

**Differential Associations Between Types Of Social Media Use And University Students’  
Non-Suicidal Self-Injury And Suicidal Behavior**

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1 **Abstract**

2 **Objective.** To examine differential associations between types of social media use and non-  
3 suicidal self-injury (NSSI) and suicidal behaviors.

4 **Methods.** Participants were N = 40,065 Norwegian college and university students, age 18-25,  
5 from the 2018 Students' Health and Wellbeing (SHoT) study. Students reported on their use of  
6 social media for seven specific activities, which we categorized into active and passive non-  
7 social use, passive social use, active public social, and active private social use. We also  
8 considered students' tendency for negative social comparisons on social media. Outcomes were  
9 past-year NSSI, NSSI ideation, suicidal ideation, and suicide attempt. Covariates were age,  
10 gender, total daily screen time and financial stress.

11 **Results.** Results of multiple logistic regression revealed differential associations between types  
12 of social media use and outcomes. Notably, active social private use (e.g., messaging friends)  
13 was associated with decreased odds of all outcomes, whereas active social public use (e.g., status  
14 updates) was associated with increased odds of NSSI ideation, NSSI, and suicide attempt. Social  
15 comparison was associated with increased odds of all outcomes.

16 **Conclusion.** Our results suggest that specific types of social media use are differentially  
17 associated with NSSI and suicidal outcomes among university students.

18

19 **Keywords:** Non-suicidal self-injury; suicide attempt; social media use, young adults

20



44 providing users at least some of the benefits of social connection despite boundaries such as  
45 physical distance.<sup>12</sup> However, disproportionately little research has examined the implications of  
46 the digital social landscape on mental health and suicidal behavior among university students.  
47 Some research has linked social media use to negative outcomes, including depressive  
48 symptoms<sup>13,14</sup> – however, findings are mixed, with other studies reporting a protective effect of  
49 social media use.<sup>12,15</sup>

50 Recent reviews of studies examining associations between social media use and wellbeing  
51 have suggested that these mixed findings may be due to a lack of precision in the way social  
52 media use is operationalized.<sup>16,17</sup> The term ‘social media’ is a broad catch-all for a wide range of  
53 platforms and applications that serve as a medium for social interaction. Even within a given  
54 platform, there are many different ways in which students can use the tools made available by  
55 the medium. *Passive* use of social media describes use of a platform for the purpose of  
56 consuming content,<sup>18</sup> for example, reading posts or viewing pictures. *Active* use, on the other  
57 hand, includes creation of both public (e.g., status updates, tweets) and private content (e.g.,  
58 direct messages).<sup>19</sup> Additionally, although much social media use is, as its name suggests, *social*  
59 in nature, social media platforms are so ubiquitous that many users rely on them for *non-social*  
60 activities – for example, accessing news items and media consumption.<sup>20</sup> Measures of social  
61 media usage often ignore these various types of use - assessing, for example, only the total time  
62 spent on social media.<sup>18</sup>

63 Different types of media use might be expected to be differentially associated with  
64 outcomes – for example, active social use may serve to strengthen social networks and improve  
65 social capital, which may in turn protect against poor mental health. On the other hand, excessive  
66 passive use of such media may facilitate social comparison,<sup>16</sup> which has been linked with

67 depression and NSSI in offline contexts.<sup>16,21,22</sup> In one experimental study, passive, but not active,  
68 use of social media predicted subsequent declines in subjective wellbeing.<sup>23</sup> Similarly, a large  
69 population-based study of Icelandic adolescents suggested that whereas passive use of social  
70 media was associated with symptoms of anxiety and depression, active use of social media was  
71 not.<sup>24</sup> To our knowledge, no existing population-based studies have examined links between  
72 types of social media use and NSSI and suicidal behavior.

73         The objective of the present study was therefore to examine associations between different  
74 types of social media engagement (e.g., active vs. passive; public versus private) and NSSI and  
75 suicidal behaviors among university students.

76

## 77 **2. Method**

78 Data were drawn from the SHoT-2018 study (Students' Health and Wellbeing Study), a survey  
79 of approximately 50,000 Norwegian college and university students (ages 18-35), both in  
80 Norway and studying abroad.<sup>25</sup> Data collection was conducted from February to April 2018 via  
81 online questionnaire. Informed consent was obtained from all respondents; all procedures were  
82 compliant with the Code of Ethics of the World Medical Association (Declaration of Helsinki).  
83 Responses were received from 50,054 students, representing 30.8% of the eligible student  
84 population. For the present study we focused on students age 18- 25 (corresponding to the  
85 transitional period of early or emerging adulthood, as in previous literature),<sup>26</sup> yielding a final  
86 sample of N = 40,065.

