

Regular Article

Depressive symptoms amplify the impact of feeling supported or ignored online by friends on adolescents' well- and ill-being

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Abstract

Adolescents' communication with friends increasingly occurs online and research has primarily focused on the quantity rather than the quality of interactions, such as feeling supported or ignored. Since feeling supported or ignored by friends *offline* affects adolescents' well- and ill-being, it is essential to understand how these dynamics unfold in online contexts, particularly for adolescents with elevated depressive symptoms, who may be especially sensitive to these experiences. In this preregistered 100-day diary study, 479 adolescents ($M_{age} = 15.98$, 54.9% girls; 96.9% Dutch) reported daily on time spent communicating online with friends, their experiences of feeling supported and ignored by friends, and their well- and ill-being. Results showed that time spent communicating online with friends did not relate to adolescents' well- and ill-being. Feeling supported by friends online resulted in higher well-being and lower ill-being, while feeling ignored by friends online was related to lower well-being and higher ill-being. Adolescents with elevated depressive symptoms experienced intensified effects, both positive and negative, suggesting more vulnerability to everyday online social experiences but also increased benefit from online support. Altogether, this underscores the importance for parents and clinicians to foster open conversations to help adolescents with elevated depressive symptoms navigate their digital social world.

Keywords: adolescence; depression; friends; online interactions; social media experiences

(Received 22 July 2025; revised 20 March 2026; accepted 21 March 2026)

A critical developmental task in adolescence is the formation and maintenance of friendships (Berndt, 2002). Friendships serve as a cornerstone for social development, providing essential support, intimacy, and opportunities to develop interpersonal skills (Furman & Buhrmester, 1985; Hartup, 1996). However, they can also involve stressful experiences, including feeling rejected or ignored (Furman & Buhrmester, 1985; Hartup, 1996). Adolescents are particularly susceptible to such experiences given their heightened emotional sensitivity to interpersonal dynamics (Crone & Dahl, 2012; Somerville, 2013). While supportive friendship experiences may boost adolescents' well-being, negative experiences such as rejection may undermine it (see for reviews Alsarrani et al., 2022; Schwartz-Mette et al., 2020).

In today's digital age, social media platforms have become central to how adolescents form, maintain, and experience their friendships (Anderson & Jiang, 2018; Rideout & Robb, 2018). Online communication with friends can be a source of positive experiences: feeling supported by friends online has been associated with a lower negative mood among adolescents (Frison & Eggermont, 2015, 2016; Frison et al., 2019; Politte-Corn et al., 2023). At the same time, online communication with friends may

also involve negative experiences. Research on these negative online social experiences has predominantly focused on cyberostracism, defined as being ignored or excluded in online contexts, typically within broader peer groups (Pew Research Center, 2018; West et al., 2024b; Williams et al., 2000). Such peer-group-level cyberostracism has been associated with lower levels of positive mood (Ruggieri et al., 2013) and higher internalizing symptoms among adolescents (Marengo et al., 2021; Niu et al., 2018). However, adolescents may also have negative experiences with close friends, such as feeling ignored by friends during direct or private online communication (e.g., not receiving a response to messages).

Social media thus present a dual-edged dynamic for adolescents, where its capacity to foster connection with friends is accompanied by new vulnerabilities to feeling ignored. While prior research has provided some insights into the links between online communication and adolescent mental health, three important gaps remain in our understanding of how these experiences shape adolescent mental health. First, little is known about how feeling supported or ignored by friends online affects adolescent mental health in the daily flow of life. So far, studies have relied on cross-sectional designs (Frison & Eggermont, 2015, 2016; Marengo et al., 2021; Niu et al., 2018; Politte-Corn et al., 2023), longitudinal designs with two time points six months apart (Frison et al., 2019), or an experimental design (Ruggieri et al., 2013). These designs do not capture how adolescents' online experiences with friends and

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Cite this article: Janssen, L., van der Wal, A., & Beyens, I. (2026). Depressive symptoms amplify the impact of feeling supported or ignored online by friends on adolescents' well- and ill-being. *Development and Psychopathology*, 1–12, <https://doi.org/10.1017/S0954579426101485>

mental health fluctuate from day to day. Therefore, as a first aim, we examine how adolescents' experiences of feeling supported or ignored in private communication with friends online impact their mental health on a daily basis.

Second, previous research has primarily focused on how online friend support and cyberostracism relate to either well-being (e.g., positive mood) or ill-being outcomes (e.g., negative mood), without considering both dimensions in the same study. Yet, the effects of social media on well- and ill-being may differ. Several scholars have emphasized that well-being and ill-being are distinct constructs rather than endpoints of a single continuum (Dodge et al., 2012; Meier & Reinecke, 2021; Ryff et al., 2006). This notion is supported by a recent study showing that increased posting and browsing were associated with lower well-being, but not ill-being (Politte-Corn et al., 2024). Whether experiences of feeling supported or ignored online by friends online also have differential effects on well- and ill-being remains unexplored. As a second aim, we therefore examine the effects of feeling supported or ignored by friends online on well-being and ill-being. On the daily level, these constructs are typically conceptualized as positive and negative affect (often using the Positive and Negative Affect Schedule for Children (PANAS-C); Ebesutani et al., 2012; Watson et al., 1988). Prior work has shown that happiness and sadness are key indicators of positive and negative affect (Beyens et al., 2020; Janssen et al., 2024). Accordingly, we operationalized well-being as happiness and ill-being as sadness.

Third, while individual differences in susceptibility to social media effects are well established (Beyens et al., 2020; Valkenburg et al., 2021), little is known about whether individual differences exist in the effects of online experiences on adolescent well-being and ill-being, and what factors contribute to these differences. One potential determinant is depressive symptomatology, as adolescents with higher levels of depressive symptoms tend to show heightened sensitivity to interpersonal experiences (Beeson et al., 2020; Rudolph, 2009). For instance, they showed greater increases in negative emotions and decreases in positive emotions in response to *offline* peer rejection compared to peers with lower levels of depressive symptoms (Ha et al., 2019). With rates of depressive symptoms among adolescents rising over the past decades (Shorey et al., 2022), it is vital to understand how these symptoms may shape the effects of feeling supported or ignored by friends online on well-being and ill-being, which is the third aim of the study. Using happiness and sadness as indicators of well- and ill-being aligns with core affective components of depressive symptoms (i.e., reduced positive affect, more negative affect; Janssen et al., 2024; Silk et al., 2011).

To address these three aims of the study, we employed a 100-day diary design among 479 adolescents. We focused on middle adolescence (14 to 18 years old) as friends and friendships become more important during this developmental stage (Brown & Larson, 2009; De Goede et al., 2009) and sensitivity to rejection of peers and friends is heightened (Crone & Dahl, 2012). Each evening over 100 consecutive days, adolescents reported whether they had communicated online with their friends, for how long, and to what extent they felt supported and ignored during the online communication. They also provided daily assessments of well-being and ill-being. Using a person-specific approach, we assessed the effects of feeling supported or ignored by friends online at the level of the individual adolescent. Understanding these person-specific dynamics in the context of adolescents' daily online communication with friends may offer valuable insights for

interventions and help to formulate more personalized advice for adolescents struggling with depressive symptoms.

Feeling supported or ignored online by friends

Most research on social media and adolescent mental health to date has focused on time spent on social media or specific activities (e.g., browsing, posting) (see for reviews Odgers & Jensen, 2020; Orben, 2020; Valkenburg et al., 2022; Verduyn et al., 2017; Webster et al., 2020) or on aspects such as friendships closeness, quality, or cyberbullying (see for reviews Nesi et al., 2018; Valkenburg & Peter, 2011; Yau & Reich, 2018). To enable comparisons with earlier work, as a first step, we investigate how the time adolescents spend communicating with friends online impacts their well-being and ill-being. Guided by prior research (Anthony et al., 2023; Valkenburg & Peter, 2007), we preregistered the hypotheses that more time spent communicating with friends online will positively impact adolescents' well-being (H1a) and negatively impact ill-being (H1b).

While existing studies offer valuable insights, they fail to capture the diverse experiences adolescents may have online (van der Wal et al., 2024). One key experience during online communication with friends is feeling supported, which caters to adolescents' need for relatedness – the fundamental need to feel connected and belong. According to self-determination theory (SDT; Ryan & Deci, 2000), the satisfaction of this basic psychological need contributes to adolescents' healthy development and promotes their well-being (Ryan & Deci, 2000; Vansteenkiste & Ryan, 2013). Online friendship communication may thus fulfill relatedness, by supporting emotional closeness among friends (West et al., 2024a), which may, in turn, promote well-being. Although research on feeling supported by friends online remains limited, existing studies found it reduces adolescents' negative mood (Frison et al., 2019; Frison & Eggermont, 2015, 2016; Politte-Corn et al., 2023). We therefore preregistered the hypotheses that higher levels of online friend support will positively impact adolescents' well-being (H2a) and reduce ill-being (H2b).

