



# The Effect of a 1-Week Abstinence From Instagram on Mental Health in Youth and Young Adults

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**Abstract:** *Theoretical Background:* Results concerning the association between the use of social networking sites and mental health are so far inconsistent. *Objective:* To investigate the effects of a 1-week abstinence from Instagram on depressive symptoms, self-esteem, and the role of social comparison orientation in youth. *Methods:* Participants were  $N = 298$  youth (76.2% f; mean age 22.28,  $SD = 2.25$ ). Three groups were assigned: non-Instagram users ( $n = 113$ ), Instagram users randomly assigned to a control group (CG,  $n = 106$ ) with no change in their Instagram use, and an experimental group (EG,  $n = 79$ ) that agreed to a 1-week abstinence. Participants completed questionnaires on depressive symptoms, self-esteem, social comparison orientation, and general mental state. *Results:* The EG and CG revealed a reduction in depressive symptoms, an increase in self-esteem, and an improvement in general mental state. *Discussion and Conclusion:* The short-term positive effects of Instagram abstinence on mental health.

**Keywords:** social networking sites, abstinence, adolescents, social comparison orientation, Instagram

## Die Wirksamkeit einer 1-wöchigen Instagram Abstinenz auf die psychische Gesundheit von Jugendlichen und jungen Erwachsenen

**Zusammenfassung:** *Theoretischer Hintergrund:* Soziale Medien bieten Kontrolle über die selektive Präsentation des eigenen Selbst. Instagram fokussiert insbesondere auf bildbasierte Inhalte wie Fotos und Video, welche häufig bearbeitet werden und dadurch Perfektion und glücklich sein suggerieren. Durch die Möglichkeit einer verzerrten Darstellung der User kann der Gebrauch von Instagram die psychische Gesundheit der Nutzer beeinflussen. *Fragestellung:* Die Studie untersuchte die Wirksamkeit einer 1-wöchigen Instagram Abstinenz auf depressive Symptome, Selbstwert und allgemeine psychische Befindlichkeit, sowie die soziale Vergleichsorientierung als möglicher Mediator auf die psychische Gesundheit. *Methode:* Die Stichprobe bestand aus 298 Jugendlichen und jungen Erwachsenen zwischen 16 und 27 Jahren ( $MW = 22.28$ ,  $SD = 2.25$ ; 76.2% weiblich). Es wurden drei Gruppen gebildet: Nicht-Nutzer ( $n = 113$ ), welche kein Instagram Profil haben, sowie Instagram Nutzer, welche randomisiert der Experimentalgruppe (EG,  $n = 79$ ) oder der Kontrollgruppe (CG,  $n = 106$ ) zugewiesen wurden. Die EG stimmte einer 1-wöchigen Instagram Abstinenz zu, die CG musste ihr Instagram Verhalten nicht verändern. In einer Online-Erhebung wurden Fragebögen zu depressiven Symptomen, Selbstwert, sozialer Vergleichsorientierung, Instagram Nutzungsverhalten und allgemeiner psychischer Befindlichkeit vor und nach der Intervention erhoben. *Ergebnisse:* Es zeigte sich eine signifikante Reduktion mit kleinem Effekt auf die depressive Symptomatik, eine Verbesserung des Selbstwerts und der allgemeinen psychischen Befindlichkeit. Jedoch zeigten sich die Effekte sowohl in der EG als auch in der CG. Das Mediatormodell mit der sozialen Vergleichsorientierung konnte nicht bestätigt werden. *Diskussion und Schlussfolgerung:* Die Ergebnisse verweisen auf einen kurzzeitigen positiven Effekt einer Instagram-Abstinenz auf die psychische Gesundheit. Welche Mediatoren und Moderatoren dabei eine Rolle spielen, ist in zukünftigen Studien zu untersuchen.

**Schlüsselwörter:** soziale Medien, Instagram, Abstinenz, Jugendliche, soziale Vergleichsorientierung

The average user spends 145 minutes on social networking sites daily (Statista, 2022a). One of these social networking sites (SNS) with high popularity is Instagram, which currently counts over one billion users, more than 70% of whom are younger than 34 years (Statista, 2022b). In Germany, adolescents rated Instagram as the second most important app on their smartphones with increasing popularity with age (JIM, 2021). Compared to other SNS, Instagram focuses on image-based content such as photos and videos that often reflects the perfection and happiness of others. On Instagram, most photos posted are fil-

