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## Social comparison on social networking sites

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Because of the rise of social networking sites (SNSs), social comparisons take place at an unprecedented rate and scale. There is a growing concern that these online social comparisons negatively impact people's subjective well-being (SWB). In this paper, we review research on (a) the antecedents of social comparisons on SNSs, (b) the consequences of social comparisons on SNSs for SWB and, (c) social comparison as a mechanism explaining (mediator) or affecting (moderator) the relationship between SNSs and SWB. The occurrence of social comparisons on SNSs depends on who uses the SNS and on how the SNS is being used with passive use in particular resulting in increased levels of social comparison. Moreover, social comparison on SNSs may occasionally result in an increase in SWB but typically negative effects are found as people tend to engage in contrasting upward social comparisons. Finally, several studies show that social comparison is a key mechanism explaining the relationship between use of SNSs and SWB and that users with a tendency to engage in social comparison are especially likely to be negatively impacted by SNSs. The dynamic, cyclical processes that result from this pattern of findings are discussed.

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Social networking sites (SNSs) have fundamentally changed the way people interact. Facebook is the largest SNS having no less than 2.5 billion monthly active users [1] but other SNSs such as Instagram (one billion [2]) and Twitter (330 million [3]) have vast user bases as well. These users spend a lot of time on SNSs with recent statistics

revealing that worldwide people spend on average more than 2 hours on SNSs each day [4]. The list of SNSs is long but each of these platforms have three common defining features [5]; they allow users to (a) create a personal profile, (b) generate a list of online connections, and (c) view and interact with a stream of frequently updated information which includes posts of one's online connections (e.g. Facebook's News Feed).

People have a fundamental need for social connection [6] and SNSs provide a wide range of tools which may fulfill this need. One might therefore expect that use of SNSs positively impacts subjective well-being (SWB). However, longitudinal [7,8], experimental [9–11], and meta-analytic studies [12,13\*\*] converge on the conclusion that SNSs have a small negative rather than positive effect overall on indicators of SWB. This implies that usage of SNSs not only instigates psychological processes which stimulate SWB but also processes that have a negative impact. Many scholars have pointed to online social comparison as a key mechanism underlying the detrimental impact of SNSs [14,15,16\*,17].

In this paper we review research examining the role of online social comparison in the context of the relationship between SNSs and SWB. We begin by first providing a brief explanation of the function and mechanisms underlying social comparison. We then review studies examining (a) the antecedents of social comparisons on SNSs, (b) the consequences of social comparisons on SNSs for SWB and, (c) social comparison as a mechanism explaining (mediator) or affecting (moderator) the relationship between SNSs and SWB.

### Social comparison: from an offline to an online context

Social comparison refers to the tendency of using other people as sources of information to determine how we are doing relative to others (ability comparison), or how we should behave, think, and feel (opinion comparison) [18]. These comparisons provide us with information about our own as well as other people's abilities, social standing, and performance, allowing us to navigate the social world smoothly. Furthermore, knowledge about other individuals and groups has the potential to satisfy basic human needs, such as the need for affiliation and esteem [18]. Social comparison is ubiquitous across cultures [19], is evident in young children [20], and

has been put forward as a core feature of human social evolution [21].

Central to the social comparison process are the selection of the comparison target (upward: superior other versus downward: inferior other) and the consequence of the comparison (assimilation versus contrast). Specifically, assimilation refers to the comparer's self-evaluation changing towards the comparison target, becoming more positive after upward comparison and more negative after downward comparison. Conversely, contrast refers to the comparer's self-evaluation changing away from the comparison target, becoming more negative after upward comparison and more positive after downward comparison. Although people also make non-diagnostic comparisons with irrelevant comparison targets [22], social comparisons are more likely when the comparison dimension is relevant to the self, and when the comparison target is similar to the self. Recent meta-analytic research shows that in offline contexts, individuals predominantly tend to compare to someone who outperforms them in a contrasting manner, resulting in lowered self-evaluations, envy and overall worsened mood [23\*\*].

