

The Relationship Between Cognitive Reappraisal, Gender and Perceived Stress

[Relația dintre reevaluarea cognitivă, gen și nivelul de stres perceput]

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Abstract

The transition to university is a significant life adjustment, often associated with increased stress and mental health challenges. This study investigated the relationship between cognitive reappraisal, gender, and perceived stress in first-year university students. It explored whether women report lower levels of perceived stress than men, whether higher levels of cognitive reappraisal predict lower levels of perceived stress, and whether gender moderated this relationship. Participants completed two questionnaires measuring perceived stress and cognitive reappraisal. The results showed no significant main effects of gender or cognitive reappraisal on perceived stress, and no significant interaction. However, an exploratory analysis focusing exclusively on women revealed that higher cognitive reappraisal was associated with lower perceived stress. These findings suggest that although gender did not significantly moderate the relationship between cognitive reappraisal and perceived stress, cognitive reappraisal may still be an important strategy for reducing perceived stress, particularly among women. This emphasizes the complexity of stress and emotion regulation during life transitions and highlight the importance of addressing sample imbalances.

Keywords: perceived stress, cognitive reappraisal, gender differences, university transition, first-year students.

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Introduction

The transition to university represents a significant life adjustment within young adulthood, marked by a range of academic, social, and personal challenges, particularly for first-year students. This period is often associated with increased levels of stress, loneliness, homesickness, and interpersonal conflict¹. Such stressors increase vulnerability to mental health issues, including anxiety and depression, making this a crucial period for intervention². These challenges highlight the need for a deeper understanding of the factors that contribute to perceived stress among first-year students.

Stress during this period is particularly complex since it includes not only objective stressors but also perceived stress. Unlike general stress responses, which often involve physiological or behavioural reactions to stressors, perceived stress focusses on an individual's subjective evaluation of how stressful situations in their life are³. According to previous research, perceived stress is a more accurate predictor of mental health outcomes, such as anxiety and depression, compared to objective stress levels because it directly reflects an individual's emotional burden and personal experience of stress⁴. Moreover, perceived stress and negative emotions have been found to mutually reinforce one another, creating a cognitive-emotional downward spiral that exacerbates mental health challenges⁵. Without effective emotion regulation or coping strategies this cycle can intensify over time, leading to increasingly negative emotional states. Understanding perceived stress among first-year university students is thus critical for developing effective interventions to address stress-related mental health issues during this transitional period.

One key factor in managing perceived stress is the use of emotion regulation strategies. Emotion regulation refers to the processes by which individuals alter their emotional responses, such as which emotions they experience, when they experience them, and how they express them⁶. Cognitive reappraisal, one of the main emotion regulation strategies, is the process of reinterpreting a potentially emotion-provoking event in order to alter its emotional impact⁶. As an antecedent-focused strategy, it takes place early in the emotional process, before emotional tendencies are entirely developed, allowing it to effectively change the emotional trajectory⁶. Research has shown that cognitive reappraisal is associated with numerous positive outcomes, including reduced depression, lower anxiety,

¹ C. S. Conley, L. V. Travers, and F. B. Bryant, *Promoting Psychosocial Adjustment and Stress Management in First-Year College Students: The Benefits of Engagement in a Psychosocial Wellness Seminar*, in *Journal of American College Health* 61, no. 2 (2013): 75–86, <https://doi.org/10.1080/07448481.2012.754757>

² R. Beiter, R. Nash, M. McCrady, D. Rhoades, M. Linscomb, M. Clarahan, and S. Sammut, *The Prevalence and Correlates of Depression, Anxiety, and Stress in a Sample of College Students*, in *Journal of Affective Disorders* 173 (2015): 90–96, <https://doi.org/10.1016/j.jad.2014.10.054>

³ S. Cohen, T. Kamarck, and R. Mermelstein, *A Global Measure of Perceived Stress*, in *Journal of Health and Social Behavior* 24, no. 4 (1983): 385–396, <https://doi.org/10.2307/2136404>

