



 Opín vísindi

---

*This is not the published version of the article / Þetta er ekki útgefna útgáfa greinarinnar*

Author(s)/Höf.: Thorisdóttir, I. E., Sigurvinsdóttir, R., Asgeirsdóttir, B. B., Allegrante, J. P., & Sigfusdóttir, I. D.

Title/Titill: Active and Passive Social Media Use and Symptoms of Anxiety and Depressed Mood Among Icelandic Adolescents

Year/Útgáfuár: 2019

Version/Útgáfa: Post-print (lokagerð höfundar)

**Please cite the original version:**

**Vinsamlega vísið til útgefnu greinarinnar:**

Thorisdóttir, I. E., Sigurvinsdóttir, R., Asgeirsdóttir, B. B., Allegrante, J. P., & Sigfusdóttir, I. D. (2019). Active and Passive Social Media Use and Symptoms of Anxiety and Depressed Mood Among Icelandic Adolescents. *Cyberpsychology Behavior and Social Networking*, 22(8), 535–542. <https://doi.org/10.1089/cyber.2019.0079>

Rights/Réttur: © Mary Ann Liebert, Inc

**Active and Passive Social Media Use and Symptoms of Anxiety and Depressed mood  
among Icelandic Adolescents.**

Ingibjorg Eva Thorisdottir, MPH,<sup>1,2</sup> Rannveig Sigurvinsdottir, PhD,<sup>1</sup> Bryndis Bjork Asgeirsdottir, PhD,<sup>1</sup> John P. Allegrante, PhD,<sup>3,4</sup> and Inga Dora Sigfusdottir, PhD<sup>1-3</sup>

<sup>1</sup>Department of Psychology, Reykjavik University, Reykjavik, Iceland.

<sup>2</sup>Icelandic Centre for Social Research and Analysis, Reykjavik University, Reykjavik, Iceland.

<sup>3</sup>Department of Health and Behavior Studies, Teachers College, Columbia University, New York, New York.

<sup>4</sup>Department of Sociomedical Sciences, Mailman School of Public Health, Columbia University, New York, New York.

**Abstract**

Adolescent use of social media platforms such as Facebook, Instagram, and Snapchat has increased dramatically over the last decade and now pervades their everyday social lives. Active and passive social media use may impact emotional health differently, but little is known about whether and to what extent either type of social media use influences emotional distress among young people. We analyzed population survey data collected from Icelandic adolescents (N = 10,563) to document the prevalence of social media use and investigate the relationship of both active and passive social media use to self-reported symptoms of anxiety and depressed mood. A hierarchical linear regression model revealed that passive social media use was related to greater symptoms of anxiety and depressed mood among adolescents and active social media use was related to decreased symptoms of anxiety and depressed mood, even after controlling for time spent on social media. When adding known risk and protective factors, self-esteem, offline peer support, poor body image and social comparison to the model, active use was not related to emotional distress; however, passive use was still related to adolescent symptoms of anxiety and depressed mood. The effect of social media on emotional distress differed by gender, as time spent on social media had a stronger relationship with emotional distress among girls. In addition, passive use was more strongly related to symptoms of depressed mood among girls. Future research should include risk and protective factors as mediators of different types of social media use and adolescent emotional distress.

**Keywords:** active social media use, adolescence, anxiety, depressed mood, emotional distress, passive social media use

## **Introduction**

Self-reported emotional distress such as symptoms of anxiety and depressed mood among youth has increased in recent decades, especially for girls.<sup>1-6</sup> Engagement with social media such as Facebook, Instagram, and Snapchat may contribute to this distress.<sup>7</sup> Most adolescents use social media regularly (90% in the United States and 93% in Iceland), with approximately 25% reporting heavy use (over four hours daily).<sup>8,9</sup>

Time spent on social media has been connected to poor psychological well-being<sup>10</sup> and symptoms of depression<sup>7</sup> and anxiety.<sup>11</sup> Similarly, frequency of use is related to poor psychological well-being.<sup>12,13</sup> However, some use may be advantageous, with moderate users reporting the greatest psychological well-being when compared to no use and high use.<sup>7,14</sup>

Focusing solely on frequency or duration of social media use may be overly simplistic. “Active use” involves chatting, sharing photos or status updates with a specific audience or posting other personal content that others can then comment or give “likes,” whereas “passive use” refers to browsing, scrolling, re-posting links or looking at content from others. Active use can therefore reflect the individual's self-concept, words or thoughts, which may be used to engage with others.<sup>15</sup> Passive use, however, involves consuming information and re-posting links not aimed at anyone in particular, unrelated to the person's self-concept and requiring minimal effort. Emerging research suggests that passive use is related to greater depressive symptoms and active use with fewer depressive symptoms.<sup>15-17</sup> Passive Facebook users, for example, benefit from taking a break from the medium in terms of positive feelings and life satisfaction.<sup>18</sup>

Both active and passive use appear to be related to, and may possibly cause, emotional distress because they are connected with known risk factors for poor youth mental health. For example, social comparison is a risk factor for emotional distress,<sup>17,19,20</sup> especially upward comparisons.<sup>21,22</sup> Social media is replete with upward comparisons, as users disproportionately

