

**The Mediation Effect of Autonomy on the Relationship between Gratitude, Self-Efficacy  
and Happiness in University Students**

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## Abstract

University students are confronted with a variety of challenges, regarding not only their academic and private life but also their mental health and they are at risk for suffering from mental health problems. Self-Determination theory (SDT) displays a framework accounting for well-being and motivation, that highlights the importance of the basic psychological need for autonomy regarding university students' mental health. Further, gratitude and self-efficacy display important positive psychological skills that have been linked to increasing levels of autonomy and happiness. The aim of this study was to investigate the underlying mechanisms of students' levels of happiness. Therefore, a cross-sectional study was conducted, investigating a sample of university students ( $N = 114$ ). To measure students' levels of the different variables, four questionnaires were used, namely the Oxford Happiness Questionnaire for measuring happiness, the Basic Needs Satisfaction in General Scale (BNSG-S) for measuring autonomy, the General Self-Efficacy Scale for the measurement of self-efficacy, and the Gratitude Questionnaire – Six Item Form (GQ-6) for measuring gratitude. Autonomy was used as a supposed mediator regarding the influence that the positive psychological concepts of gratitude and self-efficacy have on students' happiness. It was hypothesised that autonomy mediates both relationships and two mediation analyses were conducted. Thus, multiple regression analyses and two Sobel tests were done, and the results revealed that autonomy did partially mediate both, the relationship between gratitude and happiness, and the relationship between self-efficacy and happiness. Furthermore, the relationships between the variables were also significant. The findings indicate that students' levels of happiness can be linked to gratitude and self-efficacy, as well as autonomy. Future research is needed to clarify what other factors might influence the relationship between these positive psychological concepts and happiness. However, the current research demonstrated the importance of the satisfaction of the need for autonomy for students' levels of happiness.

*Keywords:* autonomy, happiness, university students, Self-Determination theory, positive psychology

## **Introduction**

Faced with many challenges, university students are at risk for experiencing high levels of stress and associated negative outcomes for their mental health (Yusoff et al., 2013). A systematic review of 24 studies that investigated the prevalence of depression in university students revealed that with a prevalence rate of 30.6%, university students have significantly higher rates of depression than the general public (Ibrahim et al., 2013). To combat these issues, and not only decrease the mental health problems of students but also increase their positive feelings, making use of the principles of positive psychology seems to be a promising path (Carr et al., 2021). Positive psychology is defined as the study of optimal human functioning in a scientific manner (Linley et al., 2006). Thereby, Linley et al. (2006), as well as Seligman and Csikszentmihalyi (2000), emphasize the aim of positive psychology of directing attention in the field of psychology to positive aspects of human functioning and experience in contrast to a focus on solely negative aspects. Thus, it focuses on “positive subjective experience, positive individual traits, and positive institutions“ (Seligman & Csikszentmihalyi, 2000, p.5.). To effectively tailor the principles of positive psychology to students’ needs, their mental health must be considered.

### **Mental Health and Happiness of University Students**

Evaluating the well-being and mental health of university students, being confronted with a variety of challenges in their daily life, regarding not only their professional academic situation but also aspects of their private life, their mental health and well-being are seriously challenged. A substantial amount of university students suffer from serious mental health issues which can affect their functioning (Saleem et al., 2013). Stallman & Shochet (2009) investigated a sample of Australian university students and revealed that 45.1% of participants received elevated scores on a measure of nonspecific psychological distress, indicating serious psychological problems. Further, 24.4% had scores that are related to mild psychological disorders. Another 11.8% of students scored for a moderate disorder and the final 8.9% reached high scores and are likely to suffer from a severe mental illness. Therefore, some preventive efforts should be made to increase the well-being of students. An important factor in mental health, particularly for university students, is experiencing feelings of happiness. Uchida & Oishi (2016) describe a happy person as someone who feels pleasant feelings the majority of the time and is overall satisfied with his or her life. Further, Dar & Wani (2017) define happiness as a state of well-being that is linked to positive feelings and pleasure characterized by enjoyment and satisfaction. In general, happiness is an important predictor of quality of life and an indicator of individuals that are well-adjusted and functioning (Burns & Crisp, 2022).

Moreover, Burns & Crisp (2022) investigated the effect of happiness on mental health and found a significant relationship between higher levels of happiness being associated with higher levels of mental health and fewer adverse symptoms. Regarding university students and their academic achievements, Barker et al. (2016) concluded that generally happy students receive higher academic success, deal more efficiently with their emotions and better cope with negative affect and maintain overall positive feelings even when confronted with negative emotions during their studies. As students are required to maintain academic achievements to finish their studies, a theoretical framework that accounts for student motivation and provides insights into processes influencing their happiness is of interest. Such a framework might be able to allow for a better understanding of how students' levels of happiness can be further supported.

### **Self-Determination Theory**

A framework that should be considered when investigating students' happiness can be found within Deci and Ryan's (2000) Self-Determination theory (SDT). SDT differentiates the concept of goal-directed behaviour by taking into account three basic psychological needs that every human possesses – competence, relatedness, and autonomy (Deci & Ryan, 2000). Thereby, psychological needs are perceived as innate and universal within all cultures, even though the ways of fulfilling the needs might manifest differently among cultures and individuals. Further, they explain that the degree to which people can satisfy these basic needs determines the pursuit and attainment of their goals. The first need, competence, regards a sense of confidence that influences what kind of challenges people set for themselves and perceive as optimal for their capacities and abilities (Deci & Ryan, 2002). Further, Deci and Ryan (2002), describe the second need, relatedness, as wanting to connect with and be accepted by others, to feel being in relation to others in a secure community. The third need, autonomy, regards the “experience of integration and freedom, and it is an essential aspect of healthy human functioning” (Deci & Ryan, 2000, p. 231). In summary, SDT displays a promising framework accounting for underlying mechanisms in the form of psychological needs that need to be fulfilled to allow students to develop good mental health and motivation to engage in their studies. To enhance students' happiness, this study focuses on the need for autonomy, which seems to be of key importance when considering the challenges that students face in their daily lives.

