Social comparisons on Facebook and offline: The relationship to depressive symptoms

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ABSTRACT

Facebook and offline social comparisons have been associated with depressive symptoms, however no study has simultaneously examined comparison tendencies across both settings as predictors of depressive symptomology. Accordingly, this study investigated the difference between comparison orientation (tendency to make comparisons) and direction on Facebook and offline, and the predictive utility of these comparisons on depressive symptoms. A convenience sample of 181 young adults aged 18 to 25 years (M_{age} = 21.90 years, SD = 2.14; 51 males, 130 females) completed an online questionnaire measuring comparisons, depressive symptoms and Facebook use. Paired samples t-tests indicated that participants had higher comparison tendencies offline, CI [1.97, 4.18], d = 0.40, and had more negative comparison tendencies on Facebook, CI [−6.37, −2.58], d = 0.25. Hierarchical multiple regression indicated that offline orientation and negative direction predicted significant unique variance in depressive symptoms (2.6% and 9.4% respectively, f^2 = 0.33), whilst Facebook orientation and direction did not. Findings indicate that Facebook comparison tendencies may simply reflect offline comparison tendencies, and that depressive symptoms may be a result of a general tendency to compare across both settings.

1. Introduction

There is a growing body of literature exploring the relationship between social networking site use and various mental health outcomes in young adults. One area of research examines the effect of engaging in social comparisons on social networking sites such as Facebook (Appel, Gerlach, & Crusius, 2016). The propensity to make social comparisons, and the direction of social comparisons, varies across individuals. Findings generally indicate that Facebook use encourages individuals to engage in social comparisons, and that these comparisons are typically negative and appear to lead to depressive symptoms (Appel et al., 2016; Seabrook, Kern, & Rickard, 2016). No studies however have looked at the differences between Facebook and offline social comparison strength and direction, or their relative contribution to depressive symptoms.

Festinger (1954) proposed a social comparison theory positing that individuals compare their opinions and abilities with others in order to evaluate themselves. Social comparisons are conceptualised and measured in terms of orientation (Gibbons & Buunk, 1999) and direction (Allan & Gilbert, 1995). Social comparison orientation is defined as the tendency to make comparisons, with individuals higher in orientation more likely to make comparisons (Gibbons & Buunk, 1999). Social

comparison direction is defined as the tendency to make either more positive or negative comparisons with oneself and others (Allan & Gilbert, 1995). Positive comparisons occur when individuals compare themselves with others who they perceive as inferior, and negative comparisons occur when individuals compare themselves with others who they perceive as superior.

The relationship between offline social comparison orientation and depressive symptoms has been widely supported. Individuals who score high in offline orientation measures also tend to score high on depressive symptom measures (Butzer & Kuiper, 2006; Gibbons & Buunk, 1999). Relationships have also been found between the direction of these offline social comparison tendencies and negative mental health outcomes including depressive symptoms; that is those who tend to make more negative comparisons with others offline also tend to experience more depressive symptoms (Allan & Gilbert, 1995; Weeks, Rodebaugh, Heimberg, Norton, & Jakatdar, 2009).

Whilst most research on social comparisons and depressive symptoms has been conducted offline, recent research examined these relationships on Facebook. On Facebook, users can choose to present themselves optimally by sharing their 'highlight reel', such as career success, happiness, and achievements which therefore makes the content positively skewed (Cramer, Song, & Drent, 2016; Steers, Wickham,