tered and manipulated to achieve the best result (Henrickse et al., 2017). Kircaburun et al. (2020) showed that Instagram was associated with problematic social media use. Seeing the seemingly flawless lives of others while browsing on SNS, people may get the impression that they are doing worse than their Internet contacts (Chou & Edge, 2012), inducing feelings of inferiority. This may negatively influence people's self-evaluations and self-esteem, which in turn may influence their mental health and lead to the development of emotional problems (Orth et al., 2009). Instagram can affect therefore self-image and

mental health of adolescents and young adults in both directions, as positive effects were shown for experienced empathy, support, respect, and less social isolation (Dyson et al., 2016; Lewis & Seko, 2016), negative effects through frequent idealization and glorification of questionable and sometimes unachievable standards set by (faked) posts (e.g., Lup et al., 2015). Especially for the mental health of people who often compare themselves to others, i.e., have a high social comparison orientation (SCO), the constant upward comparison based on falsified or one-sided information can be a risk factor for mental health (e.g., de Vries et al., 2018; Kohler et al., 2021). There are also studies pointing toward the positive effects of upward comparisons during passive Instagram use (e.g., Burke et al., 2020; Kang & Liu, 2019; Meier et al., 2020; Noon & Meier, 2019) and self-presentation on SNS (e.g., Reinecke & Trepte, 2014; Toma, 2017).

## Influence of Instagram Use on Mental Health

Regarding the association between social media use and mental health, a recent metareview indicates a small negative effect (Meier & Reinecke, 2021), but the authors also indicate that the effects are complex and depend on mental health and computer-mediated communication indicators. Similar, the narrative review of reviews by Orben (2020) and of a systematic review on the relationship between Instagram use and indicators of mental health by Faelens et al. (2021) indicate that high social media use is associated with lower mental health. Faelens et al. used four categories: Instagram membership, the intensity of Instagram use, type of use and Instagram content, and characteristics of Instagram profile; as indicators of mental health self-reported well-being, depression, anxiety, stress, alcohol and drug use, and indicators of body image and disordered eating. The most evidence was obtained from the relationship between Instagram use and social comparison, body image, and disordered eating.

Studies investigating the relationship between Instagram use and mental health considered as indicators for mental health well-being, depression, anxiety and stress, alcohol and drug use, body image, and disordered eating. In a longitudinal analysis of adolescents across 9 years, Schemer et al. (2021) found that frequency of Internet use and SNS use was not substantially related to subjective well-being. The link between Instagram use and well-being seems to depend on other variables, e.g., the number of Instagram followers (Longobardi et al., 2020). Regarding depression, the relationship is more mixed, with studies that found evidence between intensity of Instagram use and depression (e.g., Keles et al., 2020; Lup et al.,

2015; Sherlock & Wagstaff, 2019) and studies that found no evidence (e.g., Fardouly et al., 2020; Robinson et al., 2019). Overall, Faelens et al. (2021) conclude that the relationship between Instagram use and indicators of mental health is inconclusive, and that further studies, especially with a longitudinal and experimental design, are needed.

## Psychological Factors Underlying the Relationship Between Instagram use and Mental Health: Social Comparison Orientation

In his theory of social comparison, Festinger (1954) postulated that “There exists, in the human organism, a drive to evaluate his opinions and his abilities.” Accordingly, humans compare themselves to others to gain information about themselves. Comparison can be directed upward (to people doing better) or downward (to people doing worse). When people need to protect their self-esteem, they tend to compare downward, whereas upward comparison can be used to improve the self by serving as a source of motivation and inspiration (Corcoran et al., 2011). Depending on the result of the comparison, positive or negative emotions ensue. Upward comparisons tend to produce more negative emotions and downward comparisons more positive feelings (Corcoran et al., 2011). In general, people with a high SCO (more frequent comparisons) tend to be self-conscious, low in self-esteem, and often experience negative emotions (Buunk & Gibbons, 2005). It is important to note that users tend to post highly flattering pictures of themselves (Appel et al., 2020), including posing, editing out flaws, and using filters. Because of the primarily positive self-representations on Instagram, comparisons induced by its passive use tend to be directed mostly upward, eliciting more negative emotions (Appel et al., 2016; de Vries et al., 2018). Nevertheless, upward comparisons on SNS may also briefly improve well-being, e.g., stimulating inspiration and motivation (Meier et al., 2020; Meier & Schäfer, 2018). Two recent meta-analyses indicate that SCO on SNS generally predicts a decrease in subjective well-being with small to medium effects, while upward SCO predicts a decrease with a medium effect (Yang et al., 2019; Yoon et al., 2019). It is, therefore, self-evident that SCO is often discussed as a mediator to explain the relationship between the use of SNS and subjective well-being (Verduyn et al., 2020).

