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To cite this article: Ine Beyens, Loes Keijsers & Patti M. Valkenburg (2024) Development, validity, and reliability of the parent-adolescent communication about adolescents' social media use scale (PACAS), *Journal of Children and Media*, 18:2, 159-177, DOI: [10.1080/17482798.2023.2299828](https://doi.org/10.1080/17482798.2023.2299828)

To link to this article: <https://doi.org/10.1080/17482798.2023.2299828>



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Published online: 30 Jan 2024.



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Development, validity, and reliability of the parent-adolescent communication about adolescents' social media use scale (PACAS)

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ABSTRACT

Adolescents spend a substantial portion of their time using social media. Yet, there is a lack of understanding regarding how often parents and adolescents communicate about this social media use. To address this gap, we developed the Parent-Adolescent Communication about Adolescents' Social Media Use Scale (PACAS). In a first data wave, among 388 Dutch adolescents (13–15 years; 54% girls), exploratory and confirmatory factor analyses distinguished four scales: parental solicitation, adolescent disclosure, adolescent secrecy, and parental knowledge. All four scales had strong internal reliability and correlated in the expected directions. We re-established the validity and internal reliability and obtained test-retest reliability in a second wave, in which 330 adolescents were surveyed again. The findings show that parents and adolescents infrequently communicate about social media. Parental knowledge about adolescents' social media use strongly depends on the communication efforts of both parties. Altogether, the PACAS provides a valuable tool to explore the dynamics of parent-adolescent communication about social media.

ARTICLE HISTORY

Received 24 February 2023

Revised 6 December 2023

Accepted 22 December 2023

KEYWORDS

Adolescents;
communication; monitoring;
parents; social media

IMPACT SUMMARY

Prior State of Knowledge: Adolescents use social media around the clock. This raises concerns among parents about what their adolescents do and experience on social media. Yet, our understanding of how parents and adolescents communicate about these issues is limited.

Novel Contributions: This study developed the Parent-Adolescent Communication about Adolescents' Social Media Use Scale (PACAS), which consists of four scales: parental solicitation, adolescent disclosure, adolescent secrecy, and parental knowledge. The findings show that parents and adolescents infrequently communicate about social media.

Practical Implications: The findings emphasize that parents should not only solicit information but also foster open communication so that adolescents can willingly disclose information about their social media use. Only then can parents keep informed about their adolescents' social media experiences.

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Social media have become an integral part of adolescents' daily lives. As soon as they wake up, adolescents check their phones for notifications and start scrolling through their social media feeds, such as Instagram, Snapchat, and TikTok (Pew Research Center, 2018; Robb et al., 2018; van Driel et al., 2019). The omnipresence of social media in adolescents' lives creates concerns among parents. Many parents believe that their adolescents spend too much time using social media, so that it disrupts their homework and sleep (Pew Research Center, 2018, 2020). In addition, many parents are concerned about what adolescents do on social media and with whom they interact, and fear that their adolescents may have negative experiences such as cyberbullying, social exclusion, or sexual solicitation (George & Odgers, 2015; Livingstone & Byrne, 2018).

Parents' concerns around adolescents' social media use may motivate them to monitor adolescents' social media use, that is, keeping track of what adolescents do on social media and with whom they interact (Beyens et al., 2022). One means of parental monitoring is *parental control*, often referred to as *restrictive mediation* in the media-specific parenting literature (Nathanson, 1999; Valkenburg et al., 1999). Parents may control adolescents' social media use by imposing rules and restrictions, such as prohibiting them to use social media or restricting the time they spend on social media or the content they can access (Fardouly et al., 2018; Modecki et al., 2022). Another means of parental monitoring is *parental surveillance*, through which parents actively check adolescents' social media activities, for example, by checking their social media profiles or "friending" their adolescents on social media so that they can scroll through their adolescents' posts (Ho et al., 2020; Mesch, 2018).

Since adolescents' social media use has increased enormously over the past years and increasingly happens outside the purview of their parents (Valkenburg & Piotrowski, 2017), parental control and surveillance have become much more challenging. Moreover, adolescents may consider rule-setting about their (social) media use as an illegitimate act of parents, as it interferes with their private spheres (Darling et al., 2007; Smetana, 1995, 2017). Therefore, parent-adolescent communication has become ever more important (Valkenburg & Piotrowski, 2017).

Parent-adolescent communication concerns the interactions between a parent and adolescent to exchange information about adolescents' activities, whereabouts, and companionship. The parenting literature has studied parent-adolescent communication for decades. Most of this work has assessed parent-adolescent communication about offline leisure time activities, whereabouts, and companionship, as well as the knowledge that parents may gain through such communication (Dishion & McMahon, 1998; Kerr & Stattin, 2000; Smetana, 2017). Since the seminal work of Stattin and Kerr (2000), scholars have distinguished parents' knowledge from the actual parental communication behaviors that contribute to such knowledge, such as parental solicitation of information. After all, simply asking questions does not always produce knowledge among parents about what adolescents are doing, where, and with whom. Moreover, scholars have progressively focused on adolescent information management strategies aimed at revealing or concealing information for parents, such as adolescent disclosure and adolescent secrecy of information (Finkenauer et al., 2002; Frijns et al., 2010; Kerr & Stattin, 2000; Lionetti et al., 2016; Smetana et al., 2006; Stattin & Kerr, 2000).

