-report	Interaction restrictions Access restrictions Active tracking Supervision and co-use Open communication	No explicit report for the source of 13 items used, but adapted another three items from Ponnet et al. (2013)	Belgium
Study 6 (Symons et al., 2017b)	Parents of children aged 13–18 (*N* = 357)	Interaction restrictions Monitoring Access restrictions Supervision and co-use Technical mediation Interpretative mediation	Primarily based on Studies 1 and 3	Belgium
Study 7 (Livingstone et al., 2017)	Parents of children aged 6–14 in eight European countries (*N* = 6,400; *n* = 800 per country)	Enabling mediation Active mediation of Internet use Active mediation of Internet safety Child-initiated support Technical controls Parental monitoring Restrictive mediation	Primarily based on Livingstone, Haddon, Görzig, and Ólafsson (2011)	France, Germany, Netherlands, Spain, Poland, Italy, Sweden, United Kingdom
Study 8 (Australian Office of the eSafety Commissioner, 2018)	Parents of children aged 2–17 (*N* = 3,520)	Restrictive parenting style Open parenting style Confidence in dealing with child's online issues	No explicit report	Australia

Study 9 (Glatz et al., 2018)	Parents of children aged 11–18 (*N* = 1,025; mothers = 513, fathers = 512)	Restrictive mediation and online monitoring Demands for child disclosure Active mediation Mediation through proximity	Primarily based on Studies 1 and 3	United States of America
Study 10 (Ergin & Kapçı, 2019)	Parent of children aged 10–14 (*N* = 728; mothers = 456, fathers = 272)	Control/restriction Active mediation	No explicit report for the source of 54 items used initially, but primarily based on assessments by a group of participants and experts	Turkey

Although all these inconsistent results of the factorial validation are also attributable to issues in statistical analysis methods and sample characteristics, they are more likely due to the lack of content validity. Items across the scales are not accurately representative of corresponding parental mediation strategies. The following subsections serve to elaborate on these issues.

Issues in Sample Characteristics

Parent and child characteristics (e.g., age, gender, education, digital skills, or country) can determine the preference for a parental mediation strategy (Dedkova & Smahel, 2020; Livingstone et al., 2017; Staksrud & Ólafsson, 2020). This makes a difference in self-reports by (a) parents of younger or older children; (b) only one parent; both child and parent; or child, mother, and father; and (c) parents in different countries.

Parents of Children in Different Age Groups

Parents of at least three distinct age groups participated in these studies: parents of toddlers and younger children aged 2–12 years (Study 4), 6–14 years (Study 7), and 2–17 years (Study 8). The rest of the studies had parents of children aged within a similar range, 9–17 (Studies 1, 2, and 3), 10–14 (Study 10), and 13–18 (Studies 5, 6, and 9). Younger children (e.g., aged 9–12) and adolescents (aged 13–17) differ in their online activities or Internet use, which influences parents' self-reports (Caivano et al., 2020; Dedkova & Smahel, 2020). Although children's age differences might be another reason for the inconsistent findings (Dedkova & Smahel, 2020), there was no evidence/report of measurement invariance for the age groups.

Types of Self-Reports

The reviewed studies differed in their use of self-reports; some used both child and parent (Studies 1, 2, and 10), some used only parent (Studies 3, 4, 7, 8, and 9), and some used child, mother, and father (Studies 5 and 6). Studies that required participation of only one parent were mostly based on mothers' self-reports (Symons et al., 2017a). However, mothers and fathers could differ in their mediation strategies (Glatz et al., 2018). Therefore, one might argue that self-reports by only mother, father, child, or parent-child might affect the factor structure of parental mediation strategies. However, there is no consensus regarding whether characteristics of children or parents mostly determine a parental mediation strategy (Symons et al., 2017a). There is inconsistency in the factor structure of all types of self-reports. Moreover, no definition of mediation strategy is based on a set of items for mothers distinctively.