## Self-Esteem

Self-esteem may also underly the relationship between Instagram use and mental health. Rosenberg (1965) defined self-esteem as the estimation of the value of oneself, that is, the attitude toward the self. Especially adolescence and young adulthood represent critical periods for its stability because of many changes that occur during these important transition phases (Chung et al., 2014). As this age group accounts for the majority of Instagram users, the effects of the SNS on self-esteem should be critically examined as well as including self-esteem as a mediator between Instagram use and well-being as low self-esteem increases the risk for psychopathology (In-Albon et al., 2017; Sowislo & Orth, 2013). Faelens et al. (2021) included 17 articles that examined the relationship between Instagram use and self-esteem and concluded that, although the evidence is limited, some findings suggest a role for self-esteem in linking Instagram membership with anxiety and depressive symptoms (Mackson et al., 2019). Further, most studies indicate that intensive Instagram users reported lower levels of self-esteem (e.g., Sherlock & Wagstaff, 2019). Evidence for a mediating role of SCO on the association between Instagram use and self-esteem was partially found (Sherlock & Wagstaff, 2019), and Stapleton et al. (2017) found that participants reporting that their self-esteem is highly contingent on approval from others show a stronger relationship between the intensity of Instagram use and social comparison. Examining self-esteem as a mediating or moderating variable in the association between Instagram use and mental health, especially in youths, is warranted.

## Abstinence from SNS

Similar to the inconsistent results of an association between SNS use and mental health, experimental studies on the effects of abstaining from SNS have shown mixed effects. Radtke et al. (2021) recently conducted a systematic review on digital detox with 21 studies, including 12 randomized controlled trials. Not surprisingly, the results showed that digital detox interventions' effects varied across studies on health, well-being, social relationships, self-control, and performance. Regarding studies that indicated the benefits of SNS abstinence: Abstaining from Facebook for 2 to 7 days increased life satisfaction (Tromholt, 2016) and positive emotions (Tromholt, 2016). In the study by Hunt et al. (2018), a limited SNS use to 10 minutes of each program per day for 4 weeks decreased loneliness and depression but not anxiety or well-being. Vanman et al. (2018) found lower cortisol levels but also lower subjective well-being after a 5-day break on Face-

book. Fioravanti et al. (2020) showed that taking a break of 7 days from Instagram increased life satisfaction and positive affect for women high on social comparison. Yet, social comparison did not moderate the effect of taking an Instagram break on life satisfaction. Stieger and Lewetz (2018) found a higher boredom level after a 7-day social media abstinence. Hanley et al. (2019) found a decrease in positive affect for active users and no effect on life satisfaction after a 1-week vacation from both Facebook and Instagram. Hall et al. (2021) found no effect on loneliness, affective well-being, and quality of life and no main effect of social media abstinence for 4 weeks on daily measured loneliness, well-being, and quality of day. Therefore, further research investigating an abstinence on Instagram among youth is necessary.

## Present Study

This study investigates the effects of a 1-week abstinence from Instagram on depressive symptoms, self-esteem, and general well-being and explores whether SCO plays a mediating role in adolescents and young adults. We hypothesized that participants abstaining from Instagram differ in the amount of change in depressive symptoms, self-esteem, and general well-being from participants allowed to use Instagram as usual. Further, we expected that participants abstaining from Instagram report a greater decrease in depressive symptoms and a greater increase in self-esteem and general well-being the more often they compare themselves with others (i.e., the higher their SCO).

## Methods

### Recruitment

For recruitment purposes, we posted the study link online and shared it via the mailing lists of German universities. Participants had to be at least 16 years old and with either daily use of Instagram or no previous use at all. The local Ethics Committee approved the study.

### Participants

The sample consisted of 298 participants ( $M_{\text{age}} = 22.28$  years,  $SD = 2.25$ , range = 16–27), mostly female ( $n = 227$ , 76.2%). Of these, 185 (56.5%) were daily Instagram users. Regarding education, 70.5% ( $n = 210$ ) had a university-

entrance diploma and 84.2% ( $n = 251$ ) were currently studying at a university.