The study of parent-adolescent communication of adolescents' offline activities has yielded valuable insights. However, hardly any study has assessed to what extent parents

and adolescents communicate about adolescents' social media activities (for a review see Beyens et al., 2022), even though such activities play a prominent role in many adolescents' lives. The media-specific parenting literature, and in particular the parental media-tion literature, has extensively studied parent-adolescent communication concerning more traditional media, such as television and games. These communicative interactions have been termed *active mediation* in the literature and encompass conversations between parents and adolescents through which they may explain, discuss, and evaluate media content (Nathanson, 1999; Valkenburg et al., 1999).

While numerous studies have explored active mediation of adolescents' media use (for an overview see Collier et al., 2016), there has been a considerable lack of studies focusing on active mediation of adolescents' social media use (for some notable exceptions see, for example, Daneels & Vanwynsberghe, 2017; Ho et al., 2020, 2017; Symons et al., 2017). Moreover, studies that have investigated active mediation of adolescents' social media use have primarily conceptualized it as parent-initiated communication, in which parents tell and explain to their adolescents what is considered appropriate social media behavior. However, it is widely recognized that parent-adolescent communication is inherently bidirectional, with both parents and adolescents acting as active agents.

One reason for the scarcity of research into parent-adolescent communication about adolescents' social media use is that, thus far, an instrument to assess such communication was lacking. The aim of the current study is to fill this void by developing the Parent-Adolescent Communication about Adolescents' Social Media Use Scale (PACAS) and investigating its validity and reliability. Based on existing well-validated instruments for offline parent-adolescent communication (Frijns et al., 2010; Kerr & Stattin, 2000; Kerr et al., 2010; Lionetti et al., 2016), the PACAS measures three aspects of parent-adolescent communication, that is, parental solicitation, adolescent disclosure, and adolescent secrecy, as well as the outcome of parent-adolescent communication, that is, parental knowledge.

Parental solicitation

A first aspect of parent-adolescent communication that the PACAS assesses is parental solicitation of information. Parental solicitation concerns parents' efforts to actively seek information about their adolescents' activities, whereabouts, and companionship, by asking adolescents questions (Kerr & Stattin, 2000; Stattin & Kerr, 2000). To our knowledge, four studies have investigated parental solicitation about social media use (Biernesser et al., 2020; Dhir et al., 2019; Wallace, 2021, 2022). One study investigated how often parents ask their adolescents what they do and whom they chat with on social media (Dhir et al., 2019). The two studies by Wallace (2021, 2022) investigated whether parents ever asked their adolescents about what they post or do on social media, which about 60% of parents did. And a fourth study, based on interviews among 13- to 20-year-olds diagnosed with depression and their parents, showed that parents engaged in solicitation both in person and via social media, especially when they feared that their adolescents' social media use was harmful (Biernesser et al., 2020).

While these studies provide initial insights into parental solicitation of what adolescents do on social media and with whom they interact, it is not yet understood to what extent parents solicit information about adolescents' enjoyable and unenjoyable social

media experiences. Therefore, the PACAS will include a parental solicitation measure that encompasses solicitation of what adolescents do on social media (i.e., social media activities), with whom they interact on social media (i.e., social media companionship), and their enjoyable and unenjoyable social media experiences (i.e., the valence of activities).

Adolescent disclosure

A second aspect that the PACAS assesses is adolescents' disclosure of information, which concerns adolescents' sharing of information with their parents (Kerr & Stattin, 2000; Stattin & Kerr, 2000). Adolescents may, for example, tell their parents what they do on social media or whom they interact with. The parenting literature has increasingly acknowledged that adolescents are not passive recipients of parenting, but active agents who manage the information they want to share with their parents (Marshall et al., 2005). In fact, research on adolescent leisure time activities and whereabouts has shown that parents obtain most knowledge about adolescents' activities from adolescents' disclosure of information, rather than by soliciting information (Keijsers et al., 2016; Kerr & Stattin, 2000; Stattin & Kerr, 2000).