### **Autonomy**

The need that is particularly important when investigating student mental health and motivation, is the need for autonomy. As Deci and Ryan (2000) describe the psychological need

for autonomy is necessary to understand not only goal-directed behaviour but also psychological development and growth, as well as well-being, and integrity. Furthermore, Niemiec & Ryan (2009) investigated the relevance of autonomy and competence toward education in different university cultures and found autonomy associated with perceived competence as well as higher levels of well-being in all samples. They further pointed out that school systems would display a healthier environment for students when they would provide autonomy-supporting contexts to their students. Additionally, cognitive evaluation theory (CET), which is a mini-theory within SDT concerned with social contexts and interpersonal interaction that enhance or undermine intrinsic motivation, argues for the importance of autonomy for intrinsic motivation (Ryan, 2009). Ryan (2009) further points out in CET that factors like rewards, deadlines, feedback and pressure, which university students are commonly confronted with, affect their feelings of autonomy and can thus, enhance or undermine their intrinsic motivation. Therefore, the need for autonomy is of key interest when investigating the happiness of university students as it promotes their happiness and growth as well as exerts great influence on their motivation (Niemiec & Ryan, 2009; Ryan, 2009). To enhance the happiness levels of students, it is of interest to explore possible factors that might increase the fulfilment of the need for autonomy. Thus, certain positive psychological skills should be considered that are easy to train and display effective tools in increasing happiness.

### **Gratitude**

One skill that can be repeatedly found as a topic of conversation in positive psychology and that is linked in the literature to enhancing happiness, is gratitude. Gratitude can be defined as both, an emotion as well as an attitude and it is linked to feeling grateful for something good that one received (Walker, 1981). Further, Walker (1981) explains that gratitude does not imply one received favour from someone else but rather that one can also be favoured by beneficial circumstances or the environment, such as being gifted with a specific talent or enjoying the sunshine on a day in winter. Therefore, Walker (1981) summarizes that being grateful does not focus on being favoured, but on the response to this which entails the desire for making a return and giving back. Gratitude has been linked to enhanced psychological, as well as physical health, lower symptoms of depression, higher levels of positive affect and life satisfaction, higher quality sleep, and an increase in health behaviours (Alkozei et al., 2018). Furthermore, Alsukah & Basha (2021) researched a sample of students and revealed that higher levels of gratitude were related to higher happiness scores and an increase in gratitude led to an increase in happiness. Additionally, Zainoodin et al. (2021) describe that gratitude helps university students to accept reality in a more positive way and to view situations from broader cognitive

perspectives. Further, they state that practising gratitude throughout university life increases cognitive functioning, allows for better memory and creativity and for building resilience. However, gratitude is not only important when it comes to happiness, but is of particular interest regarding the need for autonomy. Lee et al. (2015) investigated the relationship between gratitude and autonomy, using a cross-lagged longitudinal study design. Their participants reported their emotions and need satisfaction twice, once at the beginning of the study and again after two months. The results of their study show that gratitude plays a role in fulfilling the need for autonomy and, in turn, increased autonomy led to higher levels of gratitude. In summary, Lee et al. (2015) reported higher levels of autonomy predict higher levels of gratitude over time and higher levels of gratitude predict higher levels of autonomy over time as well. Overall, gratitude is linked to a variety of positive outcomes for students with an increase in happiness and autonomy as well as a decrease in adverse symptoms. As university students are faced with many challenges and need to master them accordingly, gratitude should be accompanied by another important skill to guide them in their academic careers.

### **Self-Efficacy**

A second concept that is associated with increased happiness and motivation and that is directly related to the academic context, is self-efficacy. As introduced by Bandura (1994), self-efficacy refers to the beliefs that people hold about their capability to reach a certain goal or engage in successful behaviours. Self-efficacy can determine the way people think and feel, or their level of motivation (Bandura, 1994). Thereby, he explains that higher levels of self-efficacy are associated with enhanced achievements and happiness. Furthermore, according to Bandura (1994), people with higher self-efficacy tend to evaluate difficult tasks as challenges that should be mastered rather than threatening problems that should be avoided. As a result, they are more likely to establish ambitious objectives for themselves and are willing to successfully reach them and even when faced with failure, people with high self-efficacy heighten and sustain their efforts and recover rather quickly when confronted with setbacks. Additionally, Bandura (1994) describes that self-efficacy is linked to lowering levels of stress and vulnerability to depression. These assumptions are further supported by a study conducted by van Zyl and Dhurup (2018) who investigated a sample of university students. Their findings indicate that higher levels of self-efficacy can lead to enhanced levels of happiness and life satisfaction in general. Moreover, Roick & Ringeisen (2017) conducted a longitudinal study that investigated the role of self-efficacy in academic success and their results reveal that self-efficacy is positively related to academic success as well as the significance that students attach to their academic outcomes. Self-efficacy is linked to autonomy as well. Girelli et al. (2018)

tested a predictive model by using SDT with the integration of self-efficacy to investigate the underlying mechanisms of academic adjustment in university students. Their study measured, besides other variables, students' self-efficacy and perceived autonomous support from teachers and parents at the start and end of their academic year (Girelli et al., 2018). The findings reveal that both forms of autonomy support have an impact on students' self-efficacy and intrinsic motivation (Girelli et al., 2018). Furthermore, Girelli et. al (2018) suggest that an environment that supports students' autonomy, increases self-efficacy. In turn, students with higher autonomy and self-efficacy were less likely to develop drop-out intentions during the academic year. Girelli et al. (2018) concluded that both, autonomous motivation, and self-efficacy are central for undergraduate students to master their academic activities. Overall, self-efficacy is important for students in multiple regards. It influences the thoughts and beliefs that university students hold about themselves and their abilities and is linked to higher levels of happiness as well as greater academic achievements and it can be supported by autonomy (Bandura, 1994; Girelli et al., 2018; van Zyl & Dhurup, 2018).

### **The Current Study**

As has become clear, university students are facing a variety of challenges in their daily lives which can cause them to suffer from adverse mental health symptoms and weaken their well-being. A strong factor that reduces these negative effects and that can lead to higher well-being is the level of happiness perceived by students. An effective way to increase happiness is to train positive psychological skills, such as gratitude and self-efficacy, to improve the mental health of students (Deci & Ryan, 2000; Koydemir & Sun-Selışık, 2016; Sin & Lyubomirsky, 2009). Especially suitable for this demand seems to be training that focuses on increasing gratefulness and self-efficacy as these skills have been shown to increase happiness while also enhancing academic abilities (Alsukah & Basha, 2021; Roick & Ringeisen, 2017; van Zyl & Dhurup, 2018; Zainoodin et al., 2021). However, the underlying mechanisms of the described, and in the literature well-established relationships, remain rather unclear, even though insights could provide an important understanding of how to foster happiness in students and enhance their satisfaction of the need for autonomy. Thus, exploring the underlying mechanisms of the relationships between the described positive psychological skills and happiness through the basic psychological need for autonomy is of interest. The basic need for autonomy has been described as necessary for achieving and maintaining good mental health and happiness, and it has been linked in the literature to both, gratitude, and self-efficacy (Girelli et al., 2018; Lee et al., 2015). However, it remains unknown whether autonomy is involved in the influence that these positive psychological skills have on happiness. To fill this gap in research, this study

