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Facebook use and sleep quality: Light interacts with socially induced alertness

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It has been demonstrated that the use of social networking sites late at night can lead to sleep-related problems that extend into the next day. A common explanation is that the light emitted from screens is disrupting the users' circadian rhythms. An alternative explanation is that the social cognition inherent in the use of social networking sites is responsible. Here, the two factors were looked at together. Participants used Facebook on iPad tablets before sleep. This was done on different nights with two lighting conditions and with two levels of content. In the 'light' condition, blue wavelength light was manipulated so that it was either full wavelength or blue light filtered. In the 'alertness' condition, the personal significance of the content was changed from personally relevant to irrelevant. A modified version of the Pittsburgh Sleep Quality Index was used to measure sleep-related problems. No evidence was found that simply filtering blue light or simply removing relevant content improved sleep quality. However, the two factors interacted. The results suggest that the light emitted from screens can affect sleep quality under some conditions but this is behaviourally irrelevant in the context of normal Facebook usage.

There is growing evidence that using laptops, tablets, and phones before going to sleep has a detrimental effect on sleep quality. Disruptive effects have been reported in large-scale questionnaire surveys of sleep quality (Gradisar *et al.*, 2013; Levenson, Shensa, Sidani, Colditz, & Primack, 2016). One explanation is that this is due to the pre-sleep exposure to blue wavelength light emanating from screens. This inference is drawn from physiological studies which have demonstrated that bright light in the evening inhibits the secretion of melatonin which in turn can delay the onset of drowsiness and sleep (Cajochen *et al.*, 2011; Chang, Aeschbach, Duffy, & Czeisler, 2014).

It is light with short wavelengths, especially in the blue wavelength range of around 460–480 nm that produce the most melatonin suppression. Cajochen *et al.* (2011) report a suppression of the normal evening increase in melatonin levels when people are exposed to a computer screen that emanates more blue light relative to one that produces less. Similarly, Wood, Rea, Plitnick, and Figueiro (2013) found that when participants viewed tablets through clear goggles with attached blue light-emitting diodes (LED), melatonin increase was significantly suppressed relative to when they viewed tablets through orange-tinted glasses that block blue light. The effect seems mediated by a

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circadian rhythm phase delay that leads to a postponement of sleep onset (Cajochen *et al.*, 2011). Likewise, Van der Lely *et al.* (2015) found that when viewing an LED computer screen while wearing blue light-blocking glasses, melatonin levels increased and self-perceived alertness reduced. Furthermore, Chang *et al.* (2014) found that light emitted from eBooks viewed on an iPad tablet, reduced participants' level of melatonin, and increased their sleep latency by 10 min, compared to those participants that read a printed book. Together, these findings show that the use of computer screens before sleep has a direct physiological effect via the light emitted from the screen. This suppresses the normal evening rise in melatonin; thus, it is argued, sustaining alertness, and delaying sleep onset.

Mainstream media and device manufacturers have inferred from this that light from screens is the cause of sleep disturbance. A corollary of this is the assumption that if appropriate filters are used, the supposed effects on sleep quality can be mitigated 'for example, f.lux' (Flux Software LLC, 2017) 'Kids Sleep Dr' (RMA Consulting Ltd, 2015). However, the psychological consequences of the delay in melatonin production are far from clear. Even the evidence for its effect on sleepiness is mixed. A recent meta-analysis (Souman, Tinga, te Pas, van Ee, & Vlaskamp, 2018) identified a set of 28 papers that manipulated light in the blue part of the spectrum. The results show that the relationship with alertness is not as robust as often assumed. While some studies report strong effects, others report no significant difference. Nonetheless, the hypothesis that light from screens may be the factor that causes the sleep disruption reported in the survey studies remains plausible given the clear physiological evidence of disrupted melatonin release and independent reports that this can lead to delays in sleepiness. It is similarly plausible that light in the blue part of the spectrum from screens has an effect on the quality of peoples' sleep beyond possibly delaying its onset. Existing findings of the effect of light on sleep do not address the range of negative effects reported in survey studies, for example, next day sleepiness and motivation. Similarly, it is far from clear whether the use of blue light filters has any beneficial effect on sleep quality.