## Adolescent social media use and emotional distress

post positive content from their lives and downplay the negative.<sup>23</sup> Time spent on Facebook, number of logins and type of Facebook use relate to greater social comparison,<sup>20,24–26</sup> some report that passive use relates to increased social comparison<sup>17,27</sup> and active use to decreased social comparison,<sup>17</sup> while others have found that both active and passive Facebook use are related to greater social comparison.<sup>26</sup> Similarly, body dissatisfaction is a risk factor for emotional distress.<sup>28,29</sup> Body image concerns relate to social comparison, as youth may internalize unrealistic ideals and engage in appearance comparison, self-surveillance and self-objectification.<sup>30–32</sup> Facebook users report lower body satisfaction<sup>30,33–35</sup> and social comparison mediates the relationship between passive Facebook use and body image concerns.<sup>27</sup>

Both active and passive use may relate to protective factors for emotional distress, such as social support.<sup>36–38</sup> The rich-get-richer hypothesis proposes that individuals with good offline social relationships will use social media to extend their social networks and friendship quality.<sup>39</sup> Active use connects to offline social inclusion and less loneliness,<sup>40,41</sup> greater feelings of bonding<sup>40</sup> and greater daily online social connectedness to friends.<sup>41</sup> In addition, online social support mediates the relationship between active use and decreased symptoms of depressed mood.<sup>15</sup>

Another protective factor against emotional distress is self-esteem.<sup>42,43</sup> Greater use is connected with lower self-esteem<sup>7,44,45</sup> and negative self-esteem is a mediator between Facebook use and psychological distress.<sup>46</sup> Limited research exists on the relationship between social media use, self-esteem and symptoms of anxiety and depressed mood. In a network analysis, Facebook use was linked to social comparison and self-esteem, which in turn were linked to anxiety and depressive symptoms. Given that high self-esteem relates to less emotional distress<sup>42,43</sup> and that self-esteem connects Facebook use to symptoms of

anxiety and depressed mood,<sup>26</sup> self-esteem should be assessed when examining social media use and mental health.

Although social media use can affect adolescents positively or negatively, the relationship is complex and little is known about it.<sup>47-49</sup> Both time on social media<sup>7,10,11</sup> and type of use may play a role in well-being.<sup>15,16</sup> Parents, school officials and even developers of social media at Instagram and Facebook are concerned about the possible negative consequences of social media use.<sup>50</sup> Passive social media use can be a risk factor for detrimental influences in the lives of adolescents, such as social comparison and body dissatisfaction.<sup>17,27</sup> Conversely, active use has potential benefits for peer relations and self-esteem.<sup>15,37,39-41,44,45</sup> Thus, the purpose of this study was to estimate the prevalence of active and passive social media use, and to examine how use relates to symptoms of anxiety and depressed mood. We hypothesized that time spent on social media is positively related to greater emotional distress and that emotional distress has a positive relationship with passive use and a negative relationship with active use,<sup>15,40</sup> even after controlling for known risk and protective factors for adolescent symptoms of anxiety and depressed mood.

## **Methods**

### ***Participants and procedures***

The data come from a national survey of Icelandic adolescents conducted in February 2018. The sample consists of all students, ages 14 to 16 in the 8th, 9th and 10th grade of compulsory school, whose parents consented to their participation. Anonymous questionnaires were administered to all students present in class on the day of the survey. Teachers distributed the questionnaires, and students returned them sealed in blank envelopes upon completion. The data collection protocol has been described elsewhere.<sup>51</sup> In total, 10,563 students completed the questionnaire, yielding an 84% response rate; 50.3% were girls.

### **Measures**

**Time on social media.** This was assessed with one question: “On average how many hours a day do you spend on social media (e.g., Facebook, Snapchat, Twitter, and Instagram)?” Participants answered on an 8-point scale, ranging from almost no time (= 1) to 6 hours or more (= 8). This scale is comparable to other studies examining how long adolescents spend on social media.<sup>7,14</sup>

**Type of social media use.** This was assessed with the Multidimensional Scale of Facebook Use,<sup>52</sup> modified to refer to all types of social media and translated into Icelandic. Participants answered six questions on how often they take part in certain activities on social media. A principal component exploratory factor analysis with varimax rotation showed that the items loaded well onto the two factors, explaining 71% of the variance. Both factors had acceptable internal consistency (active:  $\alpha = 0.80$ , passive:  $\alpha = 0.74$ ). The confirmatory factor analysis revealed adequate fit of the two-factor model (CFI = 0.98, TLI = 0.96).

**Anxiety.** This was measured with two dimensions from the Icelandic version of the Multidimensional Anxiety Scale for Children,<sup>53</sup> the physical symptoms scale (12 items) and the social anxiety scale (9 items). Participants reported how often they experienced each symptom on a four-point scale, from never to often. Examples of symptoms include feeling nervous, hands shaking and worrying about speaking in front of others. The scale has been tested among a sample of Icelandic adolescents and has good reliability and validity.<sup>53</sup> In this sample, reliability was excellent ( $\alpha = 0.95$ ).

**Depressed mood.** This was measured with 10 items from the depression dimension scale of the Original Symptom Checklist.<sup>54</sup> Participants reported how often in the previous week they experienced symptoms of depressed mood, such as feeling hopeless and without energy. Participants answered on a four-point scale (never to often). The scale demonstrates

good internal consistency and test-retest reliability.<sup>55</sup> In this sample, reliability was high ( $\alpha = 0.91$ ).