Parent's Country of Residence

The inconsistency in the factor structure might also be attributed to differences in countries. Country can make a substantial difference in children's experiences of online safety/risks and corresponding parental strategies (Livingstone et al., 2017; Staksrud & Ólafsson, 2020). For instance, enabling mediation is likely to be common among parents in Ireland (McGuire & O'Higgins Norman, 2017), Spain, and Italy, and less so in Sweden and the Netherlands (Livingstone et al., 2017). However, the same set of items used across 25 European countries resulted in a somehow distinctly identified or defined number of factors

(Studies 1, 2, and 7). This distinction can also be seen when their results are compared with those about a specific country like the Netherlands in other studies (Studies 3 and 4). This indicates a lack of consensus regarding contents/representativeness of items rather than the country differences.

Issues in Item Generation

Item generation can be based on theoretical definitions, quantitative/qualitative research, experts' reviews, and/or interviews with representatives of the target population (MacKenzie, Podsakoff, & Podsakoff, 2011). In this regard, none of the reviewed studies explained theoretically the foundation of the item generation. Furthermore, only half of them explicitly stated the source of the item used (see Table 1).

Studies 1, 4, and 8 reported no explicit reference for item generation; Study 7 referred to Livingstone, Haddon, Görzig, and Ólafsson (2011) as the source for the use of 45 out 50 items, but showed no source for the remaining five items. In a similar way, Study 5 reported only the source of three of 16 items used, derived from the open parent-child communication scale (Barnes & Olson, 1985; Ponnet et al., 2013). In contrast, Studies 2 and 3 adapted items primarily from Study 1, whereas Studies 6 and 9 adapted items from Studies 1 and 3. Both Studies 3 and 4 further mentioned an adaptation of items from previous research on parental mediation of children's television viewing or video gaming, but Study 4 made no explicit reference, and Study 3 explicitly noted studies by Valkenburg and colleagues (1999). Although only Study 10 provided some information about item generation by referring to a sample of the target population (individual interviews with three mothers and two fathers) and reviews by a panel of experts, it also reported no explicit literature for 54 items used initially.

Study 1 noted that many of its items "are similar to those used in previous research (on television mediation, on Internet use; some parallel [to] those asked in the European Safety Awareness Facts and Tools (SAFT) project; Staksrud, 2005)" (Livingstone & Helsper, 2008, p. 6). However, the "selection of items was not sufficiently fine-grained to distinguish positive from negative mediation" (Livingstone & Helsper, 2008, p. 9). Without a theoretical remedy (content and face validation) to improve this insufficiency, Study 2 largely adapted the items from Study 1 (the UK survey), performed the dimensionality and reliability tests, and then translated the findings into the other participating languages (French, Spanish, and German).

Issues in Contents and Number of Items, and Corresponding Terms

Inconsistent or contradictory terms are used for the same content (items) among the reviewed studies. For instance, Study 7 considered parental monitoring, technical control, and child-initiated support as forms of *enabling* mediation. In contrast, parental monitoring and technical control mediation strategies were considered as *restrictive mediation* and online monitoring in Study 9. Such contradictory use of terms raises concerns about the lack of content and construct validity of parental mediation scales.

Subfactors are also inconsistently or contradictorily labeled. First, the term *restrictive mediation* (Studies 7, 8, and 10) was also operationalized as demands for child disclosure (Study 9), as technical (Studies 1, 2, 3, and 6), as monitoring (Studies 1, 2, 3, 6, and 9), or as setting rules for online interaction (Studies 1, 5, 6, and 8), online content (Studies 3 and 4), and Internet access (Studies 4, 5, and 6). Next,

the term *active mediation* (Studies 9 and 10) was also operationalized as online safety (Studies 2, 3, 4, and 7), as Internet content/interpretive (Studies 2 and 6), or as open parenting style (Study 8). Last, the main term *co-use* mediation was operationalized as only supervision (Study 4), as with supervision (Studies 1, 5, and 6), or as mediation through proximity (Study 9).