⁴ G. S. Shields, A. Fassett-Carman, Z. J. Gray, J. E. Gonzales, H. R. Snyder, and G. M. Slavich, *Why Is Subjective Stress Severity a Stronger Predictor of Health than Stressor Exposure? A Preregistered Two-Study Test of Two Hypotheses*, in *Stress and Health: Journal of the International Society for the Investigation of Stress* 39, no. 1 (2023): 87–102, <https://doi.org/10.1002/smi.3165>

⁵ G. Feng, X. Xu, and J. Lei, *Tracking Perceived Stress, Anxiety, and Depression in Daily Life: A Double-Downward Spiral Process*, in *Frontiers in Psychology* 14 (2023), <https://doi.org/10.3389/fpsyg.2023.1114332>

⁶ J. J. Gross and O. P. John, *Individual Differences in Two Emotion Regulation Processes: Implications for Affect, Relationships, and Well-Being*, in *Journal of Personality and Social Psychology* 85, no. 2 (2003): 348–362, <https://doi.org/10.1037/0022-3514.85.2.348>

and higher life satisfaction, self-esteem, and emotional well-being^{7, 8, 9}. Individuals who frequently use reappraisal tend to view stressful situations optimistically, reframe challenges and better manage their emotions¹⁰. For university students, cognitive reappraisal may be particularly beneficial in reducing the psychological impact of academic and social pressures during the transition to higher education¹¹.

In addition to cognitive reappraisal, another key factor that plays an important role in emotion regulation and stress outcomes is gender. Research suggests that men and women differ in their use of emotion regulation strategies, with women more likely to practice cognitive reappraisal¹² and men more inclined to suppress emotions¹⁰. These gender differences are shaped by social norms, where emotional expression is generally viewed as less masculine¹³. Boys, for example, report being expected to inhibit their emotional expressions more than girls¹⁴. These differences in emotion regulation may lead to gender-specific variations in perceived stress, with women potentially benefiting more from reappraisal in managing stress than men¹⁵. However, research on how these gender differences influence perceived stress during major life transitions remains limited.

While previous studies have established that the transition to university is a highly stressful period, particularly for first-year students, there is limited understanding of how emotional regulation strategies and gender differences are associated with stress outcomes during this critical life phase. Despite evidence that cognitive reappraisal is a key strategy for managing stress and that gender differences shape emotion regulation tendencies, little is known about how these factors collectively impact perceived stress in the unique context of transitioning to university. Given the important role of cognitive reappraisal and the influence of gender on emotion regulation, this study seeks to investigate the relationship between cognitive reappraisal, gender, and perceived stress in first-year university students.

By exploring these associations, this study will contribute to a deeper understanding of how gender plays into the effectiveness of emotion regulation strategies in managing stress during the transition to university. The findings could inform practical interventions designed to improve students' emotional well-being, such as workshops teaching cognitive

⁷ N. Garnefski and V. Kraaij, *Relationships between Cognitive Emotion Regulation Strategies and Depressive Symptoms: A Comparative Study of Five Specific Samples*, in *Personality and Individual Differences* 40, no. 8 (2006): 1659–1669, <https://doi.org/10.1016/j.paid.2005.12.009>

⁸ S. A. Moore, L. A. Zoellner, and N. Mollenholt, *Are Expressive Suppression and Cognitive Reappraisal Associated with Stress-Related Symptoms?*, in *Behaviour Research and Therapy* 46, no. 9 (2008): 993–1000, <https://doi.org/10.1016/j.brat.2008.05.001>

⁹ T. B. Kashdan, V. Barrios, J. P. Forsyth, and M. F. Steger, *Experiential Avoidance as a Generalized Psychological Vulnerability: Comparisons with Coping and Emotion Regulation Strategies*, in *Behaviour Research and Therapy* 44, no. 9 (2006): 1301–1320, <https://doi.org/10.1016/j.brat.2005.10.003>

¹⁰ Gross and John, *Individual Differences in Two Emotion Regulation Processes*, 348–362.