At the same time, from a SDT perspective, the frustration of relatedness can undermine adolescents' well-being and increase ill-being (Ryan & Deci, 2000; Vansteenkiste & Ryan, 2013). Negative online experiences with friends – such as being ignored or excluded – can threaten adolescents' sense of belonging and weaken friendship closeness (West et al., 2024a), potentially decreasing adolescents' well-being and increasing ill-being. So far, studies have examined group-based online exclusion and cyberostracism in peer groups, showing that such experiences make adolescents feel less positive and more negative (Marengo et al., 2021; Niu et al., 2018; Ruggieri et al., 2013). However, adolescents may also feel ignored by their friends in private online communication, which has received little empirical attention. Guided by these findings, we preregistered the hypotheses that higher levels of feeling ignored by friends online will negatively impact adolescents' well-being (H3a) and increase ill-being (H3b).

Depressive symptoms as explanation of individual differences

Cognitive-affective and interpersonal theories of depression suggest that depressive symptoms may alter how adolescents process social interactions, making adolescents with higher levels of depressive symptoms more sensitive to both positive and negative

interactions (Beck, 1967, 1979; Rottenberg et al., 2005; Rudolph, 2009). As a result of this heightened sensitivity, they may benefit more from feeling supported by friends online but may also be more vulnerable to feeling ignored by friends online. Evidence from studies in *offline* settings support this notion (e.g., Ha et al., 2019; Janssen et al., 2020). Daily peer rejection was associated with more negative affect and less positive affect among adolescents with higher levels of depressive symptoms compared to their peers (Ha et al., 2019). Similarly, adolescents with higher depressive symptoms experienced a greater reduction in negative affect with increased parental support (Janssen et al., 2020).

Yet, other studies paint a less clear picture. Depressive symptoms may also lead to a blunted response (i.e., a reduced or diminished reaction) in adolescents (Hilty et al., 2023). Consequently, these adolescents may benefit less from the support, resulting in less increase in well-being and less decrease in ill-being. Additionally, research in adults suggests that positive and negative experiences may affect positive and negative affect differently (Thompson et al., 2012). Given the limited research on how depressive symptoms affect the impact of feeling supported or ignored by friends online on adolescents, and the mixed evidence, we pose the following research questions: To what extent do adolescents' depressive symptoms influence the impact of feeling supported by friends online on well-being (RQ1a) and ill-being (RQ1b)? And to what extent do adolescents' depressive symptoms influence the impact of feeling ignored by friends online on well-being (RQ2a) and ill-being (RQ2b)?

Methods

This preregistered study (<https://osf.io/mdyj8>) is part of a larger project studying the effects of social media use on adolescent well-being. This project consisted of four phases: (1) an online intake interview, (2) a baseline questionnaire, (3) a 100-day daily diary, and (4) an optional exit interview. The current study focuses on data collected from the baseline questionnaire and the daily diary study. The larger project was approved by the Ethics Review Board of the Faculty of Social and Behavioral Sciences at the University of Amsterdam (2022-YME-15724). Adolescents provided informed assent to participate and if adolescents were below the age of 16, parents also provided informed consent.

Participants

Participants were recruited in collaboration with an insight and strategy firm CHOICE that had access to several panels of adults and adolescents who regularly participate in research studies. Adolescents interested in participating were asked to invite their friends. Additionally, participants were recruited from earlier projects, through social media, and the personal network of the researchers. A total of 480 adolescents, aged 14 to 18 years at the time of inclusion, from all regions in the Netherlands enrolled in the larger project, but one adolescent withdrew after the first day of the daily diary study. Therefore, the final sample for the current study consisted of 479 adolescents ($M_{age} = 15.98$, $SD = 1.15$; 44.3% boys, 54.9% girls, 0.8% nonbinary). The adolescents were enrolled in different educational tracks: vocational education (29.9%), higher general secondary/higher professional education (29.2%), and academic preparatory education (40.9%). Most of the adolescents were born in the Netherlands (96.9%).

Procedure

The study procedure of the project was designed following recommendations for collecting intensive longitudinal data (van Roekel et al., 2019). A detailed overview of the procedure and design of the study can be found on the Open Science Framework (OSF; <https://osf.io/k47ta>). After providing consent, participants were invited for an online intake interview in January 2023. Before the intake interviews, adolescents received instructions for installing the daily diary software application m-Path (m-path.io; Mestdagh et al., 2023) on their smartphones. During the intake interviews, adolescents were asked about their social media use, learned about the study's procedure, and practiced with the daily diary app. Five days before the 100-day diary study started, participants received a link to the online baseline questionnaire, including questions about demographics and depressive symptoms.

Daily diary

From January to May 2023, participants received one questionnaire a day via the m-Path app for 100 consecutive days. The micro-questionnaires were sent at 8:30 PM and could be started until midnight. If participants had not yet completed the questionnaire, reminders were sent at 9:15 PM and 10:00 PM. Each questionnaire consisted of 34–38 questions, depending on follow-up questions. At the end of the 100-day diary study, participants could extend their participation for 15 days to catch up on any missed days. We monitored participants' compliance daily and answered participants' questions and problems via WhatsApp, telephone, and e-mail. We also regularly messaged participants via WhatsApp to motivate them, update them on their weekly response rates, and check for problems (e.g., when they missed three subsequent questionnaires).

Compliance

Over the 100-day diary period, 82.8% of the daily questionnaires sent were completed (39,598 out of 47,847 observations). After the 15 catch-up days, adolescents completed a total of 44,211 questionnaires, with an average of 92.3 daily questionnaires per participant ($SD = 24.55$, range 12–115). A small proportion of the daily diaries (115, <0.3%) had irregularities or were not sent due to unforeseen technical issues with the m-Path application. Non-responses were due to technological factors (e.g., uploading errors) and human factors (e.g., illness).

Incentives

Adolescents received compensation for participation in every part of the study, except the optional exit interviews. They received €5,- for the intake interview and €5,- for completing the baseline questionnaire. For each daily diary completed, adolescents earned €1,-. Those who completed 100 questionnaires or more (including catch-up days) received an additional €10,-. Participants who completed 14 consecutive questionnaires in the middle of the study (day 47 until 60) earned a €5,- bonus. Additionally, using a compliance-based raffle, we selected two participants once a week to receive €25,-. Compensation was paid monthly throughout the study.

Measures

Baseline questionnaire

Depressive symptoms. To assess adolescents' depressive symptoms, a validated and short form of the Reynolds Adolescent Depression

Scale Second Edition (RADS-2; Reynolds, 2005) was used. The scale consists of 10 items (e.g., “In the past two weeks I was sad”) which were answered on a 4-point scale ranging from 1 (*never*) to 4 (*often*). One item was reverse-coded before calculating a sum score. Sum scores could range between 10 and 40, with higher scores reflecting higher levels of depressive symptoms. On average, adolescents reported a depressive symptom score of 19.77 ($SD = 5.79$, range = 10–38). A confirmatory factor analysis confirmed the one-factor structure (Hu & Bentler, 1999): $\chi^2(35) = 105.474$, $p < .001$, comparative fit index (CFI) = 0.956, Tucker-Lewis index (TLI) = 0.943, root mean square error of approximation (RMSEA) = 0.065 (90% CI: 0.051, 0.079), standardized root mean squared residual (SRMR) = 0.039, supporting treating depressive symptoms as a unidimensional construct. The measure demonstrated good internal consistency, with a Cronbach’s alpha of 0.86.

Daily diary

The study used single-item measures, which are common in diary studies as they reduce participant burden (Eisele et al., 2022) and still have high validity (Wolfers & Baumgartner, 2025).

Time spent communicating online with friends. Adolescents were asked whether they had communicated online with their friends. We did not provide a specific definition of friend, following prior work that adolescents may report on anyone they perceive as friend (Yau & Reich, 2018). If adolescents indicated that they had communicated online with their friends, they were subsequently asked “How long did you chat with your friends today (via Snapchat, WhatsApp, DM)?”. Adolescents were instructed to estimate the duration in hours and minutes, which were later converted to minutes for ease of analysis.

Feeling supported by friends online. If adolescents had communicated with their friends online, the experience of support by their friends was assessed by asking adolescents: “Did you feel supported by your friends while chatting today?” Adolescents answered on a visual analogue scale (VAS) that ranged from 0 (*not supported at all*) to 100 (*very supported*).

Feeling ignored by friends online. If adolescents had communicated with their friends online, the experience of feeling ignored by friends was assessed by asking adolescents: “Did you feel ignored by your friends today after sending a snap, app, or DM?”. Adolescents answered on a VAS that ranged from 0 (*not ignored at all*) to 100 (*very ignored*).