This inconsistency or contradiction has also occurred in the content and number of items used to measure a subfactor (see Table 2). Regarding the number of items, only two items measured technical restriction, interpretive mediation (Study 6), monitoring (Study 1), active mediation, and demands for child disclosure (Study 9). To represent a factor, three or more items are suggested (Costello & Osborne, 2005). As to the content, Study 4 used (a) one item measuring *supervision* (i.e., "keep an eye on the child and the computer"; Nikken & Jansz, 2014, p. 260), which is almost identical with other items of the co-use scale and can be an indicator of co-use mediation; (b) three items measuring *co-use* (i.e., "surf together . . . and talk to child about what is fun on the Internet"; Nikken & Jansz, 2014, p. 260), which reflect *active* engagement in children's Internet use and can be indicators of enabling mediation; and (c) one item measuring *supervision* (i.e., "allow the child to Web surf only when you are present"; Nikken & Jansz, 2014, p. 260), which reflects the presence of the parent as the conditional rule for (restriction on) Internet use and can be restrictive mediation. Likewise, Study 6 used one item measuring *co-use mediation* (i.e., "helping the child using the Internet"; Symons et al., 2017b, p. 101), which is indistinguishable from other items of the active (enabling) mediation scale and can be an indicator of enabling mediation. Study 7 also used two items measuring enabling mediation (i.e., "sit with your child while he/she uses the Internet? Stay nearby when your child uses the Internet?"; Livingstone et al., 2017, p. 89), which are indistinguishable from the other items of the co-use scales and can be considered within the same factor.

Table 2. Three Common Parental Mediation Strategies and Corresponding Items.

Strategies	Forms	Items	Studies
Restrictive		Rules apply as to whether the child can:	Study 1
Parental	RSR	Give out personal information	(Livingstone &
Mediation	RSR	Buy anything online	Helsper, 2008)
	RSR	Fill out online forms/quizzes	
	RSR	Use e-mail	
	RSR	Use chat rooms	
	RSR	Use instant messaging	
	RSR	Play games on the Internet	
	RSR	Download things	
	RSR	Use instant messaging	Study 2
	RSR	Download music or films from the Internet	(Dürager &
	RSR	Watch video clips on the Internet	Sonck, 2014)
	RSR	Have his/her own social networking profile	
	RSR	Give out personal information to others on the Internet	
	RSR	Upload photos, videos, or music to share with others	

RSR	Have his/her own social networking profile	Study 3
RSR	Watch video clips on the Internet	(Sonck et al.,
RSR	Use instant messaging	2013)
RSR	Download music or films from the Internet	
RSR	Upload photos, videos, or music to share with others	
RSR	Say that online games are unsuitable	Study 4
RSR	Say which online game genres are allowed	(Nikken &
RSR	Tell your child when/how long to use Internet	Jansz, 2014)
RSR	Say which films may be downloaded	
RSR	Say which products may be bought online	
RSR	Say what kind of avatar is allowed	
RSR	Say what music may be listened to/downloaded	
RSR	Allow the child to Web surf only when you are present	
RSR	Rules – the time the child can spend online	Study 6
RSR	Rules – times of the day the child can be online	(Symons et al.,
RSR	Rules – use of the Internet in the bedroom	2017b)
RSR	Rules – the pictures the child can post online	
RSR	Rules – the information the child can share	
RSR	Rules – with whom the child can chat	
RSR	Rules – whom the child can add to social network	
RSR	Rules about how long or when your child is allowed to go online	Study 7
	Rules apply as to whether the child can:	(Livingstone et
RSR	Use the Internet for schoolwork	al., 2017)
RSR	Watch video clips (e.g., on YouTube)	
RSR	Download music or films	
RSR	Read/watch news online	
RSR	Visit a social networking profile	
RSR	Visit a chat room	
RSR	Use instant messaging	
RSR	Play games with other people online	
RSR	Spend time in a virtual world (e.g., Habbo, Minecraft)	
RSR	Use a webcam	
RSR	Put (or post) photos, videos, or music online to share with others (social networking or instant messaging)	
RSR	Put (or post) a message on a website	
RSR	Write a blog or online diary	
RSR	Participate in a site concerned with good causes (e.g., campaigns)	
RSR	Use a file-sharing site	
RSR	Download games	
RSR	Play online games alone	

