

AMENDED Exhibit 382

PLAINTIFFS' OMNIBUS OPPOSITION TO DEFENDANTS' MOTIONS FOR SUMMARY JUDGMENT

Case No.: 4:22-md-03047-YGR

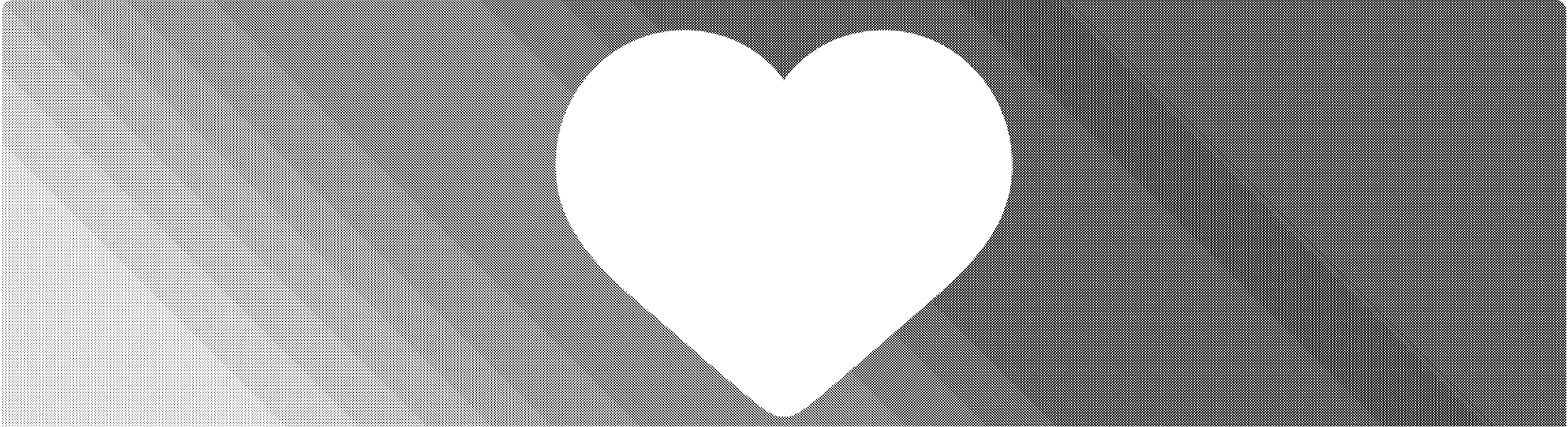
MDL No. 3047

In Re: Social Media Adolescent Addiction/Personal Injury Products Liability Litigation

Likes and Social Comparison on Instagram

Justin Cheng · Last edited October 27, 2020 · 12 minute read

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Likes and Social Comparison on Instagram

Justin Cheng and Moira Burke

- On average, a person will receive about 5% as many Likes on their own posts as the posts they see in their Feeds.
- Seeing more posts with high Like counts (10+ for friends, 10K+ for verified accounts) is associated with feeling worse: more negative and less positive social comparison.
- Receiving more Likes from others is associated with feeling better: less negative social comparison and more positive social comparison.
- Like counts are likely more strongly associated with negative comparison than comment counts.
- These findings suggest that hiding Like counts can reduce negative outcomes of social comparison, corroborating research on Project Daisy.

Introduction

In past research, Like and comment counts have been cited as a potential trigger of social comparison. In particular, a “Like paradox” (i.e., that people’s friends tend to receive more Likes than they do) may lead people to overestimate their friends’ popularity and thus feel worse. Nonetheless, Likes (and comments) are also a fundamental part of relationship maintenance on social media and have positive outcomes. This note examines the relationship between social comparison and both seeing and receiving Likes (and comments) on Instagram.

As in previous notes on social comparison, social comparison was measured with a nine-country survey involving over 100,000 people, and then combined this survey data with data about what people posted or saw on Instagram. All results reported are cross-sectional.

Seeing Likes and Comments on Others’ Posts

How often do people see posts with many Likes?

A majority of people in our sample saw posts with at least 1000 Likes in their Feed, with about a 1 in 4 posts receiving over 10,000 Likes (Fig 1). [1]