**Gender.** This is a binary variable asking participants to indicate whether they are a boy (= 0) or a girl (= 1).

**Family structure.** Participants were asked who they currently lived with, and this variable was coded 1 for both biological parents (69.8%) and 0 for other family arrangements. This measure and coding have been previously used among Icelandic youth.<sup>56</sup>

**Parental support.** The Perceived Parental Support scale consists of five items, measured on a four-point scale asking how adolescents perceive general support from parents. Participants were asked how easy or hard is it for them to receive the following from their parents, “caring and warmth”, “discussion about personal affairs”, “advice about the studies”, “advice about other issues” and “assistance with other things”. A higher score reflects more parental support. The scale has shown good internal consistency and convergent validity.<sup>57,58</sup> In this sample, reliability was high ( $\alpha = 0.88$ ).

**Subjective relative deprivation.** Participants were asked how well financially off their family is compared to other families in Iceland, the scale ranged from much worse off (= 1) to much better off (= 7). This measure has previously been used among Icelandic adolescents.<sup>59</sup>

**Offline peer support.** Participants were asked how easy or hard is it for them to receive the following from their friends, “caring and warmth”, “discussion about personal affairs”, “advice about their studies”, “advice about other issues” and “assistance with other things”. Participants answered on a four-point scale with a higher score reflecting greater perceived peer support. In this sample, reliability was good ( $\alpha = 0.89$ ). This measure has been previously used among Icelandic adolescents.<sup>60,61</sup>

**Social comparison.** This was measured with the 11-item Iowa Netherlands Comparison Orientation Measure.<sup>62</sup> The measure was translated into Icelandic and then back



translated into English. Participants were asked how much they agree with statements such as: “I often compare myself with others with respect to what I have accomplished in life.”

Participants answered on a five-point scale, ranging from strongly disagree to strongly agree. Higher scores indicate a greater tendency to compare oneself with others. The scale is widely used and has good reliability and validity.<sup>62,63</sup> In this study, scale reliability was high ( $\alpha = 0.83$ ).

***Self-esteem.*** This was measured with 10 statements from the Rosenberg Self-Esteem Scale.<sup>64</sup> The scale consists of positive and negative self-appraisal statements rated on a four-point scale. Higher scores indicate a higher level of self-esteem.<sup>42</sup> The scale has good psychometric properties.<sup>65,66</sup> In this study, reliability was high ( $\alpha = 0.90$ ).

***Body image.*** This was measured with five items from the body image subscale of the Offer Self-Image Questionnaire.<sup>67</sup> Participants indicate how much they agree or disagree with statements such as: “I am happy with my body” rated on a four-point scale and higher scores indicate a more negative body image. The Offer Self-Image Questionnaire has been used in adolescent research and has high reliability<sup>68</sup>, and moderate discriminant validity.<sup>69</sup> In this study, reliability was high ( $\alpha = 0.82$ ).

#### *Data analyses*

To examine bivariate relationships, we calculated Spearman correlations. To investigate the unique effects of social media on emotional distress (time spent on social media, active use and passive use), as well as risk factors (social comparison and body image) and protective factors (offline peer support and self-esteem), we performed a hierarchical linear regression. We controlled for family structure,<sup>70</sup> relative deprivation<sup>71</sup> and parental support<sup>72</sup> because they relate to emotional distress. The analysis examined control variables in model 1, time spent on social media in model 2, active and passive use in model 3, risk and protective factors in model 4. In the fifth and final model, two-way interactions with gender

and social media variables were added, because girls are more likely to report emotional distress<sup>1</sup>, compare themselves on social media, report poor body image<sup>24,73</sup> and spend more time on social media.<sup>74,75</sup> Mplus version 6.12 and SPSS version 25 were used.

## Results

Table 1 shows that most girls (84.7%) and more than half of boys (68.5%) actively use social media once or more a day. Posting a photo or a video on social media is a daily activity for 23.7% of boys and 42.9% of girls, although 45.3% of boys and 22.9% of girls report never posting a photo or a video. Passive use is less prevalent, with 13.7% of boys and 19% of girls looking at their friends' profiles or social media accounts once a day or more and 11.5% of boys and 18.3% of girls browsing through profiles of people they do not know once a day or more.

Symptoms of anxiety and depressed mood were positively correlated with time on social media (Table 2). Both active and passive use correlated with greater symptoms of anxiety and depressed mood. Poor body image and social comparison correlated with greater symptoms of anxiety and depressed mood and self-esteem and offline peer support with fewer symptoms of anxiety and depressed mood.

The regression analysis showed that time spent on social media was correlated with greater symptoms of depressed mood (Table 3) and anxiety (Table 4). When time on social media was controlled for, passive use related to greater symptoms of anxiety and depressed mood but active use to fewer symptoms of anxiety and depressed mood. When social media time and use were controlled for, self-esteem and offline peer support negatively correlated with emotional distress and social comparison and poor body image positively related to emotional distress. When adding the risk and protective factors, passive use remained a significant correlate to emotional distress, but active use did not. Girls reported greater

symptoms of anxiety and depressed mood, even when controlling for use as well as risk and protective factors. Significant interactions emerged, as time spent on social media had a stronger relationship with emotional distress among girls. In addition, passive use was more strongly related to symptoms of depressed mood among girls.