RSR	I limit the amount of time my child spends online	Study 8 (Australian Office of the eSafety Commissioner, 2018)
RSR	I set clear rules for my child about Internet use	
RSR	Do you have rules about the time your child spends on the Internet?	Study 9 (Glatz et al., 2018)
RSR	Do you have rules about what your child is allowed to do on the Internet?	
RSR	I limit the time that he/she spends on the Internet	Study 10 (Ergin & Kapçı, 2019)
MR	(Checking) Sites child visited later	Study 1 (Livingstone & Helsper, 2008)
MR	(Checking) Child's e-mail messages	
MR	(Checking) Which websites (child) visited	Study 2 (Dürager & Sonck, 2014)
MR	(Checking) The messages in (child's) e-mail or instant messaging account	
MR	(Checking) Child's profile on a social network or online community	
MR	(Checking) Which friends or contacts (child) adds to social networking profile	
MR	(Checking) Which friends or contacts the child adds to a social networking profile or instant messaging service	Study 3 (Sonck et al., 2013)
MR	(Checking) Child's profile on a social networking or online community	
MR	(Checking) The messages in the child's e-mail or instant messaging account	
MR	(Checking) Which websites the child visited	
MR	(Checking) Logging in to child's profile to read messages	Study 6 (Symons et al., 2017b)
MR	(Checking) Child's social network page	
MR	(Checking) Added contacts to child's social network	
MR	(Checking) Which websites he/she visited	Study 7 (Livingstone et al., 2017)
MR	(Checking) Which friends or contacts he/she adds to his/her social networking profile/instant messaging service	
MR	(Checking) The messages in his/her e-mail or instant messaging account	
MR	(Checking) His/her profile on a social networking or online community	
MR	(Checking) The apps he/she downloaded	
MR	(Checking) The in-app purchases he/she made	

MR	I take an active role in monitoring what my child does online	Study 8 (Australian Office of the eSafety Commissioner, 2018)
MR	Demand to know which websites your child has visited	Study 9 (Glatz et al., 2018)
MR	Demand to know whom your child chats with	
MR	(Checking) Websites that your child has visited	
MR	(Checking) Child's messages (e.g., e-mail, Facebook, texts)	
MR	(Checking) Websites that he/she visits	Study 10 (Ergin & Kapçı, 2019)
MR	(Checking) Whom he/she adds as a friend on social networking sites	
MR	(Checking) His/her immediate text messages	
MR	(Checking) His/her e-mail correspondence	
MR	(Checking) The applications he/she downloads	
MR	(Checking) What he/she shares on social networking sites	
MR	I know his/her passwords for the social networking site	
MR	I ask him/her to tell or show me his/her personal information before he/she shares it on the Internet	
MR	I ask him/her to show me the photos or videos of our family, friends, or his/her friends before he/she uploads them	
TR	Filters/monitoring software installed for (e-mail, chat rooms, instant messaging, porn sites, junk mail, ads)	Study 1 (Livingstone & Helsper, 2008)
TR	Parental controls or other means of blocking or filtering some types of websites	Study 2 (Dürager & Sonck, 2014)
TR	Parental controls or other means of keeping track of the websites you visit	
TR	A service or contract that limits the time you spend on the Internet	
TR	Software to prevent spam/junk mail or viruses	
TR	Parental controls or other means of blocking or filtering some types of websites	Study 3 (Sonck et al., 2013)
TR	Parental controls or other means of keeping track of the websites the child visits	
TR	A service or contract that limits the time the child spends on the Internet	
TR	Software to limit Internet access in time	Study 6 (Symons et al., 2017b)
TR	Software to block access to certain websites	

