# The Effect of Neuroticism on the Relationship Between Screen Time and Social Connectedness in Students Enrolled in Tertiary Education

Leonie van Asselt (s2773775)

Department of Psychology, University of Twente

Nienke Peeters

June 10, 2024

Word Count: 5428

**Abstract**

Previous research has explored the effects of screen time and the importance of social connectedness in academics, as well as the general trait of neuroticism. However, little is known about how high levels of neuroticism might affect the relation between screen time and social connectedness. This is especially relevant as individuals high in neuroticism tend to be higher in social anxiety and shyness than the average person which might influence the levels of social connectedness, as well as the tendency of high neuroticism increasing sensitivity to external stressors, such as screen time. The aim of this study was to examine the moderating role of neuroticism on the relationship between screen time and social connectedness among students in tertiary education. Data were collected through an online questionnaire on Qualtrics, using validated scales to measure screen time, social connectedness, and neuroticism. The results indicate that individuals high in neuroticism generally have lower social connectedness, and that individuals with higher levels of screen time also tend to have lower levels of social connectedness, and both these results turned out statistically significant. However, neuroticism was found to not play a moderating role in this relationship. These findings help to narrow the gap in the ongoing research about the impacts of screen time on social connectedness. Future research should explore other potential variables, such as the type of screen time activity or other personality traits. Limitations of the present study include the reliance on self-report measures, which may affect the generalizability and accuracy of the findings.

*Keywords:* Neuroticism, screen time, social connectedness, tertiary education, young adults

## Introduction

In the current digital era, imagining any university lecture hall without screens is impossible. Even though the digital era is still evolving, people are becoming increasingly reliant on digital devices for education, communication, and entertainment. This dependency has driven the average screen time worldwide to 6 hours and 37 minutes across devices (Binns & Dyson, 2023), with young adults aged 18-24 averaging over 7 hours (Backlinko Team, 2024). When considering the recommended 8 hours of sleep, this means that individuals spend approximately 40% of their waking hours looking at screens, and young adults closer to 50% (Watson et al., 2015)

Accessibility to screens in our pockets is a development of the last 20 years, and the surge in screen time is worrying to many researchers and parents alike (Facer, 2012; Gale and Bolzan, 2016; Marwick, 2008; Rao and Lingam, 2020). Research into the effects of screen time is constantly evolving, and there are no set answers to the effect screen time has on individuals. This is partly because screen types and their applications are still developing. However, researchers have discovered that screen time can have negative effects on certain areas of life, both in the short term and long term. For example, research done by Neophytou et al. (2019) suggests that excessive stimulation through high levels of screen time affects cognitive functioning, and can increase the chances of cognitive disorders, like early onset dementia, as well as slowed learning, among other issues. Another study conducted by Rosenthal et al. in 2021 highlights the effects of excessive screen time and mentions that students with an average screen time higher than 5.72 hours have higher odds of developing depressive symptoms compared to students with a lower screen time. Besides, research has shown that in various age groups, individuals with high levels of screen time were less socially skilled and socially connected to their parents, peers, and teachers (Ma et al., 2022; Richards et al., 2010; DeWeese, 2014).

The lack of social connectedness could be explained by individuals using screen time and social media to replace face-to-face social interactions, decreasing the feeling of social connectedness (Twenge et al., 2019). Another explanation is that, starting in childhood, screen time reduces the likelihood critical social interactions occur, as well as the number of times these interactions occur. Simply put, critical social interactions are social relations and interactions a child has with parents, peers, and other authority figures (e.g. teachers). These key interactions give them the opportunity to socially develop. The interactions include

support and empathy, and conflict and resolution, to name a few (Huang & Tran-Chi, 2021; Lian, 2008; Pagani et al., 2010).

Both replacing face-to-face interactions as well as the lack of critical social interactions can influence the social development of individuals, further decreasing the feelings of social connectedness (Sigman, 2012). The consequences of a lack of social development can become apparent as early as from childhood, as children with lower social development are more likely to exhibit violent behaviour and aggression, poor sleep habits and hyperactivity (Hu et al., 2018; Muppalla et al., 2023).

Social interactions are crucial in daily life and so are also a vital aspect of student life. Research has shown that students do not only prefer social interactions during classes as it makes them feel more connected to their peers, but it also helps them retain more information, and can enhance critical thinking, as well as improving their communication skills, and all these factors overall improve the academic performance of students (Huitt et al., 2014; Hurst et al., 2005). Besides the effect of social interaction on academic performance, it also has a positive effect on the overall well-being of individuals. Research shows that the quantity of social interactions in daily life is associated with higher well-being in the moment, as well as overall individual well-being (Sun et al., 2020). Social interaction and feelings of social connectedness are two highly interconnected variables, where social interaction are the levels of interaction with other individuals, and social connectedness the perceived level of belongingness to other people. A higher level of social interaction is thus associated with a higher level of social connectedness (Kim et al., 2015).

It has been found that higher social interaction and thus higher feelings of social connectedness are profitable for student life, and that screen time can hinder the quantity and quality of student interactions, as students might let online interactions or screens in general in the way of face-to-face interactions (Rotondi et al., 2017). However, not every student is the same, and individual differences can change the effect screen time has on an individual, as well as the extent to which social connectedness is influenced by the amount of screen time of an individual. One factor that could moderate this relationship is personality traits, such as neuroticism.

Neuroticism is one of the Big Five personality traits, which is intriguing to research in relation to effects of screen time and social connectedness. This is because people with this personality trait are more susceptible to environmental stressors (Widiger & Oltmanns, 2017). This suggests that neurotic people may react more strongly to screen time, which is a source

of stress for many people, especially students (Ge et al., 2020). Furthermore, individuals with trait neuroticism are more likely to be shy than the average person and to experience negative emotions such as anxiety, which can influence their overall social interactions and so feelings of social connectedness (Widiger, 2009).

For the purposes of this study, in this paper "students", or "young adults" refer to individuals aged 18-25 enrolled in tertiary education. This age group was chosen as it corresponds to the early years of adulthood, where identity formation and transition into adult roles are important, and screen time is more likely to influence everyday life, as adolescents' developing brain are more sensitive to external stimuli compared to fully developed brains (Arnett, 2000; Foulkes & Blakemore, 2016).

Even though there is a lot of research into the effects of screen time, as well as the importance of social connectedness and the trait neuroticism in general, there is little to be found about how an individual high in neuroticism might react to the stressor that is screen time. There is also not a lot known about how screen time in turn will affect social connectedness in these people (Widiger, 2009). Therefore, it would be interesting to see how screen time influences the feelings of social connectedness of students high in neuroticism, and if this influence is higher in students scoring high on neuroticism compared to other individuals. It is important to understand this relationship as education could be improved to encourage social behaviour to improve social connectedness for the groups that need it. Besides, individuals could learn about the effects of screen time on various aspects of their life, including social connectedness as well as the possible differences or similarities in reactions based on their personality traits. Applying these recommendations can also improve mental health among students, as high levels of screen time was shown to put individuals at risk for depressive symptoms.