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& Acitelli, 2014). 'Facebook Depression' is a term coined by psychologists and the mass media to describe the negative affective consequences of spending a large amount of time on Facebook (Blease, 2015), and while this term has since been criticized as being 'oversimplistic' (Baker & Algorta, 2016), the negative effect of engaging in social comparisons on Facebook is one of the theories posited to explain this (Appel et al., 2016; Blease, 2015). Research examining Facebook social comparison orientation and depressive symptoms has indicated similar findings to the offline setting. Cross-sectional studies (Hanna, Ward, Seabrook, et al., 2017; Lee, 2014; Steers et al., 2014) and prospective and experimental studies (Nesi & Prinstein, 2015; Vogel, Rose, Okdie, Eckles, & Franz, 2015). indicate that those with a higher tendency to compare on Facebook also tend to have poorer mental health. Further, those who tend to make more negative comparisons on Facebook also tend to experience more depressive symptoms (de Vries & Kühne, 2015; Haferkamp & Kramer, 2011; Steers et al., 2014; but see Lee (2014) for an exception). Similar associations with depression emerge when orientation and negative direction are combined into one social comparison scale (Chow & Wan, 2017). These findings highlight the potential detrimental impacts of engaging in Facebook social comparisons.

Studies examining the relationship between Facebook social comparisons and depressive symptoms have failed to consider whether offline comparison orientation and direction also contribute to the depressive symptoms. By not simultaneously considering the effect of offline comparisons, the unique effect of Facebook comparisons on depressive symptoms is not able to be determined. Although it appears that increased tendencies to compare and make negative comparisons on Facebook lead to depressive symptoms, it is possible that orientation and direction of Facebook comparisons simply reflect offline tendencies, and that the relationship with depressive symptoms is not setting specific. The study presented here overcomes this limitation by simultaneously comparing Facebook and offline comparison orientation and direction and the relationship with depressive symptoms. Given the strong links reported between social comparison orientation and direction and depressive symptoms and the integral role of Facebook in the lives of many young adults, it is important to understand whether Facebook comparison tendencies uniquely contribute to depressive symptoms.

This study had two research aims. The first aim was to compare orientation and direction of social comparisons on Facebook and offline. Due to the large amount of positively skewed information available on Facebook (Cramer et al., 2016), it was hypothesised that social comparison orientation would be higher on Facebook than offline (H1), and that tendency to make more negative social comparisons would be higher on Facebook than offline (H2). The second aim was to examine whether social comparisons on Facebook or offline would better predict depressive symptoms. As depressive symptoms are more prevalent amongst females than males (Parker & Brotchie, 2010), the following hypotheses controlled for gender. Social comparison tendencies are related to depressive symptoms both offline (Weeks et al., 2009) and on Facebook (Hanna et al., 2017), however considering the amount of information about others presented on Facebook and the typically positively skewed nature of this information (Cramer et al., 2016), it was hypothesised that Facebook orientation would better predict depressive symptoms than offline orientation (H3), and that Facebook direction would better predict depressive symptoms than offline direction (H4). Steers et al. (2014) reported that compared to those who used Facebook less, individuals who used Facebook more tended to engage in a higher number of negative comparisons on Facebook and this in turn related to increased depressive symptoms. Due to this, it was hypothesised that the relationship between Facebook direction and depressive symptoms would be moderated by the intensity of Facebook use (H5). It was expected that the relationship between Facebook direction and depressive symptoms would be stronger amongst those with higher Facebook use.

2. Method

2.1. Research design

This study employed a cross-sectional correlational design.

2.2. Participants

The population of interest was Facebook users aged between 18 and 25 years as emerging adulthood is a key period for self-identity exploration (Arnett, 2000), inviting social comparisons. An a-priori analysis determined that to capture the small to moderate effect sizes reported in previous research (Feinstein et al., 2013; Hanna et al., 2017) at a statistical power of 0.08 and an alpha level of 0.05, a sample size of 167 participants would be required. The final sample recruited was 181 participants aged 18 to 25 years (M age = 21.90 years; SD = 2.14; 51 males, 130 females). Employment status of the sample was 71.2% employed, 43.6% students, 8.9% unemployed, and 1.1% homemakers. The median number of Facebook friends was 520 (SD = 496.51; range = 1–2500), and the median number of minutes spent on Facebook per day was 60 (SD = 71.47; range = 1–300).