## **Discussion**

Consistent with previous work on psychological well-being<sup>7,14</sup> and emotional distress,<sup>11,76</sup> time spent on social media was correlated with greater symptoms of anxiety and depressed mood. Similar to the limited work available on the topic,<sup>15,16,26</sup> active and passive use were differentially related to symptoms of depressed mood and anxiety. In addition, passive use was related to greater symptoms of depressed mood for both girls<sup>15,77</sup> and boys.<sup>77</sup> We believe this is the first study to show that passive use is related to greater anxiety symptoms for both genders.

Active use was related to greater emotional distress at the bivariate level but had a negative relationship when controlling for family structure, relative deprivation, parental support and time spent on social media. Previous work has found that among adults, active use relates to decreased symptoms, regardless of gender.<sup>16</sup> However, for Belgian adolescents, active Facebook use by girls related to decreased depressive symptoms, while active public use was connected with greater depressive symptoms for boys.<sup>15</sup> Regardless of these observed gender differences, the limited research consistently shows that actively using social media may confer protection against emotional distress.

Emotional distress correlated with known risk and protective factors from adolescents' social environment. Positive relationships emerged between emotional distress and social comparison,<sup>78</sup> as well as poor body image.<sup>79</sup> Conversely, protective factors had the expected negative relationships with emotional distress, for both peer support<sup>37,48</sup> and self-esteem.<sup>43</sup>

Our findings show that the relationship between time spent on social media and symptoms of anxiety and depressed mood are stronger for girls than boys. Furthermore, passive use more strongly relates to symptoms of depressed mood among girls. This is consistent with work indicating that girls may be more sensitive than males to feedback from social experiences and be more likely to react by internalizing emotional distress, including depressed mood.<sup>80,81</sup> The relationship between different social media use, risk and protective factors and emotional distress is thus complex. The mechanism is unclear and may be bidirectional, or with feedback loops. The cross-sectional nature of our data points to a relationship, but not its directionality. Comparing results from adolescents and adults on self-esteem, body dissatisfaction, social comparison and the importance of peer relationships on mental health may also be limited as adolescent brains are still developing, along with their sense of self-worth. Moreover, most of the previously published work (with the exception of Faelens et al., 2019)<sup>26</sup> has not separately assessed the related yet distinct concepts of symptoms of anxiety and depressed mood.

Our study has several notable strengths that have not been features of previous work. First, we added known risk and protective factors for adolescent symptoms of anxiety and depressed mood to our analysis to identify the unique relationship between type of social media use and emotional distress. Second, we examined active and passive use in relation to dissatisfaction with body image, an important aspect of well-being in which social media may play a role.<sup>29-31</sup> Third, our study utilized a large sample with a high response rate. Finally, we assessed the relationship between emotional distress and social media use across platforms and not just Facebook, as much of previous work has done.<sup>12,13,17,18,20,26-28,31,33-35,41,46,52,52,77</sup> While Facebook is the most commonly used social media app among adults, Icelandic adolescents follow a similar trend as young Americans,<sup>82</sup> with Instagram, Snapchat and

## Adolescent social media use and emotional distress

Facebook being the most popular platforms. However, Facebook is mostly used to send private messages or to plan events, not create or share content.<sup>83</sup>

Despite the strengths of this study, two limitations should be acknowledged. First, we relied on self-reports of social media use. Although self-reports have been considered valid in assessing individual subjective experiences, there is potential for recall bias and inaccurate estimates of time spent on social media. Second, when measuring different types of social media use we used a scale created for active and passive Facebook use, and asked about social media use across platforms. Our factor analysis differed from previous studies since it revealed two factors instead of three.<sup>15</sup> It is therefore possible that the measure of active and passive social media use does not fully capture the difference between what is active social media use and what is passive social media use.

We believe this is the first study to show that passive social media use is related to greater anxiety symptoms for both genders. Our findings also provide insight into the relationship between emotional distress and adolescent social media use in three important ways. First, we found that there are two (i.e., active and passive use) rather than three (i.e., active public, active private and passive use) distinct factors.<sup>15</sup> Second, when controlling for known risk and protective factors, passive use is positively related to symptoms of anxiety and depressed mood. Finally, the relationship between duration of use and symptoms of anxiety and depressed mood is stronger for girls than boys, and the relationship between passive use and depressed mood is stronger for girls. Future research should focus on examining the relationship longitudinally and whether use of specific social media affects youth in different ways.