Well-Being. We assessed adolescents’ daily well-being using a single item from the Positive and Negative Affect Schedule for Children (PANAS-C; Ebesutani et al., 2012; Watson et al., 1988) that we adapted for use in the daily diary. Each evening, adolescents were asked “How happy did you feel today?” on a VAS from 0 (*not happy at all*) to 100 (*very happy*). Previous studies have successfully used this single item to assess momentary well-being (e.g., Beyens et al., 2020; Karsay et al., 2023).

Ill-Being. We assessed adolescents’ daily ill-being using a single item from the Positive and Negative Affect Schedule for Children (PANAS-C; Ebesutani et al., 2012; Watson et al., 1988) adapted for use in the daily diary. Each evening, adolescents were asked “How sad did you feel today?” on a VAS from 0 (*not sad at all*) to 100

(*very sad*). Previous studies have used this single item to successfully assess momentary ill-being (e.g., Jones et al., 2021; Manfredi et al., 2025).

Statistical analyses

We conducted our preregistered analyses (<https://osf.io/mdyj8/>) in R (Version 4.4.0) and *Mplus* 8.10. Descriptive statistics and visualization of the results were performed in R, while hypotheses and research questions were investigated using dynamic structural equation modeling (DSEM) in *Mplus*. Before estimating the DSEM models, we confirmed the stationarity assumption (McNeish & Hamaker, 2020) as day of the study explained only 0.3% of the within-person variance in well-being, and 0.1% in ill-being.

To investigate H1a–H3b, we estimated six multilevel autoregressive models (ML-AR(1)) (3 predictors $\times$ 2 outcomes). At the within-person level, each predictor was included as time-varying covariate to predict the same-day outcome, while also accounting for the lag-1 autoregressive effect of the outcome. At the between-person level, we included the latent mean level of each outcome and predictor. The DSEM default option for model estimation, Bayesian Markov Chain Monte Carlo (MCMC), enabled latent person-mean centering. The correlation between the mean levels and random effects was included to explore heterogeneity among adolescents.

Each DSEM model was run with a minimum of 5,000 iterations, with one-day time intervals. Model convergence was checked before interpreting the estimates (Hamaker et al., 2018). In all six models, the Potential Scale Reduction value (PSR; Gelman & Rubin, 1992) was very close to 1 (< 1.1), density plots looked smooth, and trace plots resembled fat caterpillars. Hence, model convergence was considered successful. Doubling iterations confirmed that the PSR value was not lower than 1.1 by chance and results did not deviate from the 5,000 iterations-model. We therefore interpreted the estimates from the 5,000 iterations-model. *Mplus* results were imported into R via *MplusAutomation* (Hallquist & Wiley, 2021) for extraction of person-specific parameters and visualization.

To examine RQ1a–RQ2b (i.e., to what extent heterogeneity in person-specific effects is explained by depressive symptoms), we added a cross-level interaction between depressive symptoms and the within-person association of each predictor-outcome in all models. Models including ill-being converged after 5,000 iterations and doubling iterations led to similar results. The model including feeling supported by friends online and well-being only converged after 10,500 iterations; doubling iterations led to similar results. The model including feeling ignored by friends online and well-being failed to converge even after 50,000 iterations. Since models at $n = 1$ level are best analyzed when having 50 observations per person (Chatfield, 2004; Voelkle et al., 2012), we reran the model for feeling ignored by friends online and well-being including only adolescents with 50 observations of communicating online with friends. This model converged after 5,000 iterations and these results were reported. As a sensitivity analysis, all models were rerun including only adolescents with a minimum of 50 observations.

To interpret the within-person effects, we assessed the standardized effects and considered an effect size of $\beta = 0.05$ as smallest effect size of interest (SESOI; Lakens et al., 2018) following recommendations for autoregressive models (Adachi & Willoughby, 2015) and described as relevant in a recent meta-analysis on social media and mental health (Meier & Reinecke,

Table 1. Descriptive statistics, correlations, and intraclass correlations of study variables

	1	2	3	4	5
1. Time spent communicating online with friends	–	0.074***	–0.003	0.003	0.018***
2. Feeling supported by friends online	0.133**	–	–0.141***	0.188***	–0.087***
3. Feeling ignored by friends online	0.093*	–0.259***	–	–0.094***	0.160***
4. Well-being	0.063	0.655***	–0.377***	–	–0.467***
5. Ill-being	0.036	–0.309***	0.746***	0.596***	–
<i>n</i>	33,590	33,590	33,590	44,211	44,211
<i>M</i>	57.64	70.54	18.07	72.37	21.48
<i>SD</i>	68.13	20.28	21.32	19.21	23.01
Range	0–1,439	0–100	0–100	0–100	0–100
ICC	0.460	0.465	0.472	0.389	0.418

Note: Correlations below the diagonal line represent between-person correlations, correlations above the diagonal line represent within-person correlations.

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

2021). Associations ranging from -0.05 to $+0.05$ were interpreted as nonexistent to very small. To interpret between-person effects, we considered an effect size of $\beta = 0.10$ as the smallest size of interest, with associations ranging from -0.10 to $+0.10$ being interpreted as nonexistent to very small (Gignac & Szodorai, 2016).

Results

Descriptive statistics and correlations

Descriptive statistics, between-person, within-person, and intraclass correlations (ICCs) of all daily study variables are provided in Table 1. All adolescents communicated online with their friends during the study period, for an average of 88 days (76.41% of the 115 days) and approximately an hour a day. On average, adolescents felt supported by their friends online, while levels of feeling ignored by friends online were relatively low. The between-person correlations indicate that adolescents who experienced more feelings of support by friends online than their peers reported higher well-being and lower ill-being than their peers. Similarly, adolescents who felt more ignored by friends online than their peers reported lower well-being and higher ill-being than their peers. Adolescents who spent more time communicating online with friends than their peers did not report higher or lower levels of well- and ill-being than their peers.

The effects of online communication with friends on well-being and ill-being

Results of the DSEM models (see Table 2) showed that on days when adolescents spent more time communicating with friends online, they did not experience changes in well-being (H1a: $\beta = 0.033$, $p < .001$, but based on the SESOI interpreted as nonexistent) and ill-being (H1b: $\beta = -0.015$, $p = .085$), rejecting our hypotheses. The results about online experiences were in line with our hypotheses. On days when adolescents reported higher levels of feeling supported by friends online, they experienced higher well-being (H2a: $\beta = 0.198$, $p < .001$) and lower ill-being (H2b: $\beta = -0.111$, $p < .001$). Similarly, on days when adolescents reported higher levels of feeling ignored by friends online, they experienced lower well-being (H3a: $\beta = -0.087$, $p < .001$) and higher ill-being (H3b: $\beta = 0.143$, $p < .001$).¹

Depressive symptoms as explanation of heterogeneity in person-specific effects

To gain insight into individual differences in the effects of feeling supported or ignored online by friends on well-being and ill-being, we interpreted the person-specific results. The distributions of the person-specific effects for all models are shown in Figure 1 (see Appendix B for person-specific effects in time spent communicating online with friends). As Figure 1 shows, the person-specific effects of feeling supported by friends online ranged from $\beta = -0.766$ to $\beta = 0.756$ for well-being and from $\beta = -0.709$ to $\beta = 0.604$ for ill-being. Person-specific effects of feeling ignored by friends online ranged from $\beta = -0.715$ to $\beta = 0.753$ for well-being and $\beta = -0.476$ to $\beta = 0.693$ for ill-being. These distributions illustrate substantial individual differences, categorized into positive, negative, and no effect.

Adolescents' level of depressive symptoms explained the differences in the effects of feeling supported by friends online on well-being (RQ1a: $\beta = 0.124$, $p < .001$), but not ill-being (RQ1b: $\beta = -0.049$, $p = .120$) (see Table 3). Adolescents' level of depressive symptoms also explained differences in the effects of feeling ignored by friends online on well-being (RQ2b: $\beta = -0.176$, $p < .001$), but not ill-being (RQ2b: $\beta = 0.092$, $p = .011$, but based on the SESOI interpreted as nonexistent). These findings suggest that adolescents with higher levels of depressive symptoms experience stronger positive effects from feeling supported by friends online and stronger negative effects of feeling ignored by friends online on their well-being. This pattern is reflected in the simple slope visualizations (Appendix C).

The person-specific effect distributions indicate that most adolescents responded in a manner consistent with our hypotheses. However, nearly one in four adolescents (23.6%) showed effects opposite of expectation in one or more models. For example, 12.9% of adolescents reported higher (instead of lower) levels of well-being on days when they experienced higher levels of feeling ignored by friends online (see Figure 1b). Similarly, 9.6% of adolescents reported higher

¹In response to a reviewer's suggestion, we explored gender as potential moderator of the effects of online communication with friends on well- and ill-being. These analyses did not alter the main conclusions. Adolescents' gender explained the differences in the effects of time spent communicating online on ill-being ($\beta = 0.165$, $p = .016$) and the effects of being ignored by friends online on ill-being ($\beta = 0.134$, $p = .006$). Results of the full moderation models with gender are reported in Appendix A.