SNSs provide a fertile ground for social comparisons to take place [15] as information about similar comparison targets is available at an unprecedented scale. Moreover, especially upward social comparisons are likely to occur as users of SNSs are more often confronted with the successes than the failures of their online connections [7]. This is partially due to SNSs making it easy to portray a rosy image of one's life. For example, many SNSs allow for asynchronous communication providing ample time to write a clever comment or for photo filtering allowing to further enhance the visual appeal of already carefully selected pictures. Obviously, before the rise of SNSs people also tried to impress others but SNSs have made this considerably simpler due to which people are now more often exposed to idealized images of others and share more often self-enhancing information themselves.

### Antecedents of social comparison on SNS

Two classes of predictors of social comparison on SNSs can be distinguished. First, the occurrence of social comparison depends on who uses SNSs. One research stream shows that the personality of users plays a key role with several studies revealing that neuroticism is positively related to upward social comparison and feelings of envy [24,25]. Moreover, users' motivations to engage with SNSs are relevant, with envy being related to using Facebook to gather information, seeking attention or passing time [25]. Finally, an increasing number of studies reveal that indicators of SWB may also be predictive of social comparison on SNSs [26]. Especially people suffering from depressive symptoms and related perceptions of low self-esteem are vulnerable to engaging in

damaging social comparisons on SNSs [27,28] which may further aggravate their mental health.

Second, the occurrence of social comparison depends on how SNSs are used. Ways of using SNSs can be divided in two categories: active and passive use [15,29]. Active usage pertains to activities that facilitate direct exchanges with others. This includes targeted one-on-one exchanges (e.g. sending a private message on Facebook) or broadcasting (e.g. posting a status update on Facebook). Passive usage refers to monitoring the online life of other users without engaging in direct exchanges with them (e.g. scrolling through news feeds or looking at other users' profiles). As such, while during active usage information is mainly produced, during passive usage information is mainly consumed. A wide range of studies indicate that passive consumption of information on SNSs results in upward comparisons and associated feelings of envy [14,30–34]. Consistently, meta-analytic evidence reveals a negative relationship between passive use of SNSs and indicators of SWB while active usage of SNSs may stimulate SWB [35\*].

It should be noted that a number of studies have questioned that passive consumption of positive information on SNSs predominantly results in damaging social comparisons [36,37]. The most well-known study in this regard was conducted by Kramer and colleagues [38] who showed that participants who were exposed to less positive (negative) words posted by their Facebook connections, subsequently posted less positive (negative) words themselves. They interpreted this result in terms of emotional contagion whereby positive (negative) emotions experienced by one person transfer to the interaction partner. Follow-up studies challenged this interpretation on methodological grounds demonstrating that the number of positive (negative) words posted or expressed is unrelated to people's experience of positive (negative) emotions [39\*,40]. Moreover, it has been argued that positive communication following exposure to positive news of others may reflect a self-enhancement strategy to deal with feelings of inferiority or envy [15,31,41\*]. For example, when being exposed to a beautiful holiday picture, one may post a similar picture oneself to deal with one's feelings of inferiority and envy. Such emotion regulatory attempts may then, in turn, initiate feelings of envy in others resulting in a self-enhancement envy spiral [31,41\*].

### Consequences of social comparison on SNS

Cross-sectional [42,43], longitudinal [30,44] and experimental [45] studies on social comparison on SNSs demonstrate that these comparisons typically result in decreases in SWB. Consistently, two recent meta-analyses [13\*\*,46] revealed that social comparison on SNSs in general (i.e. non-directional: collapsing across social comparison types) predicts a decrease in SWB with a small- to

medium-sized effect, while upward social comparisons predicted decreased SWB with a medium-sized effect.

However, a number of studies revealed that social comparisons on SNSs do not always result in declines in SWB. First of all, the comparison dimension matters as research showed that social comparison on SNSs is not associated with negative emotional consequences when the comparison is focused on opinions rather than ability [44]. Second, the position of the comparison target has consequences with research showing that downward (rather than upward) social comparison does not result in a decrease of SWB [47]. Third, the response to the comparison target matters with research showing that assimilation (rather than contrast) to an upward comparison target results in feelings of inspiration which has positive downstream consequences for SWB [48\*]. Similarly, research on subtypes of envy [49,50,51] has shown that so-called benign-envy (related to feelings of inspiration and a tendency to self-improve) positively impacts SWB while the opposite holds for malicious envy (related to feelings of inferiority and a tendency to harm the comparison target) but some authors challenge the functionality of this distinction between envy types [41\*,52].

These positive consequences may well be the exception rather than the rule, in the sense that exposure to the so-called success theatre on SNSs is more likely to elicit negative than positive emotional responses. This is consistent with the meta-analysis on online social comparison showing that these comparisons have in general a negative impact on SWB [13\*\*] and the meta-analysis on offline social comparison showing that people tend to engage in contrasting upward social comparisons [23\*\*]. Nevertheless, future research on the key components underlying the social comparison process on SNSs may further refine our understanding of the impact of social comparison on SWB. When conducting such studies, it is important to take into account that people may not readily admit feeling envy as reflected by divergent conclusions when relying on direct [36] and indirect [14,31] methods to assess the relative frequency of positive and negative emotions following exposure to positive content on SNSs.

### **Social comparison as an explanatory mechanism (mediator) or vulnerability factor (moderator)**

Several studies have directly examined whether social comparisons explain (mediate) the relationship between (subtypes of) SNS use and SWB. This should come as no surprise as the research described above clearly indicates that passive use of SNSs is predictive of online social comparison and that online social comparison most often negatively impacts indicators of SWB. A wide range of cross-sectional [33,34,53] and longitudinal studies across short [30] and long [8,54] timescales revealed that upward social comparisons indeed explain the negative impact of

passive use of SNSs on SWB. However, it should be noted that social comparison is not the only mechanism connecting SNSs to SWB. For example, several studies have shown that active use of SNSs increases social capital and associated feelings of social connectedness which, in turn, predict increases in SWB [55–57]. Moreover, information overload [58], procrastination [59], and displacement of face-to-face interactions [60] have all been proposed as additional explanatory mechanisms underlying the relation between SNSs and SWB. Future research is needed to examine how these other explanatory mechanisms relate to subtypes of SNS use and interact with online social comparison in creating an overall effect of SNSs on SWB.

Finally, a number of studies examined whether social comparison moderates the relation between SNSs and SWB. These studies suggest that social comparison acts as a vulnerability factor. For example, people who tend to compare themselves to others (versus people who do not tend to do so) experience stronger drops in self-esteem and increased levels of depression when viewing other users' profiles or browsing newsfeed on Facebook [61,62], as well as higher feelings of loneliness [63], and stronger drops in positive emotions after using Instagram [64]. This evidence further suggests that when exposure to content on SNSs results in social comparisons (as one would expect from people who have a tendency to compare themselves to others), SNS use typically results in declines in SWB. However, if people do not engage in social comparison processes, exposure to positive posts on SNS may not negatively impact their SWB and may occasionally even foster it.

### **Conclusion**

In this short review article we demonstrated that social comparison should be taken into account when explaining the relationship between SNSs and SWB. Social comparisons on SNSs may occasionally result in an increase of SWB by stimulating feelings of inspiration or motivation to self-improve. However, they typically negatively impact SWB due to the overly positive (rather than negative) content on SNSs, people's tendency to select upward (rather than downward) comparison targets and to react to these targets in a contrasting (rather than assimilating) manner. Research connecting low SWB to subsequent engagement in online social comparison suggests that the negative feelings that follow social comparison on SNSs may ironically cause people to engage in further damaging social comparisons, creating a vicious downward cycle. Moreover, as self-enhancement is an often adopted approach to deal with feelings of inferiority or envy, envious people may also post self-enhancing information on SNSs themselves. This content is then picked up by other users such that envy cycles may also spread across the SNS. A key challenge for future research is to develop interventions to break these cycles and

protect people from the damaging consequences of social comparisons on SNSs.

### Conflict of interest statement

Nothing declared.

### CRedit authorship contribution statement

**Philippe Verduyn:** Conceptualization, Investigation, Writing - original draft, Writing - review & editing. **Nino Gugushvili:** Conceptualization, Investigation, Writing - review & editing. **Karlijn Massar:** Conceptualization, Investigation, Writing - review & editing. **Karin Täht:** Conceptualization, Writing - review & editing. **Ethan Kross:** Conceptualization, Writing - review & editing.

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