Social comparison and envy on social media: A critical review

Adrian Meier

School of Business, Economics and Society, FAU Erlangen-Nuremberg, Germany

Benjamin K. Johnson

Department of Advertising, University of Florida, USA

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Corresponding author:

Adrian Meier, adrian.meier@fau.de

ORCIDs:

Adrian Meier: <https://orcid.org/0000-0002-8191-2962>

Benjamin K. Johnson: <https://orcid.org/0000-0003-0588-221X>

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Highlights

- Social media (SM) supposedly make social comparison, envy, and well-being worse
- This review finds mixed and inconsistent evidence for this claim
- Earlier studies show comparisons and envy are common on SM and linked to ill-being
- Recent studies find positive, person-specific, conditional, and reciprocal effects
- Specific causes, online/offline differences, and user agency remain open questions

Abstract

There is both public and scholarly concern that (passive) social media use decreases well-being by providing a fertile ground for harmful (upward) social comparison and envy. The present review critically summarizes evidence on this assumption. We first comprehensively synthesize existing evidence, including both prior reviews and the most recent publications (2019 to 2021). Results show that earlier research finds social comparison and envy to be common on social media and linked to lower well-being. Yet, increasingly, newer studies contradict this conclusion, finding positive links to well-being as well as heterogeneous, person-specific, conditional, and reverse or reciprocal effects. The review identifies four critical conceptual and methodological limitations of existing evidence, which offer new impulses for future research.

Keywords: social comparison, envy, well-being, social media, passive use, critical review

1. Introduction

Social media (SM) such as Facebook, Instagram, and TikTok continue to attract billions worldwide while concerns about their impact on users' well-being are unabated [1]. Recent overviews [2, 3, 4] of meta-analyses on this issue find overall small negative associations between social media use (SMU) and some, but not all, well-being indicators among adolescents [4] and young adults [2, 3]. Yet associations are heterogeneous and likely depend on numerous boundary conditions and mechanisms [3, 4]. Several reviews [5, 6, 7], plus Facebook's own research [8, 9], point to social comparison and envy as key mechanisms.

Social comparison is “the process of thinking about information about one or more other people in relation to the self” [10]. Comparisons represent a fundamental human cognition [11] occurring across cultures [12], helping humans navigate social groups by providing them with information about their own relative standing [13]. Despite these benefits, *upward comparisons*—with those who do better than oneself—have been identified as potentially problematic [14], especially on SM [7]. As users present a positively-biased version of themselves online [15], upward comparisons are assumed to be more frequent and harmful on SM [7]. They may particularly elicit *envy*, “the pain caused by the good fortune of others,” which can impair well-being [16, 17].

Whereas this negative view dominated research on SM upward comparison and envy in the 2010s, recent studies also point to positive outcomes such as inspiration [18, 19, 20]. More generally, authors [18, 20, 21, 22, 23]—including original proponents [6, 24]—have begun to question whether the effects of *passive SMU* (i.e., just browsing SM without interacting) are as detrimental as previously assumed [cf. 7] and whether “active” versus “passive” use is a useful dichotomy to explain well-being effects.

Our review seeks to advance this debate, first, with a synthesis of prior reviews and recent key studies, focused on 2019-2021. The goal is to provide both a comprehensive update and critical appraisal of the most relevant evidence. Note that we exclude studies solely investigating appearance comparison or body image because an up-to-date review of this literature appears in this special issue (see Vandenberg et al.). Instead, our review includes studies measuring all non-specific social comparisons and envy, which may be elicited by various self-presentations of people's work, leisure, travel, health, fitness, or appearance, among others. Second, and building on this evidence synthesis, we identify and critically discuss four major limitations of the literature, which point to crucial questions for future research.

2. State of the evidence

2.1. Reviews and meta-analyses

Research syntheses on SM social comparisons, envy, and well-being present a complex set of conclusions [5, 6, 7, 17, 25, 26, 27]. Current consensus is that social comparison and envy are frequent experiences for SM users, and both are associated with lower well-being, albeit depending on measurement. In a meta-analysis of $k = 22$ effects from 13 publications ($N = 11,199$) [26], Facebook social comparisons and well-being (e.g., affect, self-esteem, life satisfaction) showed a small to moderate negative association ($r = -.20$, 95% CI $[-.29, -.11]$). In a second meta-analysis of Facebook social comparisons and depressive symptoms [27], general social comparisons showed a small to moderate positive association ($r = .23$, 95% CI $[.12, .34]$, $k = 8$ effects from 5 publications, $N = 1,715$), and upward comparisons showed a moderate positive association with depressive symptoms ($r = .33$, 95% CI $[.20, .47]$, $k = 6$ effects from 5 publications, $N = 2,298$).