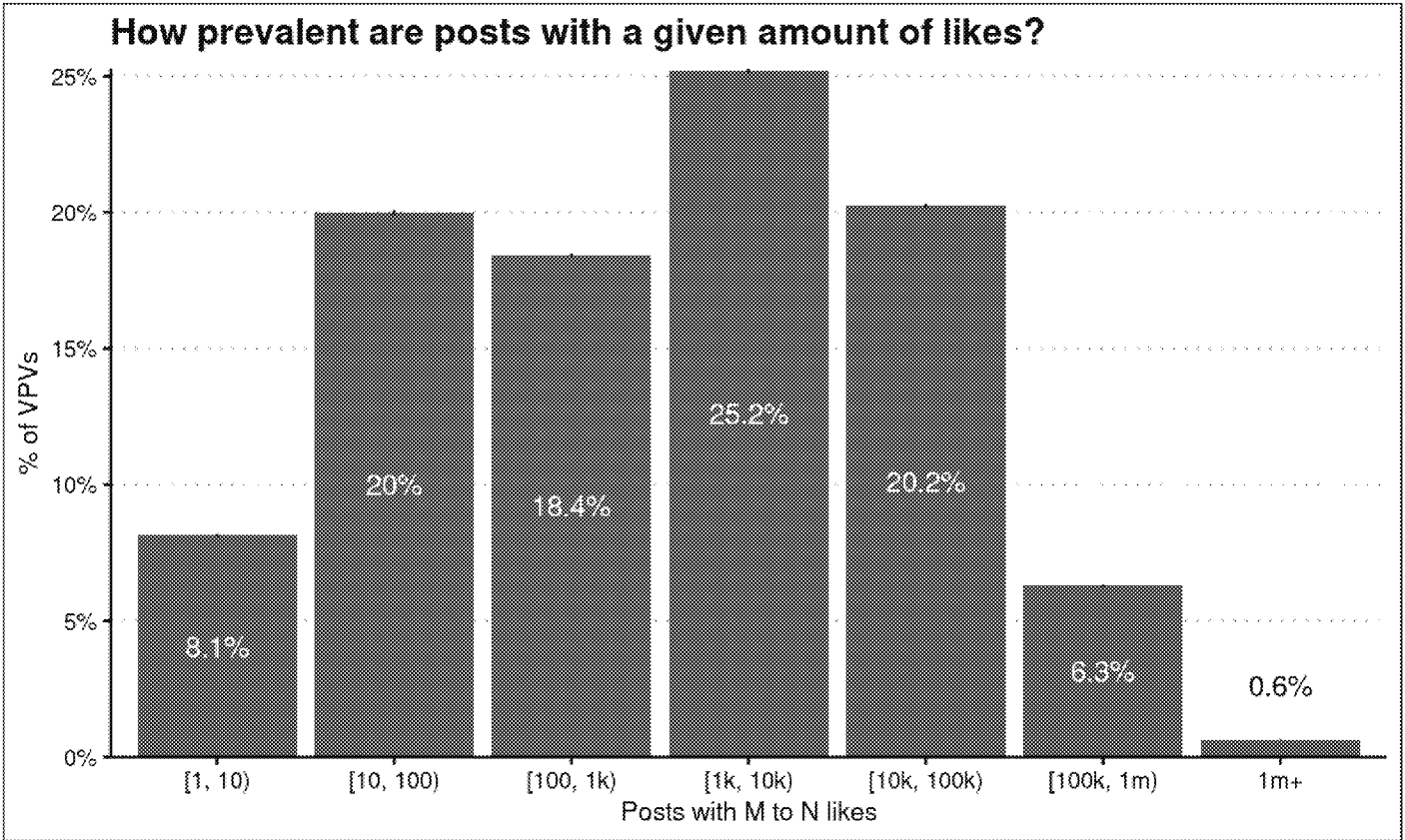


Figure 1.On average, more than half of posts in a person’s Feed has at least 1000 Likes.

How does seeing posts with many Likes relate to social comparison?

Seeing more posts with high Like counts (1K+) was associated with feeling worse: more negative social comparison and less positive social comparison. Fig. 2 shows the overall effect in our sample, where seeing more posts with 10K or more likes was associated with more negative social comparison and less positive social comparison.

Still, these thresholds vary by demographic group, so we conducted analyses among just adults, teens, women, men, and teen girls. Within every examined demographic group, seeing more posts with extreme Like counts (1M+) was associated with feeling worse: more negative social comparison and less positive social comparison (see ANP for more details). A 1 percentage point increase in the proportion of posts with 1M+ likes seen (e.g., 0.5% → 1.5%) was associated with a 0.035 standard-deviation in negative comparison (on a five-point scale) and a 0.009 standard-deviation decrease in positive comparison ($p < 0.001$).

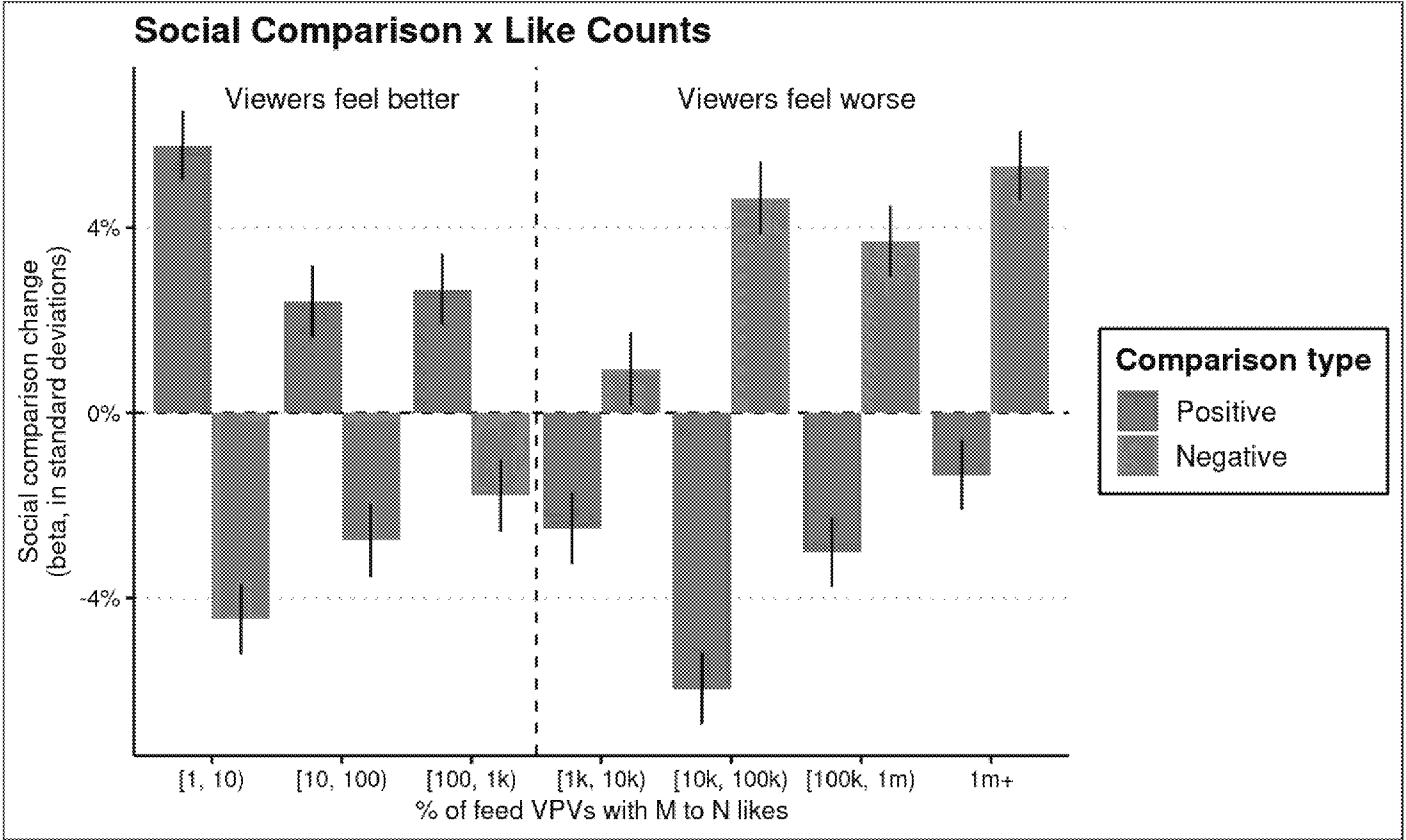


Figure 2. Seeing posts with “normal” Like counts (under 1000) is generally associated with feeling better (more positive and less negative social comparison). But seeing posts with 1,000 or more Likes is associated with feeling worse (more negative and less positive comparison).