To our knowledge, four studies have investigated adolescents' disclosure about their social media use (Bartolo et al., 2019; Biernesser et al., 2020; Law et al., 2010; Van Zalk & Van Zalk, 2020). Surprisingly, these studies showed that adolescents' perception of how much they disclosed about their online activities, including posting content online, chatting with friends, and chatting with strangers, hardly matched with parents' perception of how much they knew about adolescents' online activities (Van Zalk & Van Zalk, 2020). Moreover, adolescents' disclosure seemed to depend on how legitimate adolescents considered it for their parents to be informed about their social media use, since adolescents diagnosed with depression openly discussed their social media use and its impact on their mood with their parents when they accepted their parents' monitoring (Biernesser et al., 2020). Although the existing evidence provides valuable insights, important knowledge is still missing, such as knowledge about adolescents' disclosure of enjoyable and unenjoyable social media experiences. Therefore, the PACAS will assess adolescent disclosure of their social media activities as well as the valence of these activities, and their social media companionship.

Adolescent secrecy

While adolescents may disclose information about their social media use to their parents, they may also conceal information and keep what they do on social media secret (Finkenauer et al., 2002; Frijns et al., 2010). Such secrecy is normative given that adolescents strive for autonomy and independence from their parents (Goldstein, 2016; Shin & Kang, 2016). Indeed, the media-specific parenting literature has shown that adolescents often try to avoid or resist parental mediation and interference (Valkenburg & Piotrowski, 2017). While it is conceivable that adolescents hide information from their parents about what they do or whom they interact with on social media, adolescent secrecy concerning their social media use has not yet been investigated extensively. Biernesser et al. (2020) found that some adolescents hid information about their social media use from their

parents because they feared that their parents would deactivate their social media account or would disapprove of their social media use. In all, empirical evidence regarding adolescent secrecy about their social media use is scarce. Hence, several questions remain unanswered, such as to what extent adolescent secrecy regarding social media use is linked to parental attempts to solicit information. Therefore, adolescent secrecy will be a prominent part of the PACAS.

Parental knowledge

In addition to the three aspects of parent-adolescent communication about social media use, the PACAS also assesses adolescents' perceived parental knowledge about their social media use. In the parenting literature, parental knowledge of adolescents' activities has often been used as an operationalization of parental monitoring. Such operationalization has been criticized, since parental knowledge should be considered as an *outcome* of parental monitoring (Kerr et al., 2010; Smetana, 2017; Stattin & Kerr, 2000). This has been confirmed empirically in several studies (for a meta-analysis see Liu et al., 2020), although it is also conceivable that parental knowledge is a cause of parental monitoring.

Overall, it seems that parents have limited knowledge about adolescents' online activities and exposure to online risks, such as cyberbullying (Symons et al., 2017). Moreover, parents' knowledge about their social media activities seems to vary across topics: Van Zalk and Van Zalk (2020) found that parents had more knowledge about adolescents' chatting with friends than chatting with strangers and posting content. In addition, how much parents know about their adolescents' social media use also seems to vary across parents: Biernesser et al. (2020) showed that while some parents found it difficult to obtain knowledge about their adolescents' social media use, other parents were more confident about their knowledge. Overall, insights into parental knowledge about adolescents' social media use are scarce. Therefore, perceived parental knowledge will be included in the PACAS as an important correlate of parental solicitation, adolescent disclosure, and adolescent secrecy.

The current study

The current study uses data from a two-wave survey study among a sample of Dutch middle adolescents to assess parent-adolescent communication about adolescents' social media use (i.e., parental solicitation, adolescent disclosure, and adolescent secrecy) and the outcome of such communication (i.e., perceived parental knowledge), which together constitute the PACAS. We focused on middle adolescence because this is a period of life in which social media are immensely popular (Pew Research Center, 2022; van Driel et al., 2019). Furthermore, middle adolescence is a phase where parental control diminishes (Keijsers et al., 2009). Adolescents in this stage of life often do not accept parental regulation of their social media use (Valkenburg & Piotrowski, 2017), even though such regulation may be warranted, given the peak of risk-taking behaviors during this developmental period (Steinberg, 2007). Consequently, parent-adolescent communication becomes more important for parents to remain informed about their adolescents' social media use (Valkenburg & Piotrowski, 2017).

The research questions, hypotheses, and analysis plan of the current study were preregistered on the Open Science Framework (OSF) prior to analyzing the data (<https://osf.io/w7tc5/>). Unless stated otherwise, we fully adhered to the preregistration. As preregistered, we investigated the factorial validity, internal reliability, and construct validity of the PACAS. First, we investigated the factorial validity. That is, the extent to which the underlying factor structure of the PACAS accurately reflects the expected constructs it is intended to measure. Based on research into parent-adolescent communication of offline activities (Lionetti et al., 2016), we expected that the PACAS consists of four scales (**H1**): three parent-adolescent communication scales (i.e., parental solicitation, adolescent disclosure, and adolescent secrecy) and the outcome of parent-adolescent communication, that is, perceived parental knowledge. Second, we investigated the internal reliability of the four PACAS scales (**RQ1**). In addition to our preregistered plan, we also examined the test-retest reliability of the PACAS. That is, the extent to which the four scales of the PACAS are stable over time (Carmines & Zeller, 1979).