	TR	Parental controls or other means of blocking or filtering some types of websites	Study 7 (Livingstone et al., 2017)
	TR	Parental controls or other means of keeping track of the websites or apps your child visits	
	TR	A service or contract that limits the time your child spends on the Internet	
	TR	Software to prevent spam or junk mail/viruses	
	TR	Parental controls that filter the apps your child can download	
	TR	Parental controls that alert you when your child wants to buy content (in-app purchase)	
	TR	Software that limits the people your child can be in touch with (through voice calls and SMS/text/MMS)	
	TR	Ad-blocking software	
	TR	I use age guidelines in relation to my child's use of social media, apps, and games	Study 8 (Australian Office of the eSafety Commissioner, 2018)
	TR	Parental controls are important to how I limit my child's exposure to inappropriate content such as pornography	
	TR	Do you have installed monitoring/filtering software on one or more devices that your child uses to access the Internet?	Study 9 (Glatz et al., 2018)
	TR	I use a filtration method to prevent his/her to access inappropriate content	Study 10 (Ergin & Kapçı, 2019)
Enabling Parental Mediation	PIE	Parent helps when child uses the Internet	Study 1 (Livingstone & Helsper, 2008)
	PIE	Parent talks to child about Internet use	
	PIE	Talk to (child) about what (child) do(es) on the Internet	Study 2 (Dürager & Sonck, 2014)
	PIE	Encourage (child) to explore and learn things on the Internet (on his/her/their own)	
	PIE	Do shared activities together with (child) on the Internet	
	PIE	Helped (child) when something was difficult to do or find on the Internet	
	PIE	Explained why some websites are good or bad	
	PIE	Suggested ways to use the Internet safely	
	PIE	Suggested ways to behave toward other people online	
	PIE	Helped (child) in the past when something bothered (child) on the Internet	
	PIE	Talked to (child) about what to do if something on the Internet bothered him/her	

PIE	Suggested ways to use the Internet safely	Study 3
PIE	Suggested ways to behave toward other people on the Internet	(Sonck et al.,
PIE	Talked to the child about what he/she would do if something on the Internet bothered him/her	2013)
PIE	Explained why some websites are good or bad	
PIE	Helped the child in the past when something has bothered her/him on the Internet	
PIE	Tell your child what to do about online strangers	Study 4
PIE	Tell him/her to protect personal information	(Nikken &
PIE	Say what to do if they are bullied or harassed	Jansz, 2014)
PIE	Talk to your child about what rules of conduct to follow	
PIE	Explain how to behave on social networking sites	
PIE	Explain to your child what he/she may do on IM websites	
PIE	Explain to your child how to use webmail	
PIE	Stay close to the computer to help if necessary	
CIE	Surf together, because the child wants to	
PIE	Surf together, because you want to	
PIE	Talk with your child about what is fun on the Internet	
PIE	Helping the child use the Internet	Study 6
PIE	Discussed that not everything online is true	(Symons et al.,
PIE	Discussed the potential dangers of the Internet	2017b)
PIE	Talk to your child about what he/she does on the Internet?	Study 7
PIE	Encourage your child to explore and learn things on the Internet?	(Livingstone et
PIE	Do shared activities together with your child on the Internet?	al., 2017)
PIE	Help him/her when something is difficult to do or to find on the Internet	
PIE	Suggest ways to use the Internet safely	
PIE	Explain why some websites are appropriate or inappropriate	
PIE	Help him/her when something has bothered him/her on the Internet	
PIE	Talk to him/her about what to do if something on the Internet bothered him/her	
PIE	Explain that online games may contain hidden advertising aimed at making children want to have new products	
PIE	Explain that online games, even if downloaded without cost, may require in-app purchases to progress faster in the game or to access the full features of the game	
PIE	Talk to him/her about the commercial activities he/she is exposed to online	
CIE	(Child) Initiated a discussion with you about what she/he does on the Internet?	
CIE	(Child) Told you about things she/he finds disturbing on the Internet?	