The content of the material viewed on computer screens before trying to sleep is a second plausible explanation for the sleep disturbance reported in the large-scale surveys. If the content viewed is stimulating, it will lead to alertness at a time when the alertness system needs to be shut down (Bakotić & Radošević-Vidaček, 2012; Gradisar *et al.*, 2013). This is particularly likely in the case of Social Media use. Here, personally significant materials are being browsed and can lead to a high arousal happy state (Arora, Broglia, Thomas, & Taheri, 2014) or high arousal-negative states such as jealousy (Tandoc, Ferrucci, & Duffy, 2015) and anxiety (McCord, Rodebaugh, & Levinson, 2014). More specifically, the use of 'Facebook' has been found to induce a state of high arousal and high positive valence as measured by skin conductance (Mauri, Cipresso, Balgera, Villamira, & Riva, 2011). Facebook use has also specifically been linked to negative emotional states in college students, that is, envy and depression (Sagioglou & Greitemeyer, 2014; Tandoc *et al.*, 2015). More generally, Arora *et al.* (2014) identified a sleep latency increase in social network users that they attributed to the higher alertness that comes from the interactivity and thought required. Hence, it may be the personal engagement with the content viewed on the device that interferes with sleep, acting via the heightened physiological state of arousal (Mauri *et al.*, 2011) that it produces. If this is the sole cause, the use of light filters can be expected to be ineffectual.

Whether either of these factors do account for the reports of poor sleep quality (Gradisar *et al.*, 2013; Levenson *et al.*, 2016) remains an open question. Equally, whether they could interact to produce a poorer quality of sleep is also unknown. The previous research on other aspects of sleep such as the onset of sleep and wakefulness does identify non-additive interactions. In that case, the interactions are between the point in a circadian rhythm and the hours since last sleep (Borbély, Daan, Wirz-Justice, & Deboer, 2016). Similarly, arousal and exposure to blue wavelength light may interact to affect perception of sleep quality. Models of sleep and alertness assume a linked network by which circadian and social cues can influence the arousal system of the brain. For example, in the model of Saper, Scammell, and Lu (2005), the dorsomedial hypothalamic nucleus is identified as a site of integration of circadian, social, and other cues. More recently, Gompf *et al.* (2010) report links from the anterior cingulate to the locus coeruleus arousal centre. A possible basis for an interaction seems to exist. However, the effect of content viewed before sleep and the effect of light have tended not to be investigated together. An exception is Higuchi, Motohashi, Liu, and Maeda (2005). Under laboratory conditions, they studied the effects of computer gaming under two light intensity conditions. While game playing did affect sleep latency and time spent in REM sleep, no effect of light was found on sleep nor did light level interact with game playing versus the control condition. The current study evaluates the impact on quality of sleep as experienced by the users of social media, for example, next day sleepiness. Rather than light intensity, it investigates whether the reduction in sleep quality is due to the wavelength of light emitted from the screen, the alerting content of what is being viewed on the device or an interaction of these two factors.

The Pittsburgh Sleep Quality Index (PSQI) was used. This is a widely utilized measure of how people experience the quality of their sleep and is a standardized clinical measure (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989; Mollayeva *et al.*, 2015). Participants answer questions about different aspects of their sleep. Sleep quality is divided into seven narrower domains. These are as follows: sleep duration, sleep disturbance, sleep onset latency, daytime dysfunction, sleep efficiency, and overall quality. A 'medication use' element is also included. By the addition of the component scores, a global score of sleep quality can be produced; the higher global scores represent poorer sleep quality. The previous studies on the effects of electronic media use have successfully employed this scale (Mollayeva *et al.*, 2015).