Reviews disagree, however, about severity and implications. While most interpret the associations to suggest detrimental *effects* of SM on well-being transmitted by social comparison and envy (6, 7, 25, 26, 27), others are more cautious, emphasizing complexity and limitations in current findings (5, 17). In the following, we complement this overview with key findings from recent studies, most not included in prior reviews.

2.2. Positive correlates of social comparison and envy

In contrast to earlier SM research that assumed social comparison and envy to be entirely negative experiences [7], multiple recent studies suggest they can also be positive [18, 20, 28]. This is explained through comparisons focusing either on *assimilation* (similarities with the target) or *contrast* (differences with the target). Whereas upward assimilation and downward contrast are expected to improve well-being, upward contrast and downward assimilation are expected to decrease it [14]. Similarly, envy is sometimes distinguished into a more assimilative, beneficial emotion (*benign envy*) and a more contrastive, harmful one (*malicious envy*) [16]. Most research so far assumes that SM are particularly harmful by triggering upward contrast rather than assimilation, and malicious rather than benign envy [7, 17]. Upward contrast has also been meta-analytically identified as humans' default social comparison reaction—at least in experimental paradigms [14]. Whether this laboratory finding generalizes to peoples' face-to-face or SM comparisons in daily life remains largely unclear.

Intriguingly, recent evidence suggests assimilative experiences are quite common for SM users: For instance, two experiments [18] and three surveys [29, 30, 31] observe benign envy to be more common than malicious envy on SM. They also find *inspiration*—a positive motivational outcome of assimilative upward comparison—to be frequently associated with SMU. Another survey corroborates upward comparison on Facebook as more strongly associated

with assimilative than contrastive emotions [28]. In a three-wave panel survey among adolescents, higher self-reported exposure to positively-biased SM content was associated with increased inspiration four months later, but not increased envy [15]. However, higher SM social comparison was associated with higher envy four months later, suggesting complex effects. The positive side of SM comparisons was also apparent during the COVID-19 pandemic: in a three-wave panel survey during lockdown in Italy, online social comparison predicted improvement in anxiety, stress, loneliness, and life satisfaction levels over time, likely because SM granted opportunities for *lateral* or *downward comparisons*, seeing that others were suffering similarly or worse from lockdowns [32].

Overall, and consistent with some earlier research [19, 33], recent studies indicate that positive reactions to passive SMU are plausible and not uncommon. Yet most of these studies relied on small cross-sectional surveys and the occasional experiment. In the following, we thus review key studies employing more advanced methods and larger samples.

2.3. Heterogeneous, person-specific, and conditional effects

Recent publications used idiographic $N = 1$ methods to study passive SMU and well-being [34, 35], or envy and inspiration [20]. These studies offer new insights into person-specific effects of SMU on well-being, that is, for how many users the effects of SMU are negative, positive, or null. Experience sampling methods (ESM) find that only 10-20% of Dutch adolescents felt worse after passive SMU, with the rest either feeling better or the same [34]. Malicious envy and inspiration each occurred in a third of passive SMU episodes, suggesting similar prevalence [20].

A prior review concluded that “positive consequences may well be the exception rather than the rule” on SM [7]. Together, the person-specific evidence and the positive correlates

described above challenge this widely held view of “negative social comparison” and malicious envy as the predominant reactions on SM. Rather, effects are often conditioned on the SM used [34, 36, but see 37], SM content [8, 18, 38, 39], gender and age [8, 40], and culture [8, 12].

2.4. Longitudinal evidence

In addition to the person-specific studies [20, 34, 35], several new publications have investigated the effects of SMU on social comparison, envy, and well-being using longitudinal methods, such as panel surveys or ESM. Earlier studies [4, 6, 7] found negative longitudinal associations of (passive) SMU with well-being, and that upward comparison was associated negatively with well-being and positively with envy [see also 36, 37, 41].