	CIE	(Child) Asked for your advice on how she/he should act online?	Study 7
	CIE	(Child) Asked for products and/or services that she/he has seen advertisements for online?	(Livingstone et al., 2017)
	CIE	(Child) Asked for your help concerning a situation on the Internet that she/he cannot handle?	
	PIE	I talk to my child regularly about online risks and what to do	Study 8
	PIE	I speak to my child about being respectful to others online	(Australian Office
	PIE	I show my child how to use safety features when online	of the eSafety
	PIE	I listen to my child's online social problems, if they have any	Commissioner, 2018)
	PIE	Talk to the child about what he/she is doing on the Internet	Study 9
	PIE	Talk to the child about potential risks that he/she can encounter on the Internet	(Glatz et al., 2018)
	PIE	I ask him/her to tell me anything that disturbs him/her in his/her Internet correspondence	Study 10 (Ergin & Kapçı,
	PIE	I talk to my child about the negative aspects of texting someone he/she doesn`t know	2019)
	PIE	I talk to my child about unsafe websites	
	CIE	If my child asks for my help about the Internet, I do my best to help him/her	
	PIE	I listen to my child when he/she shares the new information that he/she learned from the Internet	
Observant Parental Mediation		Parent stays nearby when child is online	Study 1
		Parent watches screen when child online	(Livingstone &
		Parent sits with child when online	Helsper, 2008)
		Sit with (child) while (child) uses the Internet	Study 2
		Stay nearby when (child) uses the Internet	(Dürager & Sonck, 2014)
		Keep an eye on the child and the computer	Study 4 (Nikken & Jansz, 2014)
		Watching when the child uses the Internet	Study 6
		Being around when the child uses the Internet	(Symons et al., 2017b)
		Sit with your child while he/she uses the Internet?	Study 7
		Stay nearby when your child uses the Internet?	(Livingstone et al., 2017)

	Sit with the child when he/she is online Stay nearby when the child is online Watch the screen when the child is online	Study 9 (Glatz et al., 2018)
	While my child is online, I go next to him/her and watch him/her	Study 10 (Ergin & Kapçı, 2019)

Note. RSR = rule-setting restriction; MR = monitoring restriction; TR = technical restriction; PIE = parent-initiated enabling; CIE = child-initiated enabling.

Study 7 suggested considering one item (i.e., "Rules about how long or when your child is allowed to go online"; Livingstone et al., 2017, p. 89) as a measure of technical restriction "because it correlates better with other technical controls items than with restrictions; note that the alpha for technical controls was not improved by omitting it, nor was the alpha for restrictions improved by adding it" (Livingstone et al., 2017, p. 90). However, this correlation (or the lack of correlation with parental restrictions) is likely to be a *common method bias* (i.e., variations in responses are caused by the instrument rather than measured latent construct), which can be due to differences in item/question wording and item response options (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The question for the technical control was: "Do you (or your partner/other carer) make use of any of the following . . . (range 0–1)" (Livingstone et al., 2017, pp. 89–90), whereas for parental restriction, it was:

> For each of these actions, please indicate if you CURRENTLY let your child perform them whenever she/he wants, or let her/him perform them but only with your permission or supervision, or you never let her/him perform them (range 0–2). (Livingstone et al., 2017, pp. 89–90)

Such a difference in item wording and item response options substantially affects subsequent results, yielding dissimilar findings (Clark & Watson, 2016). Study 7 provided no report regarding how such possible common bias had been handled. This lack of report leaves unclear how the item content is theoretically distinguishable from very similar items used for restrictive mediation in other studies. When considering this similarity or even sameness, the item theoretically fits into the rule-setting restriction.

As a consequence, the inconsistent or contradictory operationalization indicates a lack of content validity among the reviewed scales. Further research on parental mediation of children's online safety/risks will need the conceptual clarity for what strategies make up a parental mediation model.

Issues in Binary Versus Ordinal Data Analysis

Although binary data are generally considered inappropriate for an exploratory factor analysis (EFA), especially when a linear or common factor model is assumed (Barendse, Oort, & Timmerman, 2015; Ferrando & Lorenzo-Seva, 2013), most of the reviewed studies (Studies 1, 2, 3, 5, 6, 7, and 9) were either completely or partially based on binary instead of ordinal data analysis. Studies 1, 2, and 3 were based on parents' binary responses to all items. Studies 5 and 6 used a principal component analysis (PCA) of parent's

self-reports on a dichotomous scale (yes/no) for restrictive mediation (online interaction and Internet access), but a 5-point scale for the rest. Yet, Study 5 found four components of parental mediation strategies, whereas Study 6 found six. Studies 7 and 9 were also based on a mix of binary and ordinal response options. Study 7 used a binary response to 14 items, but a 5-point scale for 19 items and a 3-point scale for 17 items. Study 9 used a binary option for three items, but an ordinal option (a 9-point scale) for the rest (seven items).