Finally, we investigated the construct validity of the four PACAS scales. That is, to what extent the four scales correlate, based on theoretically derived hypotheses (Carmines & Zeller, 1979). Based on parenting theories and the findings of previous parenting studies concerning offline activities, we formulated the following hypotheses. We expected that adolescent disclosure would be negatively associated with adolescent secrecy (**H2a**; Frijns et al., 2010; Keijsers & Laird, 2014; Lionetti et al., 2016) and positively associated with perceived parental knowledge (**H2b**; Kerr & Stattin, 2000; Kerr et al., 2010; Stattin & Kerr, 2000) and solicitation (**H2c**; Kerr & Stattin, 2000; Lionetti et al., 2016; Stattin & Kerr, 2000). In addition, we expected that adolescent secrecy would be negatively associated with perceived parental knowledge (**H2d**; Hawk et al., 2013) and solicitation (**H2e**; Darling & Tilton-Weaver, 2019; Keijsers & Laird, 2014; Lionetti et al., 2016). And we expected that perceived parental solicitation and knowledge would be positively associated (**H2f**; Kerr & Stattin, 2000; Stattin & Kerr, 2000).

Method

The study was approved by the Ethics Review Board of the Faculty of Social and Behavioral Sciences at the University of Amsterdam. Data were collected through two online surveys that are part of a larger longitudinal cohort study. Participants were surveyed using the survey software Qualtrics. They completed the first survey at school during school hours (November 2019). Six months later, they completed the second survey at home (May 2020). Participants were ensured that their responses would be kept private. The study design and sampling plan were preregistered on OSF before recruitment of the sample and collection of the data (<https://osf.io/327cx/>).

Participants

The sample was drawn from grades 8 and 9 in a secondary school in the Netherlands. A total of 388 adolescents ($M_{\text{age}} = 14.11$, $SD = 0.69$; 54% girls) provided

informed assent to participate in the study and completed the first survey. All participants' parents provided active consent for their adolescent to participate. Participants were enrolled in different educational tracks, including prevocational secondary education (44%), intermediate general secondary education (31%), and academic preparatory education (26%). Most participants were born in the Netherlands (96%) and self-identified as Dutch (96%). The sample was representative of adolescents in the Netherlands in terms of educational level and ethnic background (Statistics Netherlands, 2020).

A total of 330 adolescents ($M_{\text{age}} = 14.57$, $SD = 0.69$; 55% girls) completed the second survey. A multivariate analysis of variance (MANOVA) using Pillai's Trace showed that participants who only completed the first survey and participants who completed the two surveys did not differ on any of the four PACAS scales: parental solicitation ($F(1, 386) = 0.48$, $p = .49$, $\eta_p^2 = .00$), parental knowledge ($F(1, 386) = 0.02$, $p = .90$, $\eta_p^2 = .00$), adolescent disclosure ($F(1, 386) = 0.31$, $p = .58$, $\eta_p^2 = .00$), and adolescent secrecy ($F(1, 386) = 1.60$, $p = .207$, $\eta_p^2 = .00$).

Measures

Parent-adolescent communication about adolescents' social media use

Based on measures of (general) parent-adolescent communication (Frijns et al., 2010; Kerr & Stattin, 2000; Stattin & Kerr, 2000), the PACAS measures adolescents' perception of how often their parents ask them about their social media use (i.e., parental solicitation), how often they tell their parents about their social media use (i.e., adolescent disclosure), how often they keep secrets about their social media use (i.e., adolescent secrecy), and what their parents know about their social media use (i.e., parental knowledge).

Each of the four scales of the PACAS consists of four items, which are based on the items of the original scale of Stattin and Kerr (2000) and refer to (1) what adolescents do on social media (i.e., social media activities), (2) with whom they interact on social media (i.e., social media companionship) and (3) their enjoyable and (4) unenjoyable social media experiences (i.e., the valence of activities). In the original scale of Stattin and Kerr (2000), items measuring adolescents' physical whereabouts are included. However, because social media, and online environments more generally, can be considered whereabouts in themselves, we did not include items concerning adolescents' whereabouts in the PACAS.

Adolescents were asked to think about their parent or caregiver who is most involved in their media use. They were asked to indicate their responses to the parent-adolescent communication items on a 5-point Likert scale with response options 1 (*never*), 2 (*almost never*), 3 (*sometimes*), 4 (*often*), and 5 (*very often*). Response options for the perceived parental knowledge scale were 1 (*nothing at all*), 2 (*almost nothing*), 3 (*a little*), 4 (*a lot*), and 5 (*a great deal*). Table 1 presents an overview of all four scales and all items per scale.

Table 1. Valid percentages for the four scales of the PACAS (wave 1).

