Revealing the Complex Relationship between Social Media Use, Social Comparison Orientation and Optimism on Health Outcomes

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Research Article

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Abstract

The study assessed the influence of social media use (SMU), social comparison orientation (SCO) and optimism on wellbeing, mood and sleep quality. SCO is important because of the value of comparative information in SMU. SCO and optimism were tested as mediators between SMU and mood and wellbeing, and optimism as a moderator on the effect of SCO on mood. An online survey and correlational design were used with a convenience sample (n = 306). In terms of SMU, only passive Instagram featured as a predictor of anxiety. Optimism was the strongest predictor in enhancing wellbeing, mood and sleep quality. SCO was a predictor of adverse anxiety and wellbeing. Optimism moderated against the impact SCO had on anxiety, and optimism and SCO were mediators between SMU and wellbeing and anxiety. SCO adversely affected mood and wellbeing. Optimism predicted good sleep quality, and it functions by effecting how comparative information is processed. Understanding this better, in relation to SMU, is likely to promote healthier online interactions.

Introduction

Wellbeing is a “state of complete physical, mental and social wellbeing and not merely the absence of disease and infirmity” (World Health Organisation, 2006, p106). While critics question the assumption of ‘completeness’ as integral to wellbeing, the definition highlights the critical role of psychology in wellbeing. Adverse wellbeing effects mood and sleep quality (Linton & Bryngelsson, 2000; Matricciani et al., 2017). Research has explored the frequency and duration that individuals spend on SMU and its association with adverse health outcomes (Przybylski et al., 2013) and time on devices (e.g., smartphones and tablets) has been associated with poor sleep quality (Matricciani et al., 2017). A review on SMU, sleep and wellbeing, concluded that SMU is better understood as a range of more subtle factors (Scott & Woods, 2019). Yang (2016) developed a scale to measure these more subtle types of social media activity (SMA), called passive (e.g., checking profiles), active (e.g., sharing information) and interactive (e.g., commenting). In a survey of 208 undergraduate students, Yang (2016) found that each type of interaction was predictive of loneliness. However, the literature on the relationship between loneliness, psychological wellbeing and SMU is mixed. Some found that SMU offered a social connection and lowered loneliness (e.g., Verduyn et al., 2017), while others reported increased loneliness (e.g., Yang, 2016). A review by Verduyn et al., (2020) found that active engagement (e.g., commenting/liking content) was predictive of enhanced psychological wellbeing and Kross et al., (2021) found that active SMA increased social support, positive feedback comments and user wellbeing. This suggests measuring more nuanced SMA is important.

Social comparison orientation and optimism

The relationship between SMU and wellbeing, mood and sleep quality is, however, more complex than a simple direct association. Two important factors affecting this are SCO and optimism. Social comparison theory (Festinger, 1954) describes the tendency for one to make comparisons with others’ experiences and accomplishments. Those high in SCO tend to be high in self-consciousness, neuroticism,
and low self-esteem, as well as socially oriented and responsive to social signals (Buunk & Gibbons, 2006). The importance of SCO is magnified in SMU where platforms are designed to make visible the lives and experiences of users, enabling instant comparisons (Yang, 2016). Upward comparisons involve comparing oneself with those more accomplished. Downward comparisons involve assessments against others less accomplished. However, as most posts and content are highly selective and positive, the system is set for upward comparisons. While there might be a boost to self-esteem where similarities are found, such comparisons frequently lead to envy, low self-esteem and low mood (Twenge et al., 2018; Vogel, Rose & Roberts, 2014).

Park and Baek (2018) argued the effect of SCO on psychological health can be positive and negative from both upward and downward comparisons. Smith (2000) developed a scale to measure these different types of SCO, two upward sub-scales and two downward with positive and negative emotional components in each. Park and Baek (2018) tested these and found that the emotions triggered by such comparisons was the mediator between SCO and satisfaction with life. Tosun and Kasdama (2019) found that SMA, specifically passively engaging on Facebook, was positively associated with depression, but that this was mediated by the nature of the SCO. Specifically, by upward assimilative comparisons (i.e., where one attempts to draw inspiration or optimism through the comparisons made) and upward contrasting emotions (i.e., where one's emotional state contrasts negatively with that of others, inducing envy or sadness) (Park & Baek, 2018). The evidence suggests that SCO and the nature of the comparisons made, and the subsequent emotions evoked, can mediate between SMU and wellbeing and mood.