An essential issue in EFA of binary data is that it fails to converge items into the correct number of factors and thus underestimates the number of factors (Barendse et al., 2015), mainly because it is based on responses with similar distributions rather than with a common factor or content (Gorsuch, 1983). Hence, using ordinal instead of binary data for an EFA can improve the construct validity and reliability of parental mediation scales (Dürager & Sonck, 2014).

Issues in Methods of Statistical Analysis

Six of the 10 studies (1, 3, 4, 6, 7, and 10) were based on a PCA, and Study 8 was based on an unreported method of exploratory factor analysis. Nearly two decades ago, Nathanson, Eveland, Park, and Paul (2002) highlighted this concern about earlier findings (by Valkenburg et al., 1999); PCA resulted in no clear-cut categories, but blurry lines between parental mediation constructs. This lack of clarity is expected because PCA is not a common factor analysis method, but an item reduction method that leads to an overestimation of factor loadings, thereby inflating number of factors to be retained (Costello & Osborne, 2005). For instance, a PCA of parental self-reports in the earliest study by Livingstone and Helsper (2008) showed cross-loading items on multiple factors, indicating inconsistency in the four-factor model (Symons et al., 2017b). In such an instance, PCA suggests retaining items based on their correlations, but not on an underling common factor (i.e., a common reason for why items are correlated).

Furthermore, although statistical literature shows evidence that conducting a PCA of the same data set as a precursor to CFA should be avoided (Costello & Osborne, 2005), Studies 5, 6, and 9 were probably based on the same sample (e.g., both Studies 5 and 6 had N = 357 parents of children aged 13–18 in Belgium) for both PCA and CFA. Using a different sample, continuous variables, and three and more items is suggested for a CFA after an exploratory (common) factor analysis, given that their results are different in terms of accuracy (Costello & Osborne, 2005).

Content Validation and Proposed Conceptual Definitions

To facilitate consistency in the content and construct validity of parental mediation strategies, the present review provides in Table 2 a list of all the items in the 10 measurement scales. For the content validation, an e-mail invitation was sent to 12 academic researchers in three different countries, based on their research interests and peer-reviewed publications. Only eight consented and thus received a further e-mail that included an attachment with a table of the items, conceptual definitions (in the reviewed studies), and instructions on how to rate their agreement on a 4-point scale (ranging from 1 = *not relevant/representative* to 4 = *very relevant/representative*). Regarding research experience, one expert had six years, four had 10 years, and three had 20 years. Respondents' research included social-psychological inquiries about media and

communication, the Internet, and digital media use among children and youth, online safety/risks, cyberbullying, parental mediation, and psychometric assessment and evaluation.

The experts reported their agreement levels for the content validity based on a two-part question: (a) Is each item and (b) group of items sufficiently representative of a corresponding parental mediation strategy? These two questions are considered sufficient for an accurate judgment of content validity (MacKenzie et al., 2011). Among a panel of five experts, the agreement on one item must be 100%, but with six or more experts, ≥ 80% of agreement (as content validity index) is sufficient for items to be considered theoretically representative of a targeted construct (Sangoseni, Hellman, & Hill, 2013).

For the present review, multiple iterations of reclassification of items on the basis of the two questions were conducted until all the experts reached 94% agreement (a) on the content representativeness of each item, referred to as I-CVI/item-content validity index (i.e., the number of experts rating relevant or very relevant for each item was divided by the total number of experts), and (b) group of items, referred to as S-CVI/scale-content validity index (i.e., the sum of agreement on the I-CVI was divided by the total number of items). Both indexes indicated 94% agreement on three main groups of items reflecting three parental mediation strategies. Table 2 displays each strategy along with corresponding items: (a) *restrictive parental mediation*, (b) *enabling parental mediation*, and (c) *observant parental mediation* of children's online safety/risks. Table 2 also provides specific items for five forms of restrictive and enabling mediation, namely rule-setting-restriction (RSR), monitoring restriction (MR), technical restriction (TR), parent-initiated enabling (PIE), and child-initiated enabling (CIE).