2.3. Measures

Offline comparison orientation was measured using the Iowa-Netherlands Comparison Orientation Measure (INCOM; Gibbons & Buunk, 1999), which measures general tendency to make comparisons. The 11-item self-report measure asks participants to indicate their level of agreement with each statement ranging from 1 (*I disagree strongly*) to 5 (*I agree strongly*). Participants were instructed to focus on their offline comparisons. An example item is: "I always pay a lot of attention to how I do things compared with how others do things". The range of possible scores is 11 to 55, with higher scores indicating greater tendency to compare. The INCOM has demonstrated good reliability and validity in past samples (α = 0.78–0.83; Gibbons & Buunk, 1999), and good reliability in the current sample (α = 0.81).

Facebook comparison orientation was measured using the INCOM adapted to the Facebook setting (INCOM-F; Steers et al., 2014) by prefacing questions with "When I am on Facebook". Reliability has been demonstrated in previous samples (α = 0.85; Steers et al., 2014) and the current sample (α = 0.88).

Offline comparison direction was measured using the Social Comparison Rating Scale (SCR; Allan & Gilbert, 1995), which measures tendency towards making more negative or positive social comparisons. The measure presents the statement "In relationship to others I generally feel…" then asks participants to respond on 11 bipolar constructs (e.g. *inferior/superior*, *weaker/stronger*) on a scale between 1 and 10 the point that best represents their position between the poles. Participants were instructed to focus on their offline comparisons. Possible scores range from 11 to 110, with lower scores indicating more negative comparisons tendencies. Scores were reverse coded so that higher scores indicated more negative comparison tendencies. The scale has demonstrated good reliability in previous samples (α = 0.91; Allan & Gilbert, 1995), and the current sample (α = 0.94).

Facebook comparison direction was measured using the SCR adapted to the Facebook setting (SCR-F; Feinstein et al., 2013). The items remained the same, however the initial statement was modified to "In relationship to others *on Facebook*, I generally feel…". Scores were reverse coded, so that higher scores indicated more negative comparison tendencies. The SCR-F has demonstrated good reliability in previous samples (α = 0.94; Feinstein et al., 2013) and the current sample (α = 0.94).

Facebook use was measured using the 8-item Facebook Intensity Scale (FIS; Ellison, Steinfield, & Lampe, 2007). The response option for two items measuring number of Facebook friends and time spent on Facebook daily was changed to open text response due to ceiling effects

with the original response options (Nesi & Prinstein, 2015). The measure also included six Likert-type items measuring connection to Facebook. An example item is: "Facebook is part of my everyday activity". Participants indicated level of agreement, with responses ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Item responses were standardised and then summed to create one score for Facebook use, and higher scores indicated more intense Facebook use. The measure demonstrated good reliability in past samples (α = 0.83; Ellison et al., 2007) and acceptable reliability in the current sample (α = 0.75).

Depressive symptoms were measured using the Center for Epidemiological Studies-Depression Scale (CES-D; Radloff, 1977). The 20-item measure captures experiences of depressive symptoms in the past week and is a commonly used measure of depressive symptoms in the Facebook social comparison field (Steers et al., 2014). An example item is "I felt lonely". Responses range from 0 (*rarely or none of the time*) to 3 (*most or all of the time*). Possible scores range from 0 to 60, with higher scores indicating greater depressive symptoms. The CES-D has demonstrated good reliability in past samples (α = 0.88; Feinstein et al., 2013) and the current sample (α = 0.92).

Demographic information was also collected: gender, age, employment status, and education level.

2.4. Procedure

The Curtin University Human Research Ethics Committee granted ethical approval for the study (HRE2017–0290). Participants were recruited through advertising on Facebook and at an Australian university. Advertisements contained a link to the participant information sheet, consent form, and questionnaire. The order of presentation of the Facebook and offline social comparison measures were counterbalanced to prevent ordering effects. The survey took approximately 10–15 min to complete. Participation points were provided for psychology student participants enrolled in a participation pool. Data was downloaded into SPSS (v.23) for analysis. The percent of missing data for each item ranged from 0 to 1.1%. Little's Missing Completely at Random (MCAR) test determined the data was missing completely at random, $\chi^2 = 288$, ($df = 1221$, $p = 1$). Missing data was substituted using Expectation Maximisation.