		Never	Almost never	Sometimes	Often	Very often
Parental Solicitation	<i>How often do your parents initiate a conversation with you about ...</i>					
	what you do on social media?	31.70%	39.43%	22.94%	4.90%	1.03%
	with whom you interact on social media?	32.47%	37.37%	24.48%	4.64%	1.03%
	the enjoyable experiences you have on social media?	33.25%	33.76%	23.45%	8.76%	0.77%
	the unenjoyable experiences you have on social media?	36.86%	36.86%	19.33%	5.67%	1.29%
Adolescent Disclosure	<i>How often do you tell your parents about ...</i>					
	what you do on social media?	26.80%	37.37%	26.03%	7.99%	1.80%
	with whom you interact on social media?	25.77%	32.99%	28.87%	10.05%	2.32%
	the enjoyable experiences you have on social media?	23.45%	27.84%	29.64%	15.21%	3.87%
	the unenjoyable experiences you have on social media?	34.79%	34.54%	18.56%	8.25%	3.87%
Adolescent Secrecy	<i>How often do you keep secrets from your parents about ...</i>					
	what you do on social media?	42.78%	30.15%	17.78%	6.96%	2.32%
	with whom you interact on social media?	45.10%	32.22%	12.63%	7.22%	2.84%
	the enjoyable experiences you have on social media?	52.84%	27.32%	12.11%	5.67%	2.06%
	the unenjoyable experiences you have on social media?	50.26%	26.55%	14.18%	5.67%	3.35%
		Nothing at all	Almost nothing	A little	A lot	A great deal
Parental Knowledge	<i>What do your parents know about ...</i>					
	what you do on social media?	8.76%	17.78%	36.08%	29.12%	8.25%
	with whom you interact on social media?	13.40%	23.45%	30.93%	23.71%	8.51%
	the enjoyable experiences you have on social media?	12.63%	26.29%	27.58%	25.52%	7.99%
	the unenjoyable experiences you have on social media?	20.88%	31.19%	24.23%	16.24%	7.47%

Data availability

The data set underlying this study is openly available in Figshare at <https://doi.org/10.21942/uva.24754386>. The analysis scripts and materials belonging to this article are available at OSF (<https://osf.io/p7vku/>).

Results

Descriptive statistics

Table 1 shows the distribution of the responses for each item of the four PACAS scales in the first wave. Most parents infrequently asked their adolescents about their social media use. For example, almost one in three adolescents indicated that their parents never asked questions about what they did on social media and with whom they interacted. Moreover,

more than half of adolescents (almost) never told their parents about their social media use, whereas 10 to 19% (very) often did. At the same time, most adolescents (>70%) indicated that they (almost) never kept secrets about their social media use. Finally, while more than one in three adolescents indicated that their parents knew almost nothing or nothing at all about their companionship on social media and their enjoyable experiences, one in three adolescents indicated that their parents knew a lot or a great deal about it.

Factorial validity of the PACAS

To assess the factorial validity of the PACAS (H1), we conducted exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) at both survey waves.

Exploratory Factor Analysis (EFA)

As an extension of our preregistered analysis plan, we conducted an exploratory factor analysis (EFA) with oblique rotation with the 12 parent-adolescent communication items to assess to what extent the three hypothesized communication factors (i.e., parental solicitation, adolescent disclosure, adolescent secrecy) could be empirically distinguished. That is, whether each of the items loaded on a unique factor apart from the other factors. The EFA provided a three-factor solution at both waves, with all eigenvalues of these factors greater than 1 and the scree plots showing a sharp decrease in eigenvalues after three factors. The three factors explained 77% of the variance in the first wave and 76% in the second wave. Table 2 shows the three factors, the rotated factor loadings for all items, and the eigenvalues for each factor at the two waves.

Table 2. Oblimin-rotated factor loadings and eigenvalues of the exploratory factor analysis with the three parent-adolescent communication scales of the PACAS.

	Factor Loadings						Eigenvalues	
	Wave 1			Wave 2			Wave 1	Wave 2
	1	2	3	1	2	3	1	2
Factor 1: Adolescent Disclosure							4.78	4.66
<i>How often do you tell your parents about ...</i>								
(1) what you do on social media?	.89	.03	.05	.81	-.01	-.05		
(2) with whom you interact on social media?	.85	.01	.02	.77	-.05	-.04		
(3) the enjoyable experiences you have on social media?	.76	.00	-.04	.85	.03	.07		
(4) the unenjoyable experiences you have on social media?	.74	-.06	-.09	.71	.02	-.06		
Factor 2: Adolescent Secrecy							3.44	3.19
<i>How often do you keep secrets from your parents about ...</i>								
(1) what you do on social media?	-.03	.90	-.03	-.03	.90	.01		
(2) with whom you interact on social media?	-.02	.89	-.05	-.04	.87	-.01		
(3) the enjoyable experiences you have on social media?	.05	.90	.06	-.01	.88	-.04		
(4) the unenjoyable experiences you have on social media?	-.01	.85	-.00	.07	.81	.03		
Factor 3: Parental Solicitation							1.05	1.23
<i>How often do your parents initiate a conversation with you about ...</i>								
(1) what you do on social media?	-.08	.03	-.85	-.13	-.01	-.92		
(2) with whom you interact on social media?	.01	.05	-.74	.00	.02	-.78		
(3) the enjoyable experiences you have on social media?	.06	-.03	-.75	.17	.01	-.66		
(4) the unenjoyable experiences you have on social media?	.09	-.06	-.78	.20	-.01	-.67		

Note. Factor loadings $\geq .40$ are shown in bold.