We set up three groups: A control group of Instagram nonusers (NU) and two groups of Instagram users sorted randomly into two conditions: Either they could use Instagram as before (control group, CG), or they had to abstain from using it for 7 consecutive days (experimental group, EG). Participants in the experimental group (EG,  $n = 79$ ) were mostly female ( $n = 60$ , 75.9%), on average 21.58 years old ( $SD = 2.07$ ), and 86.1% ( $n = 68$ ) were currently studying at a university. The control group (CG,  $n = 106$ ) consisted of 88 (83.0%) females, mean age 22.09 years ( $SD = 2.23$ ), and 78.3% ( $n = 83$ ) were enrolled at a university. The control group of nonusers (NU,  $n = 113$ ) consisted of 79 (69.9%) females, mean age was 22.93 years ( $SD = 2.25$ ), and 88.5% ( $n = 100$ ) were currently university students.

The homogeneity of variances was asserted using Levine's Test, which showed equal variances for average age ( $p = .364$ ) and education ( $p = .318$ ), but not for gender ( $p < .001$ ). An analysis of variance (Welch-ANOVA) indicated that the average age was significantly higher in the NU group than in the EG and CG,  $F(2, 295) = 9.38, p < .001$ . A posthoc test with Bonferroni-Holm correction showed that, in the NU group, participants were older than in the other two groups (CG  $p = .014$ ; EG  $p < .001$ ). There were no differences for gender,  $F(2,295) = 2,53, p = .081$ , and education,  $F(2,295) = 1,77, p = .172$ .

## Measures

### Depression

The Center for Epidemiological Studies Depression Scale (CESD; Hautzinger et al., 2012) assesses depressive symptoms regarding cognitive, affectional, motivational, motoric, and somatic symptoms of the last week. It consists of 20 items rated on a 4-point Likert scale (from 1 = *rarely* to 4 = *most of the time*). In the current study, internal consistency was excellent with Cronbach's  $\alpha = .90$ .

### Self-Esteem

The Rosenberg Self-Esteem Scale (RSES, Ferring & Filipp, 1996) assesses global self-esteem with 10 items rated on a 4-point Likert scale (from 1 = *strongly disagree* to 4 = *strongly agree*). Internal consistency for the scale of the present sample was good, with Cronbach's  $\alpha = .87$ .

### Social Comparison Orientation

The Iowa-Netherlands Comparison Orientation Measure (INCOM, Schneider & Schupp, 2011) is an 11-item self-report questionnaire assessing SCO on a 5-point Likert scale (from 1 = *strongly disagree* to 5 = *strongly agree*). A higher score indicates a higher level of SCO. Internal consistency for the scale in the present sample was good, with Cronbach's alpha .84.

### Instagram Use

Because of a lack of validated questionnaires assessing Instagram use and intensity, we used a modified version of the Facebook Intensity Scale (Ellison et al., 2007). As Stapleton et al. (2017) did in their study, we replaced the term "Facebook" with "Instagram"; no further changes were made. Therefore, this is referred to as the Instagram Intensity Scale (IIS). The scale assesses how much time participants spend on average daily on Instagram and how many accounts they follow. Furthermore, participants indicated their emotional connection with the SNS and its integration into everyday life by answering six items on a 5-point Likert scale (from 1 = *strongly disagree* to 5 = *strongly agree*). If participants scored high on these questions, they were more likely to be emotionally involved in Instagram. In the current study, the alpha coefficient of internal consistency was  $\alpha = .80$ .

### General Mental State (GMS)

Participants were asked to answer a global question on how they had generally felt during the past week. Answers ranged from 1 (*very bad*) to 10 (*very good*) and were used to assess general subjective well-being without focusing on certain aspects.

### Procedure

All participants were informed about the study and provided their informed consent online. At the first assessment (T1), all participants completed the above-mentioned questionnaires and demographic questions. At the end of the first assessment, the users were sorted randomly into two conditions: They could use Instagram as before (control group, CG) or abstain from using it for 7 consecutive days (experimental group, EG). Nonusers (NU) were asked not to create a profile on Instagram for the duration of the study. One week later (T2), participants received an email asking them to complete the same questionnaires again. Furthermore,

**Table 1.** Means and standard deviations (SD) of the questionnaires for the three groups at T1 and T2

	EG (n = 79)				CG (n = 106)				NU (n = 113)			
	T1		T2		T1		T2		T1		T2	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
CESD	1.8	(.47)	1.61	(.42)	1.79	(.53)	1.7	(.49)	1.72	(.48)	1.68	(.47)
RSES	3.18	(.44)	3.26	(.47)	3.07	(.63)	3.18	(.57)	3.17	(.57)	3.22	(.55)
INCOM	3.45	(.68)	3.44	(.63)	3.49	(.74)	3.54	(.73)	3.34	(.60)	3.39	(.62)
GMS	6.99	(1.55)	7.56	(1.39)	6.75	(1.71)	7.08	(1.5)	6.86	(1.72)	7.08	(1.57)
IIS	2.81	(.93)	-	-	2.89	(.84)	-	-	-	-	-	-