3. Results

Descriptive statistics and bivariate correlations are reported in Table 1. Correlations indicated there was a significant relationship between depressive symptoms and three predictors: offline orientation, offline direction and Facebook direction. Of note are the high correlations between Facebook and offline direction, and Facebook and offline orientation. As gender was not correlated with any key constructs, it was removed from further analyses.

To test H1 and H2, paired samples *t*-tests with an α of 0.05 were conducted. Offline orientation was significantly higher than Facebook orientation, and this difference was statistically significant, *t*

(180) = 5.49, $p < .001$, CI [1.97, 4.18], with a small to medium effect size, $d = 0.40$. H1 was not supported. Offline direction was less negative than Facebook direction and this difference was also statistically significant, $t (180) = -4.67$, $p < .001$, CI [−6.37, −2.58], with a small effect size, $d = 0.25$. H2 was supported.

To test the remaining hypotheses, a hierarchical multiple regression with moderation analysis was conducted. On block 1, the predictors accounted for a significant 25% of the variance in depressive symptoms, $R^2 = 0.25$, adjusted $R^2 = 0.23$, $F (5, 175) = 11.50$, $p < .001$. The effect was medium to large, $f^2 = 0.33$. Offline orientation and direction explained significant unique variance in depressive symptoms (2.6% and 9.4% respectively), while Facebook orientation and direction did not account for any significant unique variance. H3 and H4 were was not supported. On block 2, the interaction between Facebook direction and Facebook use was added, and accounted for an additional 2% of the variance in depressive symptoms, $R^2_{change} = 0.02$, F_{change} (1, 174) = 4.44, $p = .036$. The effect was small, $f^2 = 0.02$. The moderating effect was not in the direction hypothesised and H5 was therefore not supported. For individuals with high levels of Facebook use intensity, negative comparisons made less of an impact to the level of depressive symptoms than individuals with low levels of Facebook use intensity. In combination, the predictor variables accounted for 27% of the variance in depressive symptoms, $R^2 = 0.27$, adjusted $R^2 = 0.24$, $F (6, 174) = 10.51$, $p < .001$. The effect was large, $f^2 = 0.36$. Outcomes for the predictor variables in each step of the regression are reported in Table 2.

4. Discussion

The present study had two main aims. The first was to examine the differences between social comparison orientation and direction on Facebook and offline. Results indicated that on average, participants had a higher tendency to compare offline, and the comparison tendencies were more negative on Facebook. The second was to examine how comparisons on Facebook and offline related to depressive symptoms, and whether Facebook use intensity moderated a relationship between Facebook direction and depressive symptoms. Offline orientation and direction better predicted depressive symptoms than Facebook orientation and direction. Facebook use was found to moderate the relationship between Facebook direction and depressive symptoms, however not in the direction anticipated. Overall, the model tested accounted for over a quarter of the variance in depressive symptoms.

The hypothesis that social comparison orientation would be higher on Facebook than offline (H1) was not supported. This contradicts conjecture that individuals would have an increased tendency to compare on Facebook due to the large amount of easily accessible information (Cramer et al., 2016). The only other study to measure both Facebook and offline orientation simultaneously reported equal scores across the two measures for females, and higher scores offline than online for males (Steers et al., 2014), suggesting our finding of higher

Table 1
Descriptive statistics, bivariate correlations, and Cronbach's alphas.