In addition, we conducted a separate EFA with the four parental knowledge items. This EFA provided a one-factor solution at both waves, with an eigenvalue greater than 1 (eigenvalue Wave 1: 2.88; eigenvalue Wave 2: 2.92) and the scree plot showing a sharp decrease in eigenvalues after one factor. The perceived parental knowledge factor explained 72% of the variance in the first wave and 73% in the second wave. All factor loadings were $\geq .75$. To conclude, in both waves, all items loaded on their hypothesized factors.

Confirmatory Factor Analysis (CFA)

We conducted confirmatory factor analysis (CFA) in Mplus (Version 8.4) to investigate whether the factorial structure of the general parent-adolescent communication scales (Frijns et al., 2010; Kerr & Stattin, 2000; Stattin & Kerr, 2000) could be validated for the PACAS. While our original plan was to conduct a series of four CFAs at each wave, one for each scale, we conducted a single CFA with the three communication scales that were distinguished by the EFA (i.e., parental solicitation, adolescent disclosure, and adolescent secrecy) at each wave instead, guided by the constructive recommendations of the reviewers of the current article. We evaluated the factorial validity based on the fit of the CFA models.

Table 3 provides an overview of all factor loadings of the CFA models. All factor loadings were $\geq .73$. Model fit was acceptable for both CFA models (Wave 1: CFI = .93, TLI = .91, RMSEA = .09; Wave 2: CFI = .92, TLI = .90, RMSEA = .08). Thus, factorial validity was established in both data waves. Altogether, the findings of the EFA and CFA indicate that the PACAS adequately measures three theoretically relevant and distinct dimensions of parent-adolescent communication and one dimension of perceived parental knowledge about adolescents' social media use.

Internal reliability and test-retest reliability of the PACAS and scale creation

We investigated the internal reliability of the four scales of the PACAS (RQ1), by computing Cronbach's alpha for each scale in R. All four of the PACAS scales had excellent reliability in both waves (all Cronbach's alphas $\geq .87$; see Table 4). None of the Cronbach's alphas improved upon removing items from the scales. Based on the results of the EFA, CFA, and reliability tests, we created four scales (i.e., parental solicitation, adolescent disclosure, adolescent secrecy, and parental knowledge) by averaging across the responses to the four items per scale. Such mean scoring approach enhances the

Table 3. Factor loadings of the confirmatory factor analysis with the three parent-adolescent communication scales of the PACAS.

	Wave 1			Wave 2		
	Parental Solicitation	Adolescent Disclosure	Adolescent Secrecy	Parental Solicitation	Adolescent Disclosure	Adolescent Secrecy
Item 1 – what you do on social media	.78	.85	.92	.79	.87	.90
Item 2 – with whom you interact on social media	.74	.84	.91	.77	.82	.87
Item 3 – the enjoyable experiences you have on social media	.81	.78	.87	.80	.77	.89
Item 4 – the unenjoyable experiences you have on social media	.84	.80	.84	.82	.73	.80

Table 4. Correlations, reliability estimates, means, standard deviations, and skewness and kurtosis statistics for the four scales of the PACAS.

	Parental Solicitation	Adolescent Disclosure	Adolescent Secrecy	Parental Knowledge
Parental Solicitation	–	.57***	.15**	.41***
Adolescent Disclosure	.62***	–	.02	.61***
Adolescent Secrecy	.08	–.12*	–	–.22***
Parental Knowledge	.50***	.64***	–.20***	–
<i>Cronbach's α</i> Wave 1	.87	.89	.94	.87
<i>Cronbach's α</i> Wave 2	.87	.87	.92	.88
<i>M (SD)</i> Wave 1	2.04 (0.80)	2.28 (0.92)	1.87 (0.96)	2.87 (0.97)
<i>M (SD)</i> Wave 2	1.95 (0.79)	2.28 (0.90)	1.90 (0.96)	2.89 (0.90)
Skewness Wave 1	0.52	0.54	1.17	–0.01
Skewness Wave 2	0.37	0.26	1.07	0.04
Kurtosis Wave 1	–0.04	–0.06	0.93	–0.60
Kurtosis Wave 2	–0.71	–0.40	0.61	–0.14

Note. Correlations below the diagonal line represent Wave 1 correlations, correlations above the diagonal line represent Wave 2 correlations.

* $p < .05$. ** $p < .01$. *** $p < .001$.

comparability of statistics across studies. Higher scores were indicative of greater perceived solicitation, disclosure, secrecy, and knowledge.