Table 2. DSEM estimates and 95% Bayesian credible intervals for the within-person effects, between-person associations, random effects of time spent communicating online, feeling supported by friends online, and feeling ignored by friends online on well-being and ill-being

	Time spent communicating online (H1)				Feeling supported by friends online (H2)				Feeling ignored by friends online (H3)			
	<i>b</i>	β	<i>p</i>	95% CI	<i>b</i>	β	<i>p</i>	95% CI	<i>b</i>	β	<i>p</i>	95% CI
Well-being (H1a, H2a, H3a)												
Fixed effects												
<i>Within-person</i>												
Well-being (<i>t</i> -1) → Well-being (<i>t</i>)	0.262	0.262	<.001	[0.250, 0.274]	0.244	0.244	<.001	[0.233, 0.256]	0.260	0.259	<.001	[0.247, 0.271]
Predictor → Well-being	0.011	0.033	.001	[0.015, 0.049]	0.209	0.198	<.001	[0.185, 0.210]	-0.085	-0.087	<.001	[-0.100, -0.072]
<i>Between-person</i>												
Predictor & well-being	31.895	0.056	.120	[-0.036, 0.149]	104.357	0.629	<.001	[0.568, 0.683]	-65.497	-0.370	<.001	[-0.474, -0.286]
Random effect	σ^2		<i>p</i>	95% CI	σ^2		<i>p</i>	95% CI	σ^2		<i>p</i>	95% CI
Predictor → Well-being	0.009		<.001	[0.008, 0.011]	0.072		<.001	[0.062, 0.085]	0.064		<.001	[0.055, 0.076]
Ill-being (H1b, H2b, H3b)												
Fixed effects												
<i>Within-person</i>												
Ill-being (<i>t</i> -1) → Ill-being (<i>t</i>)	0.237	0.237	<.001	[0.225, 0.248]	0.230	0.230	<.001	[0.217, 0.241]	0.226	0.226	<.001	[0.214, 0.237]
Predictor → Ill-being	-0.006	-0.015	.085	[-0.036, 0.006]	-0.137	-0.111	<.001	[-0.124, -0.097]	0.166	0.143	<.001	[0.129, 0.156]
<i>Between-person</i>												
Predictor & Ill-being	37.260	0.053	.132	[-0.038, 0.146]	-62.937	-0.306	<.001	[-0.388, -0.221]	165.405	.751	<.001	[0.706, 0.791]
Random effect	σ^2		<i>p</i>	95% CI	σ^2		<i>p</i>	95% CI	σ^2		<i>p</i>	95% CI
Predictor → Ill-being	0.009		<.001	[0.008, 0.011]	0.074		<.001	[0.062, 0.088]	0.050		<.001	[0.041, 0.061]

(instead of lower) levels of ill-being on days when they experienced higher levels of feeling supported by friends online (see Figure 1c).

Exploratory analyses

To further investigate the counterintuitive effects, we conducted exploratory analyses comparing adolescents with any counterintuitive effects to adolescents without in terms of: a) the number of days they communicated online with friends, b) their level of depressive symptoms, and c) day-to-day fluctuations (using the standard deviation) in feeling supported by friends online, feeling ignored by friends online, and well- and ill-being. Only the day-to-day fluctuations differed significantly between groups. Adolescents with counterintuitive effects showed more fluctuations (higher standard deviations) in feeling supported by friends online (counterintuitive: $M_{\text{fluctuations}} = 17.51$, others: $M_{\text{fluctuations}} = 13.03$, $t = -5.46$, $p < .001$), feeling ignored by friends online (counterintuitive: $M_{\text{fluctuations}} = 16.77$, others: $M_{\text{fluctuations}} = 13.58$, $t = -3.54$, $p < .001$), well-being (counterintuitive: $M_{\text{fluctuations}} = 17.03$, others: $M_{\text{fluctuations}} = 12.94$, $t = -5.82$, $p < .001$), and ill-being (counterintuitive: $M_{\text{fluctuations}} = 19.37$, others: $M_{\text{fluctuations}} = 15.15$, $t = -5.56$, $p < .001$). Adolescents with counterintuitive effects did not differ from the other adolescents in terms of the number of observations in which they communicated online with friends (counterintuitive: $M = 68.35$, others: $M = 70.67$, $t = 0.64$, $p = .522$), and level of depressive

symptoms (counterintuitive: $M = 20.44$, others: $M = 19.56$, $t = -1.41$, $p = .160$).

Sensitivity analyses

Two sensitivity analyses were conducted. First, we reran all models excluding adolescents with less than 50 observations of communicating online with friends (see Appendix D for detailed results). The results largely replicated the primary findings. The only differences were that the moderating role of depressive symptoms became more consistent across models, with depressive symptoms also accounting for the differences in person-specific effects of feeling supported or ignored by friends online on ill-being (feeling supported by friends online: $\beta = -0.101$, $p = .019$; feeling ignored by friends online: $\beta = 0.124$, $p = .012$).

Second, as preregistered, we reran our models excluding potentially untrustworthy responses (i.e., 1,004 of 44,211 completed observations; 2.3%; see Appendix E for detailed results). The results largely replicated the primary findings, but two findings differed. In the new models depressive symptoms also accounted for the differences in person-specific effects of feeling ignored by friends online on ill-being ($\beta = 0.138$, $p = .005$), but no longer on well-being ($\beta = -0.081$, $p = .018$).

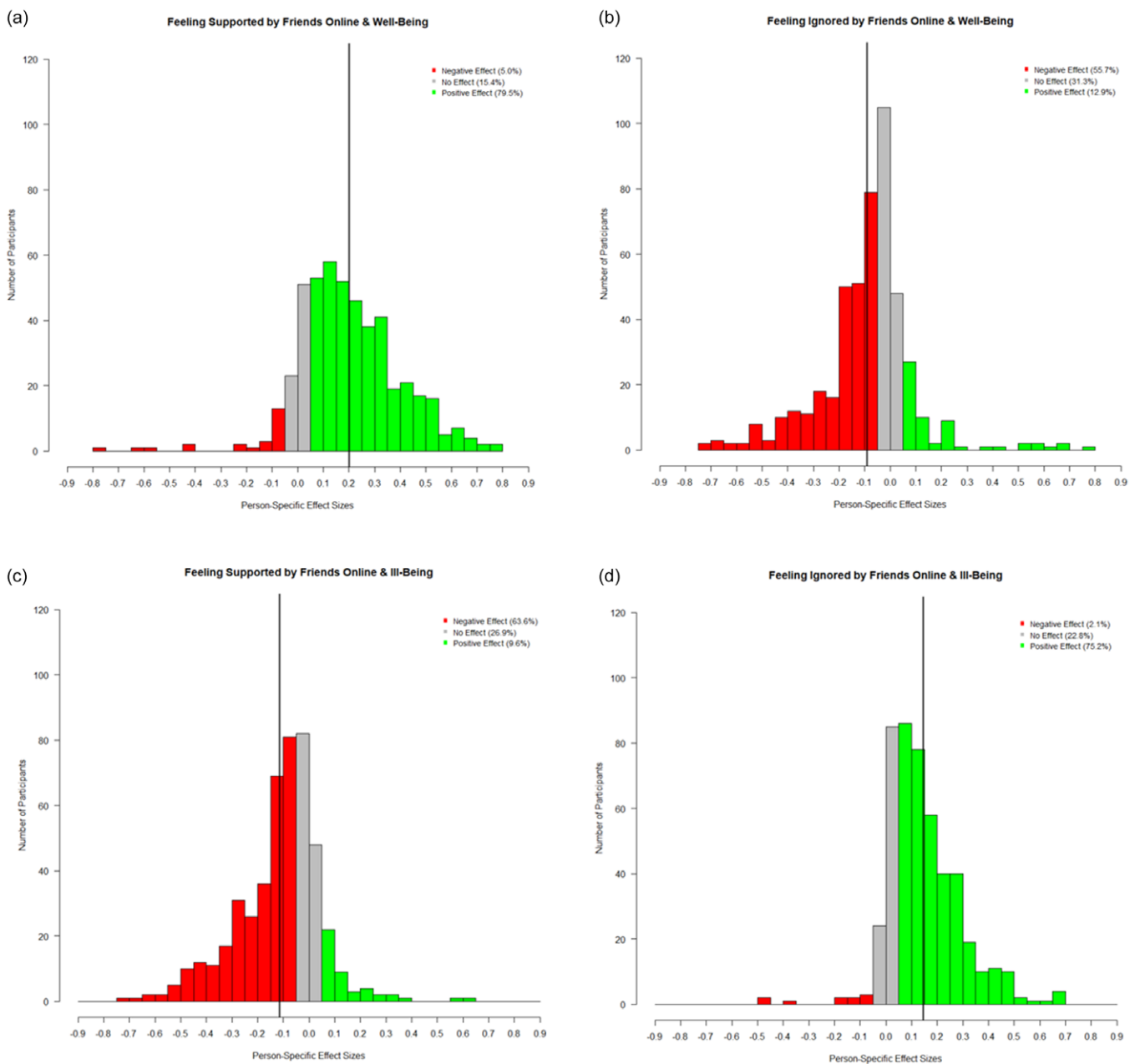


Figure 1. a–d Distribution of the Person-Specific Standardized Effects Across the Sample for the Effects of Feeling Supported and Ignored by Friends Online on Well-Being and Ill-being. Note: The x-axes display standardized effect sizes, the y-axes display the number of participants. Vertical black lines represent the average person-specific effect.