aims to investigate the questions of whether autonomy mediates the relationship between gratitude and happiness as well as whether autonomy mediates the relationship between self-efficacy and happiness. As mentioned earlier, SDT states that satisfaction of the basic psychological needs, such as autonomy, leads to increased well-being (Deci & Ryan, 2000). Moreover, previous literature described a positive link between gratitude and happiness, and self-efficacy and happiness, as well as a positive link between gratitude and autonomy and self-efficacy and autonomy (Alsukah & Basha, 2021; Girelli et al., 2018; Lee et al., 2015; van Zyl & Dhurup, 2018). The research questions that will be answered in this research are “Does autonomy mediate the relationship between gratitude and happiness?” and “Does autonomy mediate the relationship between self-efficacy and happiness?” by accepting or rejecting the following hypotheses:

*H1: Gratitude is significantly positively associated with happiness.*

*H2: Gratitude is significantly positively associated with autonomy.*

*H3: Autonomy is significantly positively associated with happiness.*

*H4: Autonomy does mediate the relationship between gratitude and happiness.*

*H5: Self-efficacy is significantly positively associated with happiness.*

*H6: Self-efficacy is significantly positively associated with autonomy.*

*H7: Autonomy does mediate the relationship between self-efficacy and happiness.*

## **Methods**

### **Participants**

The sample was collected by making use of Sona studies and the snowball sampling method. Therefore, the study was distributed by the researchers with their available contacts. Further, the study was published online at Sona Studies, a platform for students at the University of Twente where they can participate in different studies to receive so-called “Sona Credits”, depending on the length of the respective study. Participants were required to be at the minimum age of 18 years, study at a university, and had to agree to the provided informed consent. A total of 149 university students that met the criteria participated in the study, aged between 18 and 30 years ( $M = 21,85$ ,  $SD = 2,44$ ). Regarding their nationality, 50% of participants reported being German, 15% Dutch, and 35% others. No information about the gender of the participants was collected due to researchers' error. Moreover, in terms of their level of education, all respondents are studying at a university.

### **Procedure**

The study was conducted online and was estimated to take about 20 minutes to complete. Therefore, participants were required to fill in a survey consisting of four



standardized questionnaires as well as report their demographic variables. Before answering the questions, the respondents were presented with an informed consent which they were asked to read carefully and click the according box to provide their consent. Next one, the participants were asked about their demographic variables. Following that, they were presented with four questionnaires to measure their level of happiness, self-efficacy, gratitude, and satisfaction of their basic psychological needs. Finally, participants were thanked for taking part in the study and informed that their responses had been successfully reported.

## **Materials**

The study was entirely hosted on Qualtrics to manage the data collection.

The questions about demographic variables included the participants' age and nationality and participants had to confirm that they are university students.

### ***Basic Needs Satisfaction in General Scale***

The 21-item long Basic Needs Satisfaction in General Scale (BNSG-S) scale developed by Gagné (2003) was used to measure the level of satisfaction with the three needs of autonomy, relatedness, and competence. However, this study only focuses on the outcomes of the autonomy subscale (example item: I feel like I am free to decide for myself how to live my life). The subscale was administered on a 7-point Likert scale, ranging from 1 = "not at all true" to 7 = "very true". Cronbach's Alpha of the BNSG-S is acceptable with  $\alpha = .89$ , indicating good reliability (Gagné, 2003). Additionally, Cronbach's Alpha of the autonomy subscale was conducted for the present sample and is acceptable with  $\alpha = .79$ .

### ***Gratitude Questionnaire – Six Item Form***

Further, the Gratitude Questionnaire – Six Item Form (GQ-6), developed by McCullough et al. (2002) was used to measure the participants' level of gratitude. The GQ6 was administered on a 7-point Likert scale ranging from 1 = "strongly disagree" to 7 = "strongly agree" (example item: I have so much in life to be thankful for). Cronbach's Alpha of the scale has been reported between  $\alpha = .82$  and  $\alpha = .87$ , which can be considered good (McCullough et al., 2002). For the current sample, Cronbach's Alpha was calculated and appeared acceptable with  $\alpha = .79$ .

### ***Oxford Happiness Questionnaire***

Happiness was measured with the 29-item long Oxford Happiness Questionnaire (example item: I always have a cheerful effect on others) developed by Hills and Argyle (2002). The questionnaire was administered on a 6-point Likert scale, ranging from 1 = "strongly disagree" to 6 = "strongly agree". Furthermore, Cronbach's alpha for the Oxford Happiness Questionnaire has been reported as acceptable with  $\alpha = .71$  (Hills & Argyle, 2002).

Cronbach's alpha for the present sample has also been calculated and can be considered acceptable as well with  $\alpha = .75$ .

### ***Self-Efficacy Scale***

Finally, the participants' levels of self-efficacy were examined using the 23-item long self-efficacy scale, developed by Sherer et al. (1982). The scale consists of two subscales, a 17-item long subscale for general self-efficacy and a 6-item long subscale for social self-efficacy. This study focuses on the general self-efficacy subscale only (example item: I feel insecure about my ability to do things) and it was administered on a 5-point Likert scale, ranging from 1 = "strongly disagree" to 5 = "strongly agree". Cronbach's alpha for the general self-efficacy subscale has been reported as  $\alpha = .86$ , which can be considered good (Sherer et al., 1982). Further, Cronbach's alpha was also conducted for the present sample and can be considered acceptable with  $\alpha = .78$ .