In the current study, participants took an iPad tablet home for the duration of the study. On different nights, participants viewed their own or a mock Facebook account, with an amber film over the tablet screen or with no film over the tablet screen. The next day they reflected on their sleep quality by completing a modified PSQI.

Method

Participants

Thirty undergraduate students (21 females) aged between 18 and 23 years were recruited and accredited for their participation. Participants were selected who routinely used social media before sleep and who reported having a normal sleep pattern. Participants were screened to exclude those taking antidepressants, sleep medication, or beta-blockers.

Procedure

There were four conditions. In the baseline condition, the participant viewed their real Facebook account on a tablet with the normal settings. Alternatively, they viewed a mock

Facebook account (described below) on the tablet with the normal settings; their real Facebook account on the tablet with an amber filter over the screen (described below); or a mock Facebook account on the tablet with the amber filter over the screen. The experiment was run over four weekday nights. The order of the conditions was pseudo-randomized across participants within the 4-day block. A written introduction and consent form were given to participants outlining how the study would be carried out. Instructions were also verbally delivered, and participants' understanding of the instructions was checked. The instructions included the specification that depending on condition, they were to view only their own Facebook page or the mock Facebook page. To balance demand characteristics, for half of the participants, this included a brief statement that 'light level was predicted to affect the quality of sleep', whereas for the other half of participants, it was stated that 'interest level was predicted to affect the quality of sleep'. After written consent was obtained; participants received an Apple iPad 4th-generation tablet (model MD513B/A, LED-backlit screen = 9.5 × 7.31 inches; Apple Inc., Cupertino, CA, USA) to take home for the duration of the study (four nights).

Participants viewed Facebook either on the tablet screen with the normal settings or with a LEE 104 deep amber filter film cut to the size of the tablet screen and attached over the screen by a bulldog clip in each corner of the device, to filter blue light. The LEE amber film filtered all but 0–18% of 460–480 nm wavelength, as measured with a double-beam scanning spectrophotometer (Lee Filters Worldwide, 2016). In the normal 'blue light' condition, the tablet was viewed with no film over the screen. Brightness of the tablet screens was measured by a luminance (lux) meter (Lutron Digital Lux meter; Lx101 series, Lutron, Taiwan). To ensure the brightness was the same for each condition, the tablets were set to full brightness when the amber film was used (200 lux at screen level) and brightness was lowered to match this when no film was used. The luminance of each tablet was also checked after each participant returned the tablet. Hence, blue light wavelength transmission was altered but brightness (lux) was kept the same for each level.

The stimulating/arousing condition had two levels: a 'high arousal' level, where the participant's own Facebook account was viewed and a 'low arousal' level where the participant viewed a mock Facebook account. The mock Facebook account was a profile set up for this study; this profile contained no photographs or 'friends' for users to contact. The profile included 53 'liked' pages of companies that were not targeted to the participant's age range, for example, Fisher-price toys. Most users report their screen time exposure before sleep as either <15 min or <30 min (Moulin & Chung, 2017; Nordnes, Storemark, Bjorvatn, & Pallesen, 2014). Each night participants were instructed to view either their own or the mock Facebook account for 15–30 min in the hour before bed. To minimize disruption to participants' normal evening FaceTime viewing routine, they were not asked to change what they did in the rest of the hour before sleep. Participants were instructed to do the study in a dark environment with the curtains closed and no other lights on, so the only light in the room was from the tablet screen. They were asked to not change the brightness settings of the screen. They were asked to hold the device at a comfortable viewing distance. To minimize disruption to their FaceTime viewing routine, participants were trusted to follow the instructions, without further checks.

The next morning a modified version of the PSQI (described below), was completed by the participant to assess their sleep on the previous night. Exceptions were questions which dealt with daytime experience (questions 8, 9, 10) which were completed the following evening. On completion of the study, participants received a written debrief, this fully explained the true aim of the experiment, that is, to assess whether the quality of sleep may be reduced by the arousing content, the light emitted from the screen, or both. At this session, they were also asked about how interesting they found the mock Facebook condition and their ability to comply with the instructions.