Table 4 shows the means and standard deviations of the scales. As the table shows, all scales were normally distributed. On average, adolescents indicated that their parents almost never initiated a conversation about their social media use and that they themselves almost never told their parents about their social media use. At the same time, adolescents indicated that they almost never kept secrets about their social media use. In fact, adolescents disclosed more about their social media use than they kept secrets (Wave 1: $t(387) = 5.72$, $p < .001$; Wave 2: $t(329) = 5.22$, $p < .001$). The low levels of solicitation and disclosure were also reflected in adolescents' perceived parental knowledge, since, on average, adolescents thought that their parents knew a little about their social media use.

To investigate the test-retest reliability of the PACAS, we examined the zero-order correlations between the four scales measured at the first wave and the four scales measured at the second wave. The test-retest reliabilities were satisfactory for all four scales. The correlations between the four scales measured at wave 1 and at wave 2 showed that parental solicitation ($r = .44$, $p < .001$), adolescent disclosure ($r = .51$, $p < .001$), adolescent secrecy ($r = .41$, $p < .001$), and parental knowledge ($r = .50$, $p < .001$) were relatively stable over time.

Construct validity of the PACAS

To investigate the construct validity of the PACAS (H2), we investigated the (between-person) zero-order correlations among all scales at each wave (see Table 4). While our original preregistered plan was to test the construct validity via a structural model in Mplus, we instead computed the zero-order Pearson correlations between the four scales, which allowed us to look at the correlations between the composite scores. With one exception, all hypotheses concerning the construct validity of the PACAS were confirmed in the first wave. Adolescent disclosure was negatively associated with adolescent secrecy (H2a) and strongly positively associated with perceived parental knowledge (H2b) and solicitation (H2c). Perceived parental knowledge was negatively associated with adolescent secrecy (H2d) and

positively associated with parental solicitation (H2f). However, contrary to expectations, adolescent secrecy was not associated with parental solicitation (H2e). All correlations were replicated in the second wave, with two notable exceptions. First, contrary to expectations, adolescent disclosure and secrecy were not associated (H2a). Second, contrary to H2e, adolescent secrecy and parental solicitation were positively associated. Thus, adolescents whose parents more often asked questions about their social media use than other adolescents' parents, kept more secrets. Overall, the findings provided evidence for the construct validity of the PACAS in both data waves.

Discussion

Even though social media have become an integral part of adolescents' lives, very few studies have examined to what extent parents and adolescents communicate about social media. Therefore, the current study developed the Parent-Adolescent Communication about Adolescents' Social Media Use Scale (PACAS). The study demonstrated that the PACAS has excellent validity and reliability. Evidence for factorial validity was found, since four scales were distinguished: parental solicitation, adolescent disclosure, adolescent secrecy, and parental knowledge about social media use. All four scales had excellent internal reliability. In addition, evidence for construct validity was found, given that, with some notable exceptions, all four scales correlated with each other in the expected directions. We re-established the validity and reliability in a second data wave and established test-retest reliability, showing that the four scales of the PACAS are consistent over time.

What parents know about adolescents' social media use and how they know it

The findings of the current study suggest that adolescents and parents infrequently communicate about adolescents' social media use. Even though adolescents now spend more of their waking hours online than in school (Pew Research Center, 2022), only five percent of adolescents in our study indicated that their parents frequently solicited information about what they do on social media and their companionship on social media, and more than half of adolescents (almost) never told their parents about their social media use. One reason as to why parent-adolescent communication about social media use occurred infrequently may be that adolescents consider their (social) media use as a personal domain (Smetana, 1995, 2017), and thus beyond the legitimacy of their parents (Darling et al., 2007). Another reason may be that many parents and adolescents communicate infrequently in general, and not just about social media. Some families may have more open communication styles than other families, which may also be reflected in how much they communicate about adolescents' social media use (Fujioka & Austin, 2002).

Still, the process of parent-adolescent communication seems to be quite similar across offline and online activities. Just as for adolescents' offline activities (Liu et al., 2020), what parents know about adolescents' social media activities seems to depend more on adolescents' disclosure of information than on parents' solicitation of information. In

addition, and also consistent with parenting of offline behaviors (Lionetti et al., 2016), adolescents who kept fewer secrets about their social media use also reported that their parents had more knowledge about their social media use.

At the same time, and much in line with research on parenting of offline behaviors, parental solicitation, adolescent disclosure, and adolescent secrecy about social media use are intertwined. Adolescents who indicated that their parents more often asked about their social media use also disclosed information more often. In fact, consistent with research on parent-adolescent communication about offline behaviors (Lionetti et al., 2016; Stattin & Kerr, 2000), adolescent disclosure and parental solicitation were strongly correlated. This is not surprising, given the reciprocal nature of adolescent disclosure and parental solicitation, whereby parents' questions lead to disclosure by adolescents, and adolescents' disclosure leads to questions from parents. Adolescents who more often disclosed information also had fewer secrets about their social media use. Yet, overall, adolescents disclosed more about their social media use than they kept secrets, which is consistent with how much adolescents disclose and keep secret about their offline activities (Laird et al., 2013). Other types of concealment that are less effortful than secrecy, such as partial disclosure (i.e., sharing some information and leaving out other information) or avoiding discussion of the issue, may be more common (Cumsille et al., 2010).