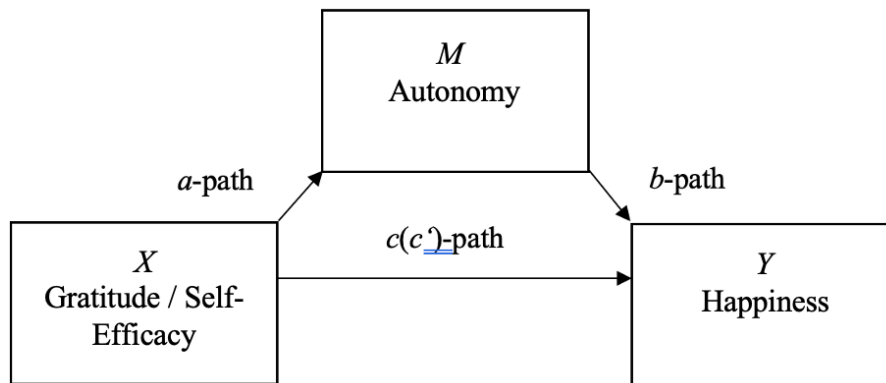
### **Data Analysis**

The entire data analysis was done in RStudio (RStudio Team, 2023). Since the study design ensured that participants could not proceed without answering all items on a page, participants with missing values did drop out of the study at some time and their data was removed. Furthermore, the items were transformed into numeric from Likert descriptions, inverting negatively phrased items. Next on, the participants' scores on the respective scales were calculated and the assumptions of linearity, normality, homoscedasticity, and independence were checked (see Appendix A). Furthermore, a Pearson's correlation analysis was performed to determine whether happiness, autonomy, gratitude, and self-efficacy were correlated with each other. The prepared data was used to conduct a mediation analysis to investigate whether autonomy mediates the relationship between gratitude and happiness, as well as the relationship between self-efficacy and happiness. Therefore, to determine the mediation coefficients,  $a$ ,  $b$  and  $c(c')$ , mediation analysis techniques, as explained by Baron and Kenny (1986), have been used (see Figure 1). Thereby, the  $a$ - and  $b$ -path are the effect of the independent variable ( $X$ ) on the dependent variable ( $Y$ ) through the mediator ( $M$ ). The  $c$ -path reflects the total effect of the independent variable on the dependent variable and  $c'$  is the remaining effect of the independent variable on the dependent variable after it has been controlled for  $a$  and  $b$ . According to Baron and Kenny (1986), several regressions need to be performed to test for mediation. Firstly, it was tested whether a significant relation between the independent variable  $X$  of the respective model and the dependent variable  $Y$  could be found, to determine the  $c$ -path, which might be mediated. Secondly,  $X$  was regressed on  $M$ , to check the relationship between the independent variable and the supposed mediator, estimating the  $a$ -

path. Next on,  $M$  was regressed on  $Y$  to determine the  $b$ -path. Lastly, it was checked whether the  $c'$ -path has become insignificant to evaluate whether a complete mediation was found. Therefore, a Sobel test was conducted. To determine whether the analysed relationships were significant, a p-value of .001 was chosen.

**Figure 1**

*Mediation Model*



**Results**

**Descriptives**

To describe the results of the analyses of the gathered data in this study, the mean scores, standard deviations, and Pearson Correlation for the variables happiness, self-efficacy, gratitude, and autonomy are displayed in Table 1. The results demonstrate that all variables are significantly positively correlated with each other. Cohen's  $d$  was used to estimate the effect size of the correlations, whereby a Cohen's  $d$  less than .2 is considered negligible, less than .5 small, less than .8 moderate and more than .8 large (Cohen, 1988). Happiness has the strongest correlation with all variables and according to Cohen's  $d$ , its correlation with self-efficacy has a large effect ( $d = 3.53$ ). Furthermore, the effect between happiness and gratitude is also large ( $d = 5.63$ ). The correlation between happiness and autonomy has a large effect size as well ( $d = 5.53$ ). Moreover, self-efficacy was also positively correlated with gratitude, with a large effect size ( $d = 2,85$ ). Finally, self-efficacy and the mediator autonomy were also positively correlated, with, according to Cohen's  $d$ , a large effect size ( $d = 2.72$ ). Further, gratitude was positively correlated with the mediator, autonomy, however, according to Cohen's  $d$ , the correlation effect is negligible ( $d = .13$ ). Furthermore, the participants' average scores on the variables happiness, self-efficacy, gratitude, and autonomy are included in Table 1 and reveal moderate levels on each variable.

**Table 1***Descriptive Statistics*

Variable	Mean	SD	<i>r</i>			
			1.	2.	3.	4.
1. Happiness	115.4	20.01	-	.66*	.64*	.56*
2. Self-Efficacy	58.1	11.22	-	-	.35*	.36*
3. Gratitude	33.21	5.12	-	-	-	.49*
4. Autonomy	33.9	5.72	-	-	-	-

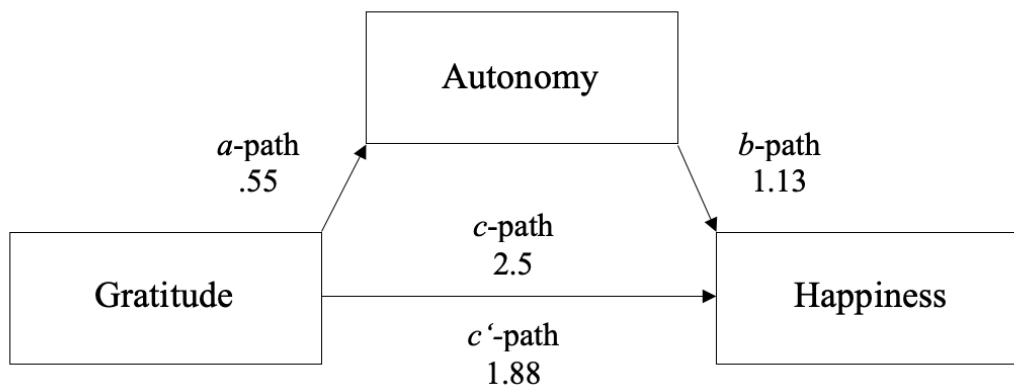
Note. \* $p < .001$

**Main analysis**

To test the hypotheses that autonomy does mediate the relationships between gratitude and happiness and between self-efficacy and happiness, two mediation models were conducted (see Figures 2 & 3). The first model, as displayed in Figure 2, was run to test the first, second, third, and fourth hypotheses. The first hypothesis, that gratitude is associated with a significant positive effect on happiness, was tested by running a simple regression that included gratitude as the independent and happiness as the dependent variable. This analysis revealed a significant relation ( $b = 2.5$ ,  $t(111) = 7.86$ ,  $p < .001$ ). Therefore, the first hypothesis was accepted. The second hypothesis, that gratitude is associated with a significant positive effect on autonomy, was tested. Therefore, gratitude was regressed on the supposed mediator autonomy. The results show again a significant relationship ( $b = .55$ ,  $t(112) = 5.91$ ,  $p < .001$ ). Thus, the second hypothesis was accepted as well. Lastly, a third model was run to test the third hypothesis, that autonomy is associated with a significant positive effect on happiness, as well as the fourth hypothesis, that autonomy does mediate the relationship between gratitude and happiness. Therefore, the model tested the significance of the effect that the mediator autonomy has on the dependent variable happiness while controlling for the independent variable gratitude. The analysis revealed a significant effect of autonomy on happiness ( $b = 1.13$ ,  $t(111) = 4.14$ ,  $p < .001$ ), while the effect of gratitude on happiness stayed also significant ( $b = 1.88$ ,  $t(111) = 6.17$ ,  $p < .001$ ). Additionally, a Sobel test was conducted to further investigate whether the reduction of the effect of gratitude on happiness, by including autonomy as a mediator, is significant and it indeed revealed a significant outcome ( $z = 3.39$ ,  $p < .001$ ). Thus, autonomy partially mediates the relationship between gratitude and happiness. The third and fourth hypotheses were, thus, accepted.