Note. EG = experimental group. CG = control group. NU = group of nonusers. CESD = Center for Epidemiological Studies Depression Scale. RSES = Rosenberg-Self-Esteem-Scale. INCOM = Iowa-Netherlands Comparison Orientation Measure. IIS = Instagram Intensity Scale. GMS = General mental state.

they were asked if they had adhered to their condition to check for noncompliance.

### Drop-out and Noncompliance to Condition

Initially, 575 people agreed to participate. Of these, 225 were lost to postassessment (28.4% NU, 36.9% CG, 34.7% EG), and 52 failed the experimental condition (0.3% NU, 14.5% CG, 29.5% EG) and were excluded. The differences for drop-out rates per condition was significant,  $F(2,572) = 3.826$ ,  $p = .022$ ,  $\eta^2 = .013$ . To check further for differences between groups, we conducted a two-factor ANOVA on participants who complied with their condition, those not complying, and those dropping out and major constructs (SCO, time spent on Instagram). There was no main or interaction effect of SCO on success rates,  $F(2,575) = 1.04$ ,  $p = .40$ ,  $\eta^2 = .015$ , but there was an interaction effect of Group x Success for time spent on Instagram,  $F(2,575) = 5.68$ ,  $p = .004$ ,  $\eta^2 = .028$ . Participants who had been asked to abstain from Instagram were more likely to comply with their condition if they had spent less time on Instagram before the experiment. High daily usage beforehand was more likely to lead to non-compliance or dropping out of the study.

### Statistical Analysis

Analyses were conducted with the statistical software IBM SPSS (Version 27.0). First, we conducted a MANOVA to test the change of depressive symptoms, self-esteem, and general mental state from T1 to T2. In a second step, to test the difference in the amount of change, we conducted difference variables by subtracting the individual measurement variables of depressive symptoms (ADSdiff), self-esteem (SEdiff), and general mental state (GFdiff) from each other, subtracting in each case T2 from T1 assessment. Further, we conducted a MANOVA with the

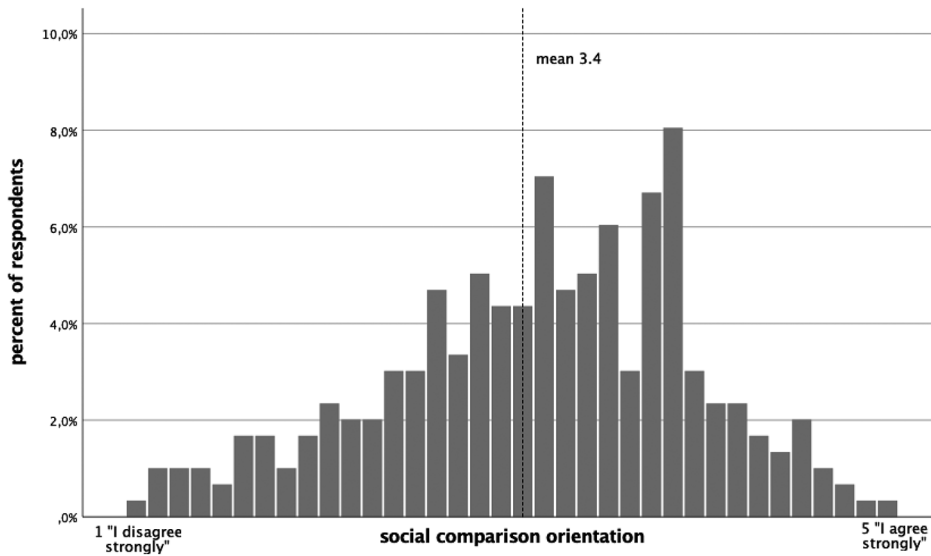
difference variables as dependent variables and Condition as between-subject factor, to address whether the association between social network abstinence and mental health (change in depressive symptoms, self-esteem, and general mental state) is mediated by social comparison orientation. To examine whether the association between social media abstinence and mental health is mediated by social comparison orientation, mediation model, calculated only for the abstinence group (EG), was analyzed using PROCESS v.4.0 by Andrew Hayes (Hayes, 2017).

