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Exploring Adolescents' Social Media Connection and Disconnection: A Latent Class Approach

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Abstract

In industrialized societies characterized by ubiquitous connectivity, many individuals disconnect from their phones or social media to break patterns of habitual use, reduce information overload, alleviate stress, and avoid distractions. Although research has predominantly focused on (young) adults, information on digital disconnection among adolescents remains limited. In response, in the present study, we analyzed survey data from 956 Flemish adolescents in Belgium (M_{age} = 15.10, SD = 1.61, and 64.8% girls) and, using latent class analysis, identified two subgroups: Class 1 labeled as "low adoption of social media apps and disconnection tools," and Class 2 labeled as "high adoption of social media apps and disconnection tools." Adolescents in Class 2 were more likely to use social media, specifically social networking, instant messaging, and entertainment apps, and to adopt disconnection tools (e.g., iOS Screentime or the Forest app). Next, drawing on the media practice model, we investigated how sociodemographic and sociopsychological factors contribute to those usage patterns and found that girls, older adolescents, and adolescents with higher scores for depressive symptoms and flourishing were more likely to belong to Class 2. Those findings offer new insights into adolescents' social media connection and disconnection that can inform interventions to promote healthier smartphone use among adolescents.

Keywords

adolescents; disconnection; latent class analysis; social media use; voluntary disconnection

1. Introduction

Concerning social media use among adolescents, there is a shared view that they constantly use the phone to seek gratification from social media platforms. Nevertheless, not all adolescents behave that way.

The emerging sense of an inescapable online presence has triggered social media users, both young and old, to reflect on their use and that of others. Even so, no study has examined such disconnection practices among adolescents. That is surprising because adolescents' developmental sensitivities (e.g., heightened peer focus and identity exploration) make them more susceptible to becoming dependent on and affected by social media use (Heffer et al., 2019). In turn, teachers, parents, and policymakers have attempted to restrict adolescents' social media screen time by, for instance, banning smartphones in high schools (Anderson et al., 2024). However, adolescents do not readily accept forms of disconnection imposed upon them (Valkenburg & Piotrowski, 2017).

Part of fostering a healthy relationship with social media platforms lies in providing the right tools to build a sustainable digital balance and exercise self-control when using the platforms. Although such digital balance (Vanden Abeele, 2021) can be obtained by voluntary disconnection, self-imposed disconnection among adolescents has rarely been investigated. In particular, adolescents' adoption of disconnection tools (e.g., iOS Screentime or the Forest app) to limit social media use has yet to be mapped.

Against that background, in the present study, we performed latent class analysis (LCA), which allowed us to identify subgroups of adolescents (i.e., classes) based on their social media use and adoption of disconnection tools. We also drew on the media practice model (Steele & Brown, 1995), which posits that individuals interpret and respond to media with reference to their lived experiences. According to this model, sociodemographic factors (i.e., age, gender, and socioeconomic status [SES]), as well as sociopsychological factors (i.e., depressive symptoms, loneliness, flourishing, and satisfaction with life) that shape adolescents' lived experiences, may be associated with the likelihood of belonging to a specific social media (dis)connection group. Those associations formed the focus of the current research.

2. Adolescents' Developmental Tasks and Social Media Use

Research on social media use and its effects has often specifically examined adolescents (Valkenburg et al., 2022). Adolescence is a developmental period marked by significant social, biological, and cognitive changes (Nesi et al., 2018) that occur while performing developmental tasks such as navigating peer relationships, developing self-identity, and establishing autonomy from adults (Valkenburg & Piotrowski, 2017). For contemporary adolescents, many of those tasks are partly undertaken on social media (Nesi et al., 2018). Adolescents receive their first smartphones at increasingly younger ages, with a recent report showing that the average age has dropped to 8 years among Flemish adolescents (Vanwynsberghe et al., 2022).

Smartphones give access to social media platforms, including TikTok, WhatsApp, and Snapchat, which are adopted by 78%, 74%, and 66% of children before their 12th birthdays (Vanwynsberghe et al., 2022). In turn, those platforms have become essential to adolescents' lives by affording constant opportunities for interacting with peers and exploring identity (Masur et al., 2022; Nesi et al., 2018). However, due to the ever-increasing use of social media, many scholars, parents, caretakers, and policymakers have voiced concerns about social media's potential negative effects on mental and physical health given harmful social media interactions and time displacement effects (Masur et al., 2022). One factor that might help adolescents strike a healthy balance in their digital media use is restricting their use of social media.