First, restrictive parental mediation refers to parental controls that involve setting rules (for their children's Internet use of social media, apps, or games), setting filters (technical restriction to online contents), and setting limits (the Internet access), while also monitoring (checking) their children's online activities (e.g., social media accounts, contacts, and browsed history). Thus, there are at least three defining attributes (forms) of restrictive parental mediation: (a) rule setting, (b) monitoring, and (c) technical restrictions. This is consistent with the operationalization of restrictive mediation (Studies 7, 8, and 10) as technical control (Studies 1, 2, 3, and 6), online interaction restriction (Studies 1, 5, 6, and 8), online content restriction (Studies 3 and 4), Internet access restriction (Studies 4, 5, and 6), and restrictive monitoring (Studies 1, 2, 3, 6, and 9).

Second, enabling parental mediation is defined as parental conception of their child as agentic online, parents addressing their children's sense of agency in both online risks and opportunities. This parental approach is demonstrated by parents regularly encouraging and instructing their children to use the Internet positively (e.g., be respectful to oneself and others online) on their own, to disclose any online risk experience, or to recognize an online risk and what to do about it. In other words, the parent takes the initiative to communicate (asking, talking, listening, discussing, or encouraging), to share (online activities), or to instruct/guide (helping, explaining, showing, or suggesting), thereby enabling children's agency in managing online safety/risks. Children also take the initiative to communicate, to share, or to ask for parental instruction or guidance. Accordingly, enabling mediation has at least two defining attributes (forms): (a) parent-initiated and (b) child-initiated offline and online communications and instructions that enable children's agency in Internet and social media use. Therefore, the term *enabling parental mediation*

is consistent with the operationalization as active mediation (Studies 9 and 10), online safety (Studies 2, 3, 4, and 7), Internet content/interpretive (Studies 2 and 6), and open parenting style (Study 8).

Third, observant parental mediation is defined as when a parent intermittently observes (i.e., intermittently alert to, watchful of, or attentive to) both the child's behavior and the screen (e.g., smartphone, tablet, or computer) when his or her child is online. Thus, the term *observant* is consistent with the operationalization as only supervision (Study 4), with supervision (Studies 1, 5, and 6), and mediation through proximity (Study 9).

Future research is needed to test this trichotomy. However, an outstanding issue in identifying a retainable number of parental mediation factors is whether there is a proportioned number of items for each strategy. The reviewed scales show a great disproportion in the numbers of items for measuring mediation strategies. As Table 2 shows, no scale has a sufficient/representative number of items for each strategy. This is also reflected when all the items are summed up. Almost 62% of 183 items have to do with restrictive mediation, 31% with enabling mediation, and about 7% with observant mediation. This disproportion itself is a determinant of numbers of factorable strategies. Future research is needed to use a more proportioned number of items for the trichotomy.

Conclusions

This narrative review aimed to assess the validity of content and factor structure of the 10 measurement scales for parental mediation of children's Internet use. The reviewed studies showed no consistent evidence for the validity (no conformity to the distinction in parental mediation strategies), although restrictive versus enabling mediation was common to all the different models. Therefore, this review further focused on establishing the content validity and proposed the trichotomy of restrictive-enabling-observant parental mediation to be tested. This contribution may facilitate research on antecedents to and consequences of parental mediation strategies, thereby producing clear policy advice for parents.

Further contribution of the review manifested itself in disclosing five aspects of measurement issues to be considered in further research: (a) sample characteristics, (b) item generation, (c) contents/number of items and representative terms, (d) binary versus ordinal data analysis, and (e) methods of statistical analysis. However, the review is narrative and limited to random selection of the 10 scales. A systematic review of parental mediation scales might provide the cutting-edge evidence for their content and construct validity. The review is also restricted to the establishment of content validity. Further empirical research is needed to test construct validity and reliability of the proposed measures of parental mediation strategies. Such research may benefit from the proposed conceptual definitions, especially for modeling and testing an accurate number of parental mediation strategies, thereby predicting a balance between children's online safety/risks and opportunities.

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