## Results

### The Effects of Instagram Abstinence

The means and standard deviations of the questionnaires for each group at both assessments are presented in Table 1. There was a significant effect in the change in depression from pre to post in the EG,  $t(78) = 4.70$ ,  $p < .001$ ,  $d = .426$ , as well as, unexpectedly, with a small effect in the CG,  $t(105) = 2.86$ ,  $p = .005$ ,  $d = .176$ . In the NU group, the change in depression from pre to post was not significant,  $t(112) = 1.73$ ,  $p = .087$ . The change in self-esteem was significant for all three groups, with small effects, EG:  $t(78) = -2.464$ ,  $p = .016$ ,  $d = -.176$ , CG:  $t(105) = -3.482$ ,  $p > .001$ ,  $d = -.183$ , NU:  $t(112) = -2.236$ ,  $p = .027$ ,  $d = -.089$ . The change in general mental state from pre to post was significant as well in the three groups, EG:  $t(78) = -3.659$ ,  $p < .001$ ,  $d = -.387$ , CG:  $t(105) = -2.448$ ,  $p = .016$ ,  $d = -.205$ , NU:  $t(112) = -2.02$ ,  $p = .046$ ,  $d = -.134$ .

They all correlated significantly, with  $p < .001$ ,  $r_{SEdiff, ADSdiff} = -.237$ ,  $r_{SEdiff, GFdiff} = .307$ ,  $r_{ADSdiff, GFdiff} = -.609$ . For the MANOVA with the difference variables as dependent variables and Condition as between-subject factor, an adequate sample size emerged as well as independence of observations. Five participants were extreme outliers and therefore excluded from further analyses. The Shapiro-



**Figure 1.** Frequency of social comparison orientation (INCOM Scale).

Wilk Test indicated neither univariate nor multivariate normality ( $p < .05$ ), but as all the points in the QQ plot fall approximately along the reference line and the robustness of MANOVA normality can be neglected (Finch, 2005). The Pearson correlation between the variables showed no multicollinearity ( $r < .90$ ). Linearity was given (scatter matrix). A homogeneity of covariances, tested with Box's test, was not found ( $p < .05$ ). A homogeneity of variances as assessed by Levene-Test was not found for depressive symptoms ( $p = .027$ ), general mental state ( $p = .037$ ), and self-esteem ( $p = .025$ ). The MANOVA is fairly robust in testing for differences. Furthermore, posthoc tests were computed using Games-Howell correction.

In an analysis of the differences of the three groups, a one-way MANOVA indicated statistically significant differences between the groups in the three difference variables,  $F(6, 678) = 2.205, p = .041, \eta^2 = .022$ , Pillai's Trace = .045. A posthoc univariate ANOVA showed significant group differences for depressive symptoms,  $F(2,293) = 5.200, p = .006, \eta^2 = .035$ . A posthoc test showed that the EG and NU differed significantly ( $p = .004, d = .479$ ) but not the EG and CG ( $p = .065, d = -.027$ ) nor the CG and NU ( $p = .567, d = .171$ ). For self-esteem, no significant differences between the groups were found,  $F(2,293) = 1.319, p = .269, \eta^2 = .009$ . For general mental state, there was also no significant group difference,  $F(2,293) = 2.839, p = .060, \eta^2 = .019$ . The means show the biggest absolute change for the EG (see Table 1).