A small modification was made to the standard PSQI questions. This was required as the standard PSQI measures sleep quality over the previous month, and the current study wished to measure sleep quality after each night. So, questions were changed from asking about sleep over the previous month to sleep over the previous night. For example, question 6 'During the past month, how would you rate your quality of sleep overall?' was altered to 'During the previous night how would you rate your sleep quality overall?' This was the only change necessary for questions 1, 2, 3, 4, 6, 9 and 10 which addressed bedtime, time to fall asleep, time of rising, actual hours of sleep, and sleep quality. Three of the PSQI questions (5, 7, 8) ask about frequency of occurrence over the previous month; not occurred, less than once a week, once or twice a week, and three or more times a week. These were changed to yes/no answer questions; not occurred, occurred. These questions dealt with trouble sleeping, medication used, and trouble staying awake.

Ethics

This study received ethical approval from the University of Lincoln, Psychology Research Ethics Committee.

Data analyses

The individual questions scores were used to compute standard subcomponent scores. The components were duration, disturbance, latency, daytime dysfunction, efficiency, quality, and hypnotics used. Scores could range from 0 to 3 for the seven components of sleep tested, which totalled to produce a global modified PSQI score (range of 0–21) for each questionnaire. The lower the global modified PSQI score, or score for any component, the better the quality of sleep.

Results

Participants' modified global PSQI scores are shown in Figure 1.

At debrief, participants confirmed that while they did not find the mock Facebook page interesting, they were able to follow the instruction of viewing for 15–30 min.

The results were analysed by a 2 × 2 within-subjects ANOVA. This dealt with self-reported sleep quality for the factors 'arousal level' (high arousal or low arousal content) and 'light' (blue light or filtered blue light). The results show no significant main effect of arousal level, $F(1, 29) = 2.60$, $p = .118$, $\eta^2_p = .082$, or light, $F(1, 29) = 1.39$, $p = .247$, $\eta^2_p = .046$. However, there was a significant interaction between arousal level and light level, $F(1, 29) = 6.867$, $p = .014$, $\eta^2_p = .191$. The interaction (see Figure 1) shows that the best sleep quality was obtained for the night condition of 'blue-filtered light' and 'low arousal' relative to the other three nights.

To further explore which components of sleep quality were the most affected, 2 × 2 within-subject ANOVAs were conducted on the components of the PSQI. There were no main effects. The results show a significant interaction of arousal level and light level for the components of sleep duration, $F(1, 29) = 5.66$, $p < .05$, $\eta^2_p = .163$, sleep onset latency, $F(1, 29) = 7.10$, $p < .05$, $\eta^2_p = .197$, and daytime activity dysfunction on the

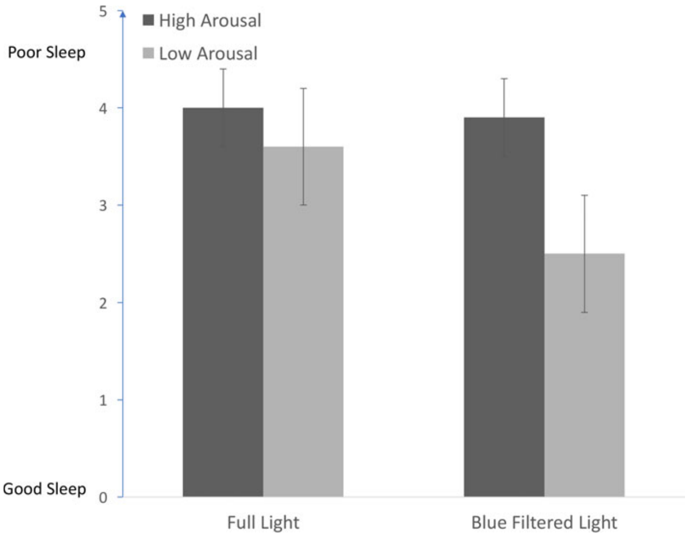

Figure 1. Effect of arousal and blue wavelength filtered light on sleep quality. In the high arousal conditions, participants viewed their own Facebook account; in the low arousal conditions, they viewed a mock Facebook account. Screens were either viewed with (full light) or with a blue wavelength filter. Poor/Good sleep is as measured on the modified Pittsburgh Sleep Quality Index. Lower numbers indicate higher quality of sleep. One standard error bars are shown.

following day, $F(1, 29) = 6.99, p < .05, \eta^2_p = .192$. Like the main analysis, these different aspects of sleep quality were all best in the 'low arousal-no blue light' condition. In contrast, no significant interactions were found for the components of sleep disturbance, $F(1, 29) = 0.05, p > .05, \eta^2_p = .002$, sleep efficiency, $F(1, 29) = 0.86, p > .05, \eta^2_p = .029$, or sleep quality overall, $F(1, 29) = 0.71, p > .05, \eta^2_p = .024$. The component of medication was not analysed as use of medication was in the participant exclusion criteria.

To test whether the instructions affected the reporting of sleep quality, instructions was added as a between subjects factor. There was no main effect, $F(1, 28) = .21, p = .65, \eta^2_p = .007$, nor any interaction effect; with 'light', $F(1, 28) = .22, p = .65, \eta^2_p = .008$, 'arousal level', $F(1, 28) = 2.43, p = .13, \eta^2_p = .08$, or 'light' by 'arousal level', $F(1, 28) = .42, p = .52, \eta^2_p = .015$. The same pattern was found for each of the components of sleep, there were no significant main effects of instructions, nor did instruction interact with the other two factors.

Discussion

The effect of pre-sleep Facebook use on sleep quality was measured using a self-report of aspects of the previous night's sleep (the modified PSQI). Two potentially disrupting factors were manipulated; the wavelength composition of the light emitted from the screen and the personal interest of the content that was being viewed. The factors interacted so that superior quality sleep was only reported when a non-personal Facebook account was viewed in blue-filtered light. At a practical level, the results suggest that the use of blue light filters is unlikely to be effective when viewing Facebook under normal viewing conditions. The results further show that under normal lighting conditions, the content of Facebook pages, at least as varied in this study, does not affect sleep quality.

The wavelength of light can have an effect on how people perceived the quality of their sleep. Previous work had shown a significant circadian rhythm phase delay in the release of melatonin (Chang *et al.*, 2014; Van der Lely *et al.*, 2015). The present results indicate that this physiological effect is visible at a wide behavioural level (i.e., sleep quality, daytime activity dysfunction) but only when the content viewed is 'low arousing'. This is consistent with Van der Lely *et al.* (2015) whose participants were tested under conditions that can be considered 'low arousal'. These participants spent 3 hrs in front of a bright monitor with relatively little interruption (mainly half hourly interruptions to measure sleepiness and to collect saliva). In the condition where blue wavelength light was blocked, a drop in vigilance was reported as was an increased sense of sleepiness.

The current results provide additional information on the length of exposure necessary and the percentage of blue wavelength light needed to effect sleep. Expanding on existing results (Cajochen *et al.*, 2011; Gringras, Middleton, Skene, & Revell, 2015; Tandoc *et al.*, 2015; Van der Lely *et al.*, 2015), the current study has found that even a brief 15- to 30-min exposure can be sufficient to produce a significant difference in sleep quality, when arousal level is low. This is considerably shorter than that typically known from previous studies, 3 hrs (Van der Lely *et al.*, 2015), 4 hrs (Chang *et al.*, 2014), 5 hrs (Cajochen *et al.*, 2011), and 2 hrs (Wood *et al.*, 2013). However, that effects can be seen this quickly is indicated by Horne, Donlon, and Arendt (1991). The amount of blue light that needs to be filtered to enhance sleep quality is also indicated by the current results. The use of a tinted LEE filter in the 'no blue light' level reduced the blue light emitted from the screen to 0–18% in the 460–480 nm wavelength range. This transmission rate is higher than that used in other studies. For example, the glasses utilized in the study by Van der Lely *et al.* (2015) transmitted 1.7–2% and the glasses utilized by Wood *et al.* (2013) transmitted 0% of light at 460–480 nm. The level filtered in the current study was adequate to enhance sleep quality when viewing low arousing content. However, this does raise the question of whether the same result would be seen with a more complete blocking of blue light.

Filtering the wavelength of light was only effective in our 'low arousing' condition. This raises the question of what it is about the material or activity that makes it 'low arousing'? The material was designed to be unexciting and uninteresting. However, this may not be the critical factor. Our 'low arousing' condition inevitably avoided social cognition and interaction (jealousy, envy, happiness). It may be this lack of personal significance that makes out stimuli 'low arousing. This view seems sensible when a comparison with Chang *et al.* (2014) is made. In that study, participants supplied their own reading material and it had to be 'pleasure' or 'leisure' reading material. They report greater sleepiness when reading a printed book in dim light relative to reading an Ebook. Clearly here the activity is not dull or uninteresting but nonetheless, a similar 'wakefulness' in normal screen light and 'sleepiness' in dim light is seen. It may well be that so long as people do not have to involve themselves with the worries, concerns, and issues of their lives (McCord *et al.*, 2014; Tandoc *et al.*, 2015) sleep will be undisrupted; the stimuli will be 'low arousal'.

The global disruption of sleep quality can be better understood by examining which aspects of sleep were and were not disrupted. The sleep onset latency component of the PSQI is disrupted, consistent with the studies showing a delay in melatonin release when viewing a screen in the evening, and this delay may also explain why total sleep duration is shorter. It is interesting to note that while participants report no awareness of any difference in their quality of sleep across the conditions, they nonetheless experienced an effect the next day of daytime dysfunction (the impact on staying awake or getting up enough enthusiasm to get things done the next day).

There are some specific methodological issues that deserve consideration. The first is whether the study had sufficient power to detect main effects of 'Light' or 'Arousal' if they were there. The effect of light in the blue part of the spectrum on sleepiness is not as robust as often assumed (Souman *et al.*, 2018). Nonetheless, given that earlier studies (Cajochen *et al.*, 2011) have shown that filtering blue light changes melatonin levels and can change measures of sleepiness, the credibility of the null result of varying the light is worth further consideration. Sample size had been chosen based on previous studies using the PSQI (Gross, Kreitzer, Russas, & Treesak, 2004; Lai & Good, 2005; Sun, Kang, Wang, & Zeng, 2013; Yook *et al.*, 2008). However, to explore whether the study had sufficient power, a power analysis with the program G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) was conducted to evaluate sample sizes sufficient to detect changes in sleep quality. Given an alpha of $p < .05$, desired power of .90 and moderate effect sizes (0.06) gives a power of .91 for a sample size of 30 participants. It seems likely therefore that the current study had sufficient power to detect differences had they existed. Nonetheless, it remains possible that the effect sizes were small and would not have been detected. This is plausible given the large proportion of studies that did not find a significant effect of manipulating the blue light content of the spectrum (Souman *et al.*, 2018). If so then the sample sizes would have had to be considerably larger. Souman *et al.* (2018) suggest a sample of $n > 155$. This would be a more reliable sample if the effect sizes are indeed small. Assuming moderate effect sizes, it seems reasonable to interpret the lack of significant difference between the 'Light' conditions and between 'Arousal' conditions as indicating that there were no simple 'Filtered light' or 'Arousal' effects.

A second methodological issue relates to the variability allowed to participants' viewing time. An important consideration in the design of this study was ensuring that participants were fully engaged in the social media experience in the intended arousing condition. For this reason, they were allowed to use any time between 15 and 30 min, that is, they could switch off the tablet if it was no longer interesting to them. While this is likely to have succeeded in ensuring socially induced high arousal throughout this condition, it does allow some variation in viewing time. It is possible that participants spent the shortest time viewing screens in the Low Arousal + Blue-Filtered-Light condition. This could happen with the reasonable assumption that people viewed the low arousal pages for less time (as they are boring) and that in blue-filtered light, they also viewed the display for less time (as they become drowsy). This could produce an alternative explanation. Rather than supposing that the effect on sleep quality is due to blue light filtering, it might instead arise from differing light exposure durations, that is, 15 min versus 30 min. It is known that full-spectrum light exposure can affect alertness (Souman *et al.*, 2018). One study (Cajochen, Zeitzer, Czeisler, & Dijk, 2000) has looked systematically at the effect of duration of light exposure. They showed that the longer participants were exposed to full-spectrum light, the greater were the effects on alertness and sleep. However, as Cajochen *et al.* (2000) made recordings every 30 min whether such effects would be seen with only a 15-min difference in light exposure is unknown from this study. No difference in subjective alertness was seen until after two hours exposure to very bright light (3,190 lux) compared to very dull light (23 lux). Souman *et al.* (2018) report eight studies that have looked at subjective alerting effects for shorter durations where full-spectrum light was used at differing intensities. With exposures of 30 min, effects on alertness are reported in six of the studies and no effect in the remaining two studies. However, as these studies used extreme brightness (thousands of lux), it is difficult to relate them to the current case where light intensity from a screen is low (200 lux). The one study (Rüger, Gordijn, Beersma, de Vries, & Daan, 2005) that used a low illumination (100 lux) compared to very low (<10) found no effects after 4 hrs. The mixed nature of these results leaves open the real possibility that sleepiness could be affected by 15 min shorter light exposure. This then highlights a confound in the current study and presents a possible alternative explanation for the current results. These factors could be separated in future experimentation. One strategy might be to match the exposure duration to that spontaneously used by a given participant when viewing Facebook before going to sleep. It would also be important to monitor behaviours around bedtime to ensure that there was no systematic variation in light exposure or activity. This could be done with a combination of technical measures, self-report, and by the wearing of ActiGraphs or other commercially available sleep and activity 'watches'.

Finally, there is the issue of demand effects. Two alternative sets of instructions were used to control this, half were led to believe that light wavelength but not content would affect sleep, and the other half the opposite. These alternative instructions had no effect. A more sophisticated expectation effect might be that participants guessed that dull light and boring material would improve sleep quality. If so this may have affected how they reported and so explain the pattern observed. However, such demand effects seem unlikely. Participants may have adopted an equally plausible alternative. They might have guessed that sleep quality would be worse after looking at exciting pages in full light. Most participants would have had to have adopted the same assumption for any statistically significant effect to emerge. There seems no obvious reason to think they would all opt for the first over the second. Indeed, the possibility that the results could be due to participants making an educated guess at the hypotheses is further weakened by the lack of a consistent effect on the subscales. If they really thought that filtered light and boring material produced better sleep, then they would be likely to report this consistently. They would likely report less disruption the next day, longer time asleep, quicker time to get to sleep, less next day disruption, less sleep disturbance, more time spent sleeping when in bed, and indeed a higher explicit rating of their sleep quality. In fact, only the first three showed any effect.

Conclusion

The practical issue of the everyday sleep quality of young adults who engage with Facebook before sleep was addressed. Evidence was found for some diminution of sleep quality (including next day functioning) when engaged in normal Facebook use. This did not improve when a blue light filter was placed over the screen, suggesting that when viewing social media, filters may not be as effective as sometimes assumed. However, there is some indication that filtering short wavelength light can have an effect on sleep quality but this seems only to be visible when the content viewed is non-arousing. Further work is needed particularly to understand this apparent interaction.

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