Optimism can be interpreted as an explanatory style, a way of interpreting success and failure and attributing outcomes in a way that leaves one feeling positive and in control (Seligman, 2002; 2012). Others conceive it as dispositional (Carver & Scheier, 2014) but researchers in both camps agree that it represents a set of cognitive strategies, such as a tendency to more readily attend to positive events over negative ones (defensive optimism), to more frequently expect positive future outcomes (Liu et al., 2017); in interpreting disappointment as experiences one can learn from (Gibbons, 2008, 2022a, 2022b; Nes & Segerstrom, 2006) and by imagining scenarios much worse (a catastrophizing fantasy) to lessen associated anxiety (Seligman, 2002). A metanalysis by Qi et al., (2012) found that optimism was negatively associated with anxiety, depression and stress and positively associated with life satisfaction, self-esteem and positive affect. A number of studies also find optimism to be predictive of sleep quality (e.g., Hernandez et al., 2014; Leola et al., 2013; Uchino et al., 2017).

Research exploring mediating influences on sleep quality have tested depression (the indirect path), between optimism and sleep (Lau et al., 2015; Uchino et al., 2017). However, Lau et al., (2015) also tested optimism as a mediator between depression and sleep quality and found optimism was a stronger mediator than depression. They concluded that optimism is likely to induce better sleep because of its positive effects in reducing depressive mood, with depressive mood explaining poor sleep quality only insofar as it is associated with pessimism (Lau et al., 2015).
Most of the research exploring the optimism-sleep relationship is cross-sectional. Lau et al., (2017) adopted a longitudinal design following up a sample of 4,245 undergraduate students in Hong Kong across three test periods over two years. The study replicated the findings of cross-sectional research – that optimism mediated between sleep quality and mood and optimism measures taken at the start of the study was the strongest predictor of sleep quality 19 months later.

Liu et al., (2017) found optimism influenced SMU: They maintained that because individuals high in optimism more readily draw favourable comparisons and because it is more readily associated with more positive health outcomes, optimism is likely to act as a mediator between SCO and health outcomes, such as depression. Moreover, because of the cognitive strategies optimists use, in relation to how they process comparative information (Seligman, 2012), it will buffer or moderate the influence of SCO on health-related outcomes.

Liu et al., (2017) surveyed 1205 university students and measured their SCO on social media. They found evidence for the moderating role of optimism on depression – those scoring high on optimism reported lower scores on depression and there was little change in depression scores, irrespective of their scores on SCO on social media. For those low in optimism, depression scores were higher and increased as upward social comparison scores increased. They additionally found evidence for optimism as a mediator between SCO on social media and depression, and SCO on social media and self-esteem. The authors concluded that optimistic thinking allows the individual to interpret comparative information in a way that reduces the negative effects of upward comparisons (Liu et al., 2017).

Aims

The study aimed to test the influence of SME and SMA (e.g., passive, active and interactive engagement on Instagram and Facebook) and SCO and optimism as predictors of sleep quality, mood and wellbeing (Qi et al., 2012; Uchino et al., 2017, Yang, 2016); to explore the separate mediating roles of SCO and optimism between SMA, SME and sleep, mood and wellbeing (Lau et al., 2015; Park & Beak, 2018; Tosun & Kasdama, 2019; Yang, 2016), and the moderating role of optimism between SCO and mood (Liu et al., 2017).

The following hypotheses were tested:

H₁ - There will be correlations between SME and SMA on wellbeing, mood and sleep quality.

H₂ - There will be correlations between SCO and optimism on wellbeing, mood and sleep quality.

H₃ - Optimism and SCO will mediate between SMU (SME and SMA) and mood, sleep quality and wellbeing.