87

### 88 **2.1 Measures**

89           **2.1.1 Use of social media.** We assessed participants' use of social media for seven specific  
90 activities. For the present study, we categorized these activities into *passive social* ("check out  
91 what's happening among friends, groups I'm in, or about cultural activities"), *passive non-social*  
92 ("read the news"), *active non-social* ("use social media associated with my studies"), *active*  
93 *social public* ("post status updates or pictures of myself / friends"; "post links or comments on  
94 issues or debates related to news, society, culture or politics";  $r = 0.36, p < .001$ ) and *active*  
95 *social private* use ("make appointments with friends organize my daily life"; "Chat with friends  
96 (individually or in groups)";  $r = 0.48, p < .001$ ). These questions are comparable to, though not  
97 as exhaustive as, the activities listed in the Passive and Active Facebook Use Measure (PAUM)  
98 used in other studies of social media use.<sup>27</sup> Participants rated their participation in each activity  
99 on a 5-point scale: 'Never'; 'Seldom'; 'Weekly'; 'Daily'; 'Several times a day'; these response  
100 options were comparable to those employed in other studies.<sup>28</sup> Participants' tendency for *social*  
101 *comparison* on social media was assessed by the question: "I find that what others post (photos /  
102 status updates) make me feel less satisfied with myself and my own life". Respondents indicated  
103 their agreement on a 5-point scale from 'not at all' to 'very much'.

104           **2.1.2 NSSI and suicidal behaviour.** History of suicidal ideation, suicide attempts, and  
105 NSSI were assessed by three items drawn from the Adult Psychiatric Morbidity Survey (AMPS):  
106 "Have you ever seriously thought of taking your life, but not actually attempted to do so?";  
107 "Have you ever made an attempt to take your life, by taking an overdose of tablets or in some  
108 other way?"; "Have you ever deliberately harmed yourself in any way but not with the intention  
109 of killing yourself?". The question about NSSI ideation was adapted from the Child and  
110 Adolescent Self-Harm in Europe study (CASE): "Have you ever thought about trying to  
111 deliberately harm yourself but not with the intention of killing yourself but have not actually

112 done so?”. Follow-up questions assessed the timing of the most recent episode of each outcome,  
113 e.g.: “when did you last think about hurting yourself like this”, with response options: ‘in the last  
114 week’; ‘in the last year’; ‘more than a year ago, but after I started studying’; ‘before I started  
115 studying’. For the present study we considered NSSI and suicidal behaviours occurring in the  
116 past year; responses were dichotomized as ‘yes’ or ‘no’.

117 **2.1.3 Covariates.** Participants self-reported their *age* and *gender*. *Total screen time* was self-  
118 reported using the question “how many hours of screen usage do you have in total during one  
119 day”, with response options from ‘0’ to ‘18 or more’ hours. *Financial stress* in the past 12  
120 months was assessed using two items – one assessing difficulty paying running household costs  
121 including food, transport, and housing, and one assessing difficulty managing a hypothetical  
122 unexpected bill. For the present analyses, both items were dichotomized (‘yes’/‘no’).

## 123 **2.2 Analysis**

124 Separate multiple logistic regression models were estimated for each NSSI and suicide outcome.  
125 First, we estimated associations between each type of social media use (passive non-social,  
126 active non-social, passive social, active social public, and active social private), the tendency for  
127 social comparison on social media, and outcomes. Next, we re-ran these models controlling for  
128 age, gender, total screen time, and financial stress. As no substantive differences were observed  
129 between these models, fully adjusted models are presented. To test the modifying effect of  
130 gender on these associations, we fitted an interaction term between gender and each type of  
131 social media use, for each outcome. None of these interactions were significant, hence we  
132 present a model which pools across genders. Cases with missing data (< 6%) were listwise  
133 deleted. All analyses were conducted using R software (version 3.6.1, The R Foundation for  
134 Statistical Computing).

### 135 **3. Results**

136 Our final sample was comprised of over 70% women. Fifty-nine students did not indicate their  
137 gender, and an additional 81 students reported a gender other than ‘man’ or ‘woman’. As this  
138 sample size was not large enough to consider these gender categories separately, these  
139 observations were excluded from further analyses. Approximately seven percent of the sample  
140 reported experiencing suicidal ideation in the past year, with less than 5 in 1000 reporting a  
141 suicide attempt; figures which did not differ significantly for men and women in the sample  
142 (Table 1). Significantly more women reported thoughts (12.4%) and instances of NSSI (5.3%)  
143 than did men (5.3% and 2.3%, respectively). Men and women in the sample reported  
144 approximately 8 and 7 hours of screen time per day, respectively. Women reported greater use of  
145 social media for social and active non-social activities, whereas men reported more passive non-  
146 social usage (Table 1).

#### 147 ***3.1 Associations between Media Use and Outcomes***

148 Results of fully adjusted models predicting NSSI and suicidality outcomes are presented in Table  
149 2. Active social use in the public sphere (posting updates/pictures/articles) was associated with  
150 increased odds of NSSI ideation, NSSI, and suicide attempt, whereas social private use  
151 (messaging friends, making plans) was associated with reduced odds of all NSSI and suicidality  
152 outcomes. Passive non-social use of social media was associated with decreased odds of NSSI  
153 ideation, NSSI, and suicidal ideation. Finally, use of social media associated with studies (active  
154 non-social use) was associated with reduced odds of suicide attempt. The tendency for social  
155 comparison on social media was also positively associated with increased odds for all NSSI and  
156 suicidality outcomes.

157

## 158 **4. Discussion**

159 In this large sample of Norwegian university students, we demonstrated consistent associations  
160 between social media use and several outcomes related to NSSI and suicidality. In particular,  
161 different types of social media engagement were differentially associated with all outcomes,  
162 suggesting that associations between social media use and mental health may be more nuanced  
163 than previously thought. Relatedly, social comparison on social media was positively associated  
164 with suicide attempt, suicidal ideation, NSSI, and NSSI ideation.

### 165 ***4.1 Public Versus Private Social Media Use***

166 Most notably, our results suggested that active use of social media in the public and private  
167 sphere were differentially associated with NSSI and suicidality. Private social media use (that is,  
168 messaging friends and organizing social plans) was protective against all four outcomes related  
169 to NSSI and suicidality. Conversely, public social media use (e.g., posting links, photos, or status  
170 updates) was associated with increased risk of NSSI and suicidality.

171 In recent years, Frison & Eggermont distinguished between public and private active use of  
172 Facebook (e.g., posting status updates versus direct messaging).<sup>19,29</sup> In a sample of adolescents,  
173 they reported that public use was associated with greater depressed mood.<sup>29</sup> Private use, on the  
174 other hand, was protective against depressed mood – a relationship mediated through  
175 adolescents' level of perceived online social support. Our results extend this line of research,  
176 using a large sample of young adults, asking explicitly about use of multiple social media  
177 platforms, and focusing on NSSI and suicidality as outcomes. Several conceptual models of  
178 media use suggest that making use of online social capital has beneficial effects for users.<sup>30,31</sup>  
179 One small longitudinal study suggested that even heavy smartphone use was protective against  
180 loneliness when participants used these tools to engage in self-disclosure with peers.<sup>32</sup> Private

181 messaging necessitates a specific, known recipient, perhaps indicating a greater degree of  
182 familiarity or closeness. This type of social media engagement may therefore serve to strengthen  
183 existing social networks.

184 Public use of social media, on the other hand, showed a positive relationship with suicide  
185 attempt, suicide ideation, NSSI, and NSSI ideation. It has been hypothesised that the observed  
186 association between public use of Facebook and depressed mood may have to do with the  
187 feedback, or lack thereof, provided by peers in response to this activity.<sup>19</sup> Public use of social  
188 media may also be driven by different motivations than private use, which may help explain  
189 differential associations with NSSI and suicidal behavior. Public use may be motivated by  
190 approval-seeking, which in turn has been linked with elevated depressive symptoms.<sup>33</sup>

191 In their study of Facebook use among high-school students, Frison and Eggermont further  
192 reported a gender difference whereby public social use was beneficial for girls but detrimental  
193 for boys.<sup>19</sup> Though we explored interactions with gender, public social use was associated with  
194 negative outcomes for both men and women in our sample. One possibility is that the relative  
195 gender equity observed in Norwegian culture<sup>34</sup> translates into fewer gender differences in the  
196 processes governing associations between social media use and mental health. Another  
197 possibility is that social media use is differentially associated with outcomes at different  
198 developmental stages (i.e., adolescence versus young adulthood), or that these processes may  
199 operate differently for NSSI and suicidality than for other mental health outcomes. Unlike the  
200 persistent gender differences noted for depression; gender differences in rates of suicide attempt  
201 tend to peak in mid-adolescence, with rates among men and women roughly equal by age 19;<sup>35</sup> it  
202 is possible that gender differences in the processes linking social media use and suicidality may  
203 similarly narrow. However, it should be noted that our sample was 70% female, slightly higher

204 than the proportion of female students observed at the national level (60%).<sup>36</sup> It is possible that  
205 this finding is an artefact of the sample composition, and would not generalize to the Norwegian  
206 university student population as a whole.

#### 207 *4.2 Passive Social Media Use and Social Comparison*

208 Other authors have reported that passive use of social media (e.g., browsing others' photographs)  
209 is associated with poorer mental health.<sup>19,23,24</sup> In our sample, we found no evidence for an  
210 association between passive media use and NSSI or suicidality. However, our measurement of  
211 passive social use of social media was restricted to a single item, whereas other studies have  
212 employed more detailed measures of passive use.

213 Social media profiles are often highly curated, showcasing only the most positive aspects  
214 of users' lives. Passive use of social media is hypothesized to facilitate unfavourable social  
215 comparisons, placing users at risk for feelings of envy and lowered self-esteem.<sup>16</sup> It is these  
216 negative appraisals of the self in comparison to others that are thought to drive the associations  
217 between passive social media use and poor mental health.

218 Contrary to expectations, in our study, we found a weak association between passive social  
219 media use and NSSI outcomes, where passive use was associated with lower odds of NSSI  
220 ideation and behavior in fully adjusted models. However, participants' self-reported tendency for  
221 negative social comparison on social media was positively associated with NSSI and suicidality.  
222 This finding extends previous work suggesting that social comparison on social media is  
223 associated with lower subjective wellbeing<sup>23</sup> and greater depressed mood.<sup>16</sup> Reducing use of  
224 social media for those vulnerable to making unfavourable social comparisons may therefore be  
225 one way to mitigate potential negative effects of social media use on NSSI and suicidal behavior.  
226 Results of one small experimental study suggested that refraining from using Instagram for a

227 week was associated with higher life satisfaction – particularly for participants’ who reported a  
228 high tendency for social comparison.<sup>37</sup> In a Danish experimental study, Tromholt (2016) reported  
229 that taking a break from Facebook was associated with increased life satisfaction and positive  
230 emotionality comparative to the control group – associations that were more pronounced among  
231 participants who mostly used the platform passively, and those who were more prone to envy.  
232 Our results suggest similar mechanisms may apply to the links between social media use and  
233 NSSI and suicidal behavior.

#### 234 ***4.3 Non-Social Use of Social Media***

235 In addition to the many social uses of social media, university students often use these tools for  
236 non-social reasons: for example, in conjunction with their studies, or to engage with current  
237 events. Our results suggested that non-social use of social media was at worst, not associated  
238 with, and at best, negatively associated with, NSSI and suicidal outcomes. Passive non-social use  
239 (exemplified by reading the news) in particular, was associated with decreased odds of three out  
240 of four outcomes. Previous researchers have worried that exposure to troubling current events  
241 may decrease wellbeing, but specific topics, reporting, and context of news consumed may alter  
242 its effects on mental health.<sup>39</sup> Some evidence suggests that among young adults, news  
243 consumption on the internet may be positively related to civic participation and perceptions of  
244 social capital.<sup>40</sup>

#### 245 ***4.4 Limitations and Strengths***

246 The cross-sectional design of the study did not allow us to assess temporality in the associations  
247 between social media use, NSSI, and suicidal behaviour. For example, it is possible that  
248 engagement in NSSI and suicidal behavior may lead to different types of social media  
249 engagement. Though the measure of social media use employed in the current study was

250 comparable with those used in other studies,<sup>27</sup> when considering separate types of social media  
251 use, several categories of media use were represented by a single item (e.g., ‘read the news’ for  
252 passive non-social use). Ideally, future studies of public versus private social media use would  
253 use several items reflecting each construct. Further, the content of social media use was not  
254 assessed- for example, students may use social media to access content related to NSSI and  
255 suicidal behavior, which may increase their own risk of such behaviours.<sup>41</sup> Cyberbullying, which  
256 has been associated with NSSI among young adults,<sup>42</sup> may also occur through social media  
257 platforms. Data for the SHoT study was collected online, and may, therefore, have been subject  
258 to some selection bias, as students who lack access to or rarely engage with social media may  
259 have been less likely to participate in the study. Finally, suicidality, NSSI, and NSSI ideation  
260 were assessed using only four items; though these items have high face validity and are  
261 comparable to assessments of NSSI and suicidality in other epidemiological studies,<sup>43-45</sup> more  
262 exhaustive validated measures of these constructs would be ideal. Strengths of the study included  
263 a large sample size and questions about multiple types of social media use.

#### 264 ***4.5 Conclusions and Implications***

265 By and large, our results suggest that social media is not a monolith with unilateral consequences  
266 for wellbeing among young adults. Rather, we suggest that social media represents a toolbox  
267 with multiple, distinct uses – each differentially associated with youth self-injury and suicidal  
268 outcomes. Inconsistent findings in previous literature are likely due to the fact that authors have  
269 rarely and inconsistently distinguished between these different ways of using social media.

270       Though we identified protective associations between private social media use and suicidal  
271 outcomes, public social media use was associated with greater likelihood of NSSI and suicidal  
272 behaviors. Optimistically, in addition to promoting use of social media to connect privately with

273 friends and family, it may be possible to mitigate the negative consequences of maladaptive use  
274 of social media. In one study of UK adolescents, family meal frequency moderated the negative  
275 association between time spent on social media and wellbeing – among teens who frequently sat  
276 down to meals with their family, social media use showed no association with wellbeing.<sup>46</sup>  
277 Bolstering family connections, even when physically separated, and strengthening face-to-face  
278 connections with friends may therefore be important in promoting mental health among  
279 university students in the digital age.

280 Social media platforms may also be used proactively to intervene on NSSI and suicidal  
281 behavior, in a way that is likely to be palatable and accessible to adolescents and young adults.  
282 Social media support has been shown to facilitate young adults' adjustment to college,<sup>47</sup> and  
283 social media interventions for those at risk of suicide have been tested and proven safe and  
284 feasible.<sup>48</sup> These studies further emphasize our primary conclusion that although some aspects of  
285 social media may be detrimental to youth mental health, other aspects may be beneficial.

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Table 1. Descriptive statistics

	Males (N = 11937)	Females (N = 28128)	<i>p</i> -value for difference <sup>a</sup>
	%		
NSSI ideation (yes)	5.3%	12.4%	< .001
NSSI (yes)	2.3%	5.2%	< .001
Suicidal ideation (yes)	6.6%	7.3%	0.093
Suicide attempt (yes)	0.4%	0.5%	0.232
Financial stress			
Difficulty affording basic necessities (yes)	21.9%	30.0%	< .001
Difficulty coping with unexpected bill (yes)	69.6%	60.3%	< .001
	Mean (SD)		
Age	22.19 (1.75)	21.94 (1.73)	< .001
Screen time (hours per day)	7.92 (3.44)	7.05 (3.39)	< .001
Active social	2.80 (0.58)	2.96 (0.50)	< .001
Public	1.66 (0.69)	1.77 (0.59)	< .001
Private	3.94 (0.78)	4.15 (0.73)	< .001
Passive social	3.59 (1.05)	3.77 (0.99)	< .001
Active non social	3.27 (1.13)	3.34 (1.10)	< .001
Passive non-social	3.89 (1.19)	3.81 (1.06)	< .001
Social comparison	1.81 (1.00)	2.52 (1.15)	< .001

NSSI: Non-suicidal self-injury

<sup>a</sup> *p*-values based on independent sample *t*-tests

Table 2. Associations between types of social media use and outcomes; adjusted models <sup>a</sup>

	NSSI ideation n = 37,510		NSSI n = 37,623		Suicidal Ideation n = 37,485		Suicide Attempt n = 37,560	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Passive non-social	<b>0.90</b>	0.88, 0.93	<b>0.89</b>	0.86, 0.94	<b>0.90</b>	0.86, 0.93	0.90	0.78, 1.04
Active non-social	1.00	0.96, 1.02	1.00	0.95, 1.04	0.97	0.93, 1.01	<b>0.80</b>	<b>0.69, 0.92</b>
Passive social	<b>0.95</b>	0.92, 0.99	<b>0.91</b>	0.86, 0.97	1.00	0.95, 1.05	0.92	0.77, 1.10
Active social								
public	<b>1.19</b>	1.12, 1.25	<b>1.26</b>	1.16, 1.37	1.06	0.99, 1.14	<b>1.55</b>	1.22, 1.95
private	<b>0.80</b>	0.76, 0.84	<b>0.80</b>	0.74, 0.86	<b>0.73</b>	0.69, 0.78	<b>0.73</b>	0.58, 0.92
Social comparison	<b>1.43</b>	1.39, 1.47	<b>1.40</b>	1.35, 1.46	<b>1.52</b>	1.47, 1.57	<b>1.66</b>	1.46, 1.89

NSSI: Non-suicidal self-injury

<sup>a</sup> Adjusted for age, gender, screen time, and financial stress.