Satisfaction of Relatedness Amongst Students to Withstand Revenge Bedtime

Procrastination

Carmen Labee

S3818357

Department of Psychology, University of Groningen

PSB3E-BT15: Bachelor Thesis

Group number 22

Supervisor: (prof.) (dr(s).) Nanxi Yan

Second evaluator: (prof.) (dr(s).)

In collaboration with: Sophia Linke, Galina Tittler, Beatrice Ganzler.

Month 07, 2022

Abstract

Bedtime procrastination describes extending one's bedtime, whilst aware of negative consequences such as sleep disruption or lower wellbeing and still engaging in it. Revenge bedtime procrastination (RBP) more specifically implies this procrastination is done in order to compensate for loss of control during the day, revenging on how daily hours were filled. For students social interaction or relatedness is important for need satisfaction within the framework of the self-determination theory. Need satisfaction positively influences well-being, relatedness creates a feeling of intimacy, frustration results in the opposite. Frustration of relatedness during the day might make students compensate for this at night, by engaging in RBP. In this self-report study the influence of relatedness on RBP for students was analyzed through questionnaires (n=321), whilst also looking at a possible moderation effect of being introverted or extraverted since introverted people are thought to be less in need of social interaction and more fond of personal time. The expectation was that lower relatedness would result in higher tendencies of RBP, results via a correlational analysis for this were significant. Furthermore it was expected that extraverts would partake in RBP more, correlational and regression analysis showed that introverts were very moderately related to RBP instead of extraverts. No significant moderation effects of the two personality types were further found between the relation of relatedness and RBP. Implications on theoretical and practical level are discussed.

Keywords: Revenge Bedtime Procrastination, Relatedness, Personality

Satisfaction of Relatedness Amongst Students to Withstand Revenge Bedtime Procrastination.

College really does seem to be the best time of their lives. Meantime, I'm kind of struggling. Not that anyone can tell. I'm always cheerful and friendly. I try to sound upbeat when I talk to my parents—I don't want them to worry. But I'm not myself. I'm having trouble keeping up with my work. I procrastinate like crazy. I don't feel really close to anyone. I can't fall asleep; then I can't get up. (Leibow, 2010, p. 2).

Eighty percent of the students in the Netherlands have reported to experience loneliness according to recent research by the Rijksinstituut voor Volksgezondheid en Milieu (RIVM) (Dopmeijer et al., 2021). Only 27 percent of students experience social support coming from their faculties according to the RIVM. Loneliness in general is associated with poor sleep quality or more disturbed sleeping patterns (Segrin & Burke, 2015).The consequences of a lower perceived social support or a lesser feeling of relatedness can also relate to a negative mental health in comparison to people who do perceive social support from within higher education (Laporte et al., 2021; Dopmeijer et al., 2021). Once mental health is negatively impacted complaints such as exhaustion and a lower resistance to other factors such as stress can further influence mental health and negatively impact sleeping patterns (Dopmeijer et al., 2021). When someone misses social support from their education one might try to compensate for this lacking, by looking for it in other manners. Compensation for an unfulfilling feeling need of relatedness during the day might be done by partaking in leisure activities at night, such as watching movies or phone use.

This relates to the concept of revenge bedtime procrastination (RBP) which describes how one extends bedtime deliberately in order to get back personal time which people felt they did not have grasp of during the day due to lack of freedom or control (Liang, 2022). Because students would feel lack of control during the day when it comes to fulfilment of the need relatedness in their university life, they compensate for this lack of relatedness by partaking in activities at night and by this procrastinate their bedtime whilst being aware of the negative consequences. The need for this relatedness within the student population might differ per person influenced by factors such as personality types, as introverts have less need for social interaction whereas extraverts would prefer it in order to feel better which might explain a greater need to engage in RBP (Jirjahn & Ottenbacher 2022). In this study answer the research question *How does lack of relatedness in higher education influences students' engagement in revenge bedtime procrastination?*. The expectation is that people who lack relatedness in school life engage in RBP more because they compensate for this shortcoming at night. Introverts would be less likely to partake in RBP due to a lesser need of social interaction. Outcomes of this study can give inside on potential influencers in RBP and demonstrate importance of mental health and social interaction which organizations in higher education have influence on.

Revenge Bedtime Procrastination

A sufficient amount of sleep is important for your health and everyday functioning (Kroese, et al., 2014). However over 40 percent of the students in the Netherlands according to the Rijksinstituut voor Volksgezondheid en Milieu (2021) have sleeping problems related to falling asleep, staying asleep or waking up too early. In general, an insufficient amount of sleep has been related to poor health outcomes such as obesity and cardiovascular disease (Buxton & Marcelli, 2010) and also has been connected to poor performance in for example memory and

concentration (Ram et al., 2010). The concept of bedtime procrastination can be defined as a tendency to deliberately procrastinate bedtime despite knowing the negative outcomes that come with it, such as insufficient sleep and negative effect on well-being (Steel, 2007). Procrastination for people who extend their bedtime goes beyond expecting consequences such as disruptive sleeping patterns, generally people also tend to experience subjective discomfort such as feeling guilty (Nauts & Kroese, 2015).

A paper by Kroese et al (2014) showed that when executive decision making is less optimal at the end of the day, one does not have the energy anymore to make the right decision of going to sleep, instead people tend to procrastinate going to bed. Kroese et al (2014) further found that low self-regulation or self-control, insufficient sleep and also not wanting to quit other activities are related to this phenomenon of bedtime procrastinating.