Seeing more posts with “normal” Like counts (<1000) was associated with feeling better: more positive and less negative social comparison. With lower Like counts, we observe the opposite from seeing more posts with high Like counts. Still, does this mean that seeing posts with fewer than 100 Likes is good?

The effect of Like counts differed depending on who posted the content. Separating by friend content vs. verified account content (Fig 3), the inflection points where the observed associations flip in direction were at <10 likes for friend content and <10K likes for verified account content (Fig. 3, see ANP for more details). In other words, the greater the proportion of seen friends’ posts that have 10 or more Likes, the worse (more negative and less positive comparison) people felt; the greater the proportion of seen verified account posts that have 10K or more Likes, the worse people felt. For example, a 1 percentage point increase in the percent of friends’ posts seen that have 10-99 Likes (i.e., 57% → 58%) was associated with a 0.0016

standard-deviation increase in negative comparison and a 0.0017 standard-deviation decrease in positive comparison ($p < 0.001$).

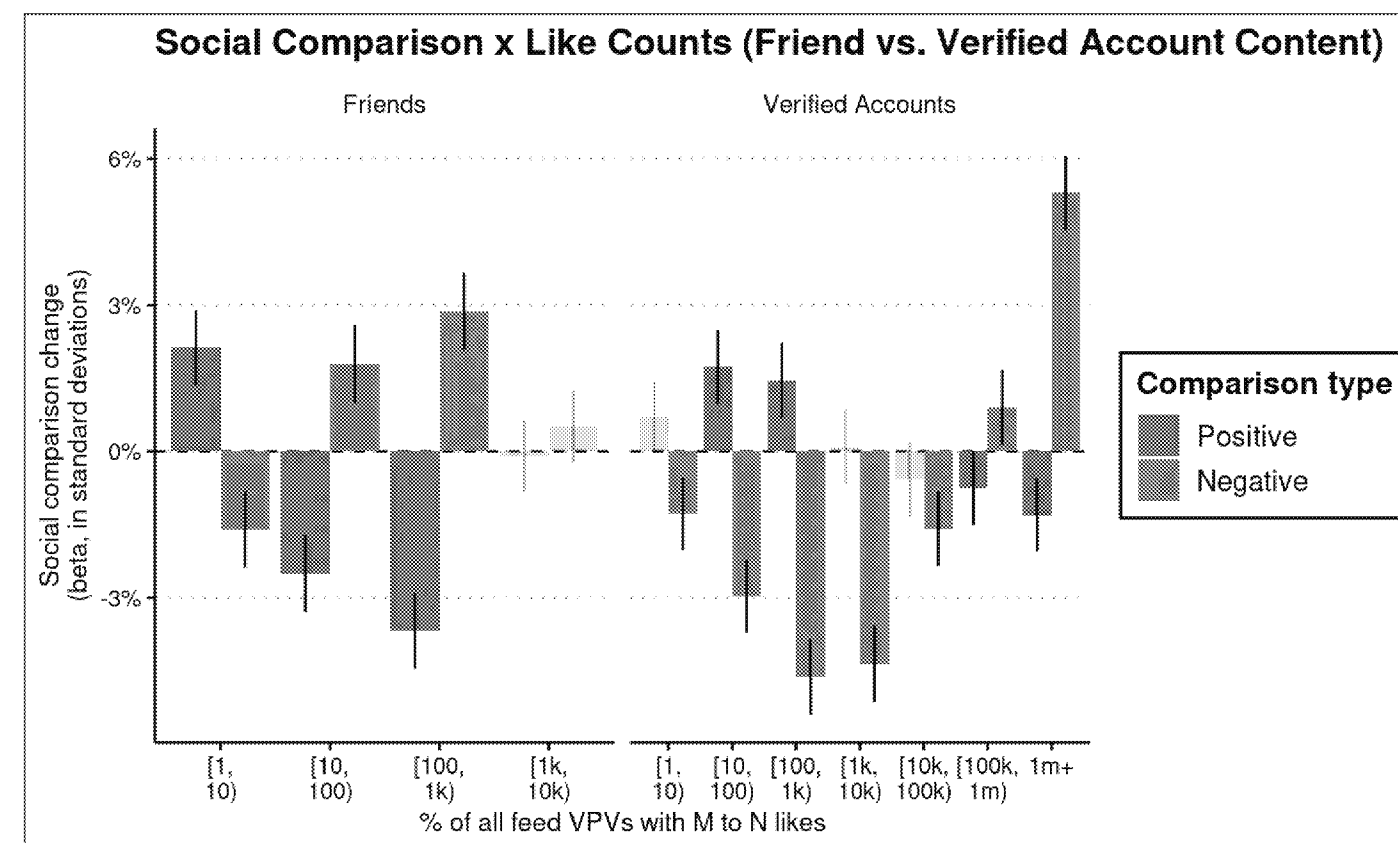


Figure 3. People have different thresholds for friend content (10+ Likes) vs. verified account content (10K+ Likes). People begin to feel worse when they see more friends' posts get 10 or more Likes, or when they see more verified account posts get 10K or more Likes.

While indicative, these results may reflect several confounding factors: (1) the content of posts that receive many Likes may be more likely to be associated with social comparison; (2) that following people who have more followers is likely associated with seeing more posts with many Likes; or that (3) receiving Likes is correlated with receiving comments, so it could be that comments play a significant role as well. We examine (3) later in this note. However, (1) and (2) remain future work.

How does seeing posts with many comments relate to social comparison?

Seeing posts with high comment counts was also associated with feeling worse. People who saw a greater proportion of posts in Feed with 10 or more comments felt more negative comparison and less positive comparison (Fig. 4). A 1 percentage point increase in the percentage of posts with 10-99 comments seen (i.e., 28% → 29%) was associated with a 0.0019 standard-deviation increase in negative comparison and a 0.0027 standard-deviation decrease in positive comparison ($p < 0.001$).

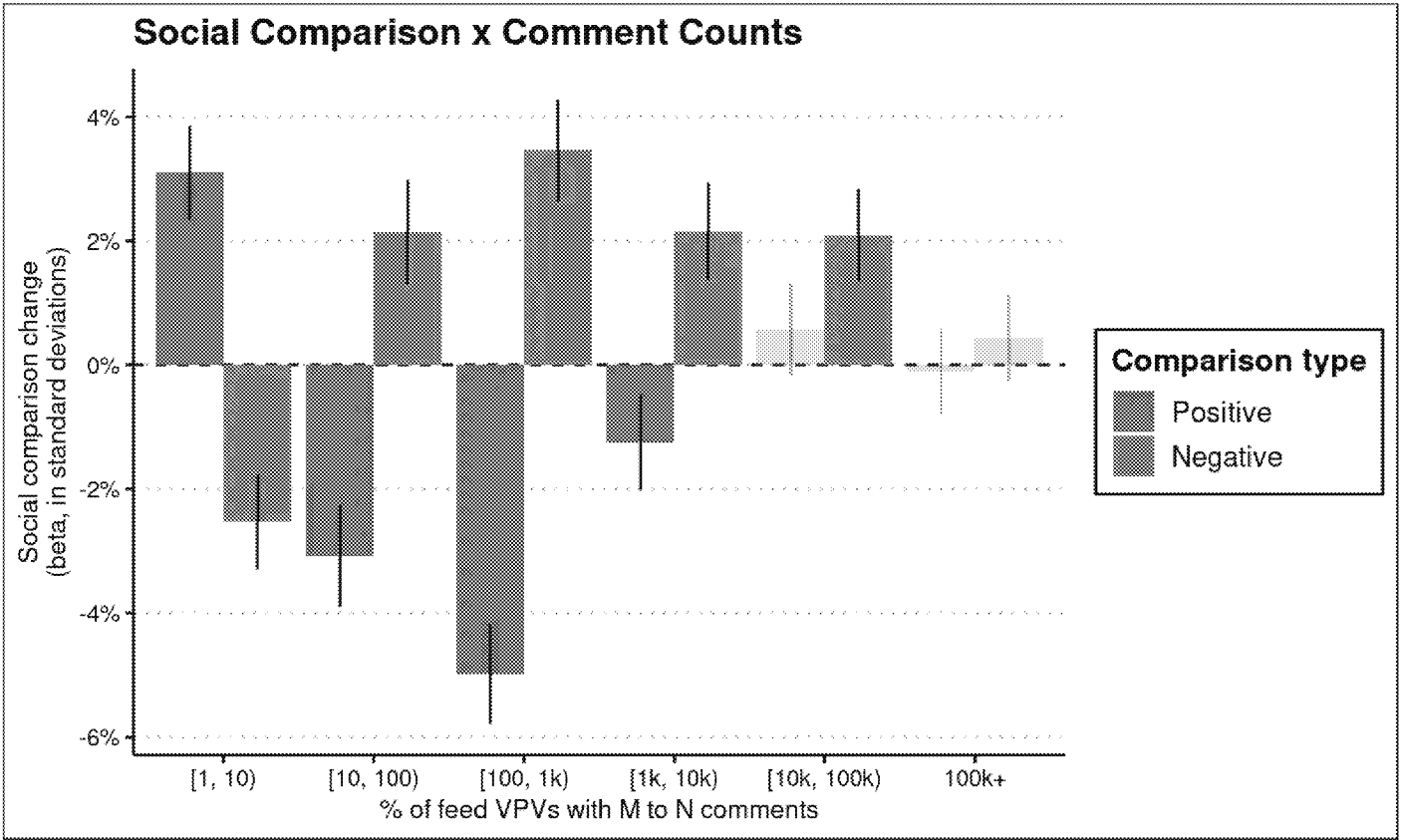


Figure 4. Seeing posts with higher comment counts (10 or more) was associated with feeling worse (more negative and less positive social comparison).

Like counts vs. comment counts

Though Like counts and comment counts were associated with social comparison, the two quantities are correlated. As such, high comment counts may be problematic only because posts with high comment counts also have high Like counts (or vice versa).

To understand if Like counts have worse effects on social comparison than comment counts (or vice versa), we use matching to compare (1) if among people who saw posts with similar Like counts, those who saw posts with more comments feel more negative comparison than those who saw posts with fewer comments, and (2) if among people who saw posts with similar comment counts, those who saw posts with more Likes feel more negative comparison than those who saw posts with fewer Likes. [2]

Like counts were likely more strongly associated with negative comparison than comment counts. The matching analyses suggest that all else equal, people who saw posts with more comments on average felt less negative social comparison, and that people who saw posts with more Likes on average felt more negative social comparison.

We can also see evidence of this in Fig. 5, which shows the mean levels of positive and negative social comparison experienced by people who saw posts with average Like counts above or below the median among all participants or average comment counts above or below the median among all participants.

- For negative comparison (Fig. 5, left), among people who saw posts with Like counts below the median, those who also saw comment counts below the median experience more negative social comparison than those who saw comment counts above the median. Still, these people experience less negative social comparison than people who saw posts with Like counts above the median, where comment counts had less of an effect on negative comparison. In other words, higher Like counts were associated with more negative comparison regardless of comment count, while higher comment counts were associated with less negative comparison in the case of lower Like counts.
- For positive comparison (Fig. 5, right), higher Like counts were associated with less positive comparison when comment counts are higher, while higher comment counts were associated with more positive comparison regardless of Like count.

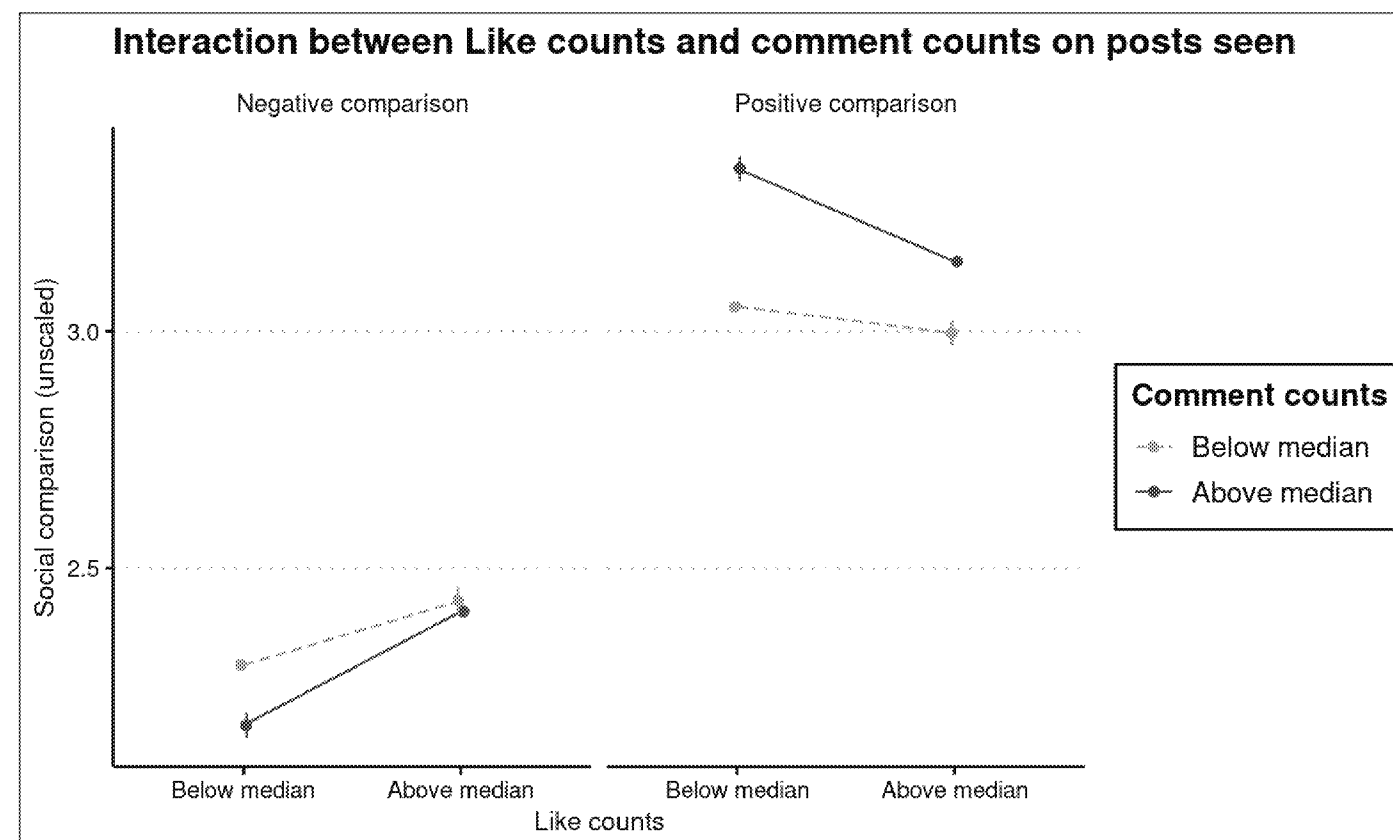


Figure 5. Higher Like counts are associated with more negative comparison regardless of comment count, while higher comment counts are associated with less negative comparison in the case of lower Like counts.

Overall, the matching analyses and Fig. 5 both suggest that on average, people who saw posts with high Like counts and low comment counts felt worse (i.e., experience the most negative social comparison), and those who saw posts with low Like counts and high comment counts felt better (i.e., experience the least negative social comparison).

Still, these analyses do not account for differences in content: posts with more comments and fewer Likes may also be posts which were less likely to make people feel worse about themselves. Experiments which involve hiding either Like counts or comment counts (or both) would also better quantify the relative importance of either.

Receiving Likes and Comments on Your Own Posts

How many likes do people’s posts receive?

Among people that responded to the survey, more than half of a person’s posts received 10 to 100 Likes in the 7 days following, while 7.5% of posts received no Likes (Fig 6).

Notably, the average post a person made received about 5% of the Likes of the average post a person saw in their Feed.

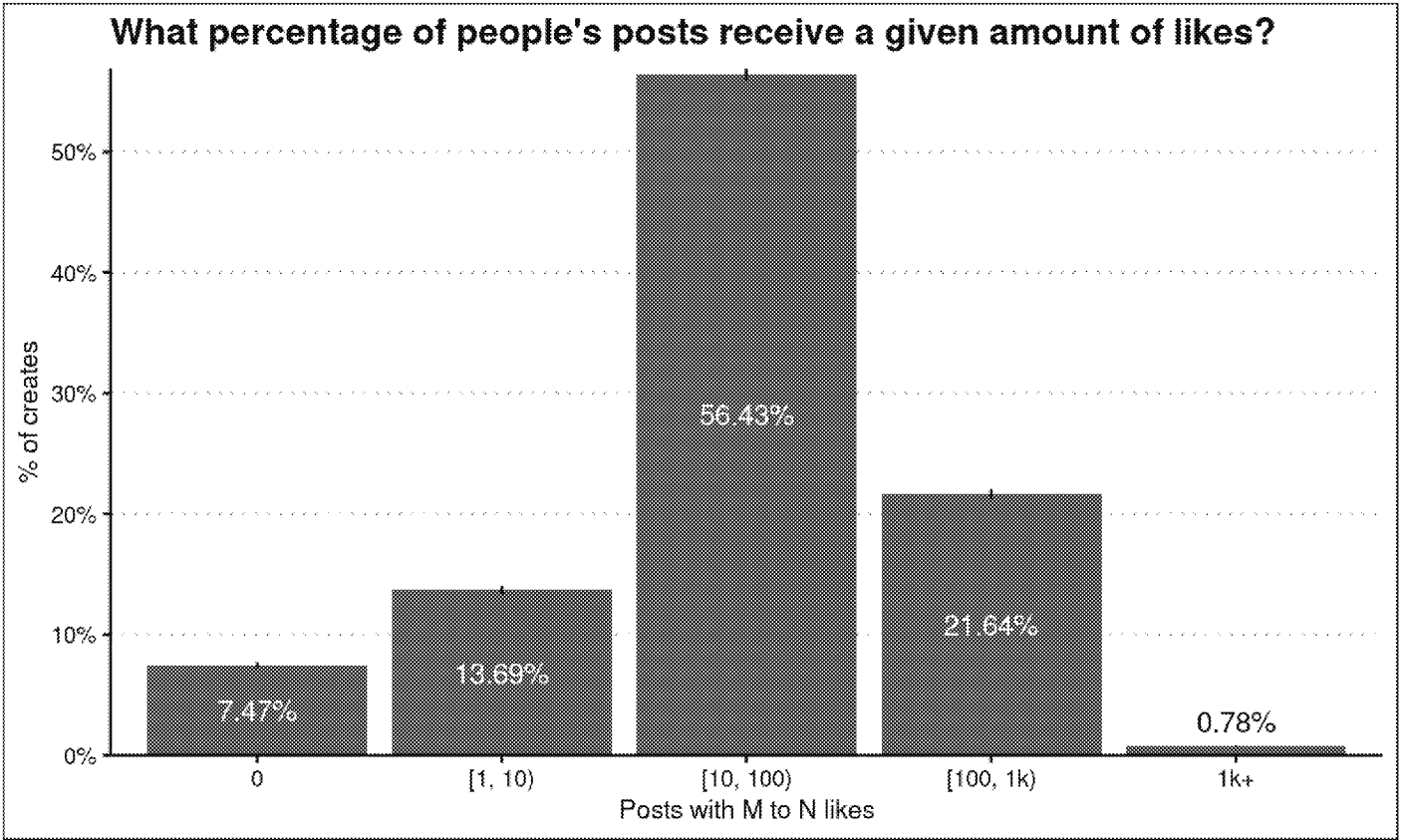


Figure 6. A majority of people’s posts received 10 to 99 Likes; less than 1 in 100 posts received more than 1000 Likes. This means that people receive about 5% as many Likes on their own posts as the posts they see in Feed (see Fig. 1).

How does receiving Likes relate to social comparison?

Overall, receiving more Likes was associated with feeling better (i.e., less negative social comparison). In line with previous findings that Likes serve as social cues of acceptance, people who received more Likes reported less negative comparison ($p < 0.05$) and more positive comparison ($p < 0.05$), after controlling for the number of posts that the person makes and the number of followers that a person has.

Notably, the association between receiving Likes and negative comparison was stronger among people who post more ($p < 0.01$). In other words, people who posted more also benefited more from receiving more Likes from others.

Receiving no Likes was associated with feeling worse (i.e., more negative comparison). People with a larger percentage of posts that received no Likes reported more negative comparison ($p < 0.001$). This included people who created and then deleted posts after a certain amount of time if no one had liked the photo yet.

Nonetheless, these findings are not entirely consistent. As Fig. 7 shows, people with more posts that received 1–99 Likes reported less negative social comparison. However, people who had more posts with 100–999 Likes reported *more* negative comparison. The trend reverses again for posts receiving 1000 or more Likes.

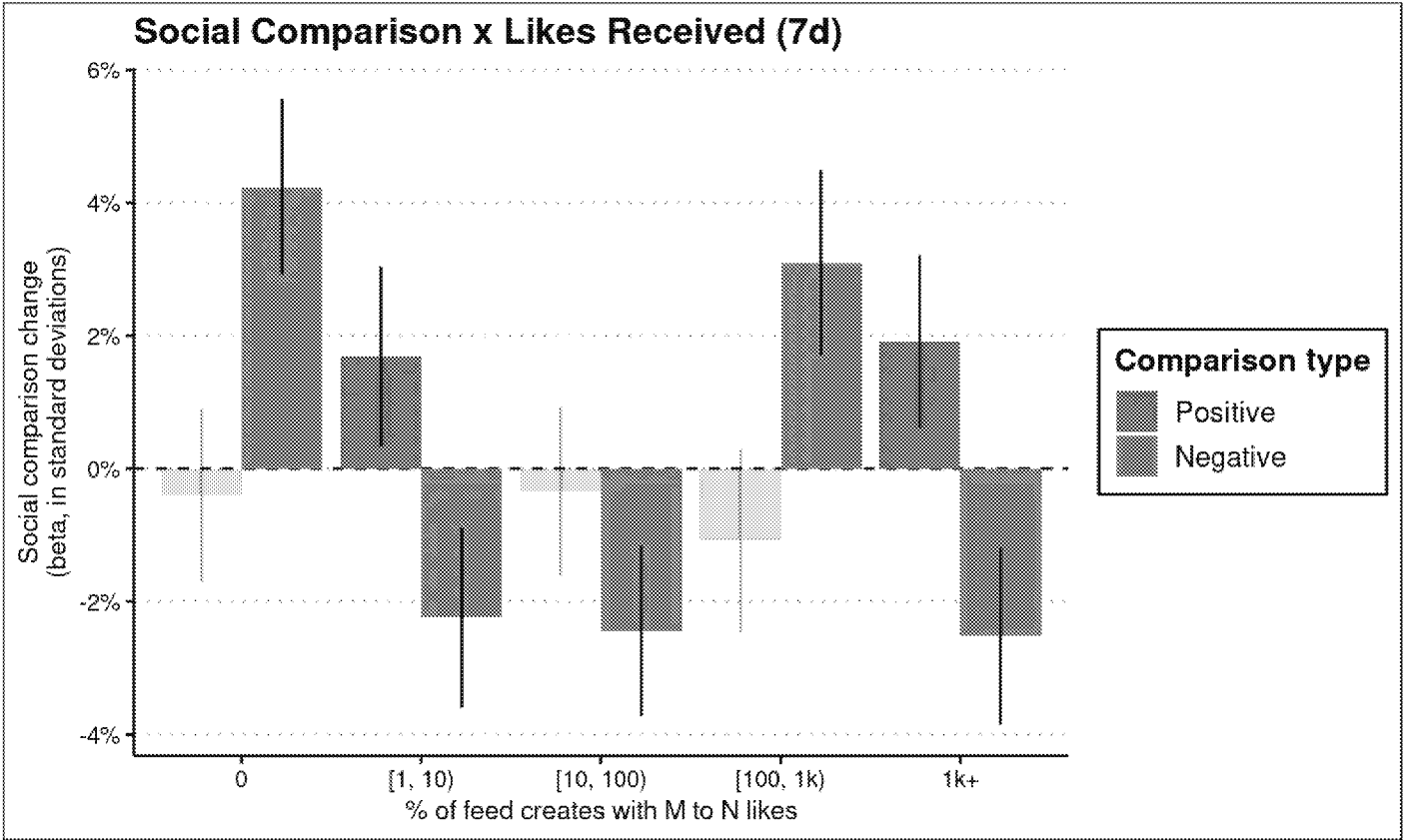


Figure 7. People who had a larger percentage of posts that received no Likes reported more negative comparison. People with a larger percentage of posts that received between 1–99 or 1000+ Likes tend to report less negative comparison. However, people with a larger percentage of posts that receive 100–999 Likes reported more negative comparison.

Why is this the case? There are several factors to consider:

- This overall trend appears to primarily reflect women’s experiences – receiving Likes was more weakly associated with social comparison among men (Fig 8).
- This effect is also moderated by how many Likes a person received on average – the association at 100–999 Likes was not significant among women who received more than 200 Likes per post on average.
- There could be a selection bias. Photos that get 100 or more likes were more likely to contain people (45% vs. 38%) and faces (40% vs. 32%), so the negative association

between 100–999 Likes may simply reflect the types of people who posted more photos of themselves.

- If one gets a very large number of Likes, the feeling of receiving significant attention from many others may outweigh all these other factors.
- Differences in how Feed ranking treated content with certain ranges of Likes may also have had an effect.

Overall, understanding this trend remains future work.

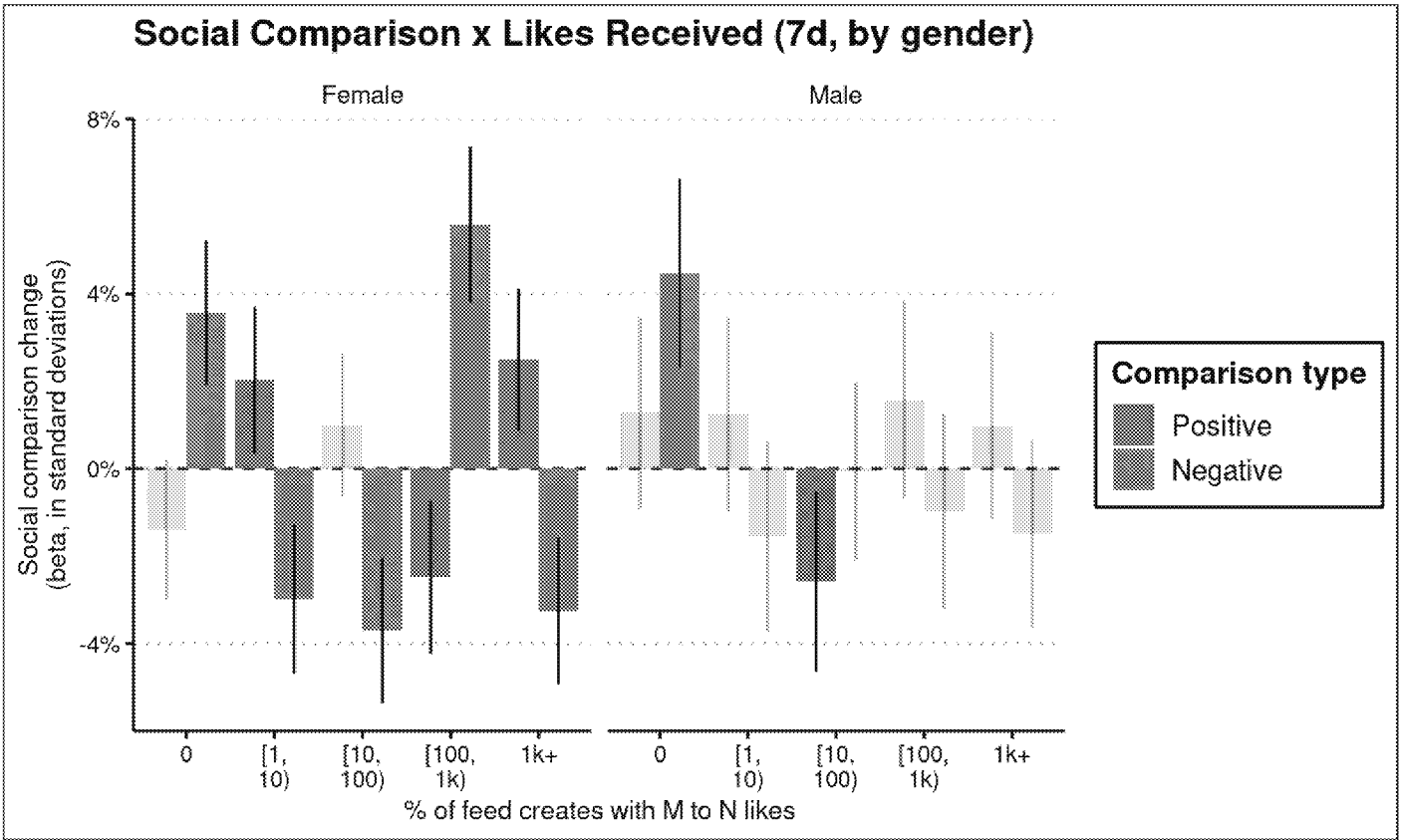


Figure 8. Gender moderates the association between receiving Likes on one’s posts and social comparison. Women with a larger percentage of posts receiving 1–99 Likes reported less negative comparison, but men do not. Notably, women with a larger percentage of posts receiving 100–999 Likes reported more negative comparison, while men did not (see text above for possible reasons why).

Do people compare the Likes they receive to the Likes they see on others’ posts?

While we did not survey people about this specifically, we can approximate this by computing the average Like counts of posts a person makes and comparing that to the average Like counts of posts a person sees.

The closer the mean number of Likes a person receives per post was to the mean number of Likes they see on others’ posts, the better they felt (i.e., they reported less negative social

comparison). In a regression controlling for demographics, as well as total views or posts made, the ratio of average Likes received per post to average Likes on posts seen was negatively associated with negative comparison ($p = 0.039$). This observation is consistent with the hypothesis that a “Like paradox” (i.e., that your friends seem to get more Likes than you do) can lead to increased social comparison [3].

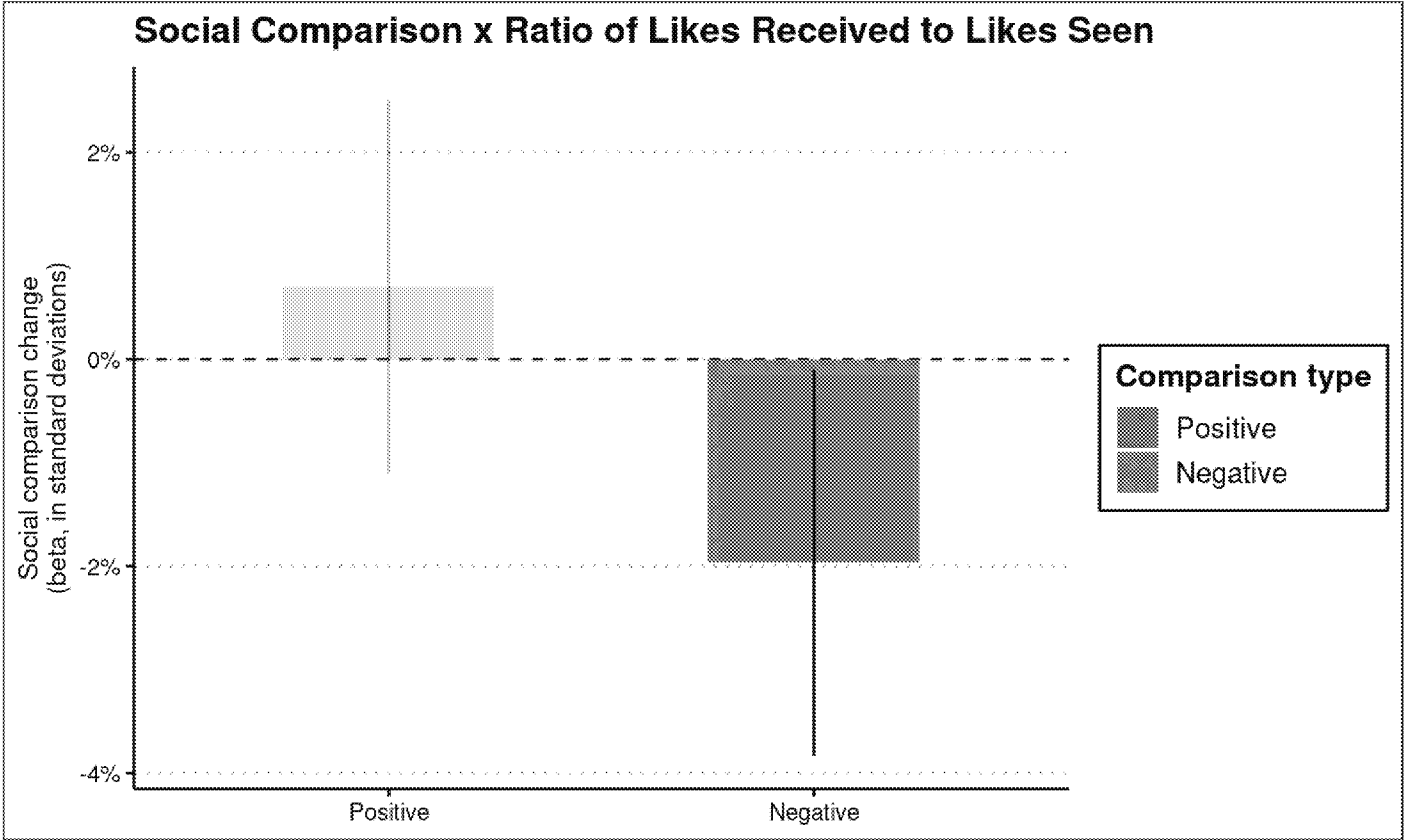


Figure 9. The closer the mean number of Likes a person receives per post is to the mean number of Likes they see on others’ posts, the less negative social comparison they reported.

How does receiving comments relate to social comparison?

Overall, receiving more comments was associated with feeling better (i.e., more positive comparison). People who received more comments reported more positive comparison ($p < 0.001$), after controlling for the number of posts that the person makes. Receiving more (or fewer) comments was not associated with negative comparison ($p = 0.48$).

There was also no significant relationship between social comparison and the ratio of average comments received to average comment counts on posts seen ($p = 0.14$, $p = 0.25$).

Implications and recommendations

Overall, our findings suggest that hiding Like counts is generally beneficial:

- People experience more negative social comparison when they view higher Like counts, so hiding Like counts, especially on celebrity or influencer content, may be more helpful.

- Similarly, as people may compare their own Like counts to others' Like counts, hiding Like counts from others' may help by making it harder to make this comparison.
- These results are in line with findings from Project Daisy, where hiding Like counts led to decreases in negative social comparison (though not positive social comparison).

Footnotes

[1] For posts that a person saw, Like counts were calculated based on the number of Likes received up to the time of viewing. For posts that a person made, Like counts were calculated by counting the number of Likes received in the 7 days following when it was posted.

[2] We used coarsened exact matching to match people by demographics (including age, gender, and country), engagement (including time spent and VPVs), and either average post Like count or comment count, and then ran regressions on these matched users. In the model controlling for average Like count, we found a significant effect of seeing more than the median number of comments on posts ($b = -0.17$, $p < 0.001$), as well as a significant interaction effect with the average Like count on posts seen ($b = 0.13$, $p < 0.001$). In the model controlling for average comment count, we found a significant effect of seeing more than the median number of Likes on posts ($b = 0.15$, $p < 0.001$) and a significant interaction effect with the average comment count on posts seen ($b = 0.17$, $p < 0.001$).

[3] Also see research on the friendship paradox.

Other research on social comparison

- Positive and negative social comparison on Instagram (May 2020)
- Which topics are associated with changes in social comparison on Instagram? (July 2020)
- How does seeing content from celebrities on Instagram affect social comparison? (August 2020)
- Selfies, filters, and social comparison on Instagram (August 2020)
- Social comparison and COVID-19 (May 2020)
- Social comparison, Like counts and Project Daisy (June 2020)
- Social comparison and deactivations (July 2020)
- Social comparison on Facebook, on Instagram, and in everyday life (April 2019)
- Country differences in social comparison (June 2019)
- Social comparison on Facebook (Feb 2016)