¹¹ A. S. Troy, A. J. Shallcross, and I. B. Mauss, *A Person-by-Situation Approach to Emotion Regulation: Cognitive Reappraisal Can Either Help or Hurt, Depending on the Context*, in *Psychological Science* 24, no. 12 (2013): 2505–2514, <https://doi.org/10.1177/0956797613496434>

¹² S. Nolen-Hoeksema, *Emotion Regulation and Psychopathology: The Role of Gender*, in *Annual Review of Clinical Psychology* 8 (2012): 161–187, <https://doi.org/10.1146/annurev-clinpsy-032511-143109>

¹³ L. R. Brody and A. H. Fischer, *The Socialization of Gender Differences in Emotional Expression: Display Rules, Infant Temperament, and Differentiation*, in *Gender and Emotion: Social Psychological Perspectives*, 24–47 (2000), <https://doi.org/10.1017/CBO9780511628191.003>

¹⁴ M. K. Underwood, J. D. Coie, and C. R. Herbman, *Display Rules for Anger and Aggression in School-Age Children*, in *Child Development* 63, no. 2 (1992): 366, <https://doi.org/10.2307/1131485>

¹⁵ T. M. Chaplin, *Gender and Emotion Expression: A Developmental Contextual Perspective*, in *Emotion Review* 7, no. 1 (2015): 14–21, <https://doi.org/10.1177/1754073914544408>

reappraisal techniques tailored to different gender needs. For instance, programs could emphasize the development of reappraisal skills among male students, who may rely less on adaptive emotions regulation strategies, while also addressing social norms that discourage emotional expression. Additionally, understanding the relationship between emotion regulation strategies and perceived stress could contribute to broader social initiatives to address gender inequalities in mental health support for young adults. Based on these arguments, this study hypothesizes that (1) women will report lower levels of perceived stress than men, (2) higher levels of cognitive reappraisal will be associated with lower levels of perceived stress, (3) women who report higher levels of cognitive reappraisal will also report lower levels of perceived stress, compared to men.

To test these hypotheses, this study will employ an observational design using self-report questionnaires. Participants will complete the Perceived Stress Scale (PSS-10) (see Appendix A) to measure their levels of perceived stress and the Emotion Regulation Questionnaire (ERQ) (see Appendix B) to assess their use of cognitive reappraisal.

Methods & Participants

The initial sample for this study consisted of 121 university students. Participants were excluded if they (1) have previously completed a bachelor's degree or were not enrolled in their first bachelor's program, (2) identified with a gender other than man or woman, or (3) completed the survey in under five minutes, which was considered insufficient for providing valid responses. Consequently, 22 participants were excluded from the initial dataset, resulting in a final sample of $N = 99$. Informed consent was obtained from all participants. The final sample consisted of 92 women (93%), with a mean age of $M = 18.9$ years ($SD = 1.3$), and 7 men (7%) with a mean age of $M = 19.9$ ($SD = 1.4$). Participants represented 13 nationalities, with the largest groups being Dutch (64.7%) and German (21.2%). Nearly all participants ($n = 98$) were enrolled in a psychology program.

A power analysis was conducted prior to data collection to determine the appropriate sample size. The analysis indicated that 99 participants were sufficient to detect a medium effect size ($f^2 = 0.15$) with a power level of 0.90 and a significance level of $\alpha = 0.05$.

Recruitment took place through the SONA research participation system and social media platforms, such as WhatsApp, and Instagram. Students who accessed the survey via SONA received 0.5 points for their participation, while participation through other online platforms was voluntary and without compensation.

Ethical approval for this study was obtained from the Light Track of the Ethics Committee of the Faculty of Social Sciences, reference number ECSW-LT-2024-10-28-1147.