A qualitative research by Nauts et al., (2019) shows why people procrastinate their bedtime in a more elaborative manner to further understand the reasons and conditions in which RBP is more likely to occur. Nauts et al., (2019) found that people tend to procrastinate deliberately, more automatically and on a strategic level. People who deliberately procrastinated were most likely to engage in leisure activity, thus wanting to spend their free time doing something fun. A frustration or conflict was seen between trying to get enough sleep and doing something they enjoy for themselves. Participants were aware of the subjective discomfort that came with procrastinating, these feelings of guilt or exhaustion were battling the temptation to attend leisure activities or engage in others chores that needed to be done instead of sleeping. Other people reported to forget the time when they watch television or spend time online. This form of procrastination was then done in unawareness. Lastly, people also chose to extent their bedtime because they thought that results of this would benefit them. Nauts et al (2019)

acknowledged that reasons for procrastination can differ greatly per person, as some attend social activities whilst others spend their whole night online or partake in any house chore activity possible. However, they found that most people have problems with managing their needs in a day, which results in the temptation of wanting to do them at night, at the cost of sleeping. Thus, people seemed to be revenging on how unsatisfying or out of control the hours in their day were filled, by engaging in activity to satisfy one's self when a perception of free time becomes available, which often is at night.

This highlights the concept of RBP, which describes reasons for procrastination to be linked to taking back something people missed during the day. Thus, RBP can be defined as extending one's bedtime, whilst being aware of the negative consequences in order to get back personal time of which people felt lacking during the day due to lack of control or freedom (Liang, 2022). RBP is different from bedtime procrastination because taking back control or personal time is intentional, thus people revenge on their lack of control in how their days are filled (Liang, 2022). For bedtime procrastination the deliberate intention to procrastination in order to take back control is not necessary. Consequences people experience once they procrastinate in this manner are thought to be quite similar to bedtime procrastination in general such as insufficient sleep, worsened overall well-being and subjective discomfort (Kroese et al., 2014; Nauts et al., 2019). The negative effects of RBP highlight the reasons as to why research on this phenomenon is important. Not much is known about RBP, with this research we extend the knowledge on the topic.

Relatedness

Relatedness can be defined as an experience or perception of connection or intimacy with your surroundings (Ryan, 1995). The concept of relatedness in general has been linked to a higher well-being and positive aspects in romantic relationships (Patrick et al., 2007). Lack of relatedness, can nevertheless also result in frustration which creates negative consequences such as a feeling of social neglect and loneliness (Laporte et al., 2021). Consequences of this loneliness can negatively influence mental health and overall well-being (Dopmeijer et al., 2021).

A study by Dasinger and Gibson (2022) found that relatedness can predict for 70 percent of anxiety variance among students attending university in rural areas. When needs of relatedness were not met, or in this study even frustrated, the stress levels students perceived were higher compared with students who did fulfill this need (Dasinger & Gibson, 2022). Students in these areas reported lower perceived relatedness due to isolation because of inability to connect with others due to bad mobile connections and not being able to attend general social activities (Dasinger & Gibson, 2022). The sample used in this study is quite uncommon being rural, thus less connected to each other in comparison to the sample used in this current study which primarily includes European participants. Nevertheless, the association between wellbeing and relatedness frustration or validation is described here, showing low relatedness can impact mental health negatively and social interaction in real life could compensate for a low relatedness.

A study done by MCIntyre et al., (2018) showed that loneliness for students was a great predictor of worsened mental health, for example experiencing depression. They further found that forming intimate university friend groups mediated the relation between loneliness and

mental health problems. These studies indicate the importance of connectedness amongst students or in their general academic life related to mental health.

Relatedness and Revenge Bedtime Procrastination

When viewing the need of relatedness, one feels connected when this need is fulfilled. However, once frustration occurs a feeling of social isolation can be a negative consequence (Toyama, Upadyaya & Salmela-Aro, 2021). Studies on bedtime procrastination indicate that low self-control, compensatory behavior or temptations can overrule the tendency to go to bed. When someone misses or was not able to fulfill something during the day one tends to compensate for this by engaging in them at night (Nauts et al., 2019). The self-determination theory conceptualizes a framework which, in relation to RBP might explain how lack of relatedness can also result in procrastination behaviors in order to compensate for an invalidated need of relatedness.

The self-determination theory

In general, the self-determination theory (SDT) supports the idea that people have innate psychological needs known as autonomy, relatedness and competence. Once these needs are fulfilled, this creates opportunity for growth and greater well-being (Deci & Ryan, 2000). When these needs are not fulfilled people can experience loss of control and loss of motivation to act in a way that optimizes the best outcome in for example academic performance or general well-being (Deci & Ryan, 2000). It has been shown that a need supportive environment is more helpful for academic engagement and it buffers general procrastination behaviors which students can fall victim to (Opdenakker, 2021). Within the theoretical framework of self-determination, taking these positive consequences into account of need supportive environments, it might seem

that students who experience this need support can thrive better and experience greater wellbeing compared with those in non-supportive environments for their needs (Deci & Ryan, 2000). Especially relatedness seems interesting in this since students have reported feelings of social isolation, which is non supportive and thereby is thought to be an influencing factor in RBP (Dopmeijer et al., 2021).