Discussion

Social media have become crucial for adolescents to communicate with their friends (Anderson & Jiang, 2018; Rideout & Robb, 2018). However, an important question that remains is how adolescents' online communication with friends affects their well- and ill-being on a daily basis. This 100-day diary study among 479 adolescents examined not only the impact of time spent communicating with friends but also the effects of adolescents' experiences of feeling supported and ignored by friends online on their mental health. Moreover, we explored whether depressive symptoms – known to heighten sensitivity to interpersonal experiences (Beeson et al., 2020; Rudolph, 2009) – moderate these associations. Results showed that on days when adolescents spent more time communicating with friends online, they did not experience changes in

their well- and ill-being. On days when adolescents experienced higher levels of feeling supported by friends online, they reported higher well-being and lower ill-being. Conversely, on days when they experienced higher levels of feeling ignored by friends online, they reported lower well-being and higher ill-being. These positive and negative effects on well-being were amplified among adolescents with higher levels of depressive symptoms.

Feeling supported and ignored by friends online impact adolescents' daily mental health

By examining both the time adolescents spent communicating online with friends and experiences of feeling supported and ignored by friends online in relation to well- and ill-being, this daily diary study advances previous work. Contrary to previous studies

Table 3. DSEM estimates and 95% Bayesian credible intervals for the within-person effects, between-person associations, random effects, and moderation of depressive symptoms of time spent communicating online, feeling supported by friends online, and feeling ignored by friends online on well-being and ill-being

	Feeling supported by friends online (RQ1)				Feeling ignored by friends online (RQ2) ^a			
	<i>b</i>	β	<i>p</i>	95% CI	<i>b</i>	β	<i>p</i>	95% CI
Well-being (RQ1a, RQ2a)								
Fixed effects								
<i>Within-person</i>								
Well-being (<i>t</i> -1) → Well-being (<i>t</i>)	0.244	0.245	<.001	[0.233, 0.256]	0.258	.258	<.001	[0.245, 0.269]
Predictor → Well-being	0.211	0.199	<.001	[0.186, 0.214]	−0.087	−.091	<.001	[−0.106, −0.077]
<i>Between-person</i>								
Predictor & Well-being	88.251	0.613	<.001	[0.550, 0.668]	−39.302	−.273	<.001	[−0.370, −0.164]
Depressive symptoms → Well-being	−0.950	−0.343	<.001	[−0.399, −0.286]	−1.019	−.362	<.001	[−0.429, −0.293]
Depressive symptoms → Predictor	−0.511	−0.153	<.001	[−0.214, −0.089]	0.991	.277	<.001	[0.206, 0.342]
Depressive symptoms → Beta	0.008	0.124	<.001	[0.055, 0.192]	−0.007	−.176	<.001	[−0.269, −0.084]
Random effect	σ^2		<i>p</i>	95% CI	σ^2		<i>p</i>	σ^2
Predictor → Well-being	0.069		<.001	[0.059, 0.032]	0.024		<.001	[0.019, 0.031]
Ill-being (RQ1b, RQ2b)								
Fixed effects								
<i>Within-person</i>								
Ill-being (<i>t</i> -1) → Ill-being (<i>t</i>)	0.232	0.233	<.001	[0.220, 0.245]	0.228	.228	<.001	[0.216, 0.240]
Predictor → Ill-being	−0.138	−0.110	<.001	[−0.125, −0.097]	0.166	.142	<.001	[0.127, 0.155]
<i>Between-person</i>								
Predictor & Ill-being	−36.899	−0.227	<.001	[−0.314, −0.138]	111.765	.687	<.001	[0.633, 0.734]
Depressive symptoms → Ill-being	1.476	0.449	<.001	[0.394, 0.499]	1.474	.447	<.001	[0.393, 0.495]
Depressive symptoms → Predictor	−0.495	−0.148	<.001	[−0.212, −0.086]	1.047	.303	<.001	[0.244, 0.361]
Depressive symptoms → Beta	−0.003	−0.049	.120	[−0.127, 0.029]	0.005	.092	.011	[0.014, 0.169]
Random effect	σ^2		<i>p</i>	95% CI	σ^2		<i>p</i>	σ^2
Predictor → Ill-being	0.073		<.001	[0.062, 0.088]	0.049		<.001	[0.040, 0.060]

^aWith regard to well-being, results concern data including adolescents with more than 50 observations as the initial model did not converge (*n* = 339).

suggesting that more time spent on social media are related to higher levels of mental health (e.g., Anthony *et al.*, 2023; Odgers & Jensen, 2020; Orben, 2020; Valkenburg *et al.*, 2022; Valkenburg & Peter, 2007; Verduyn *et al.*, 2017; Webster *et al.*, 2020), we found no effects of time spent communicating with friends online on adolescents' well- and ill-being. This absence of overall effects appears to be due to substantial individual differences in susceptibility to social media effects as found in prior research (Beyens *et al.*, 2020; Valkenburg *et al.*, 2021). In our study, about 40% of adolescents experienced no effect, while the remaining participants were split into similarly sized groups experiencing either positive or negative effects of time spent communicating online with friends on their well- and ill-being.

While the amount of time spent communicating with friends online showed no overall effects, our results highlight that how adolescents experience this online communication with friends matters greatly for their mental health. Supporting our hypotheses, adolescents reported more well-being and less ill-being on days when they felt more supported by friends online, whereas they reported less well-being and more ill-being on days when they felt more ignored by

friends online. These findings align with self-determination theory, highlighting that when adolescents' need for relatedness is satisfied, their well-being is boosted and they are protected against ill-being (Deci & Ryan, 2000; Vansteenkiste & Ryan, 2013). While some individual variability remained, these patterns were notably more homogenous across the majority of adolescents than the effects of time spent communicating online with friends.

Some adolescents, however, showed effects contrary to our expectations, reporting, for instance, more well-being on days when they experienced higher levels of feeling ignored by friends online. Although heightened emotional variability is generally related to more maladaptive functioning (Houben *et al.*, 2015), adolescents with these counterintuitive effects did not show elevated depressive symptoms. Yet, they appeared to show more day-to-day variability in their online experiences and mental health. A somewhat similar pattern was observed in a recent study, which found that women with inconsistent social media use patterns experienced less negative effects on their body image than those with less variability in their social media use (Vendemia *et al.*, 2025). More work is necessary to further explain these findings.

Despite these few individual deviations, our overall findings show that it is not the amount of online communication that matters most, it is the quality of those interactions. For researchers, clinicians, and parents alike, focusing on how adolescents experience their online communication may be far more valuable than tracking the time they spend doing it.

Depressive symptoms amplify the effects of online experiences with friends

Another central aim of this study was to understand how adolescents' depressive symptoms shape the impact of feeling supported and ignored by friends online on well- and ill-being in daily life. Consistent with theories emphasizing heightened interpersonal sensitivity in depression (Beck, 1967, 1979; Rottenberg et al., 2005; Rudolph, 2009), and extending findings from offline settings (Ha et al., 2019), we found that depressive symptoms intensified both the positive effects of feeling supported by friends online and the negative effects of feeling ignored by friends online on well-being. This pattern reflects a dual sensitivity that seems to align with the dandelion-orchid framework (Pluess et al., 2017). According to this framework, some individuals (orchids) are more sensitive to both supportive and adverse environmental influences, whereas others (dandelions) are less sensitive. Adolescents with higher levels of depressive symptoms may function as orchids, showing greater reactivity to feeling supported and ignored by friends online.

The dual sensitivity of adolescents with higher levels of depressive symptoms is troubling in light of previous research showing that these adolescents experience less support from friends online and more often feel ignored by friends online than adolescents with lower levels of depressive symptoms (Janssen et al., 2025). This convergence of increased vulnerability and greater exposure to negative experiences suggests a double burn: Adolescents with higher levels of depressive symptoms may not only experience feeling ignored by friends more frequently but may also be more deeply affected by it. Notably, even in our sample, where overall levels of feeling ignored by friends online were low, the impact on well-being was substantial and stronger among adolescents with elevated levels of depressive symptoms. This raises concerns that these effects may be even more pronounced in clinical populations.