**Figure 2**

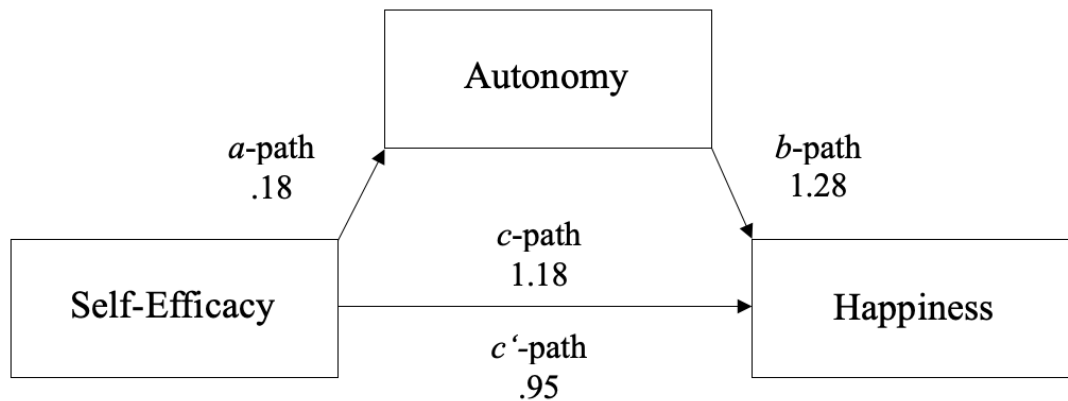
*Mediation Model: Relationship between Gratitude and Happiness Mediated by Autonomy*



The second model, shown in Figure 3, was tested by regression models as well. First, the fifth hypothesis, that self-efficacy is associated with a significant positive effect on happiness, was tested. Therefore, the relationship between self-efficacy and happiness was investigated. The outcome was significant ( $b = 1.18$ ,  $t(112) = 9.34$ ,  $p < .001$ ). Thus, the fifth hypothesis was accepted. Second, the sixth hypothesis, that self-efficacy is associated with a significant positive effect on autonomy was tested. Therefore, a model was run that included self-efficacy as the independent and autonomy as the dependent variable. The results showed a significant relationship between self-efficacy on autonomy ( $b = .18$ ,  $t(112) = 4.07$ ,  $p < .001$ ). Thus, the sixth hypothesis was also accepted. Finally, the relationship between autonomy, the supposed mediator, and happiness, the dependent variable, was tested while self-efficacy, the independent variable of the mediation model, was controlled for. The results revealed that the effect of autonomy on happiness is significant ( $b = 1.28$ ,  $t(111) = 5.4$ ,  $p < .001$ ). However, the effect of self-efficacy on happiness stayed significant as well, ( $b = .95$ ,  $t(111) = 7.86$ ,  $p < .001$ ). Further, a Sobel test was conducted to examine whether the reduction of the effect of self-efficacy on happiness, by including autonomy as a mediator, was significant. The results reveal that the reduction is significant ( $z = 3.25$ ,  $p < .001$ ), showing that autonomy was a partial mediator. Therefore, the seventh hypothesis that autonomy mediates the relationship between self-efficacy and happiness, was also accepted.

**Figure 3**

*Mediation Model: Relationship between Self-Efficacy and Happiness Mediated by Autonomy*



### **Discussion**

This study aimed to investigate whether the need for autonomy mediates the relationship between gratitude and happiness, as well as the relationship between self-efficacy and happiness, in a cross-sectional study among a sample of 114 university students. As both, gratitude and self-efficacy have been linked to happiness and autonomy in previous literature and SDT states that fulfilling the need for autonomy is central to being able to reach happiness, two research questions have been formulated to test for a mediation model (Alsukah & Basha, 2021; Girelli et al., 2018; Lee et al., 2015; van Zyl & Dhurup, 2018). First, whether autonomy mediates the relationship between gratitude and happiness and second, whether autonomy mediates the relationship between self-efficacy and happiness. Both questions can be answered as the results support the hypotheses that autonomy does influence both relationships as a mediator. However, the findings demonstrate that autonomy did mediate both relationships partially, which indicates that other factors might influence the relationships as well, which have not been included in the current research.

The first hypothesis, that gratitude is positively significantly associated with happiness, was accepted which is in line with previous literature. First off, research by Alsukah & Basha (2021) demonstrates that an increase in gratitude leads to an increase in happiness. Furthermore, Zainoodin et al. (2021) present in their study that gratitude is important for students to accept reality in more positive ways. This could also be observed in the current study, as gratitude was positively associated with happiness. Moreover, the second hypothesis, that gratitude is positively significantly associated with autonomy, was also accepted. This fits previous research, as gratitude is not only linked to happiness in the literature, as Alsukah and Basha (2021) demonstrated, but higher levels of gratitude also predict higher levels of autonomy over time (Lee et al., 2015). This was also supported by the current research as gratitude was

significantly and positively associated with autonomy. Next, the third hypothesis, that autonomy is positively significantly associated with happiness, was accepted as well. Deci and Ryan (2000), as well as Niemiec and Ryan (2009), describe that the basic psychological need for autonomy is crucial for happiness. This was supported by the outcome of the analysis as, in both models, autonomy was significantly associated with happiness. Finally, the fourth hypothesis, that autonomy mediates the relationship between gratitude and happiness, was accepted. Considering previous literature, this finding was rather expected as gratitude has been positively linked to both, happiness and autonomy, while autonomy has also been linked to an increase in happiness (Alsukah & Basha, 2021; Deci & Rany, 2000; Niemiec & Ryan, 2009).

Regarding the second mediation model, the fifth hypothesis, that self-efficacy is positively significantly associated with happiness, was accepted. As Bandura (1994) explained that higher levels of self-efficacy are associated with higher happiness, this finding is consistent with previous literature. These results were further supported by van Zyl and Dhurup (2018) who reported a link between self-efficacy and happiness. Furthermore, the sixth hypothesis, that self-efficacy is positively significantly associated with autonomy, was also accepted. This can also be linked to previous research as self-efficacy and autonomy have been related in the literature, whereby the support of students' autonomy lead to an increase in self-efficacy (Girelli et al., 2018). Lastly, the seventh hypothesis, that autonomy mediates the relationship between self-efficacy and happiness was also accepted. This fits past research since self-efficacy and happiness, as well as self-efficacy and autonomy, have been found positively linked to each other and, as already discussed, autonomy has also been found to positively influence happiness (Bandura, 1994; Deci & Ryan, 2000; Girelli et al., 2018; Niemiec & Ryan, 2009; van Zyl & Dhurup, 2018).

Considering the theoretical framework of SDT to evaluate the findings of this study, two important aspects should be considered. Firstly, autonomy was significantly and positively associated with happiness in both models, which supports the assumption of SDT that the satisfaction of this basic psychological need is necessary for increasing one's happiness and well-being (Deci & Ryan, 2000). Secondly, in both models, the positive psychological variable, either self-efficacy or gratitude, was also positively and significantly associated with autonomy. A possible explanation for these findings might be that, as discussed in previous literature, a link between the two skills and autonomy could exist whereby increasing one's level of gratitude or self-efficacy leads to an increase in autonomy (Alsukah & Basha, 2021; Girelli et al., 2018). Relating this to SDT, self-efficacy and gratitude might both enhance the fulfilment of the basic psychological need for autonomy. Additionally, since autonomy did not

completely, but partially mediate the relationships, other factors of influence might be missing in the current design. From a SDT point of view, the other two basic psychological needs, namely relatedness and competence could be, at least partly, involved in the relationships as well as they are also described to be important for optimal functioning (Deci & Ryan, 2000). However, further research is needed to confirm or deny this assumption.

### **Limitations and Future Recommendations**

Nevertheless, there are some limitations of the study that should be considered. Firstly, the cross-sectional study design does not allow for concluding cause-and-effect relationships between the included variables, thus, for examining causal effects, a longitudinal or experimental study should be conducted (Scribbr, 2020). Furthermore, in the current study, no data about the gender of participants have been selected which might have revealed further insights about possible gender differences in the levels of the different variables, namely happiness, autonomy, gratitude, and self-efficacy. For possible replication studies of the current research, it might be advisable to collect information about gender in the demographic variables to test for such possible effects. Another limitation would be that the sample was collected using convenience and snowball sampling techniques. Therefore, a lot of participants were recruited from the same university which could influence the generalizability of the findings to the wider population (Etikan, 2016). To overcome this limitation in future research, a more diverse sample is advisable to allow conclusions for a broader population. Therefore, making use of probability sampling is recommended, as it allows for generalisation of the findings to the defined population, however, careful planning is of key importance (Acharya et al., 2013). Additionally, as SDT claims that the fulfilment of all three needs is not ideal but crucial to reach optimal functioning and well-being, in future research next to autonomy, competence and relatedness should be included in the study design. This would allow for a more in-depth review of the SDT approach and might provide deeper insight into the underlying processes that influence the relationships between the positive psychological skills of self-efficacy and gratitude with happiness. These insights could be of importance for understanding how the mental health of university students could be facilitated.

### **Strengths**

Nevertheless, the study also shows several strengths that should be mentioned. To begin with, the study's focus on the relationship between the positive psychological skills of gratitude and self-efficacy with happiness, including autonomy as a mediator variable has, to the time of the study, received little to no attention in previous research. Therefore, the study contributes to a limited body of literature on the interplay of SDT, more specifically the need for autonomy,



and the influence of positive psychological skills on happiness. Therefore, the research helps to establish a better understanding of the underlying mechanisms of increasing happiness, especially for the threatened population of university students. This relates to another important strength of the study, its focus on university students. As has been discussed in detail, university students are at high risk for experiencing mental health problems or developing psychological disorders (Stallman & Shochet, 2009). Thus, focusing attention on this area and further investigating the underlying mechanisms to establish preventive efforts against the mental problems many students face, becomes increasingly important and display room for application of the study's results.

### **Implications for Practice**

The findings of the current study could be applied in the design of positive psychological interventions (PPIs). The findings are helpful to understand the relationships between the positive psychological concepts of gratitude and self-efficacy with happiness through the satisfaction of the basic psychological need for autonomy. Using these insights in the design of PPIs displays an important and interesting area of application. Thus, considering that autonomy should be satisfied and that both, gratitude, and self-efficacy seem to foster autonomy, they should be integrated into a PPI when aiming to satisfy this need. More precisely, this should be related to university students directly. Educating them about the importance of satisfying the need for autonomy and the relation between autonomy, self-efficacy or gratitude, and happiness and providing them with exercises on how to increase their levels of autonomy, self-efficacy, and gratitude might be effective in the prevention of low levels of happiness. This could be done by, for example, integrating both, knowledgeable information, as well as practical exercises in a positive psychology course available for students. As indicated by Maybury (2013), positive psychology courses that include scientific information about topics such as well-being and self-actualisation, combined with associated assignments and exercises can enhance, among others, the level of happiness of university students. Thus, including autonomy, gratitude, and self-efficacy in such courses could potentially provide an accessible and effective way for students to combat low levels of happiness and improve their mental health.

### **Conclusion**

In conclusion, the current study aimed at investigating the extent to which autonomy mediates the relationship between gratitude and happiness and the relationship between self-efficacy and happiness. Since autonomy did mediate both relationships partially, further research is needed to determine other factors, such as the basic psychological needs for relatedness and competence, that might be involved in the relations. This study underlined the

importance of autonomy in university students' happiness, as well as gratitude and self-efficacy. Since university students are at high risk for suffering from low levels of happiness, it is suggested that the results find application in this population, for example in the design of PPIs and to educate students about the relevance of autonomy, self-efficacy and gratitude and offer opportunities to practice them. By raising awareness and improving individual autonomy, for example, through self-efficacy and gratitude exercises, university students might improve their mental health.

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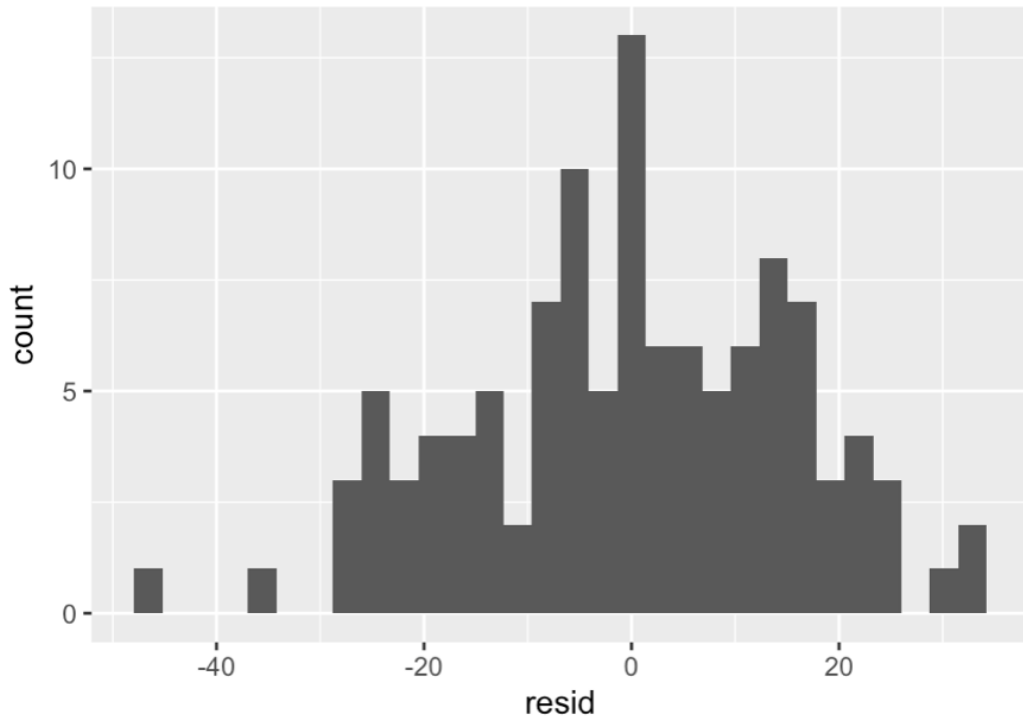
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## Appendix A

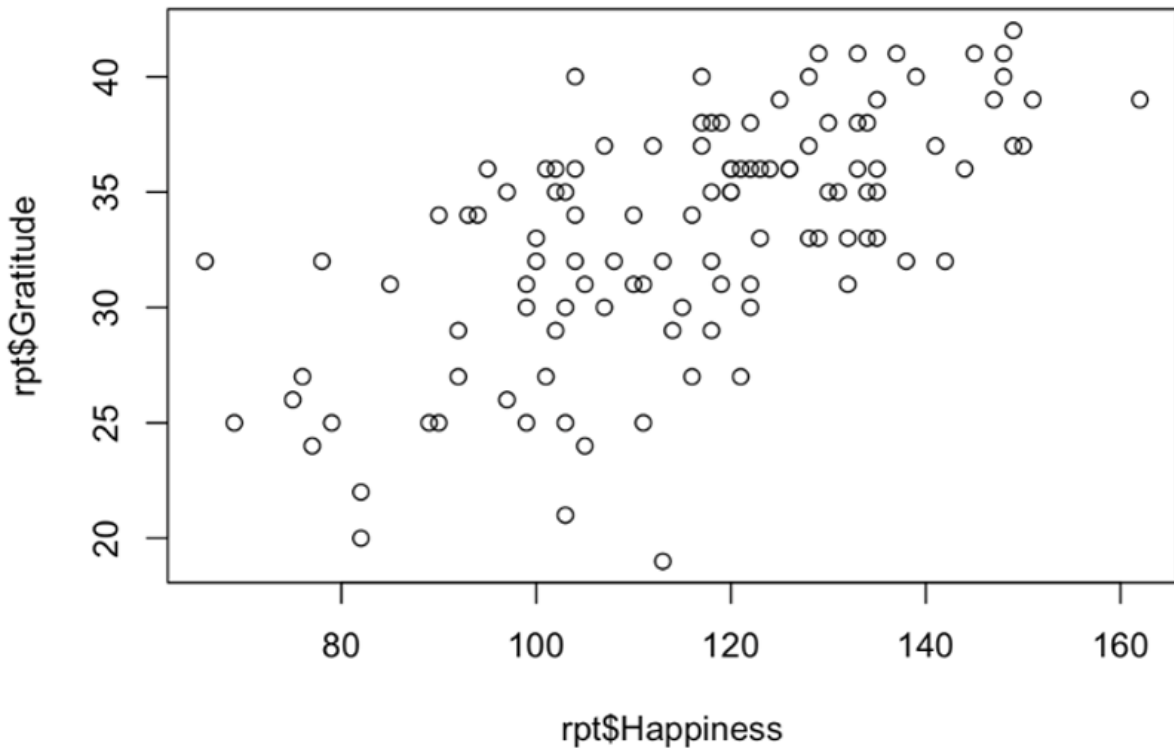
### Testing the Assumptions of Normality, Linearity, and Independence