This thesis seeks to investigate the relationship between screen time and social connectedness of students, especially looking into the moderating role of neuroticism. This relationship, as well as the gap in the research, allows for the following research question:

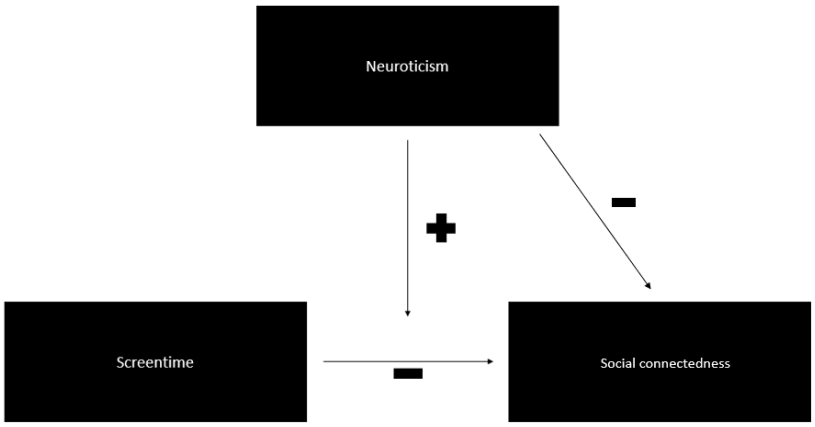
1. To what extent does neuroticism moderate the relationship between screen time and social connectedness among students in tertiary education?

**Hypotheses:**

1. Higher levels of screen time will show a negative relationship with social connectedness.

2. Higher levels of neuroticism will be negatively correlated with social connectedness.
3. Neuroticism will have a positive effect on the relationship between screen time and social connectedness.

**Figure 1.** ***Visualization of the hypothesis***




## Methods

### Design

This study investigated the relationship between screen time and social connectedness and the moderating role of neuroticism using a cross-sectional quantitative research design. This indicates that the variables are measured all at once, and the research question is investigated using only this data. An online Qualtrics survey was used to gather data, and participants were contacted via social media and SONA. So, a convenience sample was used, and participants were recruited using the snowball sampling technique. The study is a component of a larger investigation into the connection between personality, screen time, and student life. Since the survey is a component of the larger study, it contains numerous scales. The Mini International Personality Item Pool (Mini-IPIP), which measures neuroticism, a subjective screen-time questionnaire, and the revised Social Connectedness Scale are the specific scales used in this research. Appendix A contains the complete survey, with all the scales used in the larger study. Simple regression analyses will be conducted to answer the

first two hypotheses, alongside a multiple regression analysis for the third hypothesis, to test the hypotheses and provide an answer to the research question.

## Participants

The participants in this study were individuals between the ages of 18 and 25 that were enrolled in tertiary education. Inclusion criteria for participation included being within the specified age range, being enrolled in tertiary education, and being able to read and understand English on a sufficient level to fully understand the survey items. Participants who did not fit these criteria were excluded from the study.

## Materials

In order to take part in the survey, individuals had to have access to an electronic device (phone, laptop, tablet) and a stable internet connection.

### *Mini IPIP*

The Mini International Personality Item Pool (Mini-IPIP) scale assesses the Big Five personality traits: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience (Donnellan et al., 2006).

The Mini-IPIP consists of 20 items, four for each of the five personality traits. Examples of items in this scale are ‘I have frequent mood swings’, and ‘I get upset easily’. Participants rate each item on a Likert scale of 1 (strongly disagree) to 5 (strongly agree), indicating to what extent each statement applies to them. Due to this study being part of a bigger research study, extraversion, conscientiousness, and neuroticism have been investigated in the survey, as those are used in the different studies, and the other of the five personality traits are not. This study will only focus on personality trait neuroticism.

The scale has consistent and acceptable internal consistency ($\alpha$ = above .60) as well as good test-retest reliability and validity (Donnellan et al., 2006).

### *Self-reported screen time*

To measure screen time usage, participants were asked to fill out a self-report survey on their screen time (Montagni et al., 2016). The survey measures screen time in several categories: “1) working on a computer/tablet, 2) playing video games on a computer/tablet, 3) surfing the Internet on a computer/tablet, 4) watching TV or videos (movies, serials, TV programs) on a computer/tablet, and 5) using a smartphone” (Montagni et al., 2016).

Individuals were asked to fill out a 6-point Likert scale for all these categories, with 0 (never) and 5 (more than seven hours a day). Participants were also asked to fill out their estimated daily screen time across all devices. To measure total screentime use however, the mean of all categories was taken, and added into one column. It is not specifically known what the internal consistency for this scale is, but generally self-reported screen time scales are found to be reliable (Vizcaino et al., 2019).

***Revised social connectedness scale***

The revised social connectedness scale (SCA) is a self-report questionnaire which consists of 20 items, which aims to measure the connectedness an individual feels to peers or other people in their social environment. The SCA measures belongingness, closeness, support, and satisfaction in relation to social connectedness. The items in this scale consisted of questions such as, 'I fit in well in new situations', and 'I am able to relate to my peers'. Individuals are asked to rate each item before them on a 6-point Likert scale, ranging from 1 (disagree very strongly) to 6 (agree very strongly). The revised SCS has been shown to have high reliability ($\alpha = .94$) as well as validity in measuring social connectedness (Looti, 2023).

**Procedure**

Participants were recruited through the SONA-system for students from the University of Twente. If the participants filled out the survey through the SONA website, they were rewarded with 0.25 SONA credits. No other incentives were offered for participating in this study. Participants were also recruited through social media platforms like Instagram, Twitter and Whatsapp. Approval for conducting the research was given by *BMS Ethics Committee*, and dossier number for the approval is 240315.

The survey consisted of a total of 136 items and took approximately 20-30 minutes to complete. First, individuals were presented with a consent form outlining the purpose of the study, as well as information about anonymity and data storage. To ensure confidentiality and anonymity of the participants, no identifying information was collected during the survey. The survey data were stored securely on a password-protected computer and only accessible by the research team. Next, they were presented with the question whether they consented to this. If they answered yes, they would then be presented with more questions inquiring about their demographics like age, gender, nationality, and current level of education to ensure the participants are students enrolled in tertiary education. After this, the participants are

presented with the Mini-IPIP, asked questions regarding their screen time, and are asked to fill out the revised social connectedness scale.

**Data Analysis**

Data analysis was conducted using statistical software R. The data was imported from Qualtrics to R and then cleaned. Rows and columns with missing values were investigated and deleted from the analysis. After, the mean and standard deviations were calculated for demographic variables such as age, gender, nationality, and study level. Furthermore, the mean and standard deviation for neuroticism was determined and based on those scores the threshold for low/high neuroticism scores was determined. The high neuroticism threshold was determined by adding 0.5 standard deviation to the mean, and the low neuroticism threshold was determined by subtracting 0.5 standard deviation from the mean. Anyone falling within 0.5 standard deviation from the mean was considered average in neuroticism (Interpreting Individual IPIP Scale Scores, n.d.).