H₄ - Optimism will have a moderating influence with SCO on mood.
Methodology

Participants, ethics and procedures

A convenience and snowball sample were obtained, \( n = 306 \), via the researchers’ social media groups (Facebook, Instagram and WhatsApp). Age ranged from 18–79 year (\( M = 32.48, \ SD = 14.23 \)). In terms of gender, 20.3% \( n = 62 \) were male, 67% \( n = 205 \) were female. One participant identified as non-binary, and 12.1% \( n = 37 \) did not respond. Inclusion criteria were adults aged 18 and over who had and used a social media account. Surveys were completed via Qualtrics, between November 2021 and February 2022. The study was approved by the Ethics Committee of the host university. Participants received a brief and contact details for further clarification. Participation was voluntary and all acknowledged informed consent before participating. All ethical considerations and methods were executed in accordance with the Declaration of Helsinki.

Measures

The questionnaire included 86 items. Information on demographics and the following measures were used. The Cronbach’s alphas for all measures ranged from 0.624 to 0.924, suggesting all scales offered satisfactory to excellent internal reliability:

Mood

The Hospital Anxiety and Depression Scale (HADS), (Zigmond & Snaith, 1983), is a fourteen-item scale measuring mood – anxiety and depression. Each item is scored on a response-scale with four responses ranging between 0–3. An example item is: ‘Worrying thoughts go through my head.’ High scores indicate adverse mood.

Wellbeing

The Warwick-Edinburgh Mental Well-Being Scale (WEMWBS), (Stewart-Brown, 2007), measures wellbeing in the last month. The scale consists of fourteen items on a five-point Likert scale. An example item from this scale is: ‘I have been feeling optimistic about the future.’ High scores indicate positive mental wellbeing.

Sleep

The Pittsburg Sleep Quality Index (PSQI), (Buysse et al., 1989), measured respondents’ quality of sleep. The 0–3 frequency scale consists of nineteen items grouped into different factors, e.g., sleep quality, duration, disturbances. These were totalled. High scores indicate poor sleep quality.

Social media engagement (SME)
This measured the frequency and engagement with SMU. The response scales range from ‘Not one day’ (1) to Every day (7). Higher scores represent a higher level of engaging in these activities. A sample item is: ‘How often did you use social media when eating breakfast?’ (Przybylski et al., 2013).

**Social media activity (SMA)**

Respondents rated 11 items on a five-point Likert scale measuring passive (e.g., reviewing and checking others’ profiles), active (e.g., sharing information) and interactive (e.g., commenting and replying to others). An example item is: “How often do you comment on or reply to others’ posts?” Higher scores indicated a higher frequency of engaging in specific SMA (Yang, 2016).

**Optimism**

The Values in Action ‘Hope’ sub-scale was used (Park and Peterson, 2006). It includes eight items with a five-point Likert scale e.g. ‘I always look on the bright side’. These are totalled and high scores indicate greater optimistic thinking.

**Social Comparison Orientation**

IOWA-Netherlands Comparison Orientation Measure (SCOM), (Gibbons & Buunk, 1999) uses a 5-point Likert scale with participants asked to indicate how well each statement applied to them e.g. ‘I compare what I have done with others as a way to find out how well I have done something’. High scores indicated high SCO.

**Statistical Analyses**

Correlations were run to determine linearity, followed by hierarchical multiple regressions between those predictors significant with a given outcome measure. Normality checks (kurtosis, skewness, Q-Q plots and z-score distributions) indicated normality for all outcome measures (Ghasemi & Zahediasl, 2012). An interaction variable was computed to test the moderating effect of optimism on SCO (called SCOXOptimism). Table 1 tested the linearity assumption for the variables entered into the regression analyses. For mediation analyses, the significant SME or SMA predictors from Table 1 were entered and in block two the mediator (SCO or optimism). This allows the direct (block one) and indirect (block two) path to be tested. Those significant were reported.