	Mean	SD	1	2	3	4	5	6	7
1. Depressive symptoms	14.84	11.13	0.92	0.23*	0.13	0.46**	0.33**	0.09	−0.07
2. Offline orientation	38.08	6.46		0.81	0.55**	0.09	0.11	0.34**	0.00
3. Facebook orientation	35.01	8.79			0.88	0.10	0.27**	0.39**	0.07
4. Offline direction	59.46	17.90				0.94	0.73**	0.03	−0.08
5. Facebook direction	63.93	17.19					0.94	0.03	0.02
6. Facebook use	0.00	4.80						0.75	−0.08
7. Gender (female)									−

Note. $N = 181$. SD = Standard deviation. Cronbach's alphas reported along the diagonal.
* $p < .05$.
** $p < .001$.

Table 2

Hierarchical multiple regression of predictors for depressive symptoms.

Variable	B [95% CI]	β	sr^2
Step 1			
Offline orientation	0.34 [0.07, 0.61]*	0.20	0.03
Offline direction	0.28 [0.16, 0.40]**	0.46	0.09
Facebook orientation	−0.04 [−0.25, 0.18]	−0.03	−0.05
Facebook direction	−0.01 [−0.14, 0.12]	−0.01	−0.02
Facebook use	0.05 [−0.28, 0.38]	0.02	0.00
Step 2			
Interaction	−1.78 [−3.44, −0.11]*	−0.14	−0.27

Note. $N = 181$. B = unstandardised regression coefficient; CI = confidence interval; β = standardised regression coefficient; sr^2 = squared part correlations.

* $p < .05$.
** $p < .001$.

tendency to compare offline than on Facebook is unlikely to be sample-specific.

The hypothesis that the tendency to make more negative social comparisons would be higher on Facebook than offline (H2) was supported. These findings align with Appel et al. (2016) suggestion that due to the positively skewed nature of the information presented on Facebook, individuals tend to engage in negative social comparisons on Facebook. It is not always possible to present one's 'best self' in offline settings, so it is plausible that individuals engage in less negative comparisons offline.

It was hypothesised that Facebook orientation (H3) and direction (H4) would better predict depressive symptoms than offline orientation and direction. Neither hypothesis was supported, as it was found that offline orientation and direction significantly predicted unique variance in depressive symptoms, whilst Facebook orientation and direction did not. Previous studies (Chow & Wan, 2017; Lee, 2014; Steers et al., 2014) found that Facebook orientation was significantly associated with depressive symptoms, however these studies did not partial out the effects of offline orientation. Similarly, Feinstein et al. (2013) found that Facebook social comparison direction significantly predicted depressive symptoms, suggesting rumination as the mechanism through which this occurs; however this study also did not account for offline direction.

Walther, Van Der Heide, Hamel, and Shulman (2009) posit that individuals can be skeptical of the truthfulness of online self-presentations. This skepticism may result in individuals being less likely to internalise negative self-judgements resulting from Facebook comparisons than those resulting from offline comparisons. These findings indicate that an individual's overall comparison orientation and direction tendencies across both the Facebook and offline setting may relate to depressive symptoms more than an individual's comparison tendencies in a particular setting.

One possible explanation for these findings it that individual differences drive social comparisons, and the impact of social comparisons, in both everyday life and on Facebook, may increase vulnerability to depressive effects of social comparisons where individuals have a predisposition to chronic negative self-evaluations. Consistent with this proposition, Lee (2014) reported that both the frequency and direction of social comparisons on Facebook were negatively associated with self-concept clarity and positively associated with intolerance of uncertainty, private and public self-consciousness and expectation to others' responses. Similarly, social comparison orientation (Lee, 2014) and upward social comparisons (Wang, Wang, Gaskin, & Hawk, 2017) on Facebook are negatively associated with self-esteem, with self-esteem reported to partially mediate the relationship between upward social comparisons and depressive symptoms (Liu et al., 2017). These individual differences all point to a vulnerability in self-concept that may drive the frequency of seeking upward social comparisons and the potentially adverse effects of doing so (Swallow & Kuiper, 1988).