The findings underscore the need to raise awareness among adolescents with elevated levels of depressive symptoms – and those who support them – about the more pronounced effects online communication with friends can have, both positive and negative. Parents, educators, and mental health professionals can play a key role in helping adolescents reflect on their online experiences with friends and identify supportive and harmful online interactions (Tibber & Silver, 2022). Such reflection may enable adolescents to more effectively navigate their online social network and foster digital environments that support mental health.

Limitations and directions for future research

This study advances the field in various ways but has some limitations as well. First, there are limitations related to the study design and sample characteristics. By relying on daily self-reports, adolescents had to aggregate multiple online experiences within an average of 2.5 hours spent daily on social media (Siebers et al., 2024) and about one hour communicating with friends online. It remains unclear which specific moments or types of experiences

most strongly affect well- and ill-being. Adolescents' reports may be shaped by the most emotionally intense or most recent interaction, known as peak and end effects (Fredrickson, 2000). Future work may want to focus on a smaller time scale (e.g., hourly) and take into account the content of the conversations (e.g., Alluhidan et al., 2025; Verbeij et al., 2024) to gain more insight into the range of online experiences adolescents have. Another limitation is that while the use of single items is common practice in intensive longitudinal research, the use of happiness and sadness to assess well- and ill-being does not fully capture the breadth and depth of these constructs. Future research including multi-item affect scales may allow for a more comprehensive assessment of well- and ill-being in daily life. Moreover, our sample was drawn from a Western, Educated, Industrialized, Rich, and Democratic (WEIRD) population, which limits generalizability of our findings. Future research should include more diverse samples and cross-cultural contexts to enhance broad applicability.

In addition, there are limitations concerning the breadth and specificity of adolescents' (online) communication contexts. The current study did not assess adolescents' offline communication with friends. Adolescents' online and offline social worlds are deeply intertwined (Subrahmanyam & Šmahel, 2011), and offline interactions may co-occur with or shape how online experiences affect well- and ill-being. As a result, we cannot determine whether the observed associations are unique to online communication or partly reflect variability in offline experiences. Future research should simultaneously assess online and offline experiences to disentangle their unique and joint contributions to adolescents' daily well- and ill-being, for instance, by examining whether offline friend support buffers the impact of negative online experiences, such as feeling ignored by friends. Furthermore, in the current study, we focused on private online communication with friends. Future work should differentiate between private and public forms of communication, one-to-one and group interactions, and online-only and offline friends, to better capture the nuances that may inform interventions aimed at enhancing adolescents' resilience.

Conclusion

Social media are central to how adolescents communicate with their friends. By assessing how adolescents experience these interactions over a span of 100 days in addition to time spent communicating online, this study demonstrated that feeling supported by friends online improved well-being and reduced ill-being, whereas feeling ignored by friends had the opposite effect. Moreover, adolescents' levels of depressive symptoms amplified both the benefits of feeling supported by friends online as well as the harms of feeling ignored by friends online, highlighting a dual sensitivity. Helping adolescents recognize and navigate these patterns may support more purposeful engagement with their online social world. Ultimately, this may protect and promote mental health in both the general population and among those at risk.

Supplementary material. The supplementary material for this article can be found at <https://doi.org/10.1017/S0954579426101485>.

Data availability statement. A detailed overview of the project procedure, including the design of the study can be found on the Open Science Framework (OSF) (<https://osf.io/k47ta>). More information on the measures and pre-registered analyses can be found in the preregistration on OSF (<https://osf.io/mdyj8>). The R and Mplus syntaxes necessary to reproduce the analyses presented here are publicly accessible on OSF: <https://osf.io/2u8ab>. The code was

checked by a co-pilot. The data underlying this article can be found on Figshare <https://doi.org/10.21942/uva.31804444>.

Acknowledgments. We are grateful for the effort and time devoted by the participating adolescents. We would like to thank Nadia Bij de Vaate, Tim Verbeij, and Teun Siebers for their contribution to the data collection of this study. We would also like to thank Patti Valkenburg for her contribution to the overarching project and critical input to the paper.

Funding statement. This study was funded by an NWO Spinoza Prize awarded to Patti M. Valkenburg by the Dutch Research Council (NWO). Open access funding provided by University of Amsterdam.

Pre-registration statement. The study was preregistered with an analyses plan prior to analysis of the data and can be found on OSF (<https://osf.io/mdyj8>; January 29th, 2025).

Competing interests. The authors declare no other competing interests.

References

- Adachi, P., & Willoughby, T. (2015). Interpreting effect sizes when controlling for stability effects in longitudinal autoregressive models: Implications for psychological science. *European Journal of Developmental Psychology*, 12(1), 116–128. <https://doi.org/10.1080/17405629.2014.963549>
- Alluhidan, A., Park, J. K., Akter, M., Rodgers, R., Razi, A., & Wisniewski, P. J. (2025). Unfiltered: How teens engage in body image and shaming discussions via Instagram direct messages (DMs). *Proceedings of the ACM on Human-Computer Interaction*, 9(7), 1–29. <https://doi.org/10.1145/3757698>
- Alsarrani, A., Hunter, R. F., Dunne, L., & Garcia, L. (2022). Association between friendship quality and subjective wellbeing among adolescents: A systematic review. *BMC Public Health*, 22(1), 2420. <https://doi.org/10.1186/s12889-022-14776-4>
- Anderson, M., & Jiang, J. (2018). Teens, social media & technology 2018. https://www.pewresearch.org/internet/wp-content/uploads/sites/9/2018/05/PI_2018.05.31_TeensTech_FINAL.pdf. (Pew research center, Issue).
- Anthony, R., Young, H., Hewitt, G., Sloan, L., Moore, G., Murphy, S., & Cook, S. (2023). Young people's online communication and its association with mental well-being: Results from the 2019 student health and well-being survey. *Child and Adolescent Mental Health*, 28(1), 4–11. <https://doi.org/10.1111/camh.12610>
- Beck, A. T. (1967). *Depression: Clinical, experimental, and theoretical aspects*. Harper & Row.
- Beck, A. T. (1979). *Cognitive therapy of depression*. The Guilford Press.
- Beeson, C. M. L., Brittain, H., & Vaillancourt, T. (2020). The temporal precedence of peer rejection, rejection sensitivity, depression, and aggression across adolescence. *Child Psychiatry & Human Development*, 51(5), 781–791. <https://doi.org/10.1007/s10578-020-01008-2>
- Berndt, T. J. (2002). Friendship quality and social development. *Current Directions in Psychological Science*, 11(1), 7–10. <https://doi.org/10.1111/1467-8721.00157>
- Beysens, I., Pouwels, J. L., van Driel, I. I., Keijsers, L., & Valkenburg, P. M. (2020). The effect of social media on well-being differs from adolescent to adolescent. *Scientific Reports*, 10(1), 10763. <https://doi.org/10.1038/s41598-020-67727-7>
- Brown, B. B., & Larson, J. (2009). Peer relationships in adolescence. *Handbook of Adolescent Psychology*, 2(Pt I), 74–104.
- Chatfield, C. (2004). *The analysis of time series: An introduction*. Chapman & Hall/CRC.
- Crone, E. A., & Dahl, R. E. (2012). Understanding adolescence as a period of social-affective engagement and goal flexibility. *Nature Reviews Neuroscience*, 13(9), 636–650. <https://doi.org/10.1038/nrn3313>
- De Goede, I. H. A., Branje, S. J. T., & Meeus, W. H. J. (2009). Developmental changes and gender differences in adolescents' perceptions of friendships. *Journal of Adolescence*, 32(5), 1105–1123. <https://doi.org/10.1016/j.adolescence.2009.03.002>
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01
- Dodge, R., Daly, A. P., Huyton, J., & Sanders, L. D. (2012). The challenge of defining wellbeing. *International Journal of Wellbeing*, 2(3), 222–235. <https://doi.org/10.1089/cyber.2020.0020>
- Ebesutani, C., Regan, J., Smith, A., Reise, S., Higa-McMillan, C., & Chorpita, B. F. (2012). The 10-item positive and negative affect schedule for children, child and parent shortened versions: Application of item response theory for more efficient assessment. *Journal of Psychopathology & Behavioral Assessment*, 34(2), 191–203. <https://doi.org/10.1007/s10862-011-9273-2>
- Eisele, G., Vachon, H., Lafit, G., Tuytaerts, D., Houben, M., Kuppens, P., Myin-Germeyns, I., & Viechtbauer, W. (2022). A mixed-method investigation into measurement reactivity to the experience sampling method: The role of sampling protocol and individual characteristics. *Psychological Assessment*, 35(1), 68–81. <https://doi.org/10.1037/pas0001177>
- Fredrickson, B. L. (2000). Extracting meaning from past affective experiences: The importance of peaks, ends, and specific emotions. *Cognition & Emotion*, 14(4), 577–606. <https://doi.org/10.1080/026999300402808>
- Frison, E., Bastin, M., Bijttebier, P., & Eggermont, S. (2019). Helpful or harmful? The different relationships between private Facebook interactions and adolescents' depressive symptoms. *Media Psychology*, 22(2), 244–272. <https://doi.org/10.1080/15213269.2018.1429933>
- Frison, E., & Eggermont, S. (2015). The impact of daily stress on adolescents' depressed mood: The role of social support seeking through Facebook. *Computers in Human Behavior*, 44, 315–325. <https://doi.org/10.1016/j.chb.2014.11.070>
- Frison, E., & Eggermont, S. (2016). Exploring the relationships between different types of facebook use, perceived online social support, and adolescents' depressed mood. *Social Science Computer Review*, 34(2), 153–171. <https://doi.org/10.1177/0894439314567449>
- Furman, W., & Buhrmester, D. (1985). Children's perceptions of the personal relationships in their social networks. *Developmental Psychology*, 21(6), 1016–1024. <https://doi.org/10.1037/0012-1649.21.6.1016>
- Gelman, A., & Rubin, D. B. (1992). Inference from iterative simulation using multiple sequences. *Statistical Science*, 7(4), 457–511.
- Gignac, G. E., & Szodorai, E. T. (2016). Effect size guidelines for individual differences researchers. *Personality & Individual Differences*, 102, 74–78. <https://doi.org/10.1016/j.paid.2016.06.069>
- Ha, T., van Roekel, E., Iida, M., Kornienko, O., Engels, R. C. M. E., & Kuntsche, E. (2019). Depressive symptoms amplify emotional reactivity to daily perceptions of peer rejection in adolescence. *Journal of Youth and Adolescence*, 48(11), 2152–2164. <https://www.ncbi.nlm.nih.gov/pubmed/31620972>
- Hallquist, M. N., & Wiley, J. F. (2021). MplusAutomation: An R package for facilitating large-scale latent variable analyses in Mplus. *Structural Equation Modeling: A Multidisciplinary Journal*, 25(4), 621–638. <https://doi.org/10.1080/10705511.2017.1402334>
- Hamaker, E. L., Asparouhov, T., Brose, A., Schmiedek, F., & Muthén, B. (2018). At the frontiers of modeling intensive longitudinal data: Dynamic structural equation models for the affective measurements from the COGITO study. *Multivariate Behavioral Research*, 53(6), 820–841. <https://doi.org/10.1080/00273171.2018.1446819>
- Hartup, W. W. (1996). The company they keep: Friendships and their developmental significance. *Child Development*, 67(1), 1–13. <https://doi.org/10.1111/j.1467-8624.1996.tb01714.x>
- Hilty, D. M., Stubbe, D., McKean, A. J., Hoffman, P. E., Zalpuri, I., Myint, M. T., Joshi, S. V., Pakyurek, M., & Li, S.-T. (2023). A scoping review of social media in child, adolescents and young adults: Research findings in depression, anxiety and other clinical challenges. *BJPsych Open*, 9(5), e152. <https://doi.org/10.1192/bjo.2023.523>
- Houben, M., Van Den Noortgate, W., & Kuppens, P. (2015). The relation between short-term emotion dynamics and psychological well-being: A meta-analysis. *Psychological Bulletin*, 141(4), 901–930. <https://doi.org/10.1037/a0038822>