3. Adolescents' Disconnection From Social Media

Policy reports (Vanwynsberghe et al., 2022) and academic research on adolescents' social media use (Schmuck et al., 2023) that investigated the rules parents and schools impose on children highlighted that smartphones and social media restrictions are part of the upbringing of minors in contemporary society. Adolescents may need rules for social media use because they are believed to have limited to no self-control over it (Meinert & Reinecke, 2018). That reasoning may explain why voluntary disconnection has rarely been studied and why the literature on the topic mostly focuses on (young) adults. Voluntary digital disconnection can be defined as:

> A deliberate form of non-use of devices, platforms, features, interactions, and/or messages that occurs with higher or lower frequencies, and for shorter or longer periods, after the initial adoption of these technologies, and with the aim of restoring or improving one's perceived overuse, social interactions, psychological well-being, productivity, privacy and/or perceived usefulness. (Nassen et al., 2023, p. 13)

However, there is good reason to believe contemporary adolescents care about digital balance (Jorge et al., 2023). In their qualitative research, Neves et al. (2015) explored adolescents' motivations for disconnecting from social media and identified a sense of uselessness (e.g., perceived waste of time), unwanted social practices (e.g., online gossip), and unsatisfactory self-presentation (e.g., reluctance to partake in online impression management) among the top reasons. Beyond that, van der Wal et al.'s (2024) focus group study revealed that adolescents do engage in voluntary disconnection from social media as they found that adolescents try to disconnect from social media practices, including watching TikTok videos, even if they often fail in their attempts.

Among adults, various strategies for disconnecting from social media have been identified, including outright quitting, taking periodic breaks, reducing use, switching platforms, and adopting disconnection tools. These strategies can be applied at different levels, including the level of a device, (branded) application, feature, interaction, and message (Meier & Reinecke, 2021). Although most research on disconnection has focused on disconnecting from devices (Nassen et al., 2023), examples of more specific strategies for disconnecting are, for instance, restricting oneself to one hour on TikTok per day or silencing group messages. Another increasingly common way to disconnect is by adopting mobile disconnection tools (Nassen & Karsay, 2024; Nguyen, 2021), which provides a nuanced strategy by allowing disconnection from certain aspects of the smartphone without obstructing connections that the user wants to maintain. On that count, we distinguish two types of nuanced strategies for disconnecting from social media use (Nassen & Karsay, 2024). The first involves using *built-in device settings*, including iOS Screentime, to limit use, while the second involves using *external detox apps*, for example, the Forest app, which are non-default apps designed to set limits.

Such nuanced strategies for disconnecting from the mobile phone may be especially appealing to adolescents rather than invasive ones (e.g., a week without Instagram or a full day without using the phone), which are at odds in a time of constant connectedness (Nassen et al., 2023). Indeed, young adults (18–24 years old) are prevalent users of such nuanced disconnection tools (Schmuck, 2020). Adolescents may also fulfill their need for digital disconnection by using those tools and, in doing so, balance disconnection with their needs for online peer connections. After all, not all adolescents prefer unlimited social media use. Similar to adult users, they likely seek a trade-off between social media connection and disconnection (Rosič et al., 2024). Vanden Abeele

and Nguyen (2024) identified four types of digital well-being experiences among adults and confirmed the existence of distinguishable patterns of connection and disconnection. Meanwhile, other studies have even identified meaningful subgroups of adolescents based on their social media use (Foerster & Röösli, 2017). Nevertheless, no study thus far has simultaneously considered both adolescents' use of and disconnection from social media platforms, much less disconnection involving the adoption of disconnection tools. Therefore, our first research question (RQ) was:

> RQ1: What are the distinct subgroups of adolescents based on their use of social media apps and adoption of disconnection tools?

4. Individual Differences: Adolescents' Lived Experiences

Different sociodemographic and sociopsychological factors could play a role in whether someone adopts disconnection tools. The media practice model (Steele & Brown, 1995) suggests that lived experiences shape how individuals interpret and react to media. Adolescents are active (social) media users who, based on their identities and lived experiences, select, interact, and apply media. Following that reasoning, adolescents' adoption of disconnection tools is likely informed by the factors that shape their lived experiences, including sociodemographic and sociopsychological ones.

4.1. Sociodemographic Factors

4.1.1. Age

Social media use increases throughout adolescence due to more access to mobile devices and an increased desire to interact with peers (Coyne et al., 2019). Although it seems evident that social media connection increases, it is unclear whether adolescents also disconnect more from social media as they mature. In the early stages of adolescence, smartphone and social media use is primarily defined by rules and restrictions imposed by parents (Anderson et al., 2024). However, as adolescents grow older, they gain independence in their usage choices and develop self-control (Meinert & Reinecke, 2018; Siebers et al., 2021). As such, it is plausible that the desire to disconnect voluntarily becomes more prevalent. However, that possibility has yet to be explored.

4.1.2. Gender

Regarding gender, research has shown that girls use social media more often than boys and are more likely to use it for social purposes, for example, posting pictures (Nesi & Prinstein, 2015). For that reason, girls may find it more challenging than boys to disconnect from social media. On that topic, studies have indicated that voluntary disconnection could also be more difficult for adult women due to differences in social expectations (Van Bruyssel et al., 2023). Care work is often mentioned as an important expectation ascribed to women that carries over into the online context, where women are expected to display more social etiquette (e.g., sending messages on every birthday) and engagement (e.g., making sure that the family gets together), which causes them to have less opportunities to disconnect (Baumer, 2018). Such social expectations may be valid for young girls as well. Jorge et al. (2023) found that voluntary disconnection seems more difficult for girls than boys because their gendered position makes them feel more connected to their friends on social media. Even so,

they might also be more willing to disconnect due to a stronger need to spend time with their families and without their phones.

4.1.3. SES

Contextual factors may also influence adolescents' social media use and adoption of disconnection tools. Among adolescents, inequalities exist, for instance, in digital skills, digital literacy, and (the stability of) internet access (Nguyen & Hargittai, 2024). Thus, recent scholarship on digital inequality has not only considered differences in access to media and technology but also differences in taking breaks from media when needed. For instance, during the Covid-19 pandemic, some adolescents had more options to spend their free time in terms of spatial resources (e.g., their rooms to retreat to) and material resources (e.g., various materials for hobbies available at home). By contrast, others may have had fewer options, with their only means of self-expression and engaging in hobbies being via their mobile devices. Because engaging in practices of disconnection can therefore be a privilege (Treré, 2021), exploring the role of SES in the adoption of social media connection and digital disconnection tools is important.

Adolescents' identities can be attributed to forms of socioeconomic inequality and gendered socialization (Steele & Brown, 1995). Growing older also naturally involves gaining lived experiences. Thus, according to the media practice model, those sociodemographic characteristics can impact adolescents' social media use and adoption of disconnection tools (Steele & Brown, 1995). For that reason, our second RQ was:

> RQ2: Do sociodemographic characteristics (i.e., age, gender, and SES) vary across different classes of adolescents in terms of social media use and the adoption of disconnection tools?

4.2. Sociopsychological Factors

Adolescence is characterized by stage-salient developmental tasks and continuous fluctuations in well-being (Valkenburg et al., 2022). Sociopsychological factors, including levels of perceived loneliness, depressive symptoms, satisfaction with life, and flourishing, shape and are shaped by young peoples' lived experiences throughout adolescence (Steele & Brown, 1995). As such, those sociopsychological factors may also determine adolescents' social media use and adoption of disconnection tools.

4.2.1. Loneliness

The relationship between loneliness and social media use in adolescents is multifaceted and complex. Social media interactions can reduce loneliness among adolescents because meaningful interactions occur on social media (Yang & Brown, 2013). As such, feeling lonely may prevent adolescents from pursuing voluntary disconnection due to fear of feeling excluded. Loneliness has also been identified as a negative consequence that can result from disconnection (Nassen et al., 2023). However, some studies have suggested that limiting social media use can decrease loneliness (Hunt et al., 2018) by freeing up time for meaningful face-to-face connections (Nguyen, 2023). Loneliness may therefore play a role in adolescents' social media use and adoption of disconnection tools but remains underexamined.

4.2.2. Depressive Symptoms

Social media use may also relate to ill-being indicators such as depressive symptoms. On that count, adolescents who depend on social media feedback for their self-worth can feel more depressed (Schreurs et al., 2024). This can imply that adolescents who feel depressed engage in social media disconnection in an attempt to alleviate those feelings. Moreover, given the prevalence of negative discourse on social media use and ill-being (Valkenburg et al., 2022), adolescents could embrace the same mindset and attribute their negative feelings to their social media use. However, no research has investigated factors of ill-being, including depressive symptoms, and adolescents' voluntary disconnection from smartphones.

4.2.3. Flourishing and Satisfaction With Life

Adolescents' well-being may inform their social media use and adoption of disconnection tools. In the present study, we opted to investigate two distinct constructs of well-being—flourishing, and satisfaction with life—because they are subdimensions of two types of well-being: hedonic well-being and eudaimonic well-being. On the one hand, hedonic well-being focuses on the subjective experience of contentment and pleasure (Huta & Waterman, 2013) and includes, for instance, satisfaction with one's life (Diener et al., 1985). On the other, eudaimonic well-being focuses on another dimension commonly described as "the good life," which is characterized by experiences of meaningfulness, authenticity, and self-actualization (i.e., knowing one's true self and expressing it; Martela & Sheldon, 2019). One way to operationalize eudaimonic well-being is to measure flourishing (Diener et al., 2010). Overall, social media use research has consistently investigated its links with hedonic well-being. Also, research on adolescents' well-being has tended to focus on hedonia, while the quest for meaning, self-realization, and flourishing (i.e., eudaimonic well-being) among adolescents remains underexplored, even though those constructs are deemed essential to achieve optimal development. Additionally, since advocates of self-help initiatives such as digital disconnecting claim that disconnection practices can uniquely influence eudaimonia (Syvertsen & Enli, 2020), eudaimonic well-being is particularly interesting to consider when studying disconnection. From a purely hedonic perspective, engaging in voluntary disconnection is redundant if social media is used to provide immediate gratification. However, from an eudaimonic perspective, there are instances where maximizing pleasure might become problematic, which also applies to the context of social media use (Meier & Reinecke, 2021). For example, spending so much time on social media that one neglects other activities that bring joy or begins phubbing loved ones, might not result in the highest levels of well-being in the long run. However, literature on voluntary disconnection and eudaimonic well-being is scarce and is, among adolescents, virtually non-existent.

Therefore, in this study, we aimed to examine subdimensions of both types of well-being and investigate levels of satisfaction with life and flourishing among adolescents. In addition to well-being, we also sought an understanding of how adolescent levels of other sociopsychological factors (i.e., loneliness and depressive symptoms) relate to adolescents' social media app use and adoption of disconnection tools. Thus, our final RQ was:

> RQ3: Do sociopsychological characteristics (i.e., loneliness, depressive symptoms, flourishing, and satisfaction with life) vary across different classes of adolescents in terms of the use of social media apps and the adoption of disconnection tools?

5. Methods

5.1. Participants and Procedure

In this study, we used data from a larger multi-wave panel study conducted among Flemish adolescents in Belgium. Data from the third wave, in particular, conducted in June 2020 with 966 adolescents, served as our variables of interest. Adolescents were invited to participate in our study through their school but completed the online questionnaire at home. In the context of the larger research project, we collaborated with 24 high schools randomly selected from a list provided by the Flemish Education Department. However, because participation required schools' consent, the sampling method can be regarded as convenience sampling. Active consent was obtained from all participating adolescents, while parents provided passive consent. Confidentiality was assured, and ethical approval was obtained through the KU Leuven ethics committee (SMEC, G-2018 031187). Adolescents received a €5 voucher for completing the survey. During data collection, which coincided with the Covid-19 pandemic, schools were partly reopened, and several restrictive social and economic measures were lifted following a national lockdown. A more detailed description of the sampling method and procedure appears in Schreurs et al. (2023).

Ten adolescents failed the survey's attention check and were removed from the analytical sample, which thus consisted of 956 adolescents. Their mean age was 15.10 years (SD = 1.599), 64.9% were girls, and 86% were born in Belgium. By comparison, in the overall population in 2020, 49.2% of high school students were girls, and 90% were born in Belgium (Onderwijs Vlaanderen, 2020).

5.2. Measures

5.2.1. Nuanced Mobile Disconnection Tools

After participants were given a definition of disconnection tools (i.e., tools used to control how much time a person spends on their smartphone and that enable them to limit the time spent using social media apps), they were instructed to indicate which disconnection tools they used. The questionnaire presented them with six external detox apps that were among the most popular at the time—i.e., Moment, Forest, QualityTime, Space, OFFTIME, and RealizeD—and two built-in device settings—i.e., iOS Screentime and Digital Well-Being for Android. They had to mark every app that they had previously used. Regarding the use of built-in device settings, 34.5% of the participants used iOS Screentime, while 7.6% used Android Digital Well-Being. As for external detox apps, 5.6% of the sample used the Forest app, while other apps (e.g., Moment and RealizeD), were used by less than 1%. Moreover, 3.6% reported using a different detox app not listed on the questionnaire. Lastly, 43.2% indicated that they were not using any disconnection tools. If the participants indicated using at least one of the tools before, then they were identified as users of disconnection tools. We distinguished two variables for the adoption of disconnection tools: the use of external detox apps and the use of built-in device settings.

5.2.2. Social Media Use

Adolescents reported how frequently they used 10 social media platforms—Facebook, Instagram, Snapchat, Messenger, WhatsApp, YouTube, TikTok, Reddit, X, and Tumblr—on a 6-point Likert scale (1 = *never*, 2 = *seldom*,

3 = *every few weeks*, 4 = *a few times a week*, 5 = *every day*, and 6 = *multiple times a day*). We aggregated those platforms into four categories of social media use: instant messaging (i.e., WhatsApp, Messenger, and Snapchat; $M = 4.05$, $SD = 1.043$), social networking (i.e., Facebook and Instagram; $M = 4.01$, $SD = 1.229$), microblogging and news (i.e., Reddit, X, and Tumblr; $M = 1.36$, $SD = 0.724$), and entertainment (i.e., YouTube and TikTok; $M = 4.67$, $SD = 1.169$). This categorization is based on affordances shown by literature that Snapchat, for instance, is used mainly as an instant messaging platform due to the ephemerality and briefness of the messages, while also taking into account the specific platform affordances at the time of the study (i.e., Bayer et al., 2020). The categorization was also conceptualized based on literature describing how those social media platforms are used and what motivations for their use played a role in 2020 (Bayer et al., 2020; Rhee et al., 2021) when the data were collected.

5.2.3. Sociodemographic Factors

Age was assessed by subtracting adolescents' birth year from 2020, the year of the study, while gender was indicated as either boy (=1) or girl (=2). Regarding SES, participants answered a validated measure of how well off they think their family is compared with other families ($M = 7.67$, $SD = 1.397$, range from 1–10; Goodman et al., 2001).

5.2.4. Sociopsychological Factors

Loneliness was measured with the UCLA loneliness scale (RULS-8) validated among Dutch-speaking adolescents (Goossens et al., 2013). Participants indicated how true eight statements were for them on a 5-point Likert scale ranging from 1 (*completely untrue*) to 5 (*completely true*). Examples were "I miss company" and "I feel excluded" ($M = 2.15$, $SD = 0.719$, $\alpha = 0.83$).

Depressive symptoms were measured with a 12-item version of the Center for Epidemiologic Studies depression scale (Poulin et al., 2005). Adolescents had to indicate how often they experience symptoms such as lack of appetite (e.g., "I did not feel like eating, my appetite was gone") and tiredness (e.g., "I felt too tired to do things") in the past week on a 4-point Likert scale ranging from 1 (*never/rarely*) to 4 (*always*; $M = 1.84$, $SD = 0.495$, $\alpha = 0.86$).

Flourishing was captured with four items on the flourishing scale (Diener et al., 2010). Adolescents indicated their agreement to items such as "I am optimistic about my future" on a 7-point Likert scale ranging from 1 (*completely disagree*) to 7 (*completely agree*; $M = 4.95$, $SD = 1.070$, $\alpha = 0.78$).

Last, satisfaction with life was measured using one item on the satisfaction with life scale (Diener et al., 1985), for example, "I am satisfied with my life" rated on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*; $M = 5.61$, $SD = 1.338$).

5.3. Analysis

Before analysis, confirmatory factor analysis supported the hypothesized one-factor structure of the validated scales for loneliness, depressive symptoms, and flourishing. Mean scores were created and transformed into positive integers. We followed a three-step approach (Asparouhov & Muthén, 2014),

beginning with an LCA in Mplus to identify subgroups for social media use and the adoption of disconnection tools. We employed latent class indicators (i.e., social media use, built-in device settings, and external detox apps) to estimate the latent class model. Second, based on the most optimal class model, we created the variable of most likely class membership for each adolescent using the latent class posterior distribution. Third, logistic regressions were conducted to investigate the associations between the independent variables (i.e., sociodemographic and sociopsychological factors) and the dependent variable (i.e., most likely class membership) while accounting for misclassification in the second step (Asparouhov & Muthén, 2014). Please see OSF for anonymized data, syntaxes, and complete materials (https://osf.io/69drn/?view_only=17697ea2b53f4d369eb5a4a7b735acb5).

5.3.1. Identifying the Optimal Class Solution

One to five class solutions were considered. The overall fit of each model was compared via the following tests: the Akaike information criterion (AIC), the Bayesian information criterion (BIC), and the Lo-Mendell-Rubin likelihood ratio test (LMR-LRT). While a lower AIC and BIC indicate a better fit, the LMR-LRT provides a p-value that denotes whether a class solution is statistically better than the previous solution with one fewer class ($p < 0.05$). Furthermore, we evaluated the classification's accuracy based on the classification probabilities for most likely latent class membership, entropy, and minimum and maximum class sizes. Probabilities closer to 1 indicated a good classification, with acceptable values ranging between 0.80 and 0.90. The entropy value needed to be greater than 0.60, and a class needed to have a minimum class size of 5% of the total sample or at least 50 participants (Weller et al., 2020).

5.3.2. Predictors of Class Membership

To predict class membership, the variable of most likely class membership was employed as a latent class indicator variable, with uncertainty rates prefixed at the probabilities. We included the independent variables (i.e., sociodemographic and sociopsychological factors) as auxiliary variables (Asparouhov & Muthén, 2014) by following the R3STEP method. The specified auxiliary variable was treated in the three-step method as a latent class predictor. Lastly, we examined the observed means and proportions of the predictive variables for each class of the optimal class solution using SPSS.

6. Results

Entertainment apps were the most commonly used social media platforms, which more than half of the adolescents used at least daily. By contrast, microblogging and news apps were rarely used. Less than half of the participants (43.2%) did not use any disconnection tools. However, 42.1% used at least one of the built-in device settings, 11.7% used at least one external detox app, and 4.5% used both disconnection tools.

6.1. Model Selection

Table 1 presents the model fit indices and classification accuracy indices of five LCA models. As shown, the AIC decreased from the second to the fifth model, and for all solutions, class membership probability and entropy estimates were appropriate. Entropy was the highest in the five-class solution, however this solution's minimal class size was less than 5%. The LMR-LRT p value was non-significant in the three-class solution,

Table 1. Model fit indices and classification accuracy indices LCA models (n = 956).

Par.	Class	BIC	AIC	Entropy	LMR-LRT value	LMR-LRT p-value	Min. class size	Max. class size	Min. probability	Max. probability
21	1	11563.642	11461.524	—	—	—	956	956	1	1
43	2[a]	11338.727	11129.629	0.704	373.422	< 0.001	236	720	0.777	0.959
65	3	11343.929	11027.850	0.669	144.820	0.8407	138	561	0.767	0.894
87	4	11440.719	11017.659	0.755	53.834	0.8058	48	405	0.733	0.954
109	5	11543.744	11013.704	0.758	47.640	0.1318	48	397	0.679	0.862

Notes: Par. = number of free parameters; BIC = Bayesian information criterion; AIC = Akaike's information criterion; LMR-LTR = Lo-Mendell-Rubin likelihood ratio test; [a] = elected as the final model.

which indicates that adding classes after the two-class solution did not improve the model's fit compared with a model with one fewer class ($p < 0.001$). Beyond that, the BIC was lowest in the two-class solution. Accordingly, we selected the two-class solution, which was also the most parsimonious model, to further interpret. This parsimonious model balances model complexity (i.e., number of latent classes) and model fit (i.e., how well the model explains the observed data).

6.2. Model Interpretation

Table 2 displays the prevalence and item-response probabilities for the variables of social media use and the adoption of disconnection tools. Class 1 comprised 24.7% of the participants, while Class 2 comprised 75.3%. Class 1 had a high probability of being moderate to low social media users. For example, the adolescents in that class had a 0.461 probability of using instant messaging only every few weeks. However, they also showed a higher use of entertainment media apps. Regarding disconnection tools, adolescents in Class 1 showed low probabilities for using built-in device settings (0.266) and external detox apps (0.133). Based on those results, we labeled Class 1 as "low adoption of social media apps and disconnection tools."

Class 2 consisted of adolescents who scored high for social media use. For instance, the probability of using instant messaging daily in Class 2 was 0.408. Concerning social networking, the adolescents in the group showed moderate to high use. However, microblogging and news apps, as in the other class, were not frequently used. Regarding disconnection tools, the adolescents in Class 2 showed a 0.459 probability of using built-in device settings and a 0.098 probability of using external detox apps. Based on those results, we labeled Class 2 as "high adoption of social media apps and disconnection tools." We further explored the significant differences in social media use and use of disconnection tools between the two classes with an independent samples t-test, we found significant differences for instant messaging, $t(907) = 31.899$, $p < 0.001$; entertainment media, $t(907) = -12.432$, $p < 0.001$; social networking, $t(363.020) = -21.442$, $p < 0.001$; and built-in device settings, $t(444.615) = -5.336$, $p < 0.001$; but not for microblogging, $t(359.120) = 0.852$, $p = 0.395$, or external detox apps, $t(349.317) = 1.899$, $p = 0.058$.

Table 2. Prevalence and item-response probabilities for disconnection tool use and social media use ($n = 956$).

		Latent classes	
Latent class prevalences		Class 1 (24.7%)	Class 2 (75.3%)
Indicators	Sample proportions	Inter-response probabilities	
	Total sample	Class 1	Class 2
Disconnection tools			
Use of built-in device settings	0.405	0.266	0.459
Use of external detox tools	0.108	0.133	0.098
Instant messaging			
Never	0.020	0.072	0
Seldom	0.058	0.211	0
Every few weeks	0.173	0.461	0.062
A few times a week	0.402	0.253	0.458
Daily	0.295	0	0.408
Multiple times a day	0.053	0.004	0.072
Entertainment media			
Never	0.010	0.036	0
Seldom	0.031	0.062	0.019
Every few weeks	0.113	0.213	0.075
A few times a week	0.276	0.411	0.225
Daily	0.263	0.128	0.315
Multiple times a day	0.307	0.150	0.367
Microblogging and news			
Never	0.756	0.768	0.751
Seldom	0.152	0.131	0.160
Every few weeks	0.074	0.070	0.075
A few times a week	0.013	0.025	0.009
Daily	0.006	0.007	0.005
Multiple times a day	0	0	0
Social networking			
Never	0.055	0.180	0.007
Seldom	0.045	0.141	0.008
Every few weeks	0.171	0.337	0.107
A few times a week	0.410	0.341	0.437
Daily	0.205	0	0.283
Multiple times a day	0.114	0	0.158

6.3. Associations Between Sociodemographic and Sociopsychological Factors and Latent Class Membership

Last, using logistic regressions, we investigated whether different sociodemographic and sociopsychological factors predicted the probability of belonging to Class 1 or Class 2. Table 3 presents the observed means and proportions of the variables by class, while Table 4 shows the results of the logistic regressions on Class 2 membership probability for each predicting variable. Being older and being a girl predicted a higher probability of belonging to Class 2 than to Class 1. Moreover, higher scores for depressive symptoms and flourishing predicted a higher probability of belonging to Class 2 than to Class 1.

Table 3. Observed means and proportions of study variables by class ($n = 956$).

	Class 1		Class 2	
	M/%	*SD*	*M*/%	*SD*
Age	14.42	1.339	15.32	1.917
Gender (% girl)	47.5	—	70.6	—
SES	7.57	1.478	7.70	1.369
Depressive symptoms	1.81	0.602	1.91	0.564
Loneliness	2.12	0.801	2.16	0.740
Life satisfaction	5.63	1.492	5.61	1.283
Flourishing	4.83	1.217	5.00	1.084

Table 4. Results of logistic regression, membership Class 2 ($n = 956$).

	Class 2 (reference category = Class 1)			
	B	SE	OR	95% CI
Age	0.565***	0.091	1.760	[1.473/2.104]
Gender	1.233***	0.199	3.431	[2.323/5.066]
SES	0.085	0.071	1.089	[0.948/1.251]
Depressive symptoms	0.402*	0.182	1.494	[1.045/2.136]
Loneliness	0.101	0.134	1.106	[0.851/1.439]
Life satisfaction	–0.015	0.078	0.985	[0.845/1.147]
Flourishing	0.172*	0.085	1.188	[0.851/1.439]

Notes: *B* = logit coefficient; SE = standard error; OR = odds ratio; CI = confidence interval; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

7. Discussion

Through LCA, we aimed to investigate whether classes of adolescents significantly differ in their use of social media and adoption of disconnection tools (RQ1). Examining social media use and voluntary practices of disconnection simultaneously is crucial when studying different groups of adolescents. Previous LCA on adolescents' social media use has primarily focused on usage (e.g., Foerster & Röösli, 2017), while research on disconnection has primarily investigated involuntary disconnection, including parental control measures or school smartphone bans (e.g., Schmuck et al., 2023). However, initial research has indicated that today's adolescents are indeed concerned about maintaining a healthy digital balance (Jorge et al., 2023).

In our sample of 956 Flemish adolescents, we identified heterogeneity in how adolescents (dis)connect from social media and found two distinct classes. Adolescents in Class 1 can be labeled as "low adoption of social media apps and disconnection tools." In Class 2, labeled as "high adoption of social media apps and disconnection tools," adolescents reported higher use of instant messaging apps, entertainment media apps, and social networking apps than ones in Class 1. Moreover, adolescents in Class 1 showed low probabilities of using disconnection tools, specifically built-in device settings, while ones in Class 2 had higher probabilities of using those settings.

The different patterns in app usage between the two classes suggest that adolescents in Class 1 maintain a more detached relationship with social media. They do not use social media intensely and do not want assistance in disconnecting from the platforms that they use. A quarter of our sample belonged to Class 1. Conversely, adolescents in Class 2 showed a higher use of social media but were also more likely to search for balance by adopting disconnection tools. That finding indicates that most adolescents are frequent social media users, but they seek balance in their use. Adolescents adopting disconnection tools mostly used built-in device settings (e.g., iOS Screentime), while only 11.7% of the sample indicated using external detox apps (e.g., the Forest app). While previous studies have tended to merge those types of strategies (e.g., Schmuck, 2020), our findings suggest that it is important to distinguish types of disconnection tools because they seem to be adopted differently. One explanation could be that such tools might be adopted hierarchically by first attempting to disconnect without them (e.g., by putting the phone away) and, if that fails, by using the readily available settings (e.g., built-in device settings). In turn, external detox apps may be viewed as a last resort, for they also require the most effort to adopt.

Furthermore, we investigated whether sociodemographic (RQ2) and sociopsychological factors (RQ3) varied across the identified classes. Regarding sociodemographic variables, being older predicted a higher probability of belonging to Class 2. That finding aligns with previous results (Coyne et al., 2019) and literature on social media use among Flemish adolescents (Vanwynsberghe et al., 2022), which have shown that, throughout adolescence, the use of social media platforms increases. In that regard, age can be seen as a proxy for developmental change (Berk, 2014). Beyond the fact that age tends to determine whether and to what extent adolescents have access to mobile devices, a social developmental argument also applies, as the importance of peer relationships and staying connected increases during this time (Nesi et al., 2018).

Age predicting disconnection may be explained by higher social media use in the first place, but also by maturing and being able to reflect on their use (Meinert & Reinecke, 2018; Siebers et al., 2021). In line with research on developing self-control throughout adolescence, older adolescents will be more likely to reflect on their use, perceive it as too much, feel guilty about it, and want to change it (Coyne et al., 2019). Those feelings of perceived overuse can motivate voluntary disconnection (Nassen et al., 2023).

Regarding gender, girls were more likely to belong to Class 2 than boys. Research has indeed shown that girls use social media more often than boys and that it aligns with their tendency to spend more time on social relationships, dyadic friendships, and popularity, especially during adolescence (Twenge & Martin, 2020). Girls also seem more likely to engage in voluntary disconnection. Turel and Vaghefi (2019) found in their study among young adults that female social networking users were more likely to fail at self-imposed abstinence, which can be viewed as a risk for isolation, boredom, and fear of missing out. While those findings focus on failing at voluntary disconnection, they might indicate why adolescent girls are more likely than boys to use disconnection tools. The adoption of such tools can also be seen as a more drastic step in wanting to disconnect after offline mechanisms of self-control fail. Moreover, multiple studies have indicated that voluntary disconnection for women can be more difficult than for men due to gender differences in social expectations, including care work (e.g., Van Bruyssel et al., 2023). Those expectations may also apply to adolescent girls and make voluntary disconnection more difficult for them (Jorge et al., 2023). Girls might feel more obliged to stay connected at all times with close ones through social media (Baumer, 2018). In that regard, our findings confirm the possibility of the described gender difference, as previously suggested by Jorge et al. (2023).

SES did not predict membership to either of the classes. This could be due to our samples' overall high score for SES. Only 10.4% of respondents rated themselves 5 or less on a 10-point scale regarding their family's SES compared with other families. Because research has often emphasized socioeconomic inequalities in practices of disconnection (Gui & Büchi, 2021; Nguyen, 2021), future studies should pay close attention to digital inequalities among adolescents in terms of their connection and disconnection and be sure to include adolescents in their samples who represent all levels of SES. Especially in contexts such as the Covid-19 pandemic, the family context can influence the use and possibility for non-use of social media (Nguyen & Hargittai, 2024).

Regarding sociopsychological factors, higher reported levels of depressive symptoms predicted a higher probability of belonging to Class 2 ("high adoption of social media apps and disconnection tools") than to Class 1 ("low adoption of social media apps and disconnection tools"). This result is in line with past findings of positive associations between social media use and depression (Liu et al., 2019). Individuals with depression might perceive social media use as a potential driver in gaining social connectedness and peer support and, therefore, want to use it more (Dolev-Cohen & Barak, 2013). However, other research has suggested that using social media can heighten depressive symptoms among adolescents via media effects mechanisms such as availability stress, social comparison, and approval anxiety (e.g., Schreurs et al., 2023). As such, adolescents with depression may attribute their perceived ill-being to their high level of social media use and disconnect to alleviate those feelings. In any case, future qualitative research is needed to gain a more in-depth understanding of the motivations for social media (dis)connection among adolescents with depression.

Surprisingly, scoring higher on flourishing (Diener et al., 2010) also increased the probability of belonging to Class 2, whereas being satisfied with one's life (Diener et al., 1985) did not predict membership to that class. It is plausible that people with higher eudaimonic well-being are also ones who use disconnection tools, for those strategies can be seen as acts of self-help that are mostly adopted for improving eudaimonia (Syvertsen & Enli, 2020). In that context, it is puzzling that depressive symptoms also predict a higher chance of belonging to Class 2. A possible explanation for the result may be the more state-like measure used for depressive symptoms (e.g., "in the past week…I did not feel like eating, my appetite was gone") and the more trait-like measure used for eudaimonic well-being (e.g., "I lead a purposeful and meaningful life"). The difference could suggest that disconnecting from social media may come in response to differing needs; adolescents who struggle with ill-being (e.g., depressive symptoms) in a day-to-day context may use disconnection to alleviate those feelings, whereas ones who perceive their lives overall as being purposeful and fulfilling may also engage in disconnection to maintain their eudaimonia. Research has indeed shown that digital detox apps can be valuable in preventing the effects of social media use that harms well-being (Schmuck, 2020). Individuals who score high for eudaimonia will also struggle in life from time to time but, in those periods, have the highest chances of finding strategies to restore well-being (e.g., by adopting disconnection tools). Future research is needed, however, to disentangle other traits and state well-being dynamics among adolescents in their disconnection strategies.

7.1. Practical Implications

The findings of our study present some practical implications. We found that about half of the adolescents in our sample voluntarily use disconnection tools to balance their social media use. So far, the focus of research

on managing adolescents' use has been on parental control and smartphone bans at schools. Current interventions for digital literacy increasingly focus on helping adolescents gain the knowledge and skills to exercise self-control over their use of digital media. However, the efficacy of those initiatives has been questioned, because self-control is not fully developed in adolescents (Meinert & Reinecke, 2018). Our study highlights the importance of assigning responsibility to adolescents regarding their social media use because voluntary disconnection seems to be an initiative that they can and are willing to undertake themselves. It is also important to address equal gender socialization concerning social media to ensure that boys and girls face equal opportunities to engage in voluntary disconnection. Moreover, initiatives to promote voluntary disconnection and healthy social media diets should target adolescents who frequently use social media, because this subgroup seems to experience an imbalance and seeks both connection and disconnection.

7.2. Limitations and Directions for Future Research

Some limitations of our study should be addressed. First, we selected the two-class solution over the five-class solution primarily because one of the five classes was smaller than our minimal class size criterion of 5% or more than 50 participants. This small class size might be due to our sample's lack of diversity. Second, we assessed social media use and the use of disconnection tools with self-report measures. Future research could alternatively collect log data from adolescents' phones to gather an objective measure for those usage variables. Third, our data was collected six months into the Covid-19 pandemic when restrictions had already been partly lifted. That specific context might have resulted in altered or heightened (social) media use and, as a consequence, a greater need for disconnection. In response, future research should replicate our findings in a more recent, non-Covid-19 context. Fourth, as for the sociopsychological variables, we used self-report measures, meaning that only a perceived version of the concepts was assessed. However, these subjective assessments are also important in accounting for adolescents' perspectives (Valkenburg & Piotrowski, 2017). Another interesting avenue for future research could be latent class growth analysis, which requires longitudinal data, and would allow us to determine changes in the trajectories of social media use and disconnection tool use throughout adolescence. Such research could be particularly relevant given our finding that age was associated with class membership. Future research should also investigate more recent types of nuanced mobile disconnection tools, including in-app features for well-being (e.g., Instagram's time spend feature).

8. Conclusion

This study was the first to reveal different subgroups based on social media use and the adoption of disconnection tools among adolescents. A quarter of the adolescents exhibited patterns of low social media use and low interest in using tools to disconnect from social media. Most adolescents used social media very frequently and were more likely to seek out tools to disconnect. Girls, older adolescents, and adolescents who scored higher for depressive symptoms and flourishing were more likely to seek out a balance between connecting and disconnecting from social media by adopting those disconnection tools. Thus, along with examining social media use among adolescents, our study has highlighted the importance of future research to equally prioritize the exploration of disconnection strategies, recognizing their significant role in fostering a comprehensive understanding of adolescents' social media behaviors. For adolescents, mastering skills for maintaining a balanced social media diet and proficient self-control will be essential for thriving on social media later in life.

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Conflict of Interests

The authors declare no conflict of interests.

Data Availability

Please see OSF for additional information on the study and the sample, anonymized data, syntaxes, and full materials (https://osf.io/69drn/?view_only=17697ea2b53f4d369eb5a4a7b735acb5).

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