#### Model 1: Gratitude as Independent Variable

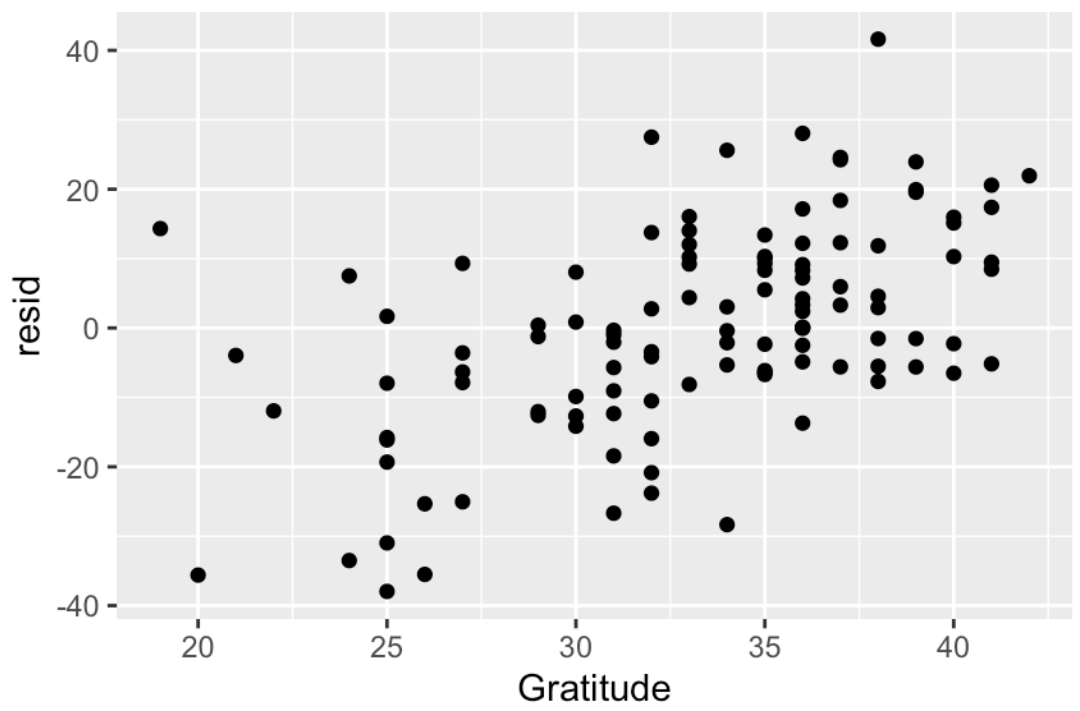
##### *Assumption of Normality*



##### *Assumption of Linearity*

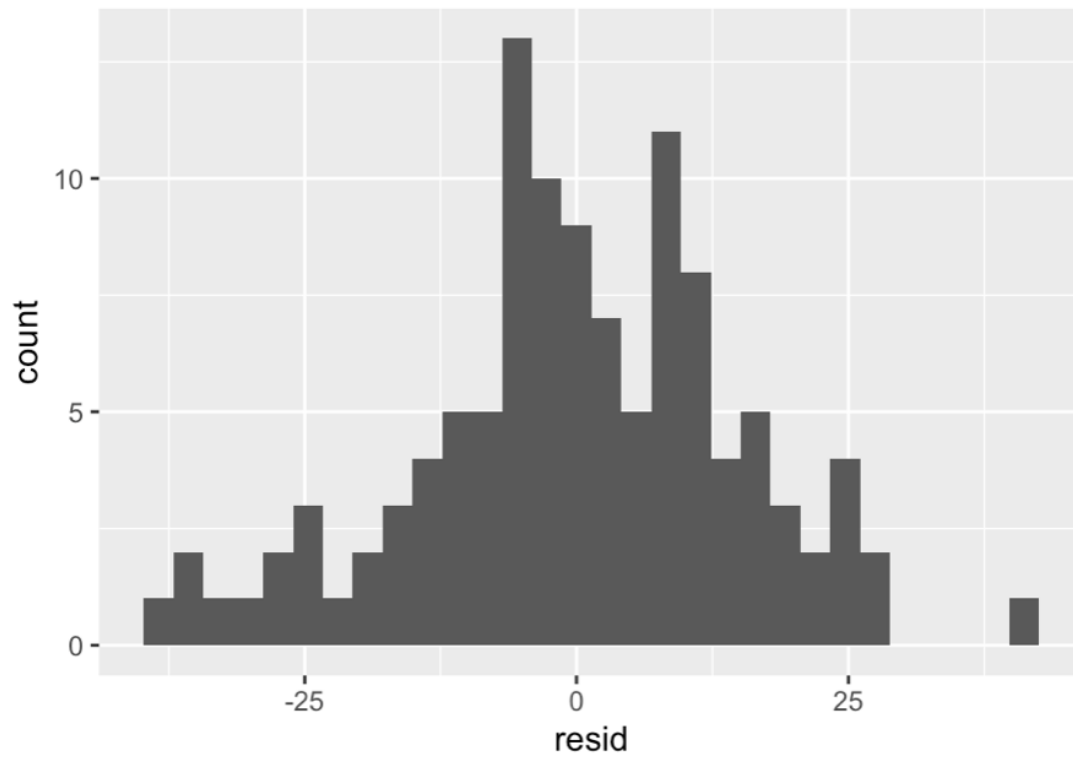


*Assumption of Independence*



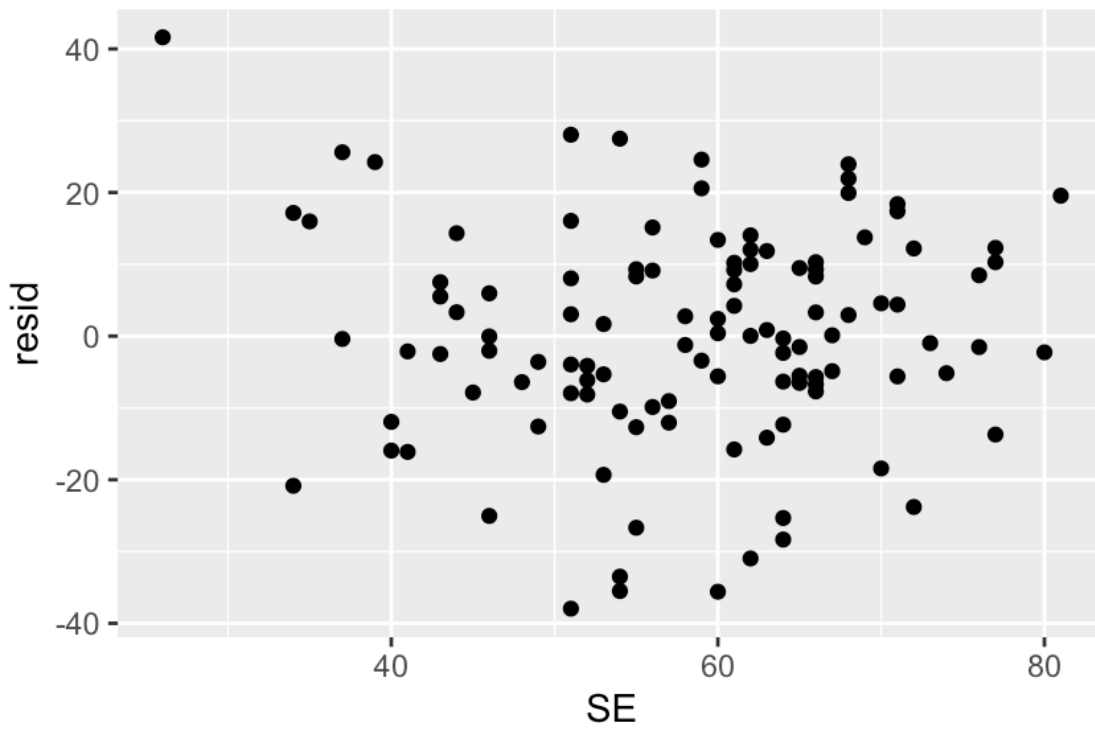
**Model 2: Self-Efficacy as Independent Variable**

*Assumption of Normality*





*Assumption of Independence*



*Assumption of Linearity*