- Hu, L.-t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Janssen, L. H. C., Elzinga, B. M., Verkuil, B., Hillegers, M. H. J., & Keijsers, L. (2020). The link between parental support and adolescent negative mood in daily life: Between-person heterogeneity in within-person processes. *Journal of Youth and Adolescence*, 50(2), 271–285. <https://doi.org/10.1007/s10964-020-01323-w>
- Janssen, L. H. C., Valkenburg, P. M., Keijsers, L., & Beyens, I. (2025). A harsher reality for adolescents with depression on social media. *Scientific Reports*, 15(1), 10947. <https://doi.org/10.1038/s41598-025-89762-y>
- Janssen, L. H. C., Verkuil, B., van Houtum, L. A. E. M., Wever, M. C. M., Wentholt, W. G. M., & Elzinga, B. M. (2024). A closer look into the affect dynamics of adolescents with depression and the interactions with their parents: An ecological momentary assessment study. *European Child & Adolescent Psychiatry*, 33 (12), 4259–4272. <https://doi.org/10.1007/s00787-024-02447-1>
- Jones, S. E., Moore, R. C., Depp, C. A., Ackerman, R. A., Pinkham, A. E., & Harvey, P. D. (2021). Daily Ecological Momentary Assessments of happy and sad moods in people with schizophrenia and bipolar disorders: What do participants who are never sad think about their activities and abilities? *Schizophrenia Research: Cognition*, 26, 100202. <https://doi.org/10.1016/j.scog.2021.100202>
- Karsay, K., Matthes, J., Schmuck, D., & Ecklebe, S. (2023). Messaging, posting, and browsing: A mobile experience sampling study investigating youth's social media use, affective well-being, and loneliness. *Social Science Computer Review*, 41(4), 1493–1513. <https://doi.org/10.1177/08944393211058308>
- Lakens, D., Scheel, A. M., & Isager, P. M. (2018). Equivalence testing for psychological research: A tutorial. *Advances in Methods and Practices in Psychological Science*, 1(2), 259–269. <https://doi.org/10.1177/2515245918770963>
- Manfredi, L., López-Pérez, B., Gregori, F., Lundie, D., Shannon, L., & Zuffianò, A. (2025). The inertia of anger and sadness among adolescents and adults: The role of self-efficacy in regulating negative emotions. *European Journal of Personality*, 39(3), 292–304. <https://doi.org/10.1177/08902070241247237>
- Marengo, D., Settanni, M., Fabris, M. A., & Longobardi, C. (2021). Alone, together: Fear of missing out mediates the link between peer exclusion in WhatsApp classmate groups and psychological adjustment in early-adolescent teens. *Journal of Social & Personal Relationships*, 38(4), 1371–1379. <https://doi.org/10.1177/0265407521991917>
- McNeish, D., & Hamaker, E. L. (2020). A primer on two-level dynamic structural equation models for intensive longitudinal data in Mplus. *Psychological Methods*, 25(5), 610–635. <https://doi.org/10.1037/met0000250>
- Meier, A., & Reinecke, L. (2021). Computer-mediated communication, social media, and mental health: A conceptual and empirical meta-review. *Communication Research*, 48(8), 1182–1209. <https://doi.org/10.1177/0093650220958224>
- Mestdaghe, M., Verdonck, S., Piot, M., Niemeijer, K., Kilani, G., Tuerlinckx, F., Kuppens, P., & Dejonckheere, E. (2023). M-path: An easy-to-use and highly tailorable platform for ecological momentary assessment and intervention in behavioral research and clinical practice. *Frontiers in Digital Health*, 5, 1182175. <https://doi.org/10.3389/fdgth.2023.1182175>
- Nesi, J., Choukas-Bradley, S., & Prinstein, M. J. (2018). Transformation of adolescent peer relations in the social media context: Part 1—A theoretical framework and application to dyadic peer relationships. *Clinical Child and Family Psychology Review*, 21(3), 267–294. <https://doi.org/10.1007/s10567-018-0261-x>
- Niu, G.-F., Zhou, Z.-K., Sun, X.-j., Yu, F., Xie, X.-C., Liu, Q.-Q., & Lian, S.-L. (2018). Cyber-ostracism and its relation to depression among Chinese adolescents: The moderating role of optimism. *Personality & Individual Differences*, 123, 105–109. <https://doi.org/10.1016/j.paid.2017.10.032>
- Odgers, C. L., & Jensen, M. R. (2020). Annual research review: Adolescent mental health in the digital age: Facts, fears, and future directions. *Journal of Child Psychology & Psychiatry*, 61(3), 336–348. <https://doi.org/10.1111/jcpp.13190>
- Orben, A. (2020). Teenagers, screens and social media: A narrative review of reviews and key studies. *Social Psychiatry & Psychiatric Epidemiology*, 55(4), 407–414. <https://doi.org/10.1007/s00127-019-01825-4>
- Pew Research Center. (2018). Teens social media habits and experiences. <https://www.pewresearch.org/internet/2018/11/28/teens-social-media-habits-and-experiences/>
- Pluess, M., Assary, E., Lionetti, F., Lester, K. J., Krapohl, E., Aron, E. N., & Aron, A. (2017). Environmental sensitivity in children: Development of the highly sensitive child scale and identification of sensitivity groups. *Developmental Psychology*, 54(1), 51–70. <https://doi.org/10.1037/dev0000406>
- Politte-Corn, M., Dickey, L., Abitante, G., Pegg, S., Bean, C. A. L., & Kujawa, A. (2024). Social media use as a predictor of positive and negative affect: An ecological momentary assessment study of adolescents with and without clinical depression. *Research on Child and Adolescent Psychopathology*, 52(5), 743–755. <https://doi.org/10.1007/s10802-024-01177-x>
- Politte-Corn, M., Nick, E. A., & Kujawa, A. (2023). Age-related differences in social media use, online social support, and depressive symptoms in adolescents and emerging adults. *Child and Adolescent Mental Health*, 28(4), 497–503. <https://doi.org/10.1111/camh.12640>
- Reynolds, W. M. (2004). Reynolds Adolescent Depression Scale - 2nd Edition. In M. Hersen, D. L. Segal & M. Hilsenroth (Eds.), *Comprehensive handbook of psychological assessment, Volume 2: Personality assessment and psychopathology* (pp. 224–236). New York: John Wiley & Sons.
- Rideout, V., & Robb, M. B. (2018). *Social media, social life: Teens reveal their experiences*. Common Sense Media.
- Rottenberg, J., Gross, J. J., & Gotlib, I. H. (2005). Emotion context insensitivity in major depressive disorder. *Journal of Abnormal Psychology*, 114(4), 627. <https://doi.org/10.1037/0021-843X.114.4.627>
- Rudolph, K. D. (2009). The interpersonal context of adolescent depression. In S. Nolen-Hoeksema, & L. M. Hilt (Eds.), *Handbook of depression in adolescents* (pp. 377–418). Routledge.
- Ruggieri, S., Bendixen, M., Gabriel, U., & Alsaker, F. (2013). Cyberball: The impact of ostracism on the well-being of early adolescents. *Swiss Journal of Psychology*, 72(2), 103–109. <https://doi.org/10.1024/1421-0185/a000103>
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066x.55.1.68>
- Ryff, C. D., Dienberg Love, G., Urry, H. L., Muller, D., Rosenkranz, M. A., Friedman, E. M., Davidson, R. J., & Singer, B. (2006). Psychological well-being and ill-being: Do they have distinct or mirrored biological correlates? *Psychotherapy & Psychosomatics*, 75(2), 85–95. <https://doi.org/10.1159/000090892>
- Schwartz-Mette, R. A., Shankman, J., Dueweke, A. R., Borowski, S., & Rose, A. J. (2020). Relations of friendship experiences with depressive symptoms and loneliness in childhood and adolescence: A meta-analytic review. *Psychological Bulletin*, 146(8), 664–700. <https://doi.org/10.1037/bul0000239>
- Shorey, S., Ng, E. D., & Wong, C. H. J. (2022). Global prevalence of depression and elevated depressive symptoms among adolescents: A systematic review and meta-analysis. *British Journal of Clinical Psychology*, 61(2), 287–305. <https://doi.org/10.1111/bjc.12333>
- Siebers, T., Beyens, I., Baumgartner, S. E., & Valkenburg, P. M. (2024). Adolescents' digital nightlife: The comparative effects of day- and nighttime smartphone use on sleep quality. *Communication Research*, 0(0). <https://doi.org/10.1177/00936502241276793>
- Silk, J. S., Forbes, E. E., Whalen, D. J., Jakubcak, J. L., Thompson, W. K., Ryan, N. D., Axelson, D. A., Birmaher, B., & Dahl, R. E. (2011). Daily emotional dynamics in depressed youth: A cell phone ecological momentary assessment study. *Journal of Experimental Child Psychology*, 110(2), 241–257. <https://doi.org/10.1176/appi.ajp.2007.06111816>
- Somerville, L. H. (2013). The teenage brain: Sensitivity to social evaluation. *Current Directions in Psychological Science*, 22(2), 121–127. <https://doi.org/10.1177/0963721413476512>
- Subrahmanyam, K., & Šmahel, D. (2011). Connecting online behavior to adolescent development: A theoretical framework. In K. Subrahmanyam & D. Šmahel (Eds.), *Digital Youth: The Role of Media in Development* (pp. 27–39). Springer.
- Thompson, R. J., Mata, J., Jaeggi, S. M., Buschkuhl, M., Jonides, J., & Gotlib, I. H. (2012). The everyday emotional experience of adults with major depressive disorder: Examining emotional instability, inertia, and reactivity. *Journal of Abnormal Psychology*, 121(4), 819. <https://doi.org/10.1037/a0027978>

- Tibber, M. S., & Silver, E. (2022). A trans-diagnostic cognitive behavioural conceptualisation of the positive and negative roles of social media use in adolescents' mental health and wellbeing. *The Cognitive Behaviour Therapist*, 15(e7), 1–46. <https://doi.org/doi.org/10.1017/S1754470X22000034>
- Valkenburg, P. M., Beyens, I., Pouwels, J. L., van Driel, I. I., & Keijsers, L. (2021). Social media and adolescents' self-esteem: Heading for a person-specific media effects paradigm. *Journal of Communication*, 71(1), 56–78. <https://doi.org/10.1093/joc/jqaa/039>
- Valkenburg, P. M., Meier, A., & Beyens, I. (2022). Social media use and its impact on adolescent mental health: An umbrella review of the evidence. *Current Opinion in Psychology*, 44, 58–68. <https://doi.org/10.1016/j.copsyc.2021.08.017>
- Valkenburg, P. M., & Peter, J. (2007). Online communication and adolescent well-being: Testing the stimulation versus the displacement hypothesis. *Journal of Computer-Mediated Communication*, 12(4), 1169–1182. <https://doi.org/10.1111/j.1083-6101.2007.00368.x>
- Valkenburg, P. M., & Peter, J. (2011). Online communication among adolescents: An integrated model of its attraction, opportunities, and risks. *Journal of Adolescent Health*, 48(2), 121–127. <https://doi.org/10.1016/j.jadohealth.2010.08.020>
- van der Wal, A., Valkenburg, P. M., & van Driel, I. I. (2024). In their own words: How adolescents use social media and how it affects them. *Social Media + Society*, 10(2), 1–11. <https://doi.org/10.1177/20563051241248591>
- van Roekel, E., Keijsers, L., & Chung, J. M. (2019). A review of current ambulatory assessment studies in adolescent samples and practical recommendations. *Journal of Research on Adolescence*, 29(3), 560–577. <https://doi.org/10.1111/jora.12471>
- Vansteenkiste, M., & Ryan, R. M. (2013). On psychological growth and vulnerability: Basic psychological need satisfaction and need frustration as a unifying principle. *Journal of Psychotherapy Integration*, 23(3), 263. <https://doi.org/10.1037/a0032359>
- Vendemia, M. A., Goodboy, A. K., Chiasson, R. M., & Dillow, M. R. (2025). Person-specific effects of women's social media use on body image concerns: An intensive longitudinal study of daily life. *Human Communication Research*, 51(3), 164–178. <https://doi.org/10.1093/hcr/hqaf001>
- Verbeij, T., Beyens, I., Trilling, D., & Valkenburg, P. M. (2024). Happiness and sadness in adolescents' Instagram direct messaging: A neural topic modelling approach. *Social Media + Society*, 10(1). <https://doi.org/10.1177/20563051241229655>
- Verduyn, P., Ybarra, O., Résibois, M., Jonides, J., & Kross, E. (2017). Do social network sites enhance or undermine subjective well-being? A critical review. *Social Issues and Policy Review*, 11(1), 274–302. <https://doi.org/10.1111/sipr.12033>
- Voelkle, M. C., Oud, J. H. L., von Oertzen, T., & Lindenberger, U. (2012). Maximum likelihood dynamic factor modeling for arbitrary N and T using SEM. *Structural Equation Modeling: A Multidisciplinary Journal*, 19(3), 329–350. <https://doi.org/10.1080/10705511.2012.687656>
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality & Social Psychology*, 54(6), 1063–1070.
- Webster, D., Dunne, L., & Hunter, R. (2020). Association between social networks and subjective well-being in adolescents: A systematic review. *Youth & Society*, 53(2), 175–210. <https://doi.org/10.1177/0044118X20919589>
- West, M., Rice, S., & Vella-Brodrick, D. (2024a). Adolescent social media use through a self-determination theory lens: A systematic scoping review. *International Journal of Environmental Research & Public Health*, 21(7), 862. <https://doi.org/10.3390/ijerph21070862>
- West, M., Rice, S., & Vella-Brodrick, D. (2024b). Exploring the “social” in social media: Adolescent relatedness—thwarted and supported. *Journal of Adolescent Research*, 39(3), 539–570. <https://doi.org/10.1177/07435584211062158>
- Williams, K. D., Cheung, C. K., & Choi, W. (2000). Cyberostracism: Effects of being ignored over the Internet. *Journal of Personality & Social Psychology*, 79(5), 748–762. <https://doi.org/10.1037/0022-3514.79.5.748>
- Wolfers, L. N., & Baumgartner, S. (2025). Short but still valid: Validating single-item measures for key communication science constructs for experience sampling research. OSF Preprints. <https://doi.org/10.31234/osf.io/zkwxv1>
- Yau, J. C., & Reich, S. M. (2018). Are the qualities of adolescents' offline friendships present in digital interactions? *Adolescent Research Review*, 3(3), 339–355. <https://doi.org/10.1007/s40894-017-0059-y>