**Conflict of Interest:** The authors declare that no competing financial interests exist.

## References

1. Bor W, Dean AJ, Najman J, et al. Are child and adolescent mental health problems increasing in the 21st century? A systematic review. *Australian and New Zealand Journal of Psychiatry* 2014; 48:606–616.
2. Collishaw S. Annual Research Review: Secular trends in child and adolescent mental health. *Journal of Child Psychology and Psychiatry* 2015; 56:370–393.
3. Collishaw S, Maughan B, Natarajan L, et al. Trends in adolescent emotional problems in England: a comparison of two national cohorts twenty years apart. *Journal of Child Psychology and Psychiatry* 2010; 51:885–894.
4. Sigfusdottir ID, Asgeirsdottir BB, Sigurdsson JF, et al. Trends in depressive symptoms, anxiety symptoms and visits to healthcare specialists: A national study among Icelandic adolescents. *Scandinavian Journal of Public Health* 2008; 36:361–368.
5. Thorisdottir IE, Asgeirsdottir BB, Sigurvinsdottir R, et al. The increase in symptoms of anxiety and depressed mood among Icelandic adolescents: time trend between 2006 and 2016. *European Journal of Public Health* 2017; 27:856–861.
6. van Geelen SM, Hagquist C. Are the time trends in adolescent psychosomatic problems related to functional impairment in daily life? A 23-year study among 20,000 15–16-year olds in Sweden. *Journal of Psychosomatic Research* 2016; 87:50–56.
7. Twenge JM, Martin GN, Campbell WK. Decreases in Psychological Well-Being Among American Adolescents After 2012 and Links to Screen Time During the Rise of Smartphone Technology. *Emotion* 2018:No Pagination Specified-No Pagination Specified.
8. Palsdottir H, Thorisdottir IE, Gudmundsdottir ML, et al. (2018) *Youth in Iceland 2018*. Reykjavik, Iceland: Icelandic Centre for Social Research and Analysis.
9. Perrin A. Social Media Usage: 2005-2015. 2015.
10. Huang C. Time Spent on Social Network Sites and Psychological Well-Being: A Meta-Analysis. *Cyberpsychology, Behavior and Social Networking* 2017; 20:346–354.
11. Vannucci A, Flannery KM, Ohannessian CM. Social media use and anxiety in emerging adults. *Journal of Affective Disorders* 2017; 207:163–166.
12. Kross E, Verduyn P, Demiralp E, et al. Facebook Use Predicts Declines in Subjective Well-Being in Young Adults. *PLOS ONE* 2013; 8:e69841.
13. Shakya HB, Christakis NA. Association of Facebook Use With Compromised Well-Being: A Longitudinal Study. *American Journal of Epidemiology* 2017; 185:203–211.
14. Przybylski AK, Weinstein N. A Large-Scale Test of the Goldilocks Hypothesis. *Psychological Science* 2017; 28:204–215.
15. Frison E, Eggermont S. Exploring the Relationships Between Different Types of Facebook Use, Perceived Online Social Support, and Adolescents' Depressed Mood. *Social Science Computer Review* 2016; 34:153–171.
16. Escobar-Viera CG, Shensa A, Bowman ND, et al. Passive and Active Social Media Use and Depressive Symptoms Among United States Adults. *Cyberpsychology, Behavior and Social Networking* 2018; 21:437–443.
17. Nisar TM, Prabhakar G, Ilavarasan PV, et al. Facebook usage and mental health: An empirical study of role of non-directional social comparisons in the UK. *International Journal of Information Management* 2019; 48:53–62.
18. Tromholt M. The Facebook Experiment: Quitting Facebook Leads to Higher Levels of Well-Being. *Cyberpsychology, Behavior and Social Networking* 2016; 19:661–666.
19. Diener E, Fujita F. (1997) Social comparisons and subjective well-being. In: *Health, coping, and well-being: Perspectives from social comparison theory*. Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers, pp. 329–357.

20. Jang K, Park N, Song H. Social comparison on Facebook: Its antecedents and psychological outcomes. *Computers in Human Behavior* 2016; 62:147–154.
21. Bänzner E, Brömer P, Hammelstein P, et al. Current and former depression and their relationship to the effects of social comparison processes. Results of an internet based study. *Journal of Affective Disorders* 2006; 93:97–103.
22. Wheeler L, Miyake K. Social comparison in everyday life. *Journal of Personality and Social Psychology* 1992; 62:760–773.
23. Barash V, Ducheneaut N, Isaacs E, et al. (2010) Faceplant: impression (mis)management in Facebook status updates. In: Vol Proceedings of the Fourth International AAAI Conference on Weblogs and Social Media. Menlo Park, CA.: AAAI, pp. 207–210.
24. Hanna E, Ward LM, Seabrook RC, et al. Contributions of Social Comparison and Self-Objectification in Mediating Associations Between Facebook Use and Emergent Adults' Psychological Well-Being. *Cyberpsychology, Behavior and Social Networking* 2017; 20:172–179.
25. Steers M-LN, Wickham RE, Acitelli LK. Seeing Everyone Else's Highlight Reels: How Facebook Usage is Linked to Depressive Symptoms. *Journal of Social and Clinical Psychology* 2014; 33:701–731.
26. Faelens L, Hoorelbeke K, Fried E, et al. Negative influences of Facebook use through the lens of network analysis. *Computers in Human Behavior* 2019; 96:13–22.
27. Rousseau A, Eggermont S, Frison E. The reciprocal and indirect relationships between passive Facebook use, comparison on Facebook, and adolescents' body dissatisfaction. *Computers in Human Behavior* 2017; 73:336–344.
28. Bucchianeri MM, Fernandes N, Loth K, et al. Body dissatisfaction: Do associations with disordered eating and psychological well-being differ across race/ethnicity in adolescent girls and boys? *Cultural Diversity & Ethnic Minority Psychology* 2016; 22:137–146.
29. Rawana JS, Morgan AS. Trajectories of depressive symptoms from adolescence to young adulthood: the role of self-esteem and body-related predictors. *Journal of Youth and Adolescence* 2014; 43:597–611.
30. Fardouly J, Vartanian LR. Social Media and Body Image Concerns: Current Research and Future Directions. *Current Opinion in Psychology* 2016; 9:1–5.
31. Manago AM, Ward LM, Lemm KM, et al. Facebook Involvement, Objectified Body Consciousness, Body Shame, and Sexual Assertiveness in College Women and Men. *Sex Roles* 2015; 72:1–14.
32. Vandenbosch L, Eggermont S. Understanding Sexual Objectification: A Comprehensive Approach Toward Media Exposure and Girls' Internalization of Beauty Ideals, Self-Objectification, and Body Surveillance. *Journal of Communication* 2012; 62:869–887.
33. Kim JW, Chock TM. Body image 2.0: Associations between social grooming on Facebook and body image concerns. *Computers in Human Behavior* 2015; 48:331–339.
34. Meier EP, Gray J. Facebook photo activity associated with body image disturbance in adolescent girls. *Cyberpsychology, Behavior and Social Networking* 2014; 17:199–206.
35. Stronge S, Greaves LM, Milojev P, et al. Facebook is Linked to Body Dissatisfaction: Comparing Users and Non-Users. *Sex Roles* 2015; 73:200–213.
36. Jensen MP, Smith AE, Bombardier CH, et al. Social support, depression, and physical disability: age and diagnostic group effects. *Disability and Health Journal* 2014; 7:164–172.
37. Oh HJ, Ozkaya E, Larose R. How does online social networking enhance life satisfaction? the relationships among online supportive interaction, affect, perceived social support, sense of community, and life satisfaction. *Computers in Human Behavior* 2014; 30:69–78.
38. Rueger SY, Malecki CK, Demaray MK. Relationship between multiple sources of perceived social support and psychological and academic adjustment in early adolescence: comparisons across gender. *Journal of Youth and Adolescence* 2010; 39:47–61.

39. Kraut R, Kiesler S, Boneva B, et al. Internet paradox revisited. *Journal of Social Issues* 2002; 58:49–74.
40. Burke M, Marlow C, Lento T. (2010) Social network activity and social well-being. In: ACM Press, p. 1909.
41. Deters F große, Mehl MR. Does Posting Facebook Status Updates Increase or Decrease Loneliness? An Online Social Networking Experiment. *Social Psychological and Personality Science* 2013; 4:579–586.
42. Asgeirsdottir BB, Gudjonsson GH, Sigurdsson JF, et al. Protective processes for depressed mood and anger among sexually abused adolescents: The importance of self-esteem. *Personality and Individual Differences* 2010; 49:402–407.
43. Sowislo JF, Orth U. Does low self-esteem predict depression and anxiety? A meta-analysis of longitudinal studies. *Psychological Bulletin* 2013; 139:213–240.
44. Vogel EA, Rose JP, Roberts LR, et al. Social comparison, social media, and self-esteem. *Psychology of Popular Media Culture* 2014; 3:206–222.
45. Woods HC, Scott H. #Sleepyteens: Social media use in adolescence is associated with poor sleep quality, anxiety, depression and low self-esteem. *Journal of Adolescence* 2016; 51:41–49.
46. Chen W, Lee K-H. Sharing, liking, commenting, and distressed? The pathway between Facebook interaction and psychological distress. *Cyberpsychology, Behavior and Social Networking* 2013; 16:728–734.
47. Best P, Manktelow R, Taylor B. Online communication, social media and adolescent wellbeing: A systematic narrative review. *Children and Youth Services Review* 2014; 41:27–36.
48. Seabrook EM, Kern ML, Rickard NS. Social Networking Sites, Depression, and Anxiety: A Systematic Review. *JMIR Mental Health* 2016; 3.
49. Spies Shapiro LA, Margolin G. Growing up wired: social networking sites and adolescent psychosocial development. *Clinical Child and Family Psychology Review* 2014; 17:1–18.
50. Anon. (2019) Instagram Is Testing A Feature That May Actually Improve Mental Health. [https://www.huffpost.com/entry/instagram-hiding-likes-mental-health\\_1\\_5cd092d3e4b0548b735e50bc](https://www.huffpost.com/entry/instagram-hiding-likes-mental-health_1_5cd092d3e4b0548b735e50bc) (accessed May14 2019).
51. Kristjansson AL, Sigfusson J, Sigfusdottir ID, et al. Data collection procedures for school-based surveys among adolescents: the Youth in Europe Study. *The Journal of School Health* 2013; 83:662–667.
52. Frison E, Eggermont S. Toward an Integrated and Differential Approach to the Relationships Between Loneliness, Different Types of Facebook Use, and Adolescents' Depressed Mood. *Communication Research* 2015:0093650215617506.
53. Olason DT, Sighvatsson MB, Smári J. Psychometric properties of the Multidimensional Anxiety Scale for Children (MASC) among Icelandic schoolchildren. *Scandinavian Journal of Psychology* 2004; 45:429–436.
54. Derogatis LR, Lipman RS, Covi L. SCL-90: an outpatient psychiatric rating scale--preliminary report. *Psychopharmacology Bulletin* 1973; 9:13–28.
55. Derogatis LR, Unger R. (2010) Symptom Checklist-90-Revised. In: *The Corsini Encyclopedia of Psychology*. American Cancer Society, pp. 1–2.
56. Sigurvinsdottir R, Asgeirsdottir BB, Ullman SE, et al. The Impact of Sexual Abuse, Family Violence/Conflict, Spirituality, and Religion on Anger and Depressed Mood Among Adolescents. *Journal of Interpersonal Violence* 2017:886260517734860.
57. Kristjansson AL, Sigfusdottir ID, Allegrante JP, et al. Social correlates of cigarette smoking among Icelandic adolescents: A population-based cross-sectional study. *BMC Public Health* 2008; 8:86.



58. Kristjansson AL, Sigfusdottir ID, Karlsson T, et al. The Perceived Parental Support (PPS) Scale: Validity and Reliability in the 2006 Youth in Europe Substance Use Prevention Survey. *Child Indicators Research* 2011; 4:515–528.
59. Bernburg JG, Thorlindsson T, Sigfusdottir ID. Relative Deprivation and Adolescent Outcomes in Iceland: A Multilevel Test. *Social Forces* 2009; 87:1223–1250.
60. Mann MJ, Kristjansson AL, Sigfusdottir ID, et al. The role of community, family, peer, and school factors in group bullying: implications for school-based intervention. *The Journal of School Health* 2015; 85:477–486.
61. Kristjansson AL, Sigfusdottir ID, James JE, et al. Perceived parental reactions and peer respect as predictors of adolescent cigarette smoking and alcohol use. *Addictive Behaviors* 2010; 35:256–259.
62. Gibbons FX, Buunk BP. Individual differences in social comparison: Development of a scale of social comparison orientation. *Journal of Personality and Social Psychology* 1999; 76:129–142.
63. Schneider SM, Schupp J. Individual Differences in Social Comparison and its Consequences for Life Satisfaction: Introducing a Short Scale of the Iowa–Netherlands Comparison Orientation Measure. *Social Indicators Research* 2014; 115:767–789.
64. Rosenberg M. (1965) *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
65. Eklund M, Bäckström M, Hansson L. Psychometric evaluation of the Swedish version of Rosenberg’s self-esteem scale. *Nordic Journal of Psychiatry* 2018; 0:1–7.
66. Martín-Albo J, Núñez JL, Navarro JG, et al. The Rosenberg Self-Esteem Scale: Translation and Validation in University Students. *The Spanish Journal of Psychology* 2007; 10:458–467.
67. Offer D, Howard KI. An Empirical Analysis of the Offer Self-Image Questionnaire for Adolescents. *Archives of General Psychiatry* 1972; 27:529–533.
68. Patton W, Noller P. The Offer Self-Image Questionnaire for adolescents: Psychometric properties and factor structure. *Journal of Youth and Adolescence* 1994; 23:19–41.
69. Laukkanen E, Halonen P, Viinamäki H. Stability and Internal Consistency of the Offer Self-Image Questionnaire: A Study of Finnish Adolescents. *Journal of Youth and Adolescence* 1999; 28:71–77.
70. Turner HA, Finkelhor D, Hamby SL, et al. Family structure, victimization, and child mental health in a nationally representative sample. *Social Science & Medicine (1982)* 2013; 87:39–51.
71. Mishra S, Carleton RN. Subjective relative deprivation is associated with poorer physical and mental health. *Social Science & Medicine (1982)* 2015; 147:144–149.
72. Stadler C, Feifel J, Rohrmann S, et al. Peer-victimization and mental health problems in adolescents: are parental and school support protective? *Child Psychiatry and Human Development* 2010; 41:371–386.
73. Haferkamp N, Eimler SC, Papadakis A-M, et al. Men Are from Mars, Women Are from Venus? Examining Gender Differences in Self-Presentation on Social Networking Sites. *Cyberpsychology, Behavior, and Social Networking* 2011; 15:91–98.
74. Rideout V. Measuring time spent with media: the Common Sense census of media use by US 8- to 18-year-olds. *Journal of Children and Media* 2016; 10:138–144.
75. Sampasa-Kanyinga H, Lewis RF. Frequent Use of Social Networking Sites Is Associated with Poor Psychological Functioning Among Children and Adolescents. *Cyberpsychology, Behavior and Social Networking* 2015; 18:380–385.
76. Twenge JM, Joiner TE, Rogers ML, et al. Increases in Depressive Symptoms, Suicide-Related Outcomes, and Suicide Rates Among U.S. Adolescents After 2010 and Links to Increased New Media Screen Time. *Clinical Psychological Science* 2018; 6:3–17.

77. Verduyn P, Lee DS, Park J, et al. Passive Facebook usage undermines affective well-being: Experimental and longitudinal evidence. *Journal of Experimental Psychology. General* 2015; 144:480–488.
78. Lee SY. How do people compare themselves with others on social network sites?: The case of Facebook. *Computers in Human Behavior* 2014; 32:253–260.
79. Dyl J, Kittler J, Phillips KA, et al. Body Dysmorphic Disorder and Other Clinically Significant Body Image Concerns in Adolescent Psychiatric Inpatients: Prevalence and Clinical Characteristics. *Child Psychiatry and Human Development* 2006; 36:369–382.
80. Asgeirsdottir BB, Gudjonsson GH, Sigurdsson JF, et al. Protective processes for depressed mood and anger among sexually abused adolescents: The importance of self-esteem. *Personality and Individual Differences* 2010; 49:402–407.
81. Gore S, Eckenrode J. (1996) Context and process in research on risk and resilience. In: Haggerty RJ, Garmezy N, Sherrod LR, et al., eds. *Stress, Risk, and Resilience in Children and Adolescents: Processes, Mechanisms, and Interventions*. Cambridge University Press.
82. Perrin A, Anderson M. Share of U.S. adults using social media, including Facebook, is mostly unchanged since 2018. <https://www.pewresearch.org/fact-tank/2019/04/10/share-of-u-s-adults-using-social-media-including-facebook-is-mostly-unchanged-since-2018/> (accessed May3 2019).
83. DeVito KM. (2019) The Youth in Iceland Model and Icelandic Adolescent Mental Health (unpublished doctoral dissertation). Teachers College, Columbia University, New York.

**Table 1** Frequencies of active and passive social media use for adolescent girls and boys

	Never		1x a month or less		1x a week		Few times a week		1x a day		2-5x a day		6x a day or more	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
<b>Active Social media use</b>														
How often do you send a private message, picture, video or chat on social media	9.3%	2.3%	5.3%	2.7%	3.8%	2.3%	13.2%	8.2%	9.5%	6.9%	21.1%	24.6%	37.9%	53.2%
How often do you send a private message, picture or a video that disappears after being seen	19.2%	7.1%	5.4%	2.8%	4.4%	2.5%	11.1%	6.9%	9.5%	7.7%	17.6%	22.9%	32.9%	50.1%
How often do you post a picture or a video from your life	45.3%	22.9%	14.9%	14.8%	6.9%	7.8%	9.2%	11.5%	6.7%	9.5%	7.6%	15.3%	9.4%	18.1%
<b>Passive social media use</b>														
How often do you look at your friends' profiles or social media accounts?	48.6%	40.1%	14.5%	13.1%	9.6%	10.9%	13.5%	17%	5.8%	8.2%	4.5%	7.1%	3.4%	3.7%
How often do you browse social media profiles or accounts of people that you do not know?	58.3%	46.8%	12.9%	12.2%	7.3%	8.2%	10%	14.5%	4.4%	7.3%	4.1%	7%	3%	4%
How often do you post other than pictures on social media, such as links, games, news or webpages	39.4%	44.7%	15.8%	19.7%	10.1%	8.5%	14.6%	10.9%	7.9%	6.5%	6.5%	5.6%	5.7%	4.1%

**Table 2** Spearman correlations between variables of interest.

	Depressed mood	Anxiety	Social media time	Active use	Passive use	Poor body image	Social comparison	Self-esteem	Offline peer support
Depressed mood	1	0.677***	0.202***	0.114***	0.116***	0.549***	0.275***	- 0.623***	- 0.255***
Anxiety		1	0.207***	0.141***	0.135***	0.539***	0.352***	- 0.570***	- 0.186***
Social media time			1	0.533***	0.345***	0.154***	0.195***	- 0.188***	0.119***
Active use				1	0.538***	0.059***	0.239***	- 0.035**	0.229***
Passive use					1	0.077***	0.244***	- 0.064***	0.098***
Poor body image						1	0.240***	- 0.726***	- 0.264***
Social comparison							1	- 0.259***	0.001
Self-esteem								1	0.303***
Offline peer support									1

\*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001

**Table 3** Hierarchical linear regression predicting symptoms of depressed mood, standardized coefficients.

	Model 1	Model 2	Model 3	Model 4	Model 5
Gender	0.239***	0.201***	0.209***	0.128***	0.053*
Family structure	-0.052***	-0.039***	-0.037***	-0.030***	-0.029**
Parental support	-0.354***	-0.342***	-0.339***	-0.058***	-0.057***
Relative deprivation	0.082***	0.090***	0.092***	0.029**	0.029**
Time on social media		0.153***	0.146***	0.053**	0.015
Active social media use			-0.046**	0,009	0.023
Passive social media use			0.086***	0.036***	0.014
Self-esteem				-0.472***	-0.471***
Offline peer support				-0.108***	-0.109***
Social comparison				0.071***	0.070***
Poor body image				0.101***	0.107***
Gender*Time on social media					0.093***
Gender*Passive social media use					0.045*
Gender*Active social media use					-0.034
Adjusted R <sup>2</sup>	0.210***	0.232***	0.237***	0.509***	0.511***

\*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001

**Table 4** Hierarchical linear regression predicting symptoms of anxiety, standardized coefficients.

	Model 1	Model 2	Model 3	Model 4	Model 5
Gender	0.338***	0.307***	0.315***	0.237***	0.187***
Family structure	-0.009	0.001	0.004	0.009	0.009
Parental support	-0.287***	-0.278***	-0.276***	-0.019	-0.019
Relative deprivation	0.113***	0.119***	0.122***	0.061***	0.062***
Time on social media		0.122***	0.108***	0.024**	-0.002
Active social media use			-0.040**	-0.002	-0.006
Passive social media use			0.098***	0.036***	0.044**
Self-esteem				-0.359***	-0.358***
Offline peer support				-0.098***	-0.099***
Social comparison				0.166***	0.165***
Poor body image				0.156***	0.156***
Gender*Time on social media					0.063*
Gender*Passive social media use					-0.016
Gender*Active social media use					0.018
Adjusted R <sup>2</sup>	0.227***	0.240***	0.247***	0.497***	0.498

\*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001