However, apart from fulfilling psychological needs for self-determination, people can also experience need frustration. This might happen once someone experiences conditions opposite to their need, namely such as the experience of pressure when one has need for autonomy or the experience of social isolation instead of connectedness (Laporte et al., 2021). The frustration of needs has been studied and related to negative factors such as poor sleeping habits, higher chances of psychopathology and proneness for maladaptive behaviors (Campbell et al., 2015). More specifically Campbell et all., (2015) found an association between need frustration and maladaptive sleeping patterns. Students who experienced need frustration found themselves more tired in evenings, whilst less capable of daily functioning due to higher fatigue and lower vitality**.**

When frustration of needs occurs according to Vansteenkiste and Ryan (2013) it can result in substitution of these needs or compensation for them through engaging in other behaviors. Substitution in this study was seen as pursuing other non-need satisfactory behaviors to compensate for the frustration, meaning these behaviors might be more extrinsically rewarded than intrinsically. Extrinsic behaviors are motivated by another outcome such as a reward and intrinsic behaviors are performed for personal satisfaction (Joosten, Bundy & Eindfeld, 2008). More extrinsic behaviors are linked to fleeting satisfaction, interfering with need satisfaction in the long run (Vansteenkiste & Ryan, 2013). Compensation behavior when needs are frustrated in

this research could be seen as release of self-control for example which was described as binge eating or abuse of alcohol in order to experience satisfaction (Vansteenkiste & Ryan, 2013). Substitution and compensation due to need frustration often lets people remain in a negative cycle, further increasing the negative consequences such as illnesses (Vansteenkiste & Ryan, 2013). When looking at relatedness and RBP within the framework of self-determination theory and the consequences of substitution and compensation, extrinsic or compensatory short term rewarding behavior might be performed instead of sleeping (Vansteenkiste & Ryan, 2013). Procrastination within this framework is then done in order to still achieve a fleeting satisfaction of needs such as relatedness, however accompanied by long term negative consequences such as sleeping problems.

Need for relatedness in the student population

The fulfillment of the need relatedness might seem challenging for students given that most hours they spend studying would not be very interactive, especially in comparison to how they experienced it in school before higher education (Dopmeijer et al., 2021). In high school attendance was obligatory five relatively full days of the week, where in higher education there are less contact hours which might negatively impact students when looking at the consequences of need frustration ("Modernisering normen onderwijstijd voortgezet onderwijs (vo)", 2022). Lack of support by peers and teachers during the day might make students compensate for this lack of feeling of social connectedness by searching for it through other social interactions outside of their education environment (online or offline, imaginable or not (Netflix i.e.). When as a student one feels lonely during the day, ways to compensate for this feeling at night can be compelling, especially once daily functioning is more impaired due to need frustration (Campbell et al., 2015). This compensation might be found in procrastination of bedtime in order

to fulfill relatedness. The expectation of this study therefore is that findings will indicate that students tend to partake in leisure activities at bedtime to compensate for the shortage of relatedness during the day, thereby partaking in RBP.

Hypothesis 1. Perceived relatedness in school life is negatively associated with revenge bedtime procrastination.

The moderating role of personality

The relation between relatedness and RBP might be influenced by someone their personality traits. Within the student population some might feel the need for connectedness more than others. When looking at introverted and extraverted people, introverts are known to be fonder of their personal and alone time whilst extraverts suffer from this alone time more (Ponzetti J.J. 1990). Extraverts are known to be needier of social interaction (Jirjahn & Ottenbacher 2022). Introverts can be defined, as not seeking excitement, not being impulsive and not being very fond of large group interactions but being fonder of their own company. Extroverts can be defined as seekers of excitement, social interaction and risks whilst being friendly and impulsive (Eysenck & Eysenck, 1975).

The social reactivity hypothesis states that extraverted people enjoy interactions more than introverted people (Srivastava et al., 2008) This, combined with a more sensitive reward system extraverts tend to have, would suggest that extraverts are more sensitive to loss of social interaction or positive social interactions (Depue & MorroneStrupinsky, 2005; DeYoung, 2015; Smillie, 2013). Research by Srivastava et al., (2008) has shown that both personality types can enjoy social interaction though extraverts are known to interact more socially. They further showed that extraverted people also attend more social activities which results in higher levels of

positive effect (Srivastava et al., 2008). Because extraverts are thus more frequently interacting with people their positive affect is higher.

In general these studies do show that extraverts can be seen as seekers of interaction whilst both introverts and extraverts might enjoy interaction. That is why in addition to the general research question, this study was carried out with the aim of finding out whether being an introvert or an extravert can moderate the relationship between relatedness and RBP for students during their education. The expectation would be that the more introverted people are the less they partake in RBP because they feel a lesser need to compensate for their relatedness needs which they experienced during the day regarding education.