**Results**

Table 1. Correlations between predictors (SCO, optimism, SME, SMA) and anxiety, depression sleep quality and wellbeing.
Poor sleep quality & Wellbeing & Anxiety & Depression
Social Comparison orientation (SCO) & .22*** & -.32*** & .42*** & .15**
Optimism & -.39*** & .67*** & -.46*** & -.51***
Social Media Engage (SME) & .08 & -.13* & .20*** & .07
Social Media Activity (SMA):
Interactive instagram & .03 & .05 & .07 & -.06
Passive instagram & .02 & -.14* & .23*** & .08
Active instagram & -.03 & -.01 & .04 & -.02
Interactive facebook & -.03 & .12 & -.05 & -.12
Passive facebook & -.01 & .07 & .03 & -.13
Active facebook & -.03 & .00 & -.02 & .00

*significant at p<.1, **significant at p<.05, ***significant at p<.01

Only those results significant or trending towards significance were entered into the regression analyses. Only with the analysis with anxiety was there evidence of moderation.

Table 2. Regression model for Poor sleep quality

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>15.952</td>
</tr>
<tr>
<td></td>
<td>Optimism</td>
<td>-.457</td>
</tr>
</tbody>
</table>

The final regression model explained 16.3% of the variance in global sleep or scores measuring poor sleep quality. The results indicated a significant effect between optimism and poor sleep quality, $F(1, 168) = 34.001, \ p <.001, R^2 = .166, \ Adjusted R^2 = .157$. Optimism, $\beta = -.410 (p <.001)$ was a significant predictor. The result offers partial support for $H_2$.

Table 3. Regression model for wellbeing
The final regression model explained 53.7% of the variance in wellbeing scores. The results indicated there was a collective significant effect between both variables in the model and wellbeing, $F(2, 220) = 129.64, p < .001, R^2 = .541$, Adjusted $R^2 = .537$). The individual predictors were explored further and indicated that optimism, $\beta = .691 (p < .001)$; SCO $\beta = -.132 (p = .006)$ were significant predictors in the model. The results offer support for H$_2$ only.

**Table 4. Regression model for anxiety**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>14.310</td>
<td>2.112</td>
</tr>
<tr>
<td>SCO</td>
<td>.139</td>
<td>.035</td>
</tr>
<tr>
<td>Optimism</td>
<td>-.619</td>
<td>.075</td>
</tr>
<tr>
<td>Passive Instagram</td>
<td>.209</td>
<td>.122</td>
</tr>
<tr>
<td>SCOXOptimism</td>
<td>.032</td>
<td>.009</td>
</tr>
</tbody>
</table>

The final regression model explained 39.7% of the variance in anxiety scores. The results indicated there was a collective significant effect between the variables in the model and anxiety, $F(4, 173) = 30.126, p<.001, R^2 = .411$, Adjusted $R^2 = .397$). The individual predictors were explored further and indicated that optimism, $\beta = -.502 (p < .001)$; SCO $\beta = .255 (p < .001)$; passive Instagram $\beta = .107 (p = .088)$; and SCOXOptimism interaction $\beta = .207 (p < .001)$ were significant predictors in the model. The results offer partial support for H$_1$ and H$_2$ and support H$_4$.

As SCO increases, scores on anxiety increase for those low, average and high in optimism. Those high in optimism (the bottom line) score lower on anxiety compared to those average or low in optimism. This offers support for H$_4$. 
**Table 5. Regression model for depression**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>14.191</td>
</tr>
<tr>
<td></td>
<td>Optimism</td>
<td>-.504</td>
</tr>
</tbody>
</table>

The final regression model explained 31% of the variance in depression scores. The results indicated there was a collective significant effect between optimism and depression, $F(1, 230) = 103.34, \ p < .001, R^2 = .310, \ \text{Adjusted } R^2 = .307$. The individual predictor was explored further and indicated that optimism, $\beta = -.557 \ (p < .001)$ was significant in the model. The results offer partial support for $H_2$.

**Mediation analyses between social media behaviour and anxiety and wellbeing.**

To test $H_3$, only those correlations significant or trending to significance, between SME and SMA against anxiety and wellbeing (Table 1), were entered into a multiple regression. In block one the SME or SMA was entered and in block two the mediator (SCO or optimism). This allows the direct (block one) and indirect (block two) path to be tested. Only those significant are reported.

**Table 6 Unmediated and mediated values between types of SMU (passive Instagram and social media engagement) and anxiety and wellbeing**
### Passive Instagram and anxiety; SME and anxiety (with Social Comparison Orientation as the mediator)

<table>
<thead>
<tr>
<th></th>
<th>β value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passive Instagram</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unmediated path</td>
<td>.234</td>
<td>.002</td>
</tr>
<tr>
<td>Mediated path</td>
<td>.113</td>
<td>.125</td>
</tr>
<tr>
<td>SME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unmediated path</td>
<td>.190</td>
<td>.004</td>
</tr>
<tr>
<td>Mediated path</td>
<td>.050</td>
<td>.433</td>
</tr>
</tbody>
</table>

### Passive Instagram and wellbeing; SME and wellbeing (with Social Comparison Orientation as the mediator)

<table>
<thead>
<tr>
<th></th>
<th>β value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passive Instagram</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unmediated path</td>
<td>-.138</td>
<td>.063</td>
</tr>
<tr>
<td>Mediated path</td>
<td>-.050</td>
<td>.516</td>
</tr>
<tr>
<td>SME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unmediated path</td>
<td>-.124</td>
<td>.060</td>
</tr>
<tr>
<td>Mediated path</td>
<td>-.014</td>
<td>.832</td>
</tr>
</tbody>
</table>

### SME and wellbeing (with Optimism as the mediator)

<table>
<thead>
<tr>
<th></th>
<th>β value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmediated path</td>
<td>-.133</td>
<td>.043</td>
</tr>
<tr>
<td>Mediated path</td>
<td>-.016</td>
<td>.743</td>
</tr>
</tbody>
</table>

The mediation analyses reveal evidence of SCO and optimism as mediators between types of SMU and anxiety and wellbeing, and offers partial support for H₃.

**Discussion**

It was expected that SME and the different SMA (passive, active and interaction) would be predictive of wellbeing, mood and sleep quality. The critical role of comparative information-processing online, would indicate that SCO would be predictive, as would optimism, given the evidence of its efficacy in relation to in-person and online interactions. For the results with sleep quality (Table 2), only optimism featured – increases in optimism were negatively associated with poor sleep quality. This result is consistent with Hernandez *et al.*, (2014) and Lemola *et al.*, (2013).
Where wellbeing was the outcome measure (Table 3), both optimism and SCO were significant. Optimism explained a larger variance in wellbeing. This supports the Qi et al., (2012) meta-analysis on the beneficial role of optimism on health and, consistent with Liu et al., (2017) and Festinger's conception of social comparison theory, a negative relationship was observed between SCO and wellbeing. The result indicates that the type of comparisons respondents made had an adverse impact on wellbeing. Given upward comparisons online are more frequent (Twenge, et al., 2018), this finding suggests it was this type of comparison that accounted for the harmful effect of SCO on wellbeing (Vogel et al., 2015; Tandoc, Ferrucci & Duffy, 2015).

For the regression with depression (Table 5), optimism was the only significant predictor and it negatively predicted depression scores. With just one predictor, the variance explained was large, suggesting it was an important coping ingredient and supports Qi et al., (2012).

For the regression with anxiety (Table 4), optimism was the strongest predictor – increases in optimism predicted low anxiety. SCO was predictive and, as with wellbeing, it had an adverse effect on anxiety. This supports Liu et al., (2017). The only evidence for social media influencing any DV was with passive Instagram predicting anxiety. This is consistent with Yang's (2016) finding in relation to passive Instagram use and loneliness.

This model reported evidence of optimism as a moderator between SCO on anxiety (figure 1). A positive relationship was observed between SCO and anxiety, irrespective of scores on optimism. However, the results revealed that those high on optimism scored lower on anxiety. This suggests that optimism acted as a buffer against the adverse effects of SCO on anxiety. Liu et al., (2017) found the same pattern with depression. The results suggest that optimistic thinking allows the individual to interpret comparative information in a way that reduces its potentially negative effects. The value of comparative information-processing online gives SCO particular potency. This is indicated by its positive association with anxiety and supports Tosun and Kasdarma (2020). The value of optimism to act as a buffer suggests there is merit in the cognitive strategies, such as defensive optimism, catastrophizing fantasies and reframing, more frequently used by optimists (Gibbons, 2022a, 2022b).