In other aspects, however, communication about social media may also have unique characteristics. In a second wave of data, we found that adolescents who reported that their parents more often solicited information, kept more secrets. This stands in contrast with findings that demonstrate that higher levels of parental solicitation of offline behaviors is linked to *lower* levels of secrecy (Darling & Tilton-Weaver, 2019; Keijsers & Laird, 2014). Perhaps adolescents consider parents' solicitation regarding their online activities as an act of privacy invasion, so that they keep such information secret (Dietvorst et al., 2018; LaFleur et al., 2016; Laird et al., 2018). Adolescents may also hide information to avoid parents' negative reactions (Darling et al., 2006; Tilton-Weaver et al., 2010). For example, they may fear that their parents will become worried or disapprove of their social media use (Biernesser et al., 2020).

Another explanation for the positive link between adolescent secrecy and parental solicitation may be that parents whose adolescents are more secretive, engage in more solicitation in an attempt to increase their knowledge. Alternatively, adolescents may simply have more opportunities to keep secrets if their parents often ask questions about their social media use. In other words, the more parents and adolescents communicate, the more opportunities there are for adolescents to conceal information. Conversely, if parents never ask questions about their social media use, adolescents may not have a reason to keep secrets.

Avenues for future research

The findings of the current study raise several new questions. While they suggest that parent-adolescent communication about social media use hardly takes place, it is yet to be assessed how problematic this is. Recently, for example, communication has been put forth as a way through which parents may shape the effects of adolescents' social media use on their well-being (Beyens et al., 2022). It is plausible that adolescents who openly

communicate with their parents about their social media use and whose parents are knowledgeable about their social media use are less susceptible to the effects of social media compared to adolescents who communicate less and whose parents know less about their social media use. To test these assumptions, studies are needed that investigate whether parent-adolescent communication moderates the effects of adolescents' social media use on their well-being.

Our findings also indicate that the extent of parent-adolescent communication differs across adolescents. For example, while more than half of adolescents (almost) never told their parents about what they do on social media, one in ten often did. Such between-person differences are also found concerning parent-adolescent communication of offline activities (Cumsille et al., 2010; Darling et al., 2006, 2009). In the parenting literature, it has been demonstrated that the extent of parent-adolescent communication also differs *within* adolescents (Darling et al., 2006, 2009; Smetana et al., 2010; Villarreal & Nelson, 2022). That is, how much information adolescents disclose or conceal may differ across situations and time. Such within-person fluctuations can be assessed using intensive longitudinal designs, such as daily diary studies (Keijsers et al., 2016, 2022). Therefore, studies are needed that use intensive longitudinal data to capture within-person variations in parent-adolescent communication about adolescents' social media use.

Intensive longitudinal data studies are also needed to unravel the direction of the associations of parental solicitation, adolescent disclosure, and adolescent secrecy with parental knowledge. While the parental monitoring literature assumes that parent-adolescent communication may result in parental knowledge (Kerr et al., 2010; Smetana, 2017; Stattin & Kerr, 2000), it is also possible that parental knowledge triggers parent-adolescent communication. It is very likely, for example, that parents start asking more questions about adolescents' social media use if they become aware that their adolescents' social media use is harmful for their well-being (Biernesser et al., 2020). Altogether, by employing intensive longitudinal data, we will be able to understand how parents and adolescents may optimally benefit from communicating about social media.

Conclusion

In the absence of instruments to assess parent-adolescent communication about social media, the study of how parents stay informed about adolescents' social media use is still in its infancy. By developing and validating an instrument to assess parental solicitation, adolescent disclosure and secrecy, and parental knowledge about adolescents' social media use, this study adds to our understanding of today's parenting in an ever more digitalized world. Altogether, the current study not only indicates that parents and adolescents infrequently communicate about social media, but also demonstrates that what parents know about adolescents' social media use depends on both parents' and adolescents' communication efforts.

Acknowledgments

We would like to thank Loes Pouwels and Irene van Driel for their contribution to the design and data collection of this study. We would like to thank Tim Verbeij and Teun Siebers for their contribution to the data collection of this study.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This preregistered study was funded by an NWO Spinoza Prize and an NWO Gravitation Grant (NWO Grant 024.001.003; Consortium on Individual Development) awarded to Patti Valkenburg by the Dutch Research Council (NWO). Additional funding was received from an NWO VIDI grant (NWO VIDI Grant 452.17.011) awarded to Loes Keijsers.

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