Hypothesis 2. The personality of a student, introvert or extravert, has influence on the impact of relatedness on revenge bedtime procrastination.
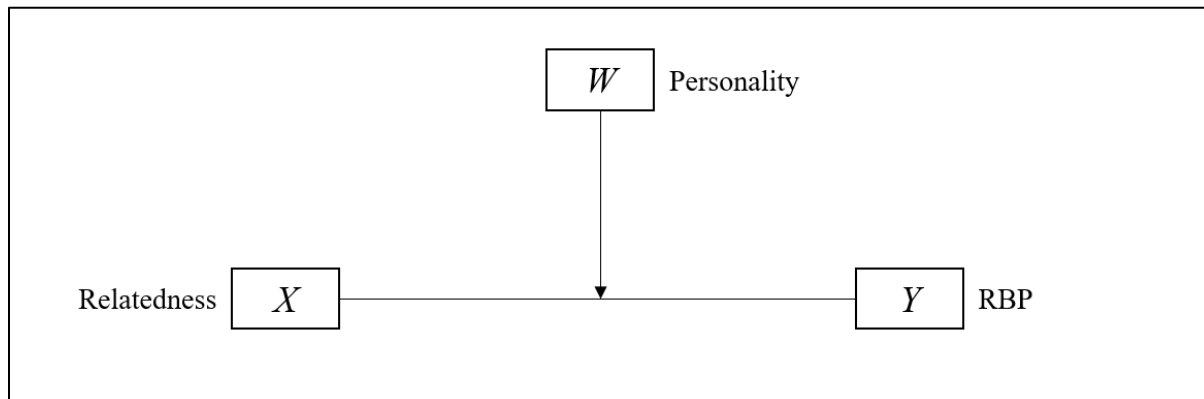

Figure 1. The moderation model of personality on the relation between relatedness and RBP.

Method

Participants

Quantitative research was carried out to form the conclusions to the research questions, consisting of questionnaires that were filled out by 321 respondents. Of these respondents 122

cases were sufficient for analysis, which is the valid sample. Case deletion was determined by fulfilment of informed consent and completion of the questionnaires and requirements such as higher education. Out of these participants 79 were females (64.8%), 23 males (18.9%), 6 non-binary 4.9%) and 14 unknown (11.5%) with a standard deviation of .49. The age of the participants ranged from 18 till 47 years old ($M = 23$, $SD = 4.702$). Respondents were only qualified when they partake in studies on higher education such as MBO, HBO or university. For 67 participants their highest form of education was a high school or equivalent level, 25 participants a bachelor's or equivalent level, 14 had a masters or equivalent level and two a doctoral or equivalent level. Participants were mostly located in the Netherlands (56.5%). Further countries were Germany (18%), the United Kingdom (11.5%), the United States (10.7%) and other countries worldwide, western oriented (3.3%).

Research Design and Procedure

Students were invited to partake in this study by filling out questionnaires from Qualtrics (see appendix) through social media, i.e., WhatsApp, Instagram. This means that the participants were conveniently sampled. The questionnaires were to be filled in anonymously and alone, after an informed consent was agreed to. Besides general questions on demographics, further questions on personality, RBP and need satisfaction of relatedness were asked with the answering format of the Likert scale (1-5). Completion of the questionnaire took 10 minutes. There was no compensation for participants. This study was ethically approved by the University of Groningen.

Once data was collected, the data analysis was performed using SPSS. To test the first hypothesis a regression was performed on relatedness and RBP. For the second hypothesis a

hierarchical moderation regression analysis was done to see whether being introverted or extraverted moderated the relation between relatedness and RBP. Whilst regression analyses were performed the variable of gender was controlled for to limit confounding influencers.

Measures

Balanced Measure of Psychological Needs

Sheldon and Hilpert's (2012) Balanced Measure of Psychological Needs (BMPN) scale was used in order to collect data on the respondents' perceived need of relatedness (see appendix A). This questionnaire included four items on need validation such as "I feel that students I care about also care about me." and it included four items on need frustration such as I feel excluded from a group at my university, I want to belong to". The Cronbach's alpha was .83 for the validation and .77 for the frustration questions. The answer possibilities ranged from a 5 point Likert scale, from completely disagree (1) to completely agree (5).

Big Five Inventory 2

Soto and John's (2016) Big Five Inventory 2 (BFI-2) was partly used in order to measure introversion and extraversion for participants (see appendix B). This questionnaire included items on extraversion such as "Is dominant, acts as a leader" and on introversion such as "I view myself as someone who tends to be quiet." Items which were included in the questionnaire are 1, 6, 11R, 16R, 21, 26R, 31R, 36R, 41, 46, 51R, 56. The Cronbach's alpha was .80 for measuring introversion and .61 for measuring extraversion. The answer possibilities ranged from a 5 point Likert scale, from completely disagree (1) to completely agree (5).

RBP Questionnaire

Questions on RBP were developed with an explanation in order to give participants some inside on the phenomenon (see appendix C). A statement was included namely "Revenge Bedtime Procrastination describes the voluntary decision to delay bedtime despite being aware of the negative consequences, such as sleep deprivation and feelings of guilt." followed by the question "Have you ever engaged in such kind of behavior?" with an answering format or "yes" or "no". Further questions were asked such as "How often do you engage in such kind of behavior?" with an answering format in scale ranging from zero to seven. One last question "Why do you engage in such kind of behavior?" with an open format to answer in order to detect reasoning behind RBP. This last question gives further information about why people engage in RBP and it can give context, also regarding introvert or extrovert people.

Results

To assess whether relatedness influences the tendency to partake in RBP the concepts were operationalized as RBP and relatedness. Out of 122 people 116 partook in RBP, the amount of times per week people procrastinate their bedtime for revenge is presented in table one.

Table 1

How often students engage in RBP during the week

Times Per Week	f	%
1	7	5.7
2	16	13.1
3	19	15.6

4	23	18.9
5	21	17.2
6	15	12.3
7	20	16.4
Missing	1	0.8
Total	122	100

Note: The amount of times per week (*f*) participants engaged in RBP.