Materials

The research employed two questionnaires: the Perceived Stress Scale (PSS-10) and the Emotion Regulation Questionnaire (ERQ). The dependent variable, perceived stress was measured with the PSS-10¹⁶, a 10-item questionnaire that examines the degree to which individuals perceive their life as stressful in the previous month. Items are scored on a 5-point Likert scale (0 = never to 4 = very often), with higher scores indicating higher perceived stress. Reliability and validity of the PSS have been well-established among university student

¹⁶ Cohen, Kamarck, and Mermelstein, *A Global Measure of Perceived Stress*, 385–396.

populations¹⁷. The independent variable, cognitive reappraisal was assessed using the Emotion Regulation Questionnaire (ERQ)¹⁸. This study focused only on the cognitive reappraisal subscale which consists of six items and measures how frequently individuals reinterpret stressful situations to decrease their emotional impact. Items are rated on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree), with higher scores indicating greater use of cognitive reappraisal. The independent variable gender was assessed through a demographic question: "What gender do you identify with?" with three answer options: woman, man, other/prefer not to say. However, for the purposes of this study, only responses identifying as either woman or man were included in the analysis.

Procedure

Participants were recruited via SONA and other online platforms, with invitations including a link to the survey hosted on Qualtrics. Students received the information letter and after consenting to participate, they completed the demographic questions, followed by the PSS-10 and ERQ. These components took about 15 to 20 minutes to complete. This study is part of a larger research project, so the full survey included additional questionnaires unrelated to this specific question. In total, the entire survey took approximately 35 minutes to complete. However, only the data from the demographic questions, the PSS-10 and ERQ were analysed for this study. Finally, the participants were thanked for their contribution.

Data analysis

The study included three independent variables: a quantitative between-subject factor, cognitive reappraisal; a qualitative between-subject factor, gender, with two levels (woman and man); and the interaction between gender and cognitive reappraisal. Since gender is a categorical variable, it was dummy-coded (man = 0, woman = 1) to enable its inclusion in the regression analysis. The dependent variable, perceived stress, is quantitative and was measured using the PSS-10. As this study is observational, no experimental manipulation occurred; the primary focus being on identifying associations rather than establishing causality.

Data was collected through Qualtrics and subsequently exported to SPSS for statistical analysis. Participants who did not complete the survey or failed to meet the inclusion criteria were excluded. Items 4, 5, 7, and 8 on the PSS, which are reversed, were calculated before summing all items to compute the total perceived stress score. Cognitive reappraisal scores were calculated by summing the relevant items on the ERQ. Prior to conducting the regression analysis, the assumptions of normality, homogeneity of variance, and the presence of outliers were assessed (see Appendix C). The Shapiro-Wilk test indicated that perceived stress scores were not significantly different from a normal distribution ($p = .170$), supporting the assumption of normality. However, the Kolmogorov-Smirnov test was significant ($p < .001$), suggesting slight deviations from normality. Levene's test for homogeneity of variance confirmed equal variances for perceived stress across gender groups ($p = .571$). Outliers were assessed by identifying values more than three standard deviations above the mean and none were found in the data.

¹⁷ E. H. Lee, *Review of the Psychometric Evidence of the Perceived Stress Scale*, in *Asian Nursing Research* 6, no. 4 (2012): 121–127, <https://doi.org/10.1016/j.anr.2012.08.004>

¹⁸ Gross and John, *Individual Differences in Two Emotion Regulation Processes*, 348–362.

All variables were analysed within a multiple regression model. Cognitive reappraisal was standardized prior to the analysis to facilitate interpretation and ensure comparability across variables. An interaction term was created by multiplying the standardized cognitive reappraisal variable by the dummy-coded gender variable. The multiple regression model allowed for the examination of both the independent effects of gender and cognitive reappraisal on perceived stress, as well as their interaction effect to examine whether gender moderates the relationship between cognitive reappraisal and perceived stress.