Descriptive statistics such as mean, and standard deviation were calculated for the variables Screen time, and Social Connectedness. Participants whose score did not indicate neuroticism were combined in one category, and individuals whose score did indicate neuroticism were combined in another category. For both neuroticism categories, descriptive statistics for variables Screen time and Social Connectedness were calculated as well. This data was used to answer the second hypothesis. To do that, the correlation between screen time and social connectedness was calculated three times: once in the full data set, once in the high neuroticism dataset and once in the low neuroticism data set. After this, the p-value was calculated for the level of social connectedness in high and low screen time. Lastly, a moderation analysis was conducted to investigate the moderating effect of neuroticism on the relationship between screen time and social connectedness.

## Results

The following section summarises the results of the data analysis conducted for this study. It starts by summarizing the demographics, like age, gender, and nationality of the participants. After, descriptive statistics are provided, and finally, a moderation analysis is shown.

**Demographics**

The total number of participants that took part in this study was 150, of which 89 filled out the complete questionnaire for this study. This discrepancy is due to dropouts and incomplete responses. When recruiting participants, inclusion criteria were explicitly mentioned, so only participants with missing answers had to be removed. The average age was just over 21 years old (M = 21.29, SD = 1.8). Of the participants, N = 63 (70.7%) participants were women, N = 22 (24.7%) men and 4 (4.5%) participants identified as non-binary/other. Of all the participants, there were N = 39 (43.8%) Dutch participants, 30 (33.7%) from Germany and 20 (22.5%) were from other countries. Participants were then asked to fill out their level of education, as an inclusion criterion was being a tertiary education student. The majority of the sample was a university bachelor's student (N = 72, 80.9%). N = 10 (11.2%) participants were HBO students, five (5.6%) were master students and one (1.1%) PhD student.

**Descriptive statistics**

The results from the study indicate that the participants in the sample had an average screen time of over M = 11 hours (M = 11.4, SD = 3.8). This is a high score, with almost 4 hours more than the 7.5h average in young adults (Backlinko Team, 2024).

The mean score on neuroticism was just under 13 (M = 12.7, SD = 3.2). The cutoff point to be considered high in neuroticism was 0.5SD above the mean, so a score of M = 14.23. Of all the participants, 27 participants scored above this cutoff, with a mean of M = 16 (SD = 1.44). This is considered a high neuroticism score. 62 participants scored below this cutoff, with a lower mean, just over 11 (M = 11.19, SD = 2.51), which is an average score for neuroticism.

The mean score on the social connectedness scale was 76 (SD = 11.86), which is considered high. The highest score possible was 120, as every question could get the participant a total score of 6, and the lowest score possible was 20. The higher the score, the higher the social connectedness. Individuals with a high neuroticism score scored on average of a little over M = 70 on the social connectedness scale (M = 70.3, SD = 11.96), which is considered average. Individuals low in neuroticism scored a mean of over M = 78 on social connectedness (M = 78.48, SD = 11), which is considered high. This means, averagely,

individuals lower in neuroticism scored slightly higher on social connectedness than individuals that scored higher on neuroticism.

**Correlation analysis**

To test the hypotheses, correlation analysis was used. The first hypothesis was: "Higher levels of screen time will be negatively correlated with social connectedness.". The moderate negative correlation that was found was indeed proven to be significant (r = -.49, p = .01). This means that there is sufficient evidence to indicate a negative relationship between screen time and social connectedness. Therefore, the results show that in the dataset the higher the level of screentime, the lower the social connectedness.

The second hypothesis was: "Higher levels of neuroticism will be negatively correlated with social connectedness.". First, this was tested in the full data set, in which moderate negative correlation was found, which turned out to be significant (r = -.46, p <.001). When this same analysis was run for the data set only including individuals above the neuroticism cutoff, a significant strong negative correlation was found (r = -.58, p = .002), and in the data set with participants below the neuroticism cutoff, a weak negative correlation was found, which also turned out to be significant (r = .29, p = .02). This means that this hypothesis can be accepted. These results indicate that individuals with higher levels of neuroticism will score lower on social connectedness than individuals with lower levels of neuroticism.

The third hypothesis was: "Neuroticism will have a positive effect on the relationship between screen time and social connectedness.". A simple moderator analysis was conducted to investigate if this hypothesis could be supported. The overall model was significant ($F(3, 85) = 8.911$, $p < .001$, $R^2 = .24$), indicating that the model was suitable to explain the moderating effect of neuroticism on the relationship between screen time and social connectedness. However, the direct effect of screen time on social connectedness was not significant ($B = -.46$, $SE = .29$, $t = -1.6$, $p = 0.12$), suggesting that screen time alone does not predict levels of social connectedness.

Furthermore, significant results were found for the relation of neuroticism and social connectedness ($B = -1.65$, $SE = .36$, $t = -4.6$, $p < .001$). This indicates that higher levels of neuroticism are associated with lower levels of social connectedness.

Lastly, the moderating effect of neuroticism on the relationship between screen time and social connectedness was investigated to answer the hypothesis: “Neuroticism will have a positive effect on the relationship between screen time and social connectedness.”. The interaction effect resulted to be non-significant ($B$ = -.087, $SE$ = .09, $t$ = -1.01, $p$ = 0.32). This implies that neuroticism does not significantly moderate the relationship between screen time and social connectedness. Therefore, the hypothesis that neuroticism moderates the relationship between screen time and social connectedness is not supported and thus is rejected.

## Discussion

The discussion examines the implications of the findings for daily life and future research, compares them with existing literature, and addresses the study's strengths and limitations.

The first hypothesis, “Higher levels of screen time will be negatively correlated with social connectedness” was supported. This means that individuals with higher levels of screen time reported lower levels of social connectedness in the survey. This result is in line with earlier research, suggesting that individuals with high levels of screen time are less socially connected to, among others, their peers (DeWeese, 2014). Research also found that individuals who use their phone while out with friends have a reduced quality of face-to-face interactions and benefit less from the positive effects that face-to-face interactions have on well-being (Rotondi et al., 2017).

In some cases, face-to-face interactions might be replaced by online interactions and friendships (Twenge et al., 2019). However, research suggests that friends that are made online are found to offer less emotional support and practical help, reducing the feelings of social connectedness even though there is still social interaction happening online (Twenge, 2013). In a self-report study, female bloggers report that they find happiness in online friendships, but the interaction that happens in real-life friendships fosters deep emotional connection, while online friendships do not offer this (Bane et al., 2010). These research studies show that overall, online interaction is not a sufficient replacement for face-to-face interaction.

However, screen time, and specifically online friendships do not only hinder the social connection of an individual. Research also shows that online interaction can strengthen offline friendships (Mesch, 2019). When interacting with individuals you know in real life, online

interaction can supplement offline friendships, rather than replace face-to-face interaction (Mesch, 2019).

The second hypothesis, “Higher levels of neuroticism will be negatively correlated with social connectedness.” was supported as well. This means that individuals scoring higher on neuroticism reported lower levels of social connectedness. This is what was expected based on earlier research, as some characteristics of personality trait neuroticism include higher levels of social anxiety and negative appraisal towards their environment (Widiger, 2009). These character traits in varying levels can strain interpersonal relationships and decrease the sense of social connectedness (Kaplan et al., 2015).

In neuroimaging studies in individuals with personality trait neuroticism, it was found that brain areas related to fear, and more specifically fear learning were more activated in these individuals. Besides, there was less activation in brain areas related to the anticipation of negative stimuli. Fear learning basically trains the brain into understanding when a situation is to be feared, and the areas controlling the anticipation of adverse stimuli are supposed to regulate the fear learning and adjust when necessary. Due to these brain areas being less active, and the fear learning areas being more active, individuals high in neuroticism constantly anticipate a negative outcome after experiencing stimuli that are not threatening, which can cause high levels of anxiety, which includes social anxiety (Servaas et al., 2013). Neuroticism has also been associated with altered brain connectivity while receiving criticism, making individuals high in neuroticism more sensitive to criticism compared to their peers (Servaas, Riese, et al., 2013). These factors are possible factors that could explain the influence of neuroticism on social connectedness.

The third hypothesis, “Neuroticism will moderate the negative correlation between screen time and social connectedness” was not supported. There was very weak evidence that neuroticism moderates this relationship, and the evidence that was there is not significant enough to say that this effect is caused by neuroticism.

This result can have various explanations. As seen in the previous hypotheses, neuroticism has a direct effect on the variables screen time and social connectedness. It is possible that neuroticism just has a direct effect on these variables instead of a moderating effect on the relationship between them. Furthermore, as mentioned before, individuals high in neuroticism often have higher levels of anxiety than the average person (Widiger, 2009).

This might result in a lack of social interaction due to this anxiety and therefore a lower level of social connectedness to begin with.

Commented [Lv1]: Possibly delete

***Strengths and limitations***

There are several strengths to be highlighted in this study. To begin, earlier research has been done into the relation between screen time and social connectedness, but often the research has been done on children, who often do not have liberty over their screen time use. This is contrary to the participant group in this study, which existed of young-adult students. Due to this, the amount of screen time is usually higher, and screens are utilized in more situations, influencing factors such as social connectedness at a different scale. This study highlighted the potential issues that high levels of screen time have on the social connectedness of students, both in academic and social settings, which is something that has been relatively understudied. The results of this study emphasised the effect of screen time on social connectedness, and how this is an issue in students, which indicates that this relationship is relevant to study further for this specific age group.

Furthermore, this study also specifically focuses on personality in relation to the variables screen time and social connectedness. One of the descriptors of neuroticism is that individuals high in this personality trait are often shy, and so often already have a lower sense of social connectedness. Factors like screen time decrease the social connectedness of most people, and it was assumed that for individuals high in neuroticism, this would decrease the level of social connectedness as well, if not more, due to their predisposition of lower levels of social connectedness. However, the results revealed that this is not necessarily true, and neuroticism does not affect this relation between screen time and social connectedness much. This result is worth looking into, as this is unexpected, and it would be worth for future research to go into specific ways that individuals high in neuroticism use screens, such as online interaction, consuming content, or gaming, for example, to find out why this moderating effect does not take place.

Lastly, based on these results, education could be improved to encourage social behaviour to improve social connectedness for the groups that need it. Besides, individuals could learn about the effects of screen time on various aspects of their life, including social connectedness, and follow recommendations to reduce these negative effects made especially for their personality trait. Applying these recommendations can also improve mental health

among students, as high levels of screen time was shown to put individuals at risk for depressive symptoms.

The study also had some limitations. Firstly, the sample had a disproportionate number of participants with low levels of neuroticism compared to participants with high levels of neuroticism. This imbalance impacted the study as an individual in the higher neuroticism group had more influence over the average than an individual in the lower neuroticism group. Due to this, the results from the lower neuroticism group were more reliable, and outliers in this group on e.g. social connectedness had less effect on the overall score, as more participants were classified 'low neuroticism'. Having these groups be of similar size would make the individual results have the same amount of impact on the different analyses done, ensuring a higher reliability. Furthermore, it was decided to use a subjective measure for screen time, due to there being limited options to measure screen time objectively. Objective measures would make the sample size smaller as well, as not everyone has screen time measures on their phone. It was determined that self-report measures of screen time are overall validated, however, objective measures tend to have a higher reliability compared to subjective measures, which is why that is preferred. Due to this, individuals might have been under- or overestimating their screen time levels, potentially weakening or strengthening the true relationship between this measure and social connectedness. To combat this, a test-retest measure of screen time could improve the reliability of the screen time measure. Besides, a more objective measure (e.g. adding a screenshot of the screen time measure tool that is often found on smartphones) could be added to ensure higher reliability. Lastly, due to the length of the survey, just under half of the people did not fully complete the survey. In future research, having a survey that only gathers data for one study could help prevent this. Having a higher response rate would make the results of the study more reliable, which would make the study more generalizable and would make the findings of the study more accurate and so more applicable to daily life.

**Conclusion**

The present study investigated the relationship between screen time and social connectedness, with neuroticism as a potential moderator. The findings indicate that higher levels of screen time in this study are generally associated with lower levels of social connectedness. Additionally, participants with higher levels of neuroticism also tended to have lower levels of social connectedness compared to those with lower levels of neuroticism.

However, no moderating effect of neuroticism on the relationship between screen time and social connectedness was observed.

These results provide a valuable foundation for future research. By building upon this study, further research can offer clearer guidelines on how to manage screen time to improve students' well-being, providing insights into recommended screen time limits and the balance between online and face-to-face interactions.

Future research should focus on various types of screen time, such as social media versus studying versus gaming, and how this influences social connectedness. Furthermore, the focus can be on using objective measures of screen time, to see how that would influence the findings. Lastly, future research with a larger sample size can use various levels of neuroticism (low, average, high) to see the effect that increasingly higher levels of neuroticism can have, and what the effect of various levels of neuroticism is. Besides, larger sample sizes could lead to more validated results.

**References**

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. ˜ *the œAmerican Psychologist*, *55*(5), 469–480. https://doi.org/10.1037/0003-066x.55.5.469

Backlinko Team, B. (2024, March 11). *Revealing average screen time statistics*. Backlinko. https://backlinko.com/screen-time-statistics#screen-time-by-age

Bane, C. M., Cornish, M., Erspamer, N., & Kampman, L. (2010). Self-Disclosure through Weblogs and Perceptions of Online and “Real-life” Friendships among Female

Bloggers. *Cyberpsychology, Behavior and Social Networking*, *13*(2), 131–139. https://doi.org/10.1089/cyber.2009.0174

Binns, R., & Dyson, M. (2023, September 5). *Screen time statistics 2024*. The Independent. https://www.independent.co.uk/advisor/vpn/screen-time-statistics

DeWeese, K. L. (2014). *Screen Time, How Much is Too Much? The Social and Emotional Costs of Technology on the Adolescent Brain*. Dominican Scholar. https://scholar.dominican.edu/masters-theses/32/

Donnellan, M. B., Oswald, F. L., Baird, B. M., & Lucas, R. E. (2006). The Mini-IPIP Scales: Tiny-yet-effective measures of the Big Five Factors of Personality. *Psychological Assessment*, *18*(2), 192–203. https://doi.org/10.1037/1040-3590.18.2.192

Facer, K. (2012). After the moral panic? Reframing the debate about child safety online. *Discourse: Studies in the Cultural Politics of Education*, *33*(3), 397–413. https://doi.org/10.1080/01596306.2012.681899

Foulkes, L., & Blakemore, S. (2016). Is there heightened sensitivity to social reward in adolescence? *Current Opinion in Neurobiology*, *40*, 81–85. https://doi.org/10.1016/j.conb.2016.06.016

Gale, F., & Bolzan, N. (2016). Online ghettoes, perils or supernannies? Australian young people with chronic illness and disability challenge some moral panics about young people online. *Disability & Society (Print)*, *31*(8), 1112–1126. https://doi.org/10.1080/09687599.2016.1236717

Ge, Y., Xin, S., Luan, D., Zou, Z., Bai, X., Liu, M., & Gao, Q. (2020). Independent and combined associations between screen time and physical activity and perceived stress among college students. *Addictive Behaviors*, *103*, 106224. https://doi.org/10.1016/j.addbeh.2019.106224

He, J., Chen, C., He, S., & Zhou, Z. (2014). Is there lower social anxiety level in online interaction? *Xinli Kexue Jinzhan*, *22*(2), 288. https://doi.org/10.3724/sp.j.1042.2014.00288

Hu, B. Y., Johnson, G. K., & Wu, H. (2018). Screen time relationship of Chinese parents and their children. *Children and Youth Services Review*, *94*, 659–669. https://doi.org/10.1016/j.childyouth.2018.09.008

Huang, N. S. T., & Tran-Chi, N. V. (2021). Exploration of the development of children's empathy. *MIER Journal of Educational Studies, Trends and Practices*, 103–112. https://doi.org/10.52634/mier/2020/v10/i1/1352

Huitt, T. W., Killins, A., & Brooks, W. S. (2014). Team-based learning in the gross anatomy laboratory improves academic performance and students' attitudes toward teamwork. *Anatomical Sciences Education*, *8*(2), 95–103. https://doi.org/10.1002/ase.1460

Hurst, B., Wallace, R. R., & Nixon, S. B. (2005). The impact of social interaction on student learning. *BearWorks*. https://bearworks.missouristate.edu/cgi/viewcontent.cgi?article=1022&context=article a-coe

Kaplan, S. C., Levinson, C. A., Rodebaugh, T. L., Menatti, A., & Weeks, J. W. (2015). Social anxiety and the big five personality traits: the interactive relationship of trust and openness. *Cognitive Behaviour Therapy*, *44*(3), 212–222. https://doi.org/10.1080/16506073.2015.1008032

Kim, Y., Glassman, M., & Williams, M. S. (2015). Connecting agents: Engagement and motivation in online collaboration. *Computers in Human Behavior*, *49*, 333–342. https://doi.org/10.1016/j.chb.2015.03.015

Lian, W. (2008). On pre-school children's peer conflict and related education. *Journal of China Women's University*. https://en.cnki.com.cn/Article_en/CJFDTOTAL-ZNXY200803019.htm

Looti, M. (2023). Social connectedness scale. *PSYCHOLOGICAL SCALES.* https://scales.arabpsychology.com/s/social-connectedness-scale/

Ma, S., Li, J., & Chen, E. E. (2022). Does screen media hurt young children's social development? Longitudinal associations between parental engagement, children's screen time, and their social competence. *Early Education and Development*, *35*(1), 10–25. https://doi.org/10.1080/10409289.2022.2151401

Marwick, A. E. (2008). To catch a predator? The MySpace moral panic. *First Monday*. https://doi.org/10.5210/fm.v13i6.2152

Mesch, S. (2019). *Educating 21st Century Children*. OECD. https://doi.org/10.1787/b7f33425-en

Montagni, I., Guichard, E., Carpenet, C., Tzourio, C., & Kurth, T. (2016). Screen time exposure and reporting of headaches in young adults: A cross-sectional study. *Cephalalgia*, *36*(11), 1020–1027. https://doi.org/10.1177/0333102415620286

Muppalla, S. K., Vuppalapati, S., Pulliahgaru, A. R., & Sreenivasulu, H. (2023). Effects of Excessive screen time on Child Development: An Updated review and Strategies for Management. *Curēus*. https://doi.org/10.7759/cureus.40608

Neophytou, E., Manwell, L. A., & Eikelboom, R. (2019). Effects of Excessive Screen Time on Neurodevelopment, Learning, Memory, Mental Health, and Neurodegeneration: a Scoping Review. *International Journal of Mental Health and Addiction*, *19*(3), 724–744. https://doi.org/10.1007/s11469-019-00182-2

Pagani, L. S., Fitzpatrick, C., Barnett, T. A., & Dubow, E. (2010). Prospective associations between early childhood television exposure and academic, psychosocial, and physical well-being by middle childhood. *Archives of Pediatrics & Adolescent Medicine*, *164*(5). https://doi.org/10.1001/archpediatrics.2010.50

Rao, N., & Lingam, L. (2020). Smartphones, youth and moral panics: Exploring print and online media narratives in India. *Mobile Media & Communication (Print)*, *9*(1), 128–148. https://doi.org/10.1177/2050157920922262

Richards, R., McGee, R., Williams, S. M., Welch, D., & Hancox, R. J. (2010). Adolescent screen time and attachment to parents and peers. *Archives of Pediatrics & Adolescent Medicine*, *164*(3), 258. https://doi.org/10.1001/archpediatrics.2009.280

Rosenthal, S. R., Zhou, J., & Booth, S. T. (2021). Association between mobile phone screen time and depressive symptoms among college students: A threshold effect. *Human Behavior and Emerging Technologies*, *3*(3), 432–440. https://doi.org/10.1002/hbe2.256

Rotondi, V., Stanca, L., & Tomasuolo, M. (2017). Connecting Alone: smartphone use, quality of social interactions and Well-Being. *Social Science Research Network*. https://doi.org/10.2139/ssrn.2893027

Servaas, M. N., Riese, H., Renken, R. J., Marsman, J. C., Lambregs, J., Ormel, J., & Aleman, A. (2013). The Effect of Criticism on Functional Brain Connectivity and Associations with Neuroticism. *PloS One*, *8*(7), e69606. https://doi.org/10.1371/journal.pone.0069606

Servaas, M. N., Van Der Velde, J., Costafreda, S. G., Horton, P., Ormel, J., Riese, H., & Aleman, A. (2013). Neuroticism and the brain: A quantitative meta-analysis of neuroimaging studies investigating emotion processing. *Neuroscience & Biobehavioral Reviews/Neuroscience and Biobehavioral Reviews*, *37*(8), 1518–1529. https://doi.org/10.1016/j.neubiorev.2013.05.005

Sigman, A. (2012). Time for a view on screen time. *Archives of Disease in Childhood*, *97*(11), 935–942. https://doi.org/10.1136/archdischild-2012-302196

Sun, J., Harris, K., & Vazire, S. (2020). Is well-being associated with the quantity and quality of social interactions? *Journal of Personality and Social Psychology*, *119*(6), 1478–1496. https://doi.org/10.1037/pspp0000272

Twenge, J. M. (2013). Does online social media lead to social connection or social disconnection? *Journal of College and Character*, *14*(1), 11–20. https://doi.org/10.1515/jcc-2013-0003

Twenge, J. M., Martin, G. N., & Spitzberg, B. H. (2019). Trends in U.S. Adolescents' media use, 1976–2016: The rise of digital media, the decline of TV, and the (near) demise of print. *Psychology of Popular Media Culture*, *8*(4), 329–345. https://doi.org/10.1037/ppm0000203

Vizcaino, M., Buman, M. P., DesRoches, C. T., & Wharton, C. (2019). Reliability of a new measure to assess modern screen time in adults. *BMC Public Health*, *19*(1). https://doi.org/10.1186/s12889-019-7745-6

Watson, N. F., Badr, M. S., Belenky, G., Bliwise, D. L., Buxton, O. M., Buysse, D. J., Dinges, D. F., Gangwisch, J. E., Grandner, M. A., Kushida, C. A., Malhotra, R. K., Martin, J. L., Patel, S. R., Quan, S. F., Tasali, E., Twery, M. J., Croft, J. B., Maher, E., Barrett, J. A., . . . Heald, J. L. (2015). Recommended amount of sleep for a healthy adult: A joint consensus statement of the American Academy of Sleep Medicine and Sleep Research Society. *Journal of Clinical Sleep Medicine*, *11*(06), 591–592. https://doi.org/10.5664/jcsm.4758

Widiger, T. A. (2009). *Neuroticism.* APA Psychnet. https://psycnet.apa.org/record/2009-12071-009

Widiger, T. A., & Oltmanns, J. R. (2017). Neuroticism is a fundamental domain of personality with enormous public health implications. *World Psychiatry/World Psychiatry*, *16*(2), 144–145. https://doi.org/10.1002/wps.20411

**AI Statement**

During the preparation of this work the author used no artificial intelligence tools.

## Appendix A

**Screen-Time among university students**

---

Start of Block: Informed Consent

Informed consent Thank you for participating in our study centered around screen time, personality, and aspects of student life. Participation in this study is completely voluntary, and it is possible to withdraw from this study at any point without giving an explanation. While participating in this study you will be asked several questions that are related to (Social Media) Screen Time, Personality, Sleep Quality, Procrastination, Life Satisfaction, Perceived Stress.

There are no known safety risks related to participation. The estimated time to complete this questionnaire is 15-30 minutes. If you are a student participating through the SONA-system, completing this study will reward you with 0.25 SONA-point(s).

The data that is collected will be anonymised and will only be available to the researchers. Since the data is anonymised, even the researchers will not be able to identify you from your personal information. So please answer all questions as honestly as possible. Once the research is concluded, the data will be disposed in accordance with the guidelines of the University of Twente. If there are any questions or remarks, please feel free to contact the researchers:

Bram Brinkman: b.g.j.brinkman@student.utwente.nl
Matea Steven: m.s.steven@student.utwente.nl
Fiona Köster: f.koster@student.utwente.nl
Sara Von Pruski: s.m.vonpruski@student.utwente.nl
Leonie van Asselt: l.m.vanasselt@student.utwente.nl

Supervisor:
Nienke Peeters: n.j.peeters@utwente.nl
Marcel Pieterse: m.e.pieterse@utwente.nl

Q21 I read the informed consent, and agree to participate in this study.

- Yes (1)
- No (2)

End of Block: Informed Consent

Start of Block: Demographics

Age What is your age?

| | 18 19 20 22 23 24 25 26 28 29 30 |
|---|---|
| Age () |  |

Gender What is your gender?

- Male (1)
- Female (2)
- Non-binary/other (3)

Nationality What is your nationality?

- Dutch (1)
- German (2)
- Other (3)

Education What is your study level?

- Bachelor student (1)
- Master student (2)
- PhD (3)
- HBO student (4)

End of Block: Demographics

Start of Block: Adjusted Mini-IPIP

Mini-IPIP  Please indicate on a range of very inaccurate to very accurate how much the statements suit you as a person.

| | Very inaccurate (1) | Moderately inaccurate (2) | Neither inaccurate nor accurate (3) | Moderately accurate (4) | Very accurate (5) |
|---|---|---|---|---|---|
| I am the life of the party (1) | ○ | ○ | ○ | ○ | ○ |
| I get chores done right away (2) | ○ | ○ | ○ | ○ | ○ |
| I have frequent mood swings (3) | ○ | ○ | ○ | ○ | ○ |
| I don't talk a lot (4) | ○ | ○ | ○ | ○ | ○ |
| I often put things back in their proper place (5) | ○ | ○ | ○ | ○ | ○ |
| I am relaxed most of the time (6) | ○ | ○ | ○ | ○ | ○ |
| I talk to a lot of different people at parties (7) | ○ | ○ | ○ | ○ | ○ |
| I like order (8) | ○ | ○ | ○ | ○ | ○ |

| | | | | | |
|---|---|---|---|---|---|
| I get upset easily (9) | ○ | ○ | ○ | ○ | ○ |
| I keep in the background (10) | ○ | ○ | ○ | ○ | ○ |
| I make a mess of things (11) | ○ | ○ | ○ | ○ | ○ |
| I seldom feel blue (12) | ○ | ○ | ○ | ○ | ○ |

End of Block: Adjusted Mini-IPIP

Start of Block: Screen Time

Screen Time For the next questions, please indicate the average time you spend in a day in front of these different screens. If you can, indicate the accurate measure by using the "screen time" option in the settings of the device. If not, try to estimate the time as good as possible.

What is the average time in a day spend...

| | Never (1) | 30 min or less (2) | 0.5 - 1 h (3) | 1 - 2 h (4) | 2 - 3 h (5) | 3 - 4 h (6) | 4 - 5 h (7) | 5 - 6 h (8) | 6 - 7 h (9) | More than 7h (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| ...working on a computer/tablet. (1) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| ...playing video games on a computer/tablet. (2) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| ...surfing the internet on a computer/tablet. (3) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| ...watching TV or videos (movies, series, TV programs) on a computer/tablet. (4) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| ...using a smartphone. (5) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Q58 What is your estimated daily screen time across all devices in hours?

_____

End of Block: Screen Time

Start of Block: Social Media Screen Time

social media  Please indicate for each social media platform how much time you spend on a daily average. For this please follow these steps on your phone:

Apple: Settings -> Screentime -> See All App & Website Activity -> Week (on top of the screen) -> click on each social media platform you used -> Daily Average
Android: Settings -> Digital Wellness and Parental Control -> click on each social media platform you used
-> Weekly (on top of the screen) -> Daily Average (...h ...min/day)
If this does not work or if you cannot find this information, take a guess at how much time on an average day in the past week you spent on each of the social media platforms you use (or look in the apps directly).

(Remember that if you fill this out at the beginning of a new week, the analysis only shows data from one or two days. In that case please look in your settings at the last week. If you do not find this, then just take a guess at how much you used the social media platform in the last week on average.)

With that information, please fill out the next items. Please  also keep in mind the time on

other devices (laptop, iPad, etc.) you use social media on (i.e., YouTube or Twitch).

| | Not at all (1) | 30 min. or less (2) | 0.5 - 1 h (3) | 1 - 2 h (4) | 2 - 3 h (5) | 3 - 4 h (6) | 4 - 5 h (7) | 5 - 6 h (8) | 6 - 7 h (9) | More than 7h (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| Instagram (1) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Snapchat (2) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| WhatsApp (3) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| TikTok (4) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Pinterest (5) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Facebook (6) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| YouTube (7) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Twitter/X (8) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Reddit (9) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Twitch (10) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Others (11) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Q49 For each statement please indicate how often you engage in said activity online when using social media on an average day, during the last 7 days.

| | Never (1) | Rarely (2) | Sometimes (3) | Often (4) | Very Often (5) |
|---|---|---|---|---|---|
| 1. I look at the photo albums of other users. (1) | ○ | ○ | ○ | ○ | ○ |
| 2. I look at the profiles/pages of other users or read through them. (2) | ○ | ○ | ○ | ○ | ○ |
| 3. I look at the stories of my friends/ my subscriptions. (3) | ○ | ○ | ○ | ○ | ○ |
| 4. I read private messages that other users send me. (4) | ○ | ○ | ○ | ○ | ○ |
| 5. I read entries on the chronicles and personal pages of other users. (5) | ○ | ○ | ○ | ○ | ○ |

| | | | | | |
|---|---|---|---|---|---|
| 6. I read through the comments on other users' pictures. (6) | ○ | ○ | ○ | ○ | ○ |
| 7. I read the comments on my own pictures. (7) | ○ | ○ | ○ | ○ | ○ |
| 8. I look at links or video clips posted on other people's profile pages (e.g., YouTube). (8) | ○ | ○ | ○ | ○ | ○ |
| 9. I look at the profile pages of my relatives. (9) | ○ | ○ | ○ | ○ | ○ |
| 10. I look at the "newsfeed" to see the latest activities of other users (e.g., if they have new friends). (10) | ○ | ○ | ○ | ○ | ○ |

Q51 For each statement please indicate whether you agree or disagree that you use social media to...

| | Stongly Disagree (1) | Disagree (2) | Somewhat Disagree (3) | Neither Disagree nor Agree (4) | Somewhat Agree (5) | Agree (6) | Strongly Agree (7) |
|---|---|---|---|---|---|---|---|
| 1. … communicate online. (1) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 2. … communicate with those I don't know. (2) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 3. … make new friends. (3) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 4. … to date. (4) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 5. … keep in touch. (5) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 6. … communicate with distant friends. (6) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 7. … communicate with those I know offline. (7) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 8. … maintain social contact. (8) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

End of Block: Social Media Screen Time

Start of Block: Short - Pittsburgh Sleep Quality Inventory

Q60 During the past month, when have you usually gone to bed?

- ○ Before 21:00 (1)
- ○ 21:00-23:00 (2)
- ○ 23:00-01:00 (3)
- ○ Later than 01:00 (4)

Q11 During the past month, how long (in minutes) has it taken you to fall asleep each night?

_____

Q61 During the past month, when have you usually gotten up in the morning?

- ○ Before 06:00 (1)
- ○ 06:00-08:00 (2)
- ○ 08:00-10:00 (3)
- ○ 10:00-12:00 (4)
- ○ Later than 12:00 (5)

Q13 During the past month, how many actual hours of sleep did you get at night? (This may be different than the number of hours you spend in bed.)

_____

Q17 During the past month, how often have you had trouble sleeping because you…

| | Not during the last month (1) | Less than once a week (2) | Once or twice a week (3) | Three or more times a week (4) |
|---|---|---|---|---|
| Cannot get to sleep within 30 minutes (1) | ○ | ○ | ○ | ○ |
| Wake up in the middle of the night or early morning (2) | ○ | ○ | ○ | ○ |
| Cannot breathe comfortably (3) | ○ | ○ | ○ | ○ |
| Cough or snore loudly (4) | ○ | ○ | ○ | ○ |
| Feel too hot (5) | ○ | ○ | ○ | ○ |
| Have bad dreams (6) | ○ | ○ | ○ | ○ |
| Have pain (7) | ○ | ○ | ○ | ○ |

Q19 During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

- Not during the last month (1)
- Less than once a week (2)
- Once or twice a week (3)
- Three or more times a week (4)

Q20 During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done?

- Not during the last month (1)
- Less than once a week (2)
- Once or twice a week (3)
- Three or more times a week (4)

**End of Block: Short - Pittsburgh Sleep Quality Inventory**

**Start of Block: Perceived Stress Scale**

Q48 The questions in this scale ask you about your feelings and thoughts during the last week. In each case, you will be asked to indicate how often you felt or thought a certain way.

| | Never (1) | Almost Never (2) | Sometimes (3) | Fairly Often (4) | Very Often (5) |
|---|---|---|---|---|---|
| 1. In the last week, how often have you been upset because of something that happened unexpectedly? (1) | ○ | ○ | ○ | ○ | ○ |
| 2. In the last week, how often have you felt that you were unable to control the important things in your life? (2) | ○ | ○ | ○ | ○ | ○ |
| 3. In the last week, how often have you felt nervous and "stressed"? (3) | ○ | ○ | ○ | ○ | ○ |

| | | | | | |
|---|---|---|---|---|---|
| 4. In the last week, how often have you felt confident about your ability to handle your personal problems? (4) | ○ | ○ | ○ | ○ | ○ |
| 5. In the last week, how often have you felt that things were going your way? (5) | ○ | ○ | ○ | ○ | ○ |
| 6. In the last week, how often have you found that you could not cope with all the things that you had to do? (6) | ○ | ○ | ○ | ○ | ○ |

| | | | | | |
|---|---|---|---|---|---|
| 7. In the last week, how often have you been able to control irritations in your life? (7) | ○ | ○ | ○ | ○ | ○ |
| 8. In the last week, how often have you felt that you were on top of things? (8) | ○ | ○ | ○ | ○ | ○ |
| 9. In the last week, how often have you been angered because of things that were outside of your control? (9) | ○ | ○ | ○ | ○ | ○ |

| | | | | | |
|---|---|---|---|---|---|
| 10. In the last week, how often have you felt difficulties were piling up so high that you could not overcome them? (10) | ○ | ○ | ○ | ○ | ○ |

End of Block: Perceived Stress Scale

Start of Block: Academic Procrastination Scale

Procrastination  These questions are about your procrastination tendencies, meaning how quickly you get things done or whether you tend to put them off. Please indicate your answer

to the questions on a scale of Disagree to Agree.

| | Disagree (1) | Somewhat disagree (2) | Neither agree or disagree (3) | Somehwat agree (4) | Agree (5) |
|---|---|---|---|---|---|
| I usually allocate time to review and proofread my work. (1) | ○ | ○ | ○ | ○ | ○ |
| I put off projects until the last minute. (2) | ○ | ○ | ○ | ○ | ○ |
| I have found myself waiting until the last day before to start a big project. (3) | ○ | ○ | ○ | ○ | ○ |
| I know I should work on schoolwork, but I just don't do it. (4) | ○ | ○ | ○ | ○ | ○ |

| | | | | | |
|---|---|---|---|---|---|
| When working on schoolwork, I usually get distracted by other things. (5) | ○ | ○ | ○ | ○ | ○ |
| I waste a lot of time on unimportant things. (6) | ○ | ○ | ○ | ○ | ○ |
| I get distracted by other, more fun, things when I am supposed to work on schoolwork. (7) | ○ | ○ | ○ | ○ | ○ |
| I concentrate on schoolwork instead of other distractions. (8) | ○ | ○ | ○ | ○ | ○ |

| | | | | | |
|---|---|---|---|---|---|
| I can't focus on schoolwork or projects for more than an hour until I get distracted. (9) | ○ | ○ | ○ | ○ | ○ |
| My attention span for schoolwork is very short. (10) | ○ | ○ | ○ | ○ | ○ |
| Tests are meant to be studied for just the night before. (11) | ○ | ○ | ○ | ○ | ○ |
| I feel prepared well in advance for most tests. (12) | ○ | ○ | ○ | ○ | ○ |
| "Cramming" and last minute studying is the best way that I study for a big test. (13) | ○ | ○ | ○ | ○ | ○ |

| | | | | | |
|---|---|---|---|---|---|
| I allocate time so I don't have to "cram" at the end of the semester. (14) | ○ | ○ | ○ | ○ | ○ |
| I only study the night before exams. (15) | ○ | ○ | ○ | ○ | ○ |
| If an assignment is due at midnight, I will work on it until 23:59. (16) | ○ | ○ | ○ | ○ | ○ |
| When given an assignment, I usually put it away and forget about it until it is almost due. (17) | ○ | ○ | ○ | ○ | ○ |

| | | | | | |
|---|---|---|---|---|---|
| Friends usually distract me from schoolwork. (18) | ○ | ○ | ○ | ○ | ○ |
| I find myself talking to friends or family instead of working on schoolwork. (19) | ○ | ○ | ○ | ○ | ○ |
| On the weekends, I make plans to do homework and projects, but I get distracted and hang out with friends. (20) | ○ | ○ | ○ | ○ | ○ |
| I tend to put off things for the next day. (21) | ○ | ○ | ○ | ○ | ○ |

| | | | | | |
|---|---|---|---|---|---|
| I don't spend much time studying school material until the end of the semester. (22) | ○ | ○ | ○ | ○ | ○ |
| I frequently find myself putting important deadlines off. (23) | ○ | ○ | ○ | ○ | ○ |
| If I don't understand something, I'll usually wait until the night before the test to figure it out. (24) | ○ | ○ | ○ | ○ | ○ |
| I read the textbook and look over notes before coming to class and listening to a lecture or teacher. (25) | ○ | ○ | ○ | ○ | ○ |

End of Block: Academic Procrastination Scale

Start of Block: Revised Social Connectedness Scale

Q52 On a scale of disagree very strongly to agree very strongly please indicate how much the statements apply to you as a person

| | Disagree very strongly (1) | Disagree strongly (2) | Disagree (3) | Agree (4) | Agree strongly (5) | Agree very strongly (6) |
|---|---|---|---|---|---|---|
| I feel comfortable in the presence of strangers (1) | ○ | ○ | ○ | ○ | ○ | ○ |
| I am in tune with the world (2) | ○ | ○ | ○ | ○ | ○ | ○ |
| Even among my friends, there is no sense of brother/sisterhood (3) | ○ | ○ | ○ | ○ | ○ | ○ |
| I fit in well in new situations (4) | ○ | ○ | ○ | ○ | ○ | ○ |
| I feel close to people (5) | ○ | ○ | ○ | ○ | ○ | ○ |
| I feel disconnected from the world around me (6) | ○ | ○ | ○ | ○ | ○ | ○ |
| Even around people I know, I don't feel that I really belong (7) | ○ | ○ | ○ | ○ | ○ | ○ |
| I see people as friendly and approachable (8) | ○ | ○ | ○ | ○ | ○ | ○ |

| | | | | | | |
|---|---|---|---|---|---|---|
| I feel like an outsider (9) | ○ | ○ | ○ | ○ | ○ | ○ |
| I feel understood by the people I know (10) | ○ | ○ | ○ | ○ | ○ | ○ |
| I feel distant from people (11) | ○ | ○ | ○ | ○ | ○ | ○ |
| I am able to relate to my peers (12) | ○ | ○ | ○ | ○ | ○ | ○ |
| I have little sense of togetherness with my peers (13) | ○ | ○ | ○ | ○ | ○ | ○ |
| I find myself actively involved in people's lives (14) | ○ | ○ | ○ | ○ | ○ | ○ |
| I catch myself losing a sense of connectedness with society (15) | ○ | ○ | ○ | ○ | ○ | ○ |
| I am able to connect with other people (16) | ○ | ○ | ○ | ○ | ○ | ○ |
| I see myself as a loner (17) | ○ | ○ | ○ | ○ | ○ | ○ |
| I don't feel related to most people (18) | ○ | ○ | ○ | ○ | ○ | ○ |

| | | | | | | |
|---|---|---|---|---|---|---|
| My friends feel like family (19) | ○ | ○ | ○ | ○ | ○ | ○ |
| I don't feel I participate with anyone (20) | ○ | ○ | ○ | ○ | ○ | ○ |

End of Block: Revised Social Connectedness Scale

Start of Block: Life satisfaction

Life satisfaction  Taking everything into consideration, during the past week how satisfied have you been with your…

| | Very Poor (1) | Poor (2) | Fair (3) | Good (4) | Very Good (5) |
|---|---|---|---|---|---|
| … physical health? (1) | ○ | ○ | ○ | ○ | ○ |
| … mood? (2) | ○ | ○ | ○ | ○ | ○ |
| … work? (3) | ○ | ○ | ○ | ○ | ○ |
| … household activities? (4) | ○ | ○ | ○ | ○ | ○ |
| … social relationships? (5) | ○ | ○ | ○ | ○ | ○ |
| … family relationships? (6) | ○ | ○ | ○ | ○ | ○ |
| … leisure time activities? (7) | ○ | ○ | ○ | ○ | ○ |
| … ability to function in daily life? (8) | ○ | ○ | ○ | ○ | ○ |
| … sexual drive, interest and/or performance? (9) | ○ | ○ | ○ | ○ | ○ |
| … economic status? (10) | ○ | ○ | ○ | ○ | ○ |

| | | | | | |
|---|---|---|---|---|---|
| … living/housing situation? (11) | ○ | ○ | ○ | ○ | ○ |
| … ability to get around physically without feeling dizzy or unsteady or falling? (12) | ○ | ○ | ○ | ○ | ○ |
| … your vision in terms of ability to do work or hobbies? (13) | ○ | ○ | ○ | ○ | ○ |
| … overall sense of well being? (14) | ○ | ○ | ○ | ○ | ○ |
| … medication? (If not taking any, leave this item blank.) (15) | ○ | ○ | ○ | ○ | ○ |

| | | | | | |
|---|---|---|---|---|---|
| … How would you rate your overall life satisfaction and contentment during the past week? (16) | ○ | ○ | ○ | ○ | ○ |

End of Block: Life satisfaction