Descriptive analyses

Table 2 shows the means, standard deviations and correlational outcomes for all the variables. Relatedness is moderately negatively correlated with RBP ($r(119) = -.30, p < .001$). When reversed coded the variable of extraversion, fitting the format of the personality trait introversion, RBP engagement was significant however weakly correlated with introversion ($r(119) = .21, p = .024$). When analyzing personality traits separately, table 2 shows that extraversion was negatively correlated with RBP, however too weak and nonsignificant ($r(119) = -.15, p = .103$). The same results were found for introversion, nonsignificant ($r(119) = .15, p = .106$).

Table 2

Descriptive Statistics and Correlations

	M	*SD*	1	2	3	4	5	6

1. Tpw.RBP	4.32	1.81	1	.21*	-.15	.15	-.30**	.21*
2. PersM	2.82	0.68	.21*	1	-.87**	.94**	-.37**	.12
3. ExtrM	3.29	0.71	-.15	-.87**	1	-.74**	.32**	-.08
4. IntrM	3.03	0.83	.148	.94**	-.74**	1	-.33**	.11
5. RelM	3.64	0.69	-.30**	-.37**	.32**	-.33**	1	-.06
6. Gender	1.84	0.50	.21*	.12	-.08	.11	-.06	1

Note: References: 1=The amount of times per week participants engaged in RBP; 2=The variable extroversion reversed coded and the variable introversion combined, thus the overall mean of introversion as a personality trait; 3=The mean of extroversion; 4=The mean of introversion; 5= The mean of relatedness; 6= Gender of participants, meaning female/male/other. ** $p<.01$, *$p<.05$

Hypothesis testing

The first hypothesis stated that relatedness would influence the engagement in RBP. A multiple linear regression analysis was done in order to test the hypothesis. The ANOVA results indicate a significant contribution to the model ($F(2,104) = 7.72$, $p = .006$). Table 3 further shows a significant result for the relationship between relatedness and RBP ($R^2 = .13$, $p < .001$) and indicates that the variance in RBP is 12.9% explained by the independent variable of relatedness when controlling for gender ($R^2 = .13$, $p = .034$). These results support the first hypothesis stating that relatedness influences the likelihood of engagement in RBP.

For the second hypothesis, which states that the relation between relatedness and RBP is moderated by personality, the variable of personality was added to the regression model. The ANOVA results indicate a significant result, meaning that means of the variables differ

significantly from one another and contribute to the model ($F(3,103) = 5.16$, $p = .002$). Results of the hierarchical regression in table 3 were nonsgifniciant ($R^2 = .13$, $p = .689$). The R-change indicates that the variance in RBP is 0.1% explained by the independent variable of personality when controlling for gender ($R^2 = .13$, $p = .039$).

The next step in analyzing moderation, the interaction variable was added to indicate whether personality moderates the relation between relatedness and RBP. The ANOVA analysis is significant for the third model, meaning that means of the variables differ significantly from one another and contributed to the model ($F(4,102) = 3.85$, $p = .006$). Results from the analysis seen in table 3 indicate that the model is not statically significant ($R^2 = .13$, $p = .810$). Table 3 further shows that the R-square value remained the same as in model 2, and the R-change did thus not differ either compared to the previous model. The moderator does not add any new predictor information to the model. These results indicate the second hypothesis was not supported,

Table 3
Hierarchical Regression Analysis on RBP

Predictor variables	Regression 1	Regression 2	Regression 3
Gender	.70*	.68*	.69*
Relatedness	-.76*	-.72*	-.72*
Personality		.11	.12
Rel x Pers			.04
R^2	.13	.13	.13
R^2 change	.13	.00	.00
F	7.72**	5.16**	3.85**

Note: $N = 122$. Rel x Pers = The interaction variable of relatedness and personality. $**p < .01$, $*p < .05$

Explanatory Analyses

Since no moderation was found, to indicate whether there is a relation between the independent and dependent variables, a regression analysis was conducted. Table 4 shows that the relationship between personality and RBP is significant ($R^2 = .042$, $p = .024$). ANOVA results were significant as well, meaning that means of the variables differ significantly from one another and contributed to the model ($F(1,119) = 5.23$, $p = .024$). This indicates that RBP can be influenced by whether someone is introverted or extraverted. However once the control variable gender was included in the model in table 5, results were nonsignificant ($R^2 = .06$, $p = .176$). ANOVA results were significant ($F(2,104) = 3.42$, $p = .036$).

Table 6 further shows that the relationship between relatedness and personality is also significant ($R^2 = .12$, $p < .001$). This indicates that there is a relation between someone their personality and perceived relatedness. ANOVA results were significant ($F(2,105) = 7.13$, $p = .001$).