In contrast, several recent studies point to reverse or reciprocal effects between SMU, social comparison, envy, and well-being [15, 40, 42, 43, 44]. For instance, an ESM study [42] observed that while passive SMU and depressive symptoms were correlated within-episode (i.e., a two-hour window), depressive symptoms predicted passive SMU over time but not vice versa. A two-wave survey found depressive symptoms to predict passive Facebook use and envy one year later, but no reciprocity [43]. Another found time on Facebook increased depressive symptoms a year later, which increased time on Facebook another year later [44]. A three-wave panel survey further found that SM social comparison and inspiration predicted exposure to attractive appearances on SM four months later, with minimal reverse effects of exposure [15]. Other panel and ESM studies, however, mostly observe no reverse or reciprocal effects [32, 36, 37, 45]. Overall, the longitudinal evidence on (passive) SMU, social comparison, envy, and well-being is conflicting. It suggests a complex interplay between user experiences across short and long timeframes.

2.5. International evidence from industry research

Beyond independent academic research, SM companies themselves increasingly investigate SM social comparison and well-being. A recent study combined survey responses with trace data from nearly 38,000 Facebook users across 18 countries [8]. Results indicate that social comparison is an occasional experience on Facebook. It is more frequent among users who are younger, have more friends, spend more time on the application and especially user profiles, and those who encounter more social, highly-liked, and positive content in their feeds [8].

However, country was the strongest predictor of comparison frequency on Facebook, with a more pronounced effect than all other factors combined. Facebook comparisons were more frequent in Eastern (more collectivist) than Western (more individualist) countries [8]. Country also interacted with gender: men in most Eastern (e.g., India) and women in several Western (e.g., UK, USA) countries reported more frequent comparison, suggesting a crucial role of both culture and gender [12]. Additionally, almost a quarter of all participants viewed a post that made them feel worse in comparison within the last two weeks, and they reported a mix of affective reactions [8].

Internal research by Meta Platforms, leaked to the public in 2021, provides additional insights into Instagram use [1, 9]. Multiple studies, including an international cross-sectional survey ($N > 22,000$) and in-depth interviews with adolescents, showed that teens perceived social comparison via Instagram as a key issue for their well-being. However, they also perceived their Instagram use to be a net benefit. These findings overall underline the importance but also the heterogeneous and conditional nature of SM social comparison effects. Although industry research should be interpreted with caution, the findings converge with independent academic studies.

3. Limitations and open questions

The evidence reviewed above has crucial limitations which inform our overarching questions to future research: (a) What are the *differences* between online and offline social comparison and envy? (b) What, exactly, *causes* social comparison and envy on SM, and their well-being effects? (c) How much does user *agency* matter? (d) What *methodological issues* need overcome?

3.1. Online and offline comparisons

Although extensive research shows that comparisons and envy occur on SM, there is insufficient demonstration that SM *change* anything about them. First, most studies simply replicate comparison and envy reactions on SM where predictors and outcomes “mirror findings from the offline context” [17], which does not show how SM are supposedly more harmful [7]. Indeed, while a positivity bias is well-documented for SM self-presentations [15], so it is for human communication in general [46]. Second, the claim that “social comparisons take place at an unprecedented rate and scale” due to SM [7] lacks evidence. Initial studies show online social comparison produces more short-term negative affect, yet offline comparison may be more prevalent and consequential for well-being [37, 47]. That SM have changed the frequency, intensity, direction, or foci of social comparison and envy—compared to general human experience—is plausible but remains largely untested. Future studies need to include non-mediated benchmarks [36, 47] and isolate SM’s unique characteristics to make this case.

3.2. Causes of social comparison and envy

Existing research remains vague on what exactly about SM triggers social comparison and envy, or what supposedly *causes* them to be more frequent, intense, or harmful. Through the lens of computer-mediated communication [2], social comparison and envy could be shaped by ubiquitous mobile access [36]; the sheer amount of SMU across applications [35, 37];

characteristics and culture of individual apps [9, 30]; design features signaling social status (e.g., likes) [48]; whether one interacts with strangers, influencers, or likeminded friends [8, 28, 31, 33, 41, 49]; characteristics of SM messages, such as content (e.g., fitspiration vs. travel) or modality (e.g., visual vs. textual), or their algorithmic ranking [17, 18, 22, 38, 39]—or any combination of these factors.

Given this complexity of potential causes, a simple dichotomization into “active” and “passive” SMU seems obsolete. Research increasingly suggests that effects of passive and active SMU are undifferentiated [23, 35]. Authors further challenge the utility of the active/passive dichotomy on conceptual and operational grounds [6, 22, 23, 24, 50]. In addition, and as noted by others [6, 7], SMU may be linked to well-being via alternative mechanisms, particularly emotional contagion [51]. Overall, future research will need to pinpoint potentially multifaceted causes for SM comparisons and envy, and their unique effects on well-being.

3.3. User agency

Almost all prior research has ignored the role of users’ *agency*, that is, the various forms of choice and control individuals are able to exert over their SM experiences. Instead, studies (implicitly) follow a dose-response model where SM users are mere recipients of content. Yet, experiments and surveys from the selective exposure paradigm indicate that SM comparisons are driven by motivations and moods [52, 53]. Users are, for instance, motivated to obtain positive outcomes by gravitating towards inspiring content or (un)following accounts [8, 15, 30, 53]. Eye-tracking research indicates users pay selective attention during passive SMU, hence partially modulating their exposure [21, 22]. However, agency on SM is clearly constrained by ranking algorithms and others’ posts and feedback [8, 13]. Agency is also no panacea against inadvertent negative effects of SMU [7, 54]. Still, identifying design interventions that increase users’

control over exposure, comparison and envy reactions, or the outcomes of unintentional comparisons, will enhance both our knowledge of these processes and users' experiences [48, 49].

3.4. Methodological issues

Beyond these largely conceptual challenges, we face methodological ones [17, 52, 55]. Self-report measures of SM social comparison often fail to specify comparison direction (upward vs. downward) and focus (assimilation vs. contrast), despite their differential outcomes [14]. Various studies conflate upward comparison with negative outcomes, inflating negative associations with well-being [52]. To avoid such confirmation bias in research design, measures must instead clearly separate SM comparison direction from comparison focus and outcomes [18, 55]. Furthermore, studies often adapt social comparison orientation scales—measures of immutable traits—to SM contexts. These are then improperly positioned as mediators or outcomes [55], when state measures would be necessary instead [18]. Similarly, envy scales differ in whether they include a social comparison component or focus on affective or motivational aspects of the emotion [17]. This incoherent measurement reflects psychology's dissensus on the nature of envy [16]. Beyond choosing or developing less biased self-report scales, future SM research should also use behavioral measures of SMU, selective exposure, and selective attention [8, 22, 52].

4. Conclusion

Do the highlight reels on social media make us feel worse due to upward comparison and envy? This question has received considerable attention and is regarded crucial by SM companies, yet this evidence review provides a mixed answer. Earlier studies and initial small meta-analyses confirmed that social comparison and envy were common on SM and linked to

lower well-being. Yet, recent studies increasingly contest this position and point to effects of (passive) SMU, social comparison, or envy on well-being as (a) positive; (b) heterogeneous and person-specific; (c) reverse or reciprocal; and (d) conditioned, e.g., on culture, gender, and SM content. In addition, studies leave unanswered (e) whether these effects are different on SM or only replicate human psychology in a technological context; (f) what exactly about SM causes effects; (g) how users' agency modulates effects; and (h) whether effects replicate when less biased measurements are used. Given contradictory findings and limitations, we cannot conclude that SM are indeed “worse”—we simply do not know yet. In any case, recommending users to just “stop comparing” on SM seems futile, given how deeply this experience is part of the human condition. Instead, efforts of researchers, companies, and users alike can be directed towards identifying ways in which SM design and usage practices can foster positive, inspiring comparisons and reduce negative ones [8, 49, 56, 57].

References and recommended reading

Papers of particular interest, published within the period of review, are highlighted as:

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This review presents the state of research on SM social comparison up until 2020. It can be read side by side with our review to get a full picture of the current evidence base and (dis)agreements in this field.

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An up-to-date, interdisciplinary, and nuanced review on the role of envy in SM environments. It concludes there is no evidence indicating envy is considerably different on SM than outside of this technological context. The review also looks beyond well-being outcomes, discussing, for instance, the importance of SM envy for advertising effects (e.g., purchase intentions).

Two experiments test whether viewing more vs. less visually optimized nature/travel Instagram posts triggers upward comparison, envy, and inspiration. Results overall suggest that more optimized pictures elicit stronger upward comparison, benign and malicious envy, but also inspiration. Upward comparison and benign (but not malicious) envy were linked to higher inspiration, which was accompanied by increased well-being.

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