While the current study sought to explore the relationship between SCO and SMU, the items on the SCO scale are context free (Gibbons & Buunk, 1999). They make no reference to the comparisons made online as distinguishable from in-person comparisons. The items, in fact, appear to be designed for in-person comparisons e.g. ‘I often like to talk with others about mutual opinions and experiences’[item 7]. While most can be interpreted as relevant for virtual as well as in-person comparisons, its lack of specificity to social media may question its validity for this context and the results may reflect the importance of SCO in relation to anxiety for both in-person and virtual comparisons.

**Mediation analysis**

Positive relationships were found between the frequency of passive Instagram use and anxiety and SME and anxiety, and similarly for wellbeing in place of anxiety (Figures 2 & 3, Table 6). However, the
relationship was no longer significant when SCO was added. This suggests that SCO was a mediator - those scoring high on SCO were more likely to engage online and, independently, those scoring high on SCO, more frequently scored high on anxiety. This implies that the attempts to draw comparisons with the lives of others was, for those scoring high on SCO, more disruptive to anxiety and wellbeing. Twenge et al., (2018) drew the same conclusion. Users that drew upward comparisons were more likely to interpret their life as less worthy and interesting. Twenge et al., (2018) argued that while users know that content shared on social media is frequently akin to a ‘highlight reel’ - of the best in others’ lives, they struggle to separate their emotional response from this cognitive understanding.

Twenge et al., (2018) sampled adolescents and Erikson (1994), in his psycho-social theory of development, argued that striving for identity achievement is critical during adolescence. One's sense of identity is formed through the interactions and responses of others, first with family, then friends and peer groups. As the self expands, the reactions of one's peer group become increasingly important. This may explain why social comparison with peers and peer pressure are highest during adolescence (Vogel et al., 2014). The sample in this study was broader than just adolescents (age range 18-79 years). It is possible that this finding suggests the tendency Twenge et al., (2018) demonstrated in adolescents, remains important in older cohorts. Erikson (1994) argued development was not confined to the family or to childhood, but to relationships outside the family and those formed across the lifespan. Using social media, not just daily but frequently throughout the day, is ubiquitous. It offers an opportunity to connect with and see the lives of others (Yang, 2016) and while the lives of those you are viewing may have a particular relevance during adolescence, they can remain important, for different reasons, across the lifespan (Erikson, 1994). This may offer an explanation for the evidence on SCO mediation found here.

SME and passive Instagram use, a particular type of SMA, featured in the direct path with anxiety and with wellbeing (figure 3, Table 6) but these were no longer significant when SCO was added. Both passive Instagram and SME positively correlated with SCO. Passive Instagram describes users passively browsing newsfeeds and profiles without leaving comments or engaging (Yang, 2016). If one is motivated to draw superficial comparisons rather than to understand and connect with others in a meaningful way, then passively scrolling is a logical choice. The most likely outcome from this is a judgement and emotional response to what one's (unedited) life is like compared to the edited highlights of others (Twenge et al., 2018). It is a type of comparison likely to lead to disappointment (Yang, 2016) and, in this study, to increased anxiety and lower wellbeing. This is consistent with the adverse effect of upward social comparisons (Tandoc, Ferrucci & Duffy, 2015; Twenge, et al., 2018).

Optimism featured as a mediator between SME and wellbeing (figure 4, Table 6). SME was negatively associated with wellbeing but was no longer significant when optimism was added. Optimism negatively related to SME and positively with wellbeing. This suggests that the amount of SME is significant, less is more beneficial and is associated with higher optimism scores and it implies that the nature of that engagement is important. This is consistent with the different impacts that passive, active and interactive engagement have on wellbeing (Smith, 2000; Yang, 2016). While the specifics of this were not measured, it is likely that those more optimistic brought the same thinking patterns used in their in-person life to
their online life (Gibbons, 2022a, 2022b; Liu et al., 2017). For example, they may look to form more meaningful connections, offer more positive comments, make more compliments and be biased to attend more to positive messages over toxic ones.

**Limitations and improvements**

As the sample was convenience and volunteer based and given the non-response rate for some of the measures, validity could be an issue. Order effects and state congruence recall may also have affected the completion rate and response validity. The use of a single attention-testing item (e.g., please choose a specified response below) in each scale and excluding respondents who did not accurately answer these attention-testing items is likely to increase validity and could form part of the screening plan.

Optimism featured in all the regression models – it is beneficial for sleep, mood and wellbeing. It featured as a moderator with SCO and as a mediator between SME and wellbeing. The results suggest that optimistic strategies appear to be beneficial, not just in face-to-face interactions but in online ones (NB the SCO items were context free). It would be fruitful to explore this further i.e., how those high in optimism engage on SMU compared to those low in optimism. The mediation result reported an inverse relationship – those high in optimism engaged less. However, this study leaves unanswered the nature of that engagement and cognitive strategies used. Exploring this further could inform the current user-guides on healthy tips for SMU. These currently focus on encouraging less time on devices, checking the credibility of sources and encouraging click restraint (Bartolomeo, 2020) but do not consider such cognitive strategies.

SCO was associated with adverse anxiety and wellbeing. On SMU, increased social comparison tendencies were harmful. Passive engagement, such as scrolling feeds and profiles, is more frequently engaged by those high in SCO. It is more frequently associated with upward comparisons and adverse health (Twenge et al., 2018; Vogel, Rose & Roberts, 2014). Optimists engage less frequently on SMU and adopting the strategies employed by optimists, irrespective of one's level of dispositional optimism, is likely to be advantageous to mood, wellbeing and even sleep. It influences how one processes comparative information in in-person interactions and on SMU.

Fredrickson and Losada (2005) took a positive psychology approach to nurture more productive business meetings in the corporate sector. They found a 3:1 ratio of positive to negative comments/statements was the optimal ratio associated with greater economic success. There may be an optimal ratio to time on devices, to time scrolling, posting, commenting etc. The analysis in this study points to the merit of exploring this and the types of cognitive strategies associated with healthy SMU.

**Declarations**

**Ethics approval and consent to participate**
The study received Ethics approval from the Ethics committee in the School of Psychology at Liverpool John Moores University (Reference: PSYREPSubmissions220222).

As part of the review, the panel considered the participant brief and consent form and all participants gave informed consent before participating. All were informed that participation was voluntary and they were free to stop at any time and all acknowledged informed consent before participating, in accordance with the Declaration of Helsinki.

The use of the survey method and collection of data was performed in accordance with Declaration of Helsinki.

The above information is detailed in the manuscript.

Consent for publication

Not applicable

Availability of data and materials

The data set is available through Orclid: DOI 0000-0001-6631-721X

The question items are subject to copyright but the sources for all the measures used are referenced and interested parties can contact any of these sources. The authors vary on their decisions to make their tests available for free for educational purposes.

Competing interests

The author has no competing interests

Funding

Not applicable

Authors' contributions

CG and SMG wrote the main manuscript and ran the analysis, SMG administered and gathered the data. CG and SMG ran analyses and interpretations. Both authors reviewed the manuscript.

Acknowledgements

Not applicable

Authors' information

Dr Chris Gibbons (1) is an Associate Professor in psychology at Queen's University Belfast. His research focus is on health psychology, positive psychology, including the influences on student well-being and
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Ms Sophie Murray-Gibbons (2) recently completed her Masters in Health Psychology at Liverpool John Moores University. Her research interest is in health-related psychology, including stress, coping and the influences of social media on wellbeing.

References


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Figures

Figure 1

Slope graph testing the interaction between optimism and Social Comparison Orientation on anxiety
Figure 2

Social Comparison Orientation (SCO) Mediator with passive Instagram, SME and anxiety

\[ a_1, \beta = .353, \quad p < .001 \]

\[ a_2, \beta = .347, \quad p < .001 \]

\[ b_1, \beta = .341, \quad p < .001 \]

\[ b_2, \beta = .401, \quad p < .001 \]

\[ c_1, \beta = .113, \quad p = .125 \]

\[ c_2, \beta = .050, \quad p = .433 \]
Figure 3

Social Comparison Orientation (SCO) Mediator with passive Instagram, SME and wellbeing

Figure 4

Optimism Mediator with SME and wellbeing