Table 4

Regression Analysis on Personality and RBP

Predictors	β	*SE*	95% CI LB	UB	*t*
Constant	2.76	.70	1.37	4.15	3.40**
Personality	.55	.24	.07	1.04	2.29*

Note: $N = 122$. $**p < .01$, $*p < .05$

Table 5
Regression Analysis on Personality and RBP whilst controlling for gender

			95% CI		
Predictors	*β*	*SE*	LB	UB	*t*
Constant	1.90	.91	.09	3.70	2.08*
Gender	.35	.26	-.16	.86	1.36*
Personality	.70	.34	.03	1.37	2.07

Note: N = 122. **p < .01, *p < .05

Table 6
Regression Analysis on Personality and Relatedness whilst controlling for gender

			95% CI		
Predictors	*β*	*SE*	LB	UB	*t*
Constant	4.69	.34	4.02	5.36	13.88**
Gender	-.02	.13	-.27	.23	-.18
Personality	-.35	.10	-.54	-.17	-3.73**

Note: N = 122. **p < .01, *p < .05

Discussion

This research was conducted in order to determine how relatedness can influence the engagement in RBP amongst students in higher education. It was hypothesized that perceived relatedness negatively related to RBP due to need frustration conceptualized within the theoretical framework of the self-determination theory. Literature in line with this indicates that frustration of needs results in compensatory behaviors which could contribute to procrastination (Vansteenkiste & Ryan, 2013). Furthermore, this study looked into a moderation effect of introversion or extraversion between the relation of relatedness and RBP. In line with previous

research indicating that extroverts are more socially seeking and also more fond of these social activities it was believed that introverts would engage less in RBP, whilst extroverts would engage in RBP more because they have a higher need to compensate at night for lack of relatedness in higher education during the day (Srivastava et al., 2008).

The first hypothesis obtained significant results indicating a lower perception of relatedness results in higher engagement in RBP. For the second hypothesis, separate correlational and regression analyses did show a connection between the concepts of RBP and personality, further findings however suggest no moderation effect between the two concepts. The second hypothesis stating that introverts would be less likely to engage in RBP was thus not supported by this study.

Theoretical and Practical Implications

This study touches more on social and psychological contributors in RBP, expanding knowledge on the phenomenon and adding to existing knowledge of procrastination which had found that low self-control, low self-regulation or insufficient sleep can be influencing factors on RBP (Kroese et al., 2014). Within the framework of self-determination, frustration or validation of relatedness needs and compensatory or replacement behaviors that come with this frustration indicate how social connectedness can influence RBP besides conflicting inner processes such as self-regulation. Reducing need frustration might buffer engagement in RBP.

For the second part of the study however nonsignificant results were found, the regression analysis on the separate variables of introversion, extroversion and RBP without controlling for gender indicate that there might be a relationship between the concept of personality and RBP. Research on the personality traits of introversion and extraversion suggest that that extraverts are

seeking social interaction more, which creates the assumption that loneliness in university makes them compensate for this at night (Jirjahn & Ottenbacher 2022). However, from a different point of view, extraverts might seek the social interaction they need still during the day whilst introverts are already content or maybe even overstimulated by the interaction they need to perform during the day. This could be the reason as to why they procrastinate their bedtime, in order to get back some personal time for themselves. These statements are in line with research done by Sun et al., (2020) who found that introverts have a more prone feeling of social connectedness when conversations were held. Both personality types might however procrastinate for different reasons. Furthermore, these results might create increased general knowledge and awareness on stereotyping, reducing bias of introverts not wanting social contact.

Practical Implications

Practical implications for this study could be seen in the field of psychology since RBP impacts well-being negatively. Studies on this bring understanding and maybe even solutions in forms of therapy or medication to recognize or prevent RBP and the negative consequences on well-being, subjective comfort and sleeping behaviors.

Furthermore, it sheds a light on the social isolation or loneliness students can or have experienced and the consequences it has on their mental health. Findings show that students might be quite lonely, resulting in their participation to RBP. This is a disturbing outcome, which shows the relevance of social interaction and research on RBP. Social interaction or other forms to increase perceived relatedness in higher education seems an important buffer for these negative effects on well-being and mental health. It is thought that universities and other organizations can act on this by stimulating group projects for example.

Strength, Limitations, and Future Research

In this study few limitations are acknowledged. This study was done in self-report form in which social desirability or the quality of the survey can influence outcomes. Concepts can be interpreted inaccurately or differently per participant which may result in faulty reporting. This could also be the case for the BFI-2 questionnaire, which scored a low reliability on the extraversion questions and non-explicit conceptualization might influence reporting in this questionnaire. Nevertheless self-report in this study was seen as the most optimal and accurate option as RBP cannot directly be observed without influencing behavior or results. The time the questionnaire took to complete, has caused some dropouts once they came about the personality and needs questionnaire, which made the sample smaller than previously expected and preferred. The demographics were placed at the end of the study which makes it unsure whether some participants are actually students, where they come from and what gender or age group they are. These demographic questions were better placed at the beginning of the study. The self-report measure did create opportunities to broaden our sample worldwide, this creates a better generalizability since not only people from the Netherlands participated in this study. Nevertheless, the sample is more western oriented, which indicates a more individualistic culture that could result in different outcomes compared to collectivistic cultures (Koons, 2019). More females in comparison to men participated in the study, which might make the control variable less effective due to the unevenness. However, reasons for using this variable were to further elaborate on qualitative differences informed by men and women in reasons to RBP so this uneven distribution does not seem to influence the general results of the study. Finally, the collection of participants was still done conveniently, which then minimizes generalizability

more. However, this study is built around students and still done very interactive internationally, thus these concerns are believed to not account for any further shortcomings.

Future directions

These findings in general do show that relatedness can be an influencing factor in RBP. Improving one's relatedness might bring back the tendency to procrastinate one's bedtime. The relation of relatedness with RBP has been shown in this study however reasons as to why or specific factors influencing the relationship could still be studied since personality was not a very influencing factor. An interesting topic in this might be cultural differences, as this sample was western oriented, and indicating more individualistic backgrounds which might influence under which conditions people procrastinate. In more collectivistic cultures relatedness might for example also be more valued and thus be a more influencing factor in RBP (Koons, 2019).