The final hypothesis was that the relationship between Facebook direction and depressive symptoms would be moderated by the intensity of Facebook use. Contrary to what was predicted, the relationship was stronger amongst those with lower Facebook use. For individuals with high levels of Facebook use, negative Facebook comparisons made less of an impact to depressive symptoms than individuals with low levels of Facebook use. This finding is in contrast to previous research by Steers et al. (2014) who found that individuals who used Facebook more tended to engage in more negative comparisons on Facebook which in turn related to increased depressive symptoms. One possible explanation for this counterintuitive finding is the discrepancy between the Facebook use measures. Steers and colleagues' study measured Facebook use with minutes spent on Facebook per day, while the measure in the current study also include friends and emotional connection. It is possible that individuals who experience depressive symptoms from negative Facebook comparisons may have less emotional connection towards Facebook. Future research is needed to explore the finding.

Overall, our findings suggest that Facebook social comparisons might not be as detrimental to wellbeing as previously suggested (Appel et al., 2016). Previous research suggested that Facebook use is detrimental to wellbeing due to the overwhelming opportunity to make social comparisons, particularly negative social comparisons, on the site (Appel et al., 2016). Facebook comparison tendencies may simply reflect offline comparison tendencies, and the relationship with depressive symptoms may not be setting specific but more related to individual differences. This is supported by the strong correlations found between Facebook and offline orientation and Facebook and offline direction.

In our research there was no significant zero-order correlation between Facebook use and depressive symptoms, undermining the concept of "Facebook depression". Our findings are consistent with a meta-analysis of social networking sites and Facebook depression (Baker & Algorta, 2016), which reported that expecting a direct relationship between use and well-being outcomes is too simplistic. Rather, affective outcomes may be positive or negative, depending on a range of individual differences and types of use.

The findings have theoretical, research, and practical implications. The findings have extended social comparison theory as they provide evidence of strong correlations between social comparison direction and orientation across settings and insight into the relationship between social comparisons and depressive symptoms. Findings have research implications; when examining the relationship between Facebook comparisons and depressive symptoms, researchers should also control or account for offline comparisons. The practical implications for mental health professionals are that when considering the relationship between an individual's social comparison tendency and their depressive symptoms, they should be aware of the potential influence of comparisons across settings and not assume that depressive symptoms are largely a function of Facebook comparisons.

This is the first study to simultaneously examine Facebook and offline social comparison orientation and direction in relation to depressive symptoms. A further strength of the study is the size, age and composition of the sample. The sample size was determined based on an a-priori power analysis and the design was sufficiently powered to detect effects. Social comparison studies commonly sample from student populations (Appel et al., 2016), however this study sampled from the wider community, making these findings more representative of the emerging adult population.

Findings must be interpreted in light of the limitations. The study relied on self-reports and participants may have over or under estimated measures such as time spent on Facebook per day. Due to the cross-sectional nature of this study, it cannot be assumed that Facebook or offline social comparison processes lead to depressive symptoms, however the findings are in line with Festinger's (1954) social comparison theory and experimental research indicating directionality (de

Vries & Kühne, 2015; Haferkamp & Kramer, 2011). Further longitudinal research is recommended. One avenue for future research is examining how Facebook and offline social comparisons relate to psychological outcomes other than depressive symptoms, allowing for a broader understanding of how social comparison tendencies across settings influence overall wellbeing. As social comparisons occur across the lifespan (Buunk & Mussweiler, 2001) and adolescents and older adults often use Facebook extensively (Sensis, 2015), future research could examine whether the same results are replicated across other age groups.

5. Conclusion

The key finding from this study is that Facebook comparison tendencies may simply reflect offline comparison tendencies, and that depressive symptoms may be a function of one's general tendency to compare across settings. This study advances knowledge about how social comparison tendencies relate to depressive symptomology across settings and highlights the need to control for offline factors in Facebook research. Mental health professionals should take into account the influence of social comparison tendencies across settings when considering the relationship between an individual's Facebook use and their depressive symptoms.

Declarations of interest

None.

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