Results

A multiple regression analysis was conducted to examine the effects of gender, cognitive reappraisal, and their interaction on perceived stress (see Table 1).

The overall model was statistically significant $F(3,95) = 3.77, p = .013$, and accounted for 10.6% of the variance in perceived stress ($R^2 = .11$). The main effect of gender was not significant ($p = .096$), indicating that gender did not predict perceived stress. Similarly, the main effect of cognitive reappraisal was not significant ($p = .555$), indicating that cognitive reappraisal did not independently predict perceived stress in this sample. Finally, the interaction between gender and cognitive reappraisal was also not significant ($p = .164$), suggesting that the relationship between cognitive reappraisal and perceived stress did not differ significantly between men and women.

Given the unequal group sizes (7 men, 92 women), an additional analysis was conducted using only the women participants ($n = 92$) (see Table 1). A linear regression analysis was used to further explore the relationship between cognitive reappraisal and perceived stress. The overall model was statistically significant $F(1,90) = 8.13, p = .005$, and accounted for 8.3% of the variance in perceived stress ($R^2 = .08$). The exploratory analysis revealed that cognitive reappraisal significantly predicted perceived stress ($p = .005$). This indicates that higher levels of cognitive reappraisal are associated with lower levels of perceived stress.

Table 1 Regression Coefficients for Predicting Perceived Stress in Primary and Exploratory Analyses

Variable	Primary analysis				Exploratory analysis			
	B	SE	t	p	B	SE	t	p
Constant	24.495	2.037	12.024	<.001	28.046	.564	49.735	<.001
Gender	3.551	2.113	1.681	.096				
Cognitive reappraisal	1.108	1.869	.593	.555	-1.628	.571	-2.851	.005
Interaction	-2.737	1.953	-1.401	.164				

Note. Raw (unstandardized) coefficients are reported for all predictors

Discussion

The present study aimed to explore the relationship between cognitive reappraisal, gender, and perceived stress in first-year university students. Specifically, it investigated whether women report lower levels of perceived stress than men, whether higher levels of cognitive reappraisal predict lower levels of perceived stress, and whether gender moderates the relationship between cognitive reappraisal and perceived stress. The primary results showed no significant differences in perceived stress between men and women, no significant association between cognitive reappraisal and perceived stress, and no significant

interaction between gender and cognitive reappraisal. However, an exploratory follow-up analysis focusing exclusively on women revealed a significant negative association between cognitive reappraisal and perceived stress.

The hypothesis that women will score lower levels of perceived stress than men was not supported. Instead, the results showed an increase in the opposite direction, with women reporting slightly higher perceived stress than men, though this difference was not statistically significant. This aligns with some previous studies suggesting that women generally report higher levels of perceived stress than men, attributed to differences in stress appraisals, coping strategies, and societal expectations regarding emotional expression^{19, 20}. One possible explanation for the lack of significance could be that the stress experienced during the transition to university may be shaped by shared environmental factors rather than by gender-specific differences. Previous research has noted that this period presents similar academic, social, and emotional challenges for all students, potentially masking gender differences²¹. While women may have an advantage in using adaptive strategies like cognitive reappraisal²², this advantage may not entirely reduce the stressors specific to transitioning into higher education.

The hypothesis that higher levels of cognitive reappraisal will be associated with lower levels of perceived stress was not confirmed in the primary analysis. This finding contrasts with prior research demonstrating the effectiveness of cognitive reappraisal in reducing stress^{23, 24}. One potential explanation is that cognitive reappraisal may be less effective when dealing with stressors perceived as controllable. Research suggests that reappraisal is most effective when stressors are uncontrollable, as it helps individuals adapt to situations they cannot change²⁵. However, in the context of university life, many stressors, such as meeting academic deadlines or balancing part-time work and studies, may be perceived as controllable, which could limit the effectiveness of cognitive reappraisal if individuals rely on it instead of employing more direct, problem-focused strategies. Furthermore, the PSS-10 measures