Regarding personality further elaborative research should be done in order to find out whether some people with certain personality traits might be more likely to procrastinate, why they would do so and how they engage in it as well. Both personality types, however, might procrastinate however for different reasons, this might also be the case for gender differences. Extroverts attend social activities whilst introverts need more personal time. Research on this can be done with different traits as well as questionnaires or non-self-report measurements such as longitudinal or experimental studies. Since the effects found in this study were very moderate different approaches might be more promising and they could control for confounding variables and state more plausible causal relations.

Conclusion

This study tried to answer the question of *How does lack of relatedness in school life influences students' engagement in revenge bedtime procrastination?* Based on the results it is concluded that lower levels of relatedness are associated with higher levels of RBP, supporting the hypothesis. This indicates that lacking relatedness for students in school life during the day might make them engage in RBP in order to compensate for this lacking at night. Furthermore, regression analyses suggested that there might be a relation between personality and RBP, however the moderation between relatedness and RBP by personality was not found. Future research should consider looking into different personality types and gender differences related to engaging in RBP and broaden information by performing more qualitative research to further support the reasons behind the relation of relatedness and RBP. A better understanding of reasons behind RBP and a better understanding of conditions in which chances of engagement in RBP are higher can aid in preventing people from procrastinating. All this might help buffer the negative consequences that come with RBP such as worse well-being, negative subjective comfort and sleeping problems.

References

Buxton, O. M., and Marcelli, E. (2010). Short and long sleep are positively associated with obesity, diabetes, hypertension, and cardiovascular disease among adults in the United States. Soc. Sci. Med. 71, 1027–1036. doi: 10.1016/j.socscimed.2010.05.041

Campbell, R., Vansteenkiste, M., Delesie, L., Mariman, A., Soenens, B., Tobback, E., Van der Kaap-Deeder, J. and Vogelaers, D., 2015. Examining the role of psychological need satisfaction in sleep: A Self-Determination Theory perspective. *Personality and Individual Differences*, 77, pp.199-204.

Dasinger, T., & Gibson, D. (2022). Perceptions of mental health and need satisfaction/frustration among rural university students. *Journal Of American College Health*, 1-8. https://doi.org/10.1080/07448481.2022.2032089

Deci, E. L., & Ryan, R. M. (2000). The "What" and "Why" of Goal Pursuits: Human Needs and the Self-Determination of Behavior. *Psychological Inquiry*, *11*(4), 227–268. http://www.jstor.org/stable/1449618

Depue, R. A., & Collins, P. F. (1999). Neurobiology of the structure of personality: Dopamine, facilitation of incentive motivation, and extraversion. *Behavioral and Brain Sciences*, 22, 491–517. http://dx.doi.org/ 10.1017/S0140525X99002046

DeYoung, C. G. (2015). Cybernetic Big Five theory. *Journal of Research in Personality*, 56, 33–58. http://dx.doi.org/10.1016/j.jrp.2014.07.004

Dopmeijer, J., Nuijen, J., Busch, M., Tak, N., & Verweij, A. (2021). *Monitor Mentale gezondheid en Middelengebruik Studenten hoger onderwijs. Deelrapport I. Mentale gezondheid*. Rijksinstituut voor Volksgezondheid en Milieu. Retrieved from

https://www.rivm.nl/publicaties/monitor-mentale-gezondheid-en-middelengebruik-studenten-deelrapport-I

Eysenck, H. J., & Eysenck, S. E. G. (1975). Manual: Eysenck Personality Inventory. San Diego, CA: Educational and Industrial Testing Service.

Feng, B., & Sun, W. (2022). Bedtime Procrastination and Fatigue in Chinese College Students: the Mediating Role of Mobile Phone Addiction. *International Journal Of Mental Health And Addiction*. https://doi.org/10.1007/s11469-022-00796-z

Jirjahn, U. and Ottenbacher, M. (2022). Big Five personality traits and sex. *Journal of Population Economics*,.

Joosten, A., Bundy, A., & Einfeld, S. (2008). Intrinsic and Extrinsic Motivation for Stereotypic and Repetitive Behavior. *Journal Of Autism And Developmental Disorders*, *39*(3), 521-531. https://doi.org/10.1007/s10803-008-0654-7

Kroese, F., De Ridder, D., Evers, C. and Adriaanse, M., 2014. Bedtime procrastination: introducing a new area of procrastination. *Frontiers in Psychology*, 5.

Koons, R. (2019). Individualism vs. Collectivism. *Academic Questions*, *32*(4), 529-541. https://doi.org/10.1007/s12129-019-09824-2

Laporte, N., Soenens, B., Flamant, N., Vansteenkiste, M., Mabbe, E. and Brenning, K., 2021. The role of daily need crafting in daily fluctuations in adolescents' need-based and affective experiences. *Motivation and Emotion*, 46(2), pp.137-149.

Leibow, D. (2010). What to do when college is not the best time of your life. Columbia University Press. https://doi.org/10.7312/leib15174

Liang, L. (2022). *The psychology behind 'revenge bedtime procrastination'*. Bbc.com. Retrieved

    1 July 2022, from https://www.bbc.com/worklife/article/20201123-the-psychology-

    behind-revenge-bedtime-procrastination.

