Relationship with Parents in Adolescence and Social Media Addiction in Adulthood:

Longitudinal Links and Mediation Analyses

Abstract

Low parental monitoring and a high level of conflict with parents in adolescence may trigger a developmental sequence that promotes the emergence of social media addiction in adulthood. This 15-year longitudinal study investigates the mediating role of chat site use in adolescence and social media involvement at age 25 that links two parental relationship characteristics at age 15 and social media addiction at age 30. A sample of 322 participants (61.2% female) completed questionnaires at ages 15, 25, and 30. A mediation analysis using structural equations modeling with serial mediators was performed to examine the direct and indirect associations between the variables. Adolescents' reports of parental monitoring at age 15 predicted social media addiction at age 30 via chat site use at age 15 and social media involvement at age 25. The level of conflict predicted social media addiction at age 30, but we observed no serial mediation effects. Parents appear to have a role to play in preventing social media addiction, but more longitudinal studies are needed to fully understand the complexity of the development of social media addiction later in adulthood.

Keywords: social media addiction, internet, parent-adolescent relationship, conflict, monitoring, longitudinal study

Public significance statements: It has been suggested that certain characteristics of the parent-adolescent relationship are associated with the development of social media addiction in adolescents. This study investigated whether these characteristics could also contribute to the development of this addiction in adulthood. While it appears that parents have a role to play in the development of this addiction, our findings underscore the importance of conducting

longitudinal studies to fully understand the complexity of the development of social media

addiction later in adulthood.

Introduction

Social media are virtual communities that include all types of websites, social networks,

messengers, and blogs, in which users can create profiles, view the profiles of others, and

communicate with each other (Van den Eijnden et al., 2016). Since their creation, the use of

social media has increased continuously and has become an integral part of the daily lives of

numerous people (Brailovskaia et al., 2020; Kuss & Griffiths, 2011). Indeed, social media can

serve various purposes, such as maintaining social relationships, acting as a source of

information, providing leisure activities, seeking positive emotions, and offering an escape from

negative ones (Brailovskaia et al., 2020). Nevertheless, despite these beneficial uses, some

individuals may develop an excessive use of social media that can lead to symptoms of addiction

(Tullett-Prado et al., 2023).

Although symptoms similar to other behavioural addictions have been identified in

people addicted to social media, this type of addiction has yet to be recognized by the Diagnostic

and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013).

Different terms are currently used to refer to this addiction, for instance, social media addiction

(Andreassen et al., 2015), social media disorder (Savci & Aysan, 2018), excessive use of social

media (Griffiths & Szabo, 2014), problematic social media use (Meena et al. 2012), compulsive

use of social media (De Cock et al. 2014) and pathological use of social media (Holmgren &

Coyne, 2017). In this paper, we use the term social media addiction, a term that Kuss and

Griffiths (2017) refer to when an individual meets six criteria of addiction that are similar for

both substance and behavioural addictions (i.e., activity salience, mood modification, tolerance,

conflict with others, withdrawal symptoms and relapse; Griffiths, 2005). Social media addiction

is characterized by an excessive preoccupation with these media, a strong motivation to use

them, and the negative impacts caused on the user's personal, professional, or psychological

health (Andreassen & Pallesen, 2014).

Several studies have identified individuals with symptoms of social media addiction.

Notably, a meta-analysis of 49 studies from diverse cultures and various age groups (Mage = 24

years old), all referring to these evaluation criteria, reported a 15% prevalence of social media

addiction in North America (Cheng et al., 2021). The impact on the lives of adults who suffer

from this addiction is significant, including lower well-being, social support and life satisfaction,

and increased feelings of loneliness, depression, and anxiety (Boer et al., 2022; Peng & Liao,

2023; Van Den Eijnden et al., 2018).

As parents act as central figures of socialization, certain family experiences in childhood

and adolescence are associated with the development of this possible addiction (Lim et al.,

2019). Indeed, adolescents' relationships with their parents play a crucial role in their later

adaptation and have been associated with the development of social media addiction

(Khodarahmi et al., 2023). However, available studies on this issue are mostly cross-sectional,

which makes it impossible to verify whether the repercussions continue into adulthood

(e.g., Bilgin et al., 2020; Paakkari et al., 2021). Thus, it is of interest to test whether

certain aspects of the relationship with parents in adolescence are associated with a social media

addiction in adulthood. These include parental monitoring and parent-adolescent conflict.

Parental Monitoring and Social Media Addiction

Parental monitoring can be conceptualized as parents' knowledge about their adolescent's activities (Stattin & Kerr, 2000). This knowledge comes mostly from the adolescent's spontaneous sharing and willingness to disclose information (Stattin & Kerr, 2000). Three aspects of parental monitoring can be considered for operationalization. First, secrecy refers to intentionally hiding information from parents (Kelly, 2002). Although it is important in the autonomy acquisition process during adolescence, high secrecy is negatively associated with other dimensions of the parent-adolescent relationship, including parental support, monitoring, involvement, and the overall quality of the relationship (Dykstra et al., 2020; Finkenauer et al., 2005). It is also associated with the development of behavioural problems such as aggression and delinquency (Frijns et al., 2005; Kapetanovic et al., 2020). Second, self-disclosure refers to the tendency of adolescents to spontaneously tell information to their parents about their activities without prompting (Stattin & Kerr, 2000). It has been established as a key component of parental monitoring and is associated with fewer deviant behaviors (Keijsers et al., 2010). Third, parental knowledge refers to the degree to which parents know where their adolescent is when not at home, who they are with, and what their activities are (Stattin & Kerr, 2000). High parental knowledge is a protective factor against engaging in risky behaviours (Kapetanovic et al., 2019).

Together, these three aspects, as reported by adolescents, can be considered to provide a measure of parental monitoring of adolescents, which may be associated with their behavior. In fact, adolescents' reports of low parental monitoring have been associated with pathological internet use and with risky social media use (Ding et al., 2017; Paakkari et al., 2021). More specifically, high secrecy, low self-disclosure, and low parental knowledge may deprive adolescents of an important source of social support and monitoring (Frijns et al., 2005). This

can increase adolescents' likelihood of engaging in culturally disapproved behaviours such as drug or alcohol use (Laird et al., 2013; Tucker et al., 2003). Like substance use, social media use is an activity that is usually subject to parental regulation (Okwach et al., 2023) and is likely to be less supervised among adolescents with low parental monitoring.

We therefore hypothesize that greater parental monitoring could protect adolescents against the development of addictions, such as social media addiction. Social control theory may provide support for this hypothesis. Social control theory (Hirschi, 1969) proposes that an individual's social bonds with conventional society act as protective factors to prevent them from engaging in risky or deviant behaviours. According to this theory, the weaker the bonds individuals have with their group, the less likely they will conform to established norms. This theory places particular importance on the relationship with parents: the social bond with parents seems to be more determinant than belongingness to any other group in the engagement in risky behaviours and in conforming to the established norms (Costelli & Laub, 2020; Krcmar & Cinger, 2016). While the use of social media is common in society, excessive use and preoccupation with social media among individuals with addiction represent non-standard and risky behaviors, raising concerns for parents (Okwach et al., 2023). By maintaining the social bond, parental monitoring could then act as a protective factor against adolescent deviance or problem behaviour, including social media addiction.

Parent-Adolescent Conflicts and Social Media Addiction

Conflicts with parents, which tend to increase during adolescence, are another component of the parent-adolescent relationship that has been associated with social media addiction (Bilgin et al., 2020; Khodarahmi et al., 2023; Lin et al., 2023). Various theories have attempted to explain this phenomenon. First, as the Compensatory Model of Internet Use (Kardefelt-Winther,

2014) suggests negative life situations, such as a conflictual relationship with parents, could motivate adolescents to go online to compensate for these negative feelings. Second, according to Social Control Theory (Hirschi, 1969), adolescents who have a less conflictual relationship with their parents would feel compelled to act in a way that respects the rules set by their parents. In contrast, those in more conflictual relationships are less likely to comply with parental demands. This would apply to parental instructions regarding social media usage as well.

The Importance of Using a Longitudinal Design

Thus, cross-sectional studies have well established that adolescents who report less parental monitoring and a more conflictual relationship with their parents are more likely to develop a social media addiction (Bilgin et al., 2020; Lin et al., 2023; Paakkari et al., 2021). However, the scientific literature still knows very little about the developmental trajectory of social media addiction through adolescence to adulthood. Could this pattern of behaviour lead to the development of social media addiction later in adulthood? Longitudinal studies are required to address this question. However, only a few longitudinal studies have focused on relationships with parents and social media, and those have mainly focused on the adolescence or emerging adulthood periods (Okwach et al., 2023; Shek et al., 2018). A study examining the trajectory of problematic internet use over three years observed a decline in use towards the end of adolescence (Toth-Kiraly et al., 2021), while another study showed that adolescents with high levels of problematic internet use reported an increase in their problematic usage two years later (Geng et al., 2023). What could be observed over a 15-year sequence from adolescence to adulthood? Over such a long period of time, it seems essential to examine the use of social media by considering the different forms that preceded it and the particularities of the cohort that grew up with the advent of social media.

The first generation of digital natives, having witnessed the emergence of the Internet and the rapid development of social media, is characteristic of what Bauman (2005) has termed the post-modern or 'liquid' society. In the early 2000s, social media, as we know it today, was not yet accessible to the public. However, chat sites with similar functionalities to social media, such as communication with both existing offline and online friends, had already become available (Boyd & Ellison, 2008; Lenhart et al., 2001). The first social media site appeared in 1997, and several blogging and chat sites began appearing in the early 2000s (Boyd & Ellison, 2008). From 2005 onwards, the popular Facebook platform expanded rapidly and became the most widely used social media platform for several years (Kuss & Griffiths, 2011). Subsequently, several other social media sites emerged, such as the popular platforms X and Instagram.

Although social media have only recently emerged, chat sites had previously begun to be used and may have helped to establish habits in their users (Lenhart et al., 2001). Given that certain patterns of a specific activity in adolescence have been associated with an addiction to that activity in adulthood (e.g., gambling; Delfabbro et al., 2014), emerging adulthood and adulthood are particularly propitious periods for the development and maintenance of addictions (Sussman & Arnett, 2014). In addition, as social media use was linked to social media addiction one year later (Van Den Eijnden et al., 2018), participation in chat sites during adolescence may lead to greater involvement in social media in emerging adulthood. In turn, those who maintained a sustained pathway of social media use may be more likely to develop an addiction once they reach adulthood. No longitudinal study has yet tested this developmental pathway.

The Present Study

The present study examines the link between two dimensions of the relationship with parents during adolescence (i.e., parental monitoring and conflict) and social media addiction in

adulthood, as well as the mediating effect of chat site use in adolescence and social media

involvement in emerging adulthood. As various aspects of the relationship with parents have

been associated with social media addiction, we propose that low parental monitoring and high

conflict with parents in adolescence may result in a developmental sequence in social media use

that would lead to social media addiction in adulthood. Gender is also included as a control

variable since social media addiction is more prevalent in females than males (Su et al., 2020).

We hypothesize that, while controlling for gender, 1) parental monitoring negatively predicts

chat site use at age 15, 2) parental monitoring at age 15 negatively predicts social media

addiction at age 30, 3) conflict with parents at age 15 positively predicts social media addiction

at age 30, and 4) chat site use at age 15 as well as social media involvement at age 25 would act

as serial mediators in the link between parental monitoring and conflict at age 15 and social

media addiction at age 30. This paper contributes to the scientific literature by being the first

long-term longitudinal study to examine those links and gender as a control variable.

Method

Participants

This study is part of a broader longitudinal project that began in 2001 with 390 Grade 6

students [M_{age} = 12.38 years; SD= 0.42, Females = 58%]. This ongoing project investigates

various aspects of social development from early adolescence to adulthood. The students were

recruited from eight elementary schools in a French school board in the province of Québec in

Canada. Written parental consent was obtained for the child's participation. Approximately 75%

of the available student population in these classes agreed to participate in the study. Of the

participants, 90% were of Canadian origin. At the beginning of the study, 72% of the participants

lived with both biological parents. Most of the sample had a family income between $45,000 and

$55,000, which was similar to the average family income in the country at that time (Statistique

Canada, 2021). The data used in this study were collected when participants were 15 years old

(2004), 25 years old (2014), and 30 years old (2019; adulthood, according to Mehta et al., 2020).

At age 30, 322 participants took part in the data collection and constituted the sample selected

for this study. As in any longitudinal study, some participants decided to withdraw from the

project during its course or could not be located. Chi-square tests were conducted on socio-

demographic variables to compare participants in the retained sample (n=322) to participants in

the not-retained sample (n=68). Participants in the non-retained sample were more likely to be

male, x^2 (1,390) = 6.08, p = .01, φ = -.13, and to come from a family structure other than one

with two biological parents, x^2 (1,390) = 14.31, $p < .001$, φ = -.19. No differences were observed

regarding the country of birth of the father and the mother.

Study Design and Procedures

First, the project was presented to school officials and Grade 6 teachers, who agreed to

participate in the study. Second, graduate research assistants described the project to the Grade 6

students in class. Third, the students interested in the project were asked to bring home a flyer

and a consent form to their parents. Only the students who returned the consent form signed by

their parents were part of the study. We used the contact information provided by parents and

participants to track participants in the longitudinal study. In the present study, data were

collected at three measurement points, representing three distinct developmental periods:

adolescence (age 15), emerging adulthood (age 25), and adulthood (age 30). At age 15, the

participants completed questionnaires during or after school under the supervision of research

assistants. At age 25, they completed the questionnaire during a home visit by a research

assistant. Those participants who lived in more distant areas received and returned the

questionnaire by mail (less than 5% of the sample). Lastly, at age 30, they completed the

questionnaire online. At each measurement time, participants provided written consent and

received financial compensation. This study was approved by the Institutional Human Research

Ethics Committee of the Université du Québec à Montréal.

Instruments

Adolescents' Reports of Parental Monitoring at Age 15

Parental monitoring of adolescents at age 15 was measured using three indicators

reported by adolescents: 1) secrecy, 2) parental knowledge, a 3) self-disclosure. These indicators

were derived from Stattin and Kerr's (2000) Parental Supervision Questionnaire translated in

French by Keijsers and Poulin (2013). Secrecy was assessed with two items (i.e., "Do you keep a

lot of secrets from your parents about what you do in your free time?" and "Do you keep a lot of

things from your parents about what you do at parties and on weekends?"). Participants were

asked to report frequency on a Likert scale ranging from 1 (never) to 5 (always or almost

always). This indicator has been used in several studies and has shown good reliability (Frijns et

al. 2010; Keijsers & Poulin 2013). In this sample, the correlation between the two items of

secrecy is $r = .68$. This variable has been reverse-coded to ensure that it is in the same direction

as the other indicators forming the parental monitoring construct so that a high score indicates

low secrecy. Adolescents' reports of parental knowledge were assessed using nine items

regarding parents' knowledge of the child's activities. Participants were asked to report

frequency on a Likert scale ranging from 1 (never) to 5 (always or almost always). Examples of

items include: "Do your parents know what you do in your free time?" and "Do your parents

know the friends you meet in your free time?". A high score indicated higher knowledge. The

scale showed good internal consistency ($\alpha = .86$). All the alphas reported in the present study

were computed with the current sample. Finally, self-disclosure was assessed using three items

(e.g., "I talk spontaneously to my parents about my friends") with the same Likert scale as in the

previous two scales. The scale has acceptable internal reliability (α= .76; a high score indicated

high self-disclosure). The parental monitoring scores correspond to a latent factor combining

secrecy, parental knowledge, and self-disclosure. According to Stattin and Kerr (2000), parental

supervision is multidimensional, which explains why we consider these three subscales to be a

more exhaustive representation of this concept.

Adolescents' Reports of Parent-Adolescent Conflict at Age 15

This measure targeted the frequency of conflictual interactions between adolescents and

their parents, using four items from the Oregon Youth Study (e.g., Dishion et al., 2012).

Participants were asked, "In the past week, how often have the following things happened

between you and at least one of your parents?" The items were, "We got mad at each other,"

"We fought at the dinner table," "We had a big fight about a small thing," and "I got what I

wanted by getting mad." Each item was measured on a 6-point Likert scale ranging from 1

(never) to 6 (more than six times). The final score was calculated as the mean across all four

items. Our French version[1] of this scale was used and showed adequate internal consistency (α =

.77; a high score indicated higher conflicts).

Chat Site Use at Age 15

Participants completed this instrument in 2004 when chat sites were available and widely

used by adolescents (Lenhart et al., 2001). A scale including 13 items was designed to measure

their use of these sites. Participants were first asked to answer two questions regarding the

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[1] Our French translations of scales were conducted following Vallerand (1989)'s procedure. For more information on how the translations were done, interested readers may write to the first author.

frequency of their chat site use (e.g., "How often do you chat on the computer (or go to a chat room?"). The choices were 1 (never), 2 (a few times a month), 3 (about once a week), 4 (almost every day) and 5 (every day). Participants were then asked, "When you go on chat sites, how often do you…". Examples of these 11 items are, "… talk about more personal things that you can't say in person? "… talk about sexuality? "… talk to people you've never met in person?" and "… send pictures of yourself to your friends?". Each item was measured on a 5-point Likert scale ranging from 1 (never or almost never) to 5 (very often). The final score was calculated as the mean across all 13 items. The internal consistency of this scale is good (α = .74; a high score indicated a higher chat site use).

Social Media Involvement at Age 25

Social media involvement at age 25 was measured using our French version of nine items based on Zammit's (2008) study. The instrument was designed to measure social media use among youth participants in the 4-H program and has demonstrated very good reliability (α = .96). The scale aims to assess users' online behaviours. Participants were asked to indicate the frequency of their weekly participation in different social media-specific activities (e.g., "looking at other people's profiles, photos, or videos, "posting photos and videos") on a five-point Likert scale ranging from 1 (never) to 5 (very often; more than 15 times a week). The final score was calculated as the mean across all nine items. The internal consistency of this scale was good (α = .87; a high score indicated higher social media involvement).

Bergen Social Media Addiction Scale at Age 30

Social Media addiction was measured using the Bergen Social Media Addiction Scale, which is an adapted version of the validated Bergen Facebook Addiction Scale (Andreassen et

al., 2012). The modification involves replacing the word "Facebook" with the words "social media" in the items (Andreassen et al., 2017). In the instructions provided to participants, social media are defined as "Facebook, Twitter, Instagram, etc.". This measure is based on the six criteria of addiction reported by Griffiths' (2005) general theory of addiction. The scale items correspond to an American Psychological Association (APA, 2013) diagnostic criterion of addiction and are measured using a Likert scale ranging from 1 (very rarely) to 5 (very often). The items were translated in French and validated by Rouleau et al. (2023). The final score was calculated as the mean across all six items. The internal consistency of this scale is high ($\alpha = .88$; a high score indicated higher social media addiction).

Data Analyses

Analyses were performed using Mplus 7.31 software (Muthèn & Muthèn, 1998). A mediation analysis using structural equations modeling with serial mediators was conducted to examine the direct and indirect relationships between the variables. Figure 1 illustrates the tested model. A latent variable named "parental monitoring", combining secrecy, parental knowledge, and self-disclosure mean scores, was created as a latent predictor in the model. At the same time, conflict with parents was also included as a predictor to account for the shared variance between predictors. We used the maximum likelihood ratio (MLR) as an estimator to correct for moderate to high non-normality of the conflict and social media addiction variables. The full information maximum likelihood (FIML) method was used to estimate missing data in our study (<19% for all variables). Furthermore, to examine the presence of common method bias, we used the Harman single-factor method, which consists of examining all items as contributors to a single latent factor (Harman, 1960). If the latent variable explains less than 50% of the variance of the model, the possibility of common method bias can be excluded. This analysis shows that 17.78%

of the variance of the model is explained by the totality of the items in the present study and, therefore, that the variance is not specifically attributable to the measurement method but to the construct itself.

To examine the model fit, we used several indices, as suggested in Kline (2023): the Chi-Square test for model fit (a non-significant p-value indicates a good fit), the root mean square error of approximation (RMSEA: ≤.06 represents a good fit), the standardized root mean squared residual (SRMR<0.08 indicates a good fit;), the comparative fit index and the Tucker-Lewis index (generally CFI/TLI ≥.90 represents acceptable fit).

In addition, to report indirect effects, we simulated 5000 bootstrap resamples to report indirect effects to have a standardized 95% unbiased confidence interval (Hayes, 2018). Bootstrapping is a non-parametric method based on resampling with replacement that is performed multiple times and generates new samples on which the real data are compared, and an indirect effect is tested each time (Shrout & Bolger, 2002). Finally, we included gender as a covariate in the analyses.

Results

Descriptive Analyses

The means and standard deviations of the variables under study and the correlations are presented in Table 1. Descriptive statistics show that the present sample is predominantly under the clinical threshold relative to social media addiction (M=1.69), whereas studies suggest that a mean of four across all six items is the clinical threshold for problematic use (Luo et al., 2021). There was a significant effect for gender, $t(319) = 3.12$, $p = .002$, Cohen's $d = .67$, with a higher mean for females (M=1.78, SD=0.69) than for males (M=1.54, SD=0.62). This gender difference is consistent with other studies (Su et al., 2020). Furthermore, correlations indicate significant

positive associations between all the parental monitoring subscales. In addition, they indicate a

significant negative correlation between secrecy at age 15 and the use of chat sites at age 15, as

well as a significant positive association between conflict and chat sites. Social media

involvement at age 25 positively correlates with chat site use at age 15 and social media

addiction at age 30. Finally, gender correlates with five of the other seven variables under study,

with girls showing higher levels than boys on each.

Structural Equation Modeling

The mediation model is depicted in Figure 1, and the detailed results are presented in

Table 2. The model fits the data, χ^2 (13, 322) = 24.46, p = .03, CFI/TLI = .96/.92, RMSEA = .05

[90% CI = .02, .08], SRMR = .04. The three observed variables constituting the latent variable

"parental monitoring" significantly contribute to the latent factor.

The upper sections of Table 2 present the detailed results of the direct effects between the

variables in the model. The parental monitoring factor does not significantly predict social media

addiction at age 30, whereas conflict substantially does. The parental monitoring factor

significantly predicts the use of chat sites, whereas conflict does not. Furthermore, the use of chat

sites at age 15 significantly predicts social media involvement at age 25 but not social media

addiction at age 30. Finally, social media involvement at age 25 significantly predicts social

media addiction at age 30. Altogether, these predictors explain 13% of the variance in social

media addiction at age 30. The model also explains 9% of the variance in social media

involvement at age 25 and 10% in chat site use at age 15. In terms of the covariates, gender

significantly predicts the use of chat sites and social media involvement, suggesting that girls

have higher scores than boys.

The last section of Table 2 presents the detailed results of the indirect effects. Although there is a significant direct effect of conflict on social media addiction, there is no indirect effect via the use of chat sites and social media involvement at age 25. However, parental monitoring significantly predicts social media addiction at age 30 via the use of chat sites at age 15 and social media involvement at age 25. This indirect association, therefore, shows a full mediation, as the direct effect of parental monitoring on social media addiction is not significant. Finally, chat site use at age 15 significantly predicts social media addiction at age 30 via social media involvement at age 25. Mplus syntax is available in the Supplemental Material.

Discussion

This 15-year longitudinal study examined the mediating role of chat site use at age 15 and social media involvement at age 25 in the longitudinal association between certain characteristics of the relationship with parents in adolescence and social media addiction in adulthood. To do so, we followed adolescents from age 15 to age 30, administering questionnaires on their relationship with their parents at age 15, their use of chat sites at age 15, their social media involvement at age 25, and social media addiction at age 30. Regarding adolescents' reports of parental monitoring, controlling for participant gender, the results indicated that parental monitoring at age 15 was not associated with social media addiction at age 30. However, a lower level of parental monitoring was associated with a higher use of chat sites in adolescence. A small but significant indirect link between low parental monitoring in adolescence and social media addiction in adulthood was observed, mediated by chat site use at age 15 and social media involvement at age 25. Regarding parent-adolescent conflicts, results indicated higher levels of conflict with parents in adolescence were associated with more social media addiction symptoms at age 30, while no significant indirect link was observed. Finally, our results suggested a

continuity of social media involvement from adolescence through emerging adulthood and into

adulthood. Results should be interpreted with caution, considering the potential influence of

various other factors not fully explored in this study. Nevertheless, this study makes a unique

contribution to the scientific literature by being the only longitudinal study to examine social

media use and the development of addiction across three distinct developmental periods.

Adolescents' Reports of Parental Monitoring in Adolescence

Results reveal that low levels of parental monitoring were associated with greater use of

chat sites in adolescence, thus partially confirming our first hypothesis. This could be explained

by the fact that adolescents whose parents provided less monitoring would be more likely to

participate in activities their parents would disapprove of (Tucker et al., 2003). Because parents

are generally concerned about teenagers' use of social media (Krcmar & Cinger, 2016),

adolescents who hide more information from their parents and whose parents are less aware of

their activities and whereabouts would have more opportunities to maintain a virtual life.

Furthermore, results show that adolescents' reports of parental monitoring at age 15 do

not significantly predict social media addiction at age 30 when controlling for conflict and

participant gender, invalidating our second hypothesis. However, a small but significant full

serial mediation effect indicates that reduced parental monitoring is linked to increased chat site

use in adolescence, which, in turn, was associated with greater involvement in social media in

emerging adulthood, contributing to the development of social media addiction in adulthood.

One possible explanation for these results is that the emerging adulthood period is

characterized by reduced parental influence, with parental monitoring having considerably less

impact on their use of social media (Coyne et al., 2013). Indeed, a study on parental influences

during adolescence found that while low parental monitoring was associated with increased

internet addiction, this influence diminishes over time as adolescents gain independence (Shek et al., 2018). It is possible to hypothesize that among adolescents with low parental monitoring, only those who maintain high social media involvement, even when parental monitoring is less influential, would be more likely to develop an addiction in adulthood. This could explain the lack of a direct link between parental monitoring during adolescence and social media addiction in adulthood. If the decline in the influence of parental characteristics was evident in a study spanning only three years (Shek et al., 2018), it is likely to be even more pronounced in a 15-year study. It is important to note that, given the small effect size of the mediation model, further studies are necessary, and the results should be interpreted with caution. We suggest that future studies employ latent class analyses to investigate whether parental monitoring is differently related to the development of social media addiction based on social media use profiles.

Adolescents' Reports of Conflicts in Parent-Adolescent Relationships

Adolescents' reports of conflicts with parents were not associated with greater use of chat sites in adolescence, which partially invalidates our first hypothesis. Based on social control theory (Hirschi, 1969), a positive link between conflict with parents at age 15 and the use of chat sites at the same age was expected. One possible explanation for this lack of association is the historical aspect of chat sites. Indeed, these sites represent the first widely used form of social media and have since evolved rapidly (Boyd & Ellison, 2008). As Bauman (2005) discusses, norms, such as those related to social media, are less well-defined and less stable in this context of constantly and rapidly evolving technological advances. It is possible that social media usage norms were not yet established, and the parents' rules regarding social media use were not entirely well-defined. Adolescents experiencing a lot of conflicts with their parents would,

therefore, be less tempted to deviate from parental requirements by using chat sites more often since no rules have yet been made regarding using these platforms.

Another possible explanation lies in the compensatory model of Internet use (Kardefelt-Winther, 2014), according to which it was expected that adolescents would have offset the conflicts experienced with their parents by spending more time on the Internet, especially on social media. Given that social media use was not yet widespread and not yet widely available at the time of data collection, it is possible that adolescents might have been compensating in other spheres of their lives and, therefore, may not have developed a social media use pattern. Also, since this construct only measures conflicts, it might be that adolescents who have conflicts with their parents still receive sufficient support from them, even if the relationship is conflictual.

We observed a significant direct association between conflict with parents in adolescence and social media addiction at age 30, which confirms our third hypothesis. Adults who had experienced higher levels of conflict with their parents in adolescence were more likely to show higher levels of social media addiction symptoms. These results support the hypothesis that adverse experiences in adolescence, such as in the relationship with parents, are associated with developing various problems in adulthood (Chainey & Burke, 2021). However, we observed no serial mediation effects via chat site use at age 15 and social media involvement at age 25. The development of social media addiction appears to be influenced by mechanisms other than those proposed in the present study, as several variables could not be included. One hypothesis is that conflicts with parents may contribute to the development of internalizing problems in adolescence and emerging adulthood, which could be compensated through the development of addictive behaviours (Majid et al., 2023). Future studies should focus on the mechanism behind the link between conflict with parents in adolescence and social media addiction in adulthood.

Evolution of Social Media Use from Ages 15 to 30

The results of the present study show longitudinal associations between chat site use at age 15, involvement on social media at age 25, and social media addiction at age 30. In addition, chat site use at age 15 predicts social media addiction via social media involvement at age 25. This finding is consistent with another longitudinal study that found various user profiles, including individuals who consumed social media exponentially since early adolescence and eventually exhibited addictive behaviours in early adulthood (Coyne et al., 2019). The cohort in our study is the first generation to have been exposed from a very young age to media such as social media (Prensky, 2001). With the massive and growing arrival of new social media platforms, we can hypothesize that the current use of social media will predict the future use of emerging platforms. Indeed, despite the evolution of social media over the past 15 years, the results suggest that their usage appears to remain consistent over time. Thus, as we are discovering all the impacts, positive and negative, that social media have on today's adolescents (Valkenburg et al., 2022), new and emerging social media companies should focus on current users when developing their platform to prevent issues that may be related to their use, such as addiction, relationship difficulties, and internalizing problems (Andreassen, 2015; Bilgin et al., 2020; Peng & Liao, 2023). In addition, these links raise the possibility that more intense use of social media in adolescence and emerging adulthood represents a risk factor in the development of social media addiction in adulthood. This is consistent with what has already been shown for other types of addiction, such as alcohol, drug, or gambling addiction (Delfabbro et al., 2014).

Implications and Contributions

The present study contributes to the scientific literature on social media addiction by providing a rare longitudinal examination of the topic. Given the recency of the phenomenon,

our study is the first to examine the impact of features of adolescent-parent relationships on social media addiction in adulthood that spans such an extended period. Furthermore, this study is unique in exploring the evolution of social media use by following one of the first cohorts of adolescents exposed to social media precursors (i.e., chat sites) over 15 years. Our results also support the idea that parents have a role to play in preventing social media addiction. The fact that parental monitoring predicts lower social media use suggests that keeping the topic of addiction taboo is not a good way of preventing it. Indeed, rather than establishing restrictive measures, parents and their children would benefit from being open with each other (Boniel-Nissim & Sasson, 2018). Finally, the results underscore the importance of continuing research to understand the development of social media addiction better, as this phenomenon is likely to become increasingly prevalent as social media becomes more prominent.

Limitations and Future Directions

This longitudinal study is based on a respectable sample size and covers 15 years. However, it has some limitations. First, the sample is relatively homogeneous, consisting almost exclusively of White, French-speaking individuals from a single geographic location and with similar family configurations. The characteristics of our sample must be considered when generalizing the results. Second, the participants self-reported all measures, increasing the shared-method variance bias probability. For example, self-report measures of social media use may not be as valid as more objective measures, as participants are rarely accurate when asked to estimate their social media use (Parry et al., 2021). Third, an important limitation of this study is its correlational design; therefore, the direction of the links cannot be assumed. Future studies should use a cross-lag design to confirm the sequence of occurrence of the variables. Finally, several factors could have been controlled for, including certain personality traits that have been

associated with social media addiction, as well as other personal and environmental factors. Indeed, several other factors may have prompted involvement in social media (e.g., self-esteem, loneliness; Hawi & Samaha, 2018; Stockdale, 2020). Future studies should include these variables. We also propose that future studies examine the mechanisms behind the adolescent-parent relationship and social media addiction in adulthood by using latent class analyses. This type of analysis would test whether different family functioning profiles or different social media use profiles are associated with the development of social media addiction in adulthood.

Conclusion

This 15-year longitudinal study aimed to examine the mediating role of chat site use at age 15 and involvement on social media at age 25 through the longitudinal association between certain dimensions of the parent-adolescent relationship at age 15 and social media addiction at age 30. Results showed associations between adolescents' reports of parental monitoring and changes in social media use into adulthood. Conflicts with parents also predicted social media addiction at age 30. Although the results only explain a small portion of the variance of social media addiction in adulthood, parents appear to have a role to play in preventing social media addiction. These findings highlight the importance for professionals and families to promote a positive parent-child relationship to prevent addictive behaviours later in adulthood, as well as the importance of conducting longitudinal studies to fully understand the complexity of the development of social media addiction later in adulthood. Social media addiction can have a substantial impact on those who suffer from it and on those around them. Therefore, conducting longitudinal studies to gain a better understanding of the mechanisms that contribute to the development of such an addiction remains essential.

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Table 1

Descriptive statistics and bivariate correlation

Variable	1	2	3	4	5	6	7	8	*M*	*SD*
1. Conflict (age 15)		-.31**	-.17**	-.21**	.28**	.04	.10	-.18**	1.75	0.83
2. Secrecy (reverse-coded; age 15)			.41**	.42**	-.31**	.01	.02	.07	2.44	1.19
3. Parental knowledge (age 15)				.53**	-.21**	.01	.05	-.04	3.89	0.72
4. Self-disclosure (age 15)					-.09	.07	.11	-.20**	2.93	1.03
5. Chat site (age 15)						.31**	.14*	-.26*	2.47	0.74
6. Social media involvement (age 25)							.36**	-.22**	2.53	0.88
7. Social media addiction (age 30)								-.17**	1.69	0.67
8. Gender										

Note. *p* <.05, **p* <.01; Gender: female = 0, male = 1; the variables included in this correlation matrix are the mean of the items.

Table 2

*Results of the path analysis*

	β	*b*	SE	*p*	95% CI (β)
Social media addiction at age 30 (R² = .132)					
Conflict (age 15)	.15*	0.17	.07	.02	.03, .28
Parental monitoring (age 15)	.15˜	0.17	.08	.05	.00, .30
Chat site use (age 15)	.06	0.04	.04	.33	-.06, .18
Social media involvement (age 25)	.30**	0.23	.05	<.01	.19, .41
Gender	-.07	-0.09	.05	.21	-.17, .02
Social media involvement at age 25 (R² = .094)					
Chat site use (age 15)	.21**	0.20	.06	.001	.09, .33
Gender	-.20**	-.035	.06	<.01	-.30, -.09
Chat site use at age 15 (R² = .096)					
Conflict (age 15)	.00	0.01	.08	.95	-.14, .15
Parental monitoring (age 15)	-.28**	-0.43	.06	<.01	-.44, -.12
Gender	-.15*	-0.30	.06	.01	-.28, -.04
	β	*b*	SE	*p*	95% BootCI (β)
Indirect effect on social media addiction (age 30)					
Conflict (age 15)	.00	0.00	.00	.96	-.01, .01
Parental monitoring (age 15)	-.02*	-0.02	.01	.03	-.03, -.01
Chat site use (age 15)	.07*	0.05	.02	<.01	.02, .11

˜*p* < .06, * *p* < .05, ** *p* < .01

Note. Bold characters indicate outcomes. Gender is included as a covariate on the endogenous variables. Serial indirect effects are depicted in Figure 1.

Figure 1

Mediation model
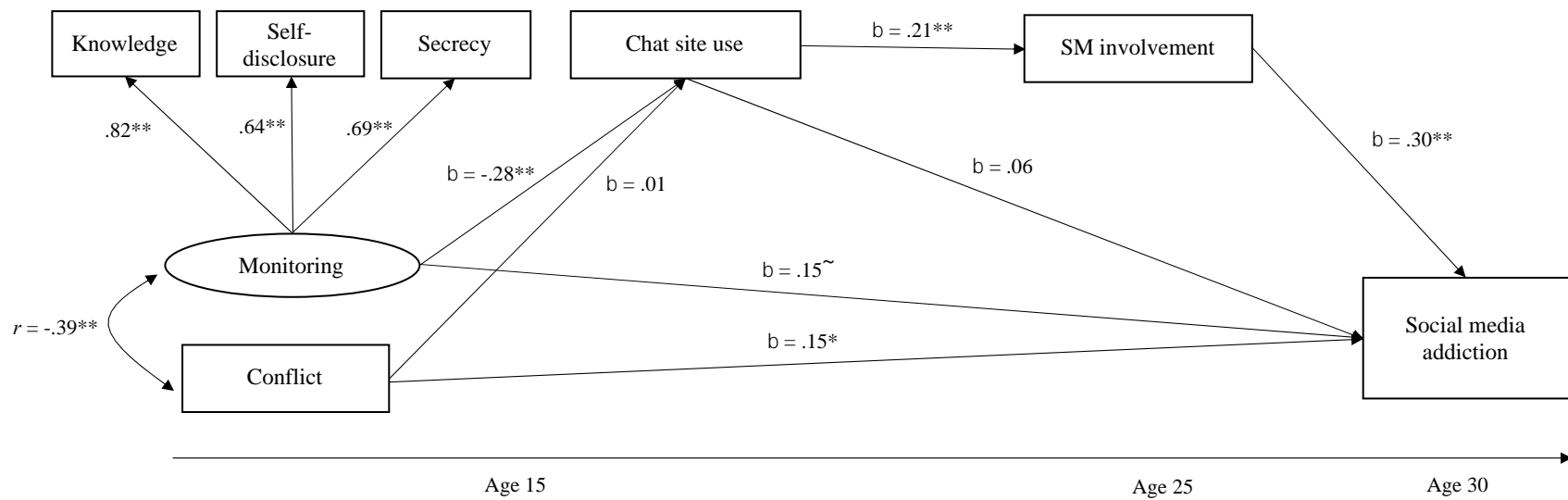
Note. ˜ *p* < .06, *p <.05, **p < .01; Gender is included as a covariate on the endogenous variables. The secrecy variable is reverse-coded.