## Social Comparison Orientation

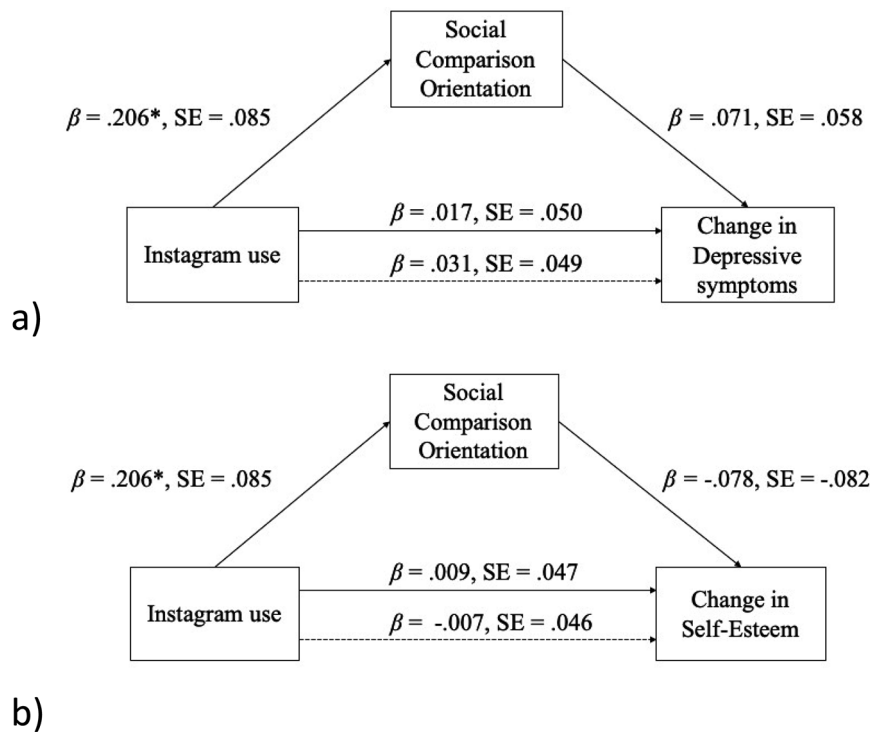
The distribution of social comparison orientation is presented in Figure 1. The average frequency of the INCOM

scale for all three groups was 3.4 ( $SD = .69$ ). There was a small group of 10% with low social comparison orientation (means  $< 2.5$ ). In contrast, 15.1% of the participants showed moderate to high social comparison orientation (means  $> 4$ ). If we take into account only the Instagram users, 3.8% are low in social comparison orientation, and 16.8% are high in social comparison orientation, with a mean of 3.5 ( $SD = .71$ ).

In the regression analysis there was no significant prediction of SCO by age ( $\beta = -.014, p = .423$ ) but a significant prediction by gender ( $\beta = -1.85, p = .038$ ). Women reported a higher social comparison orientation (MW = 3.47,  $SD = .68$ , range 1.27–4.91) compared to men (MW = 3.27,  $SD = .63$ , range 1.55–4.36), with a greater proportion of women (13.7%) with high social comparison orientation (MW  $> 4$ ) than men (8.6%).

The mediation model was computed with Instagram use as predictor, SCO as mediator, and change in depressive symptoms (or respectively self-esteem or change in general mental state) as outcome. Bootstrapping with 5,000 samples and heteroscedasticity-consistent standards were used (Davidson & MacKinnon, 1993). Even though Instagram use significantly predicted SCO,  $\beta = .206, t(79) = 2.4135, p = .0182$  95% CI [0.0360, 0.3758], SCO did not significantly predict change in depressive symptoms,  $\beta = .0714, t(79) = 1.1996, p = .2340$ , 95% CI [-0.0472, 0.1900], (see Figure 2a), or change in self-esteem,  $\beta = -.0776, t(79) = -.9554, p = .3424$ , 95% CI [-0.2394, 0.0842], (see Figure 2b) at T2. As the mediator does not predict the outcome, the postulated mediation model cannot be supported.

The mediation model for change in general mental state is not significant as well. There is no significant association of SCO on self-esteem ( $\beta = -.070, p = .803$ ) nor a



**Figure 2.** Mediation model including beta weights and standard errors for the relationship between Instagram use and a) change in depressive symptoms, b) change in self-esteem. Dotted lines show the total effect before mediation.  $p < .05^*$ .

significant total effect or direct effect ( $\beta = .206, p = .337 / \beta = .221, p = .295$ ) of the association between Instagram use and general mental state.

## Discussion

The current study aimed to investigate in adolescents and young adults the effectiveness of a 1-week abstinence from Instagram on depressive symptoms, self-esteem, and general mental state compared to nonusers and users with no restrictions in their Instagram use. Furthermore, we examined the role of social comparison orientation as a mediator. Results showed that the depressive symptoms of participants in the experimental and control groups were reduced significantly, and that self-esteem and general mental state improved significantly after intervention, which agrees with past research on Facebook (Tromholt, 2016) and Instagram abstinence (Fioravanti et al., 2020). Although the results were significant, the effect sizes for reduction of depressive symptoms and increase of general mental state were small. The findings agree with the recent review on digital detox (Radtke et al., 2021) with mixed findings as well as the inconclusive relationship between social media use and mental health (Faelens et al., 2021; Meier & Reinecke, 2021).

Puzzling are the results that, like the EG, the CG too indicated lower depressive symptoms, higher self-esteem, and general mental state with small effects after the “intervention.” One explanation may be an increased awareness about the use of Instagram, or that potential variables influenced their mental health at the second assessment. In a randomized control trial, van Wezel et al. (2021) found that participants in the control group proactively reduced their screen time on social media significantly. They indicated two possible explanations: Participants may have reduced their screen time more than they needed to avoid that situation; and the failed manipulation may result from a placebo effect. In the present study, we asked the participants for their compliance with their condition, but we did not use objective behavioral measures such as logged smartphone use. Further, dropouts might have influenced the results, when they were unable to stay abstinent on the Instagram use for the required time. Instagram NU may also be a different sample compared to Instagram users, regarding attitudes toward social media and values in life.

For future studies, device-based measurements of smartphone and SNS are necessary to enable a reliable assessment (Schemer et al., 2021). Another issue that could have had an effect is that participants became aware of SCO already after the T1 assessment.

Regarding future studies investigating digital detox effects, Radtke et al. (2021) recommend using valid measurements like device-based assessment, larger

sample sizes, randomized controlled field experiments, long-term intervention periods, and short- and long-term follow-ups. In addition, studies should focus on more nuanced aspects of social network use, such as distinguishing active vs. passive use (Hanley et al., 2019; Parry et al., 2022). Kingsbury et al. (2021) investigated differential associations between types of social media use (active and passive nonsocial use, passive social use, active public social, active private social use), and nonsuicidal self-injury and suicidal behavior. They found that active private social media use (e.g., messaging friends) was protective against nonsuicidal self-injury and suicidality. Conversely, active public social media use (e.g., posting links, photos) was associated with an increased risk of nonsuicidal self-injury and suicidality. Along this line, Frison and Eggermont (2017) found a reciprocal effect, namely, that Instagram browsing at T1 was related to greater depressed mood at T2, and that depressed mood at T1 was related to more Instagram posting at T2.

There was no evidence for a mediating role of social comparison orientation in the association of Instagram use and depressive symptoms, self-esteem, or general mental state. The hypothesis of a mediation model, as postulated by Sherlock & Wagstaff (2019), has to be rejected, which is partially in line with prior research (Lup et al., 2015; Stapleton et al., 2017) but contrasts other findings (Sherlock & Wagstaff, 2019; Teo & Collinson, 2019). Faelens et al. (2021) conclude in their review that excessive Instagram use may be linked to more SCO. SCO as a moderator was investigated by Fioravanti et al. (2020), who indicated that taking a break of 7 days from Instagram only increased positive affect for women high on social comparison. In a recent study, Meier et al. (2021) showed that users can be inspired by comparing upward on SNS, which briefly improved their well-being. Overall, because of mixed findings, more research is warranted that considers further possible mechanisms such as (perceived) social support, social skills, motivation for social network use, cyberbullying, mental health history, personality, sleep, rumination, or fear of missing out (Keles et al., 2020; Parry et al., 2022; Schemer et al., 2021; Whitlock & Masur, 2019).

The implications may be that adolescents and young adults should be informed about the possible effects of SNS use, both positive and negative. Because to date the most robust finding has been shown for intensive Instagram use, a further recommendation would be to set daily time limits. Further, general protective factors such as self-esteem, social skills, and emotion regulation should be promoted regularly. For prevention and early intervention programs, we refer to the AWMF clinical guidelines for the diagnostic and treatment of internet

use disorders that are currently established ([www.awfm.org](http://www.awfm.org); 076–011).

## Limitations

The results have to be interpreted in light of some limitations. First, the sample is not representative of the population, as participants were mostly female and well-educated. A longer intervention with more assessments might help to identify the short- and long-term effects of Instagram on mental health. Because the influence of social networks depends on countless individual characteristics and types of use as SCO and passive use, the current model only shows a limited number of the assumed mechanisms of Instagram. A longitudinal study taking more variables (e.g., temperament, peer relationships, attitudes toward social media) into account could determine their individual relevance and impact.

Further, it remains unknown whether participants abstaining from Instagram shifted their SNS use to other platforms or whether nonusers had accounts on other social networks, which was not explicitly forbidden within this study. This might have influenced the results and should be assessed in future studies to rule out confounding factors.

In sum, in our study, Instagram use and the amount of SCO are linked, though we could not validate the mediation role of SCO. This link may depend on the type of Instagram use or usage of other SNS. Future studies should distinguish between different forms of social media use (active/passive) and potential constructs as SCO to depressive symptoms, self-esteem, or other mental health aspects.

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