Lucas, R., & Fujita, F. (2000). Factors influencing the relation between extraversion and pleasant

    affect. *Journal Of Personality And Social Psychology*, *79*(6), 1039-1056.

    https://doi.org/10.1037/0022-3514.79.6.1039

McIntyre, J., Worsley, J., Corcoran, R., Harrison Woods, P., & Bentall, R. (2018). Academic and

    non-academic predictors of student psychological distress: the role of social identity and

    loneliness. *Journal Of Mental Health*, *27*(3), 230-239.

    https://doi.org/10.1080/09638237.2018.1437608

Modernisering normen onderwijstijd voortgezet onderwijs (vo). Rijksoverheid.nl. (2022).

    Retrieved 10 June 2022, from https://www.rijksoverheid.nl/onderwerpen/schooltijden-en-

    onderwijstijd/modernisering-normen-onderwijstijd-voortgezet-onderwijs-

    vo#:~:text=Urennorm%20per%20opleiding&text=Elke%20leerling%20moet%20een%20

    programma,5700%20uur%20voor%20het%20vwo.

Opdenakker, M. (2021). Need-Supportive and Need-Thwarting Teacher Behavior: Their

    Importance to Boys' and Girls' Academic Engagement and Procrastination Behavior.

    Frontiers in Psychology, 12.

Ponzetti, J. J. (1990). Loneliness among College Students. *Family Relations*, *39*(3), 336–340.

    https://doi.org/10.2307/584881

Ryan, R. M. (1995). Psychological needs and the facilitation of integrative processes. *Journal of*

    Personality, 63, 397–427.

Sanne Nauts, Bart A. Kamphorst, Wim Stut, Denise T. D. De Ridder & Joel H. Anderson (2019)
The Explanations People Give for Going to Bed Late: A Qualitative Study of the
Varieties of Bedtime Procrastination, Behavioral Sleep Medicine, 17:6, 753-762, DOI:
10.1080/15402002.2018.149185

Segrin, C., & Burke, T. (2014). Loneliness and Sleep Quality: Dyadic Effects and Stress
Effects. *Behavioral Sleep Medicine*, *13*(3), 241-254.
https://doi.org/10.1080/15402002.2013.860897

Sheldon, K. M., & Hilpert, J. C. (2012). The balanced measure of psychological needs
(BMPN) scale: An alternative domain general measure of need satisfaction. *Motivation and
Emotion*, 36, 439–451.

Smillie, L. D. (2013). Extraversion and reward processing. *Current Directions in Psychological
Science*, 22, 167–172. http://dx.doi.org/10.1177/ 0963721412470133

Soto, C. J., & John, O. P. (2017). The next Big Five Inventory (BFI-2): Developing and
assessing a hierarchical model with 15 facets to enhance bandwidth, fidelity, and
predictive power. *Journal of Personality and Social Psychology*, 113, 117-143.

Srivastava, S., Angelo, K., & Vallereux, S. (2008). Extraversion and positive affect: A day
reconstruction study of person–environment transactions. *Journal Of Research In
Personality*, *42*(6), 1613-1618. https://doi.org/10.1016/j.jrp.2008.05.002

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

Thomas, L., Orme, E. and Kerrigan, F. (2020). Student Loneliness: The Role of Social Media
Through Life Transitions. *Computers & Education*, 146, p.103754.

Toyama, H., Upadyaya, K. and Salmela-Aro, K., 2021. Job crafting and well-being among

    school principals: The role of basic psychological need satisfaction and frustration.

    European Management Journal,.

Vansteenkiste, M., & Ryan, R. (2013). On psychological growth and vulnerability: Basic

    psychological need satisfaction and need frustration as a unifying principle. *Journal Of*

    Psychotherapy Integration, *23*(3), 263-280. https://doi.org/10.1037/a0032359

Appendix A

The big Five Inventory 2 (BFI-2) by Soto and John (2016)

Q8 Here are a number of characteristics that may or may not apply to you. For example, do you

agree that you are someone who likes to spend time with others? Please fill in next to each

statement the extent to which you agree or disagree with it. "I view myself as someone who....."

1. Is outgoing sociable

2. Has an assertive personality

3. Rarely feels excited or eager

4. Tends to be quiet.

5. Is dominant, acts as a leader

6. Is less active than other people

7. Is sometimes shy, introverted

8. Finds it hard to influence people

9. Is suspicious of others intentions

10. Is talkative

11. Prefers to have others take charge

12. Shows a lot of enthusiasm

Appendix B

The Balanced Measure of Psychological Needs (BMPN) by Sheldon and Hilpert (2012)

on relatedness.

9. I feel that students I care about also care about me.

10. I feel connected with students who care for me, and for whom I care.

11. I feel close and connected with other students who are important to me.

12. I experience a warm feeling with the people I spend time with.

13. I feel excluded from a group at my university, I want to belong to.

14. I feel that other students who are important to me are cold and distant towards me.

15. I have the impression that students I spend time with dislike me.

16. I feel the relationships I have with other students are just superficial.

Appendix C

RBP Questionnaire

Revenge Bedtime Procrastination describes the voluntary decision to delay bedtime despite being aware of the negative consequences, such as sleep deprivation and feelings of guilt.

Have you ever engaged in such kind of behavior?

How often do you engage in such kind of behavior? (times per week)

Q51 Why do you engage in such kind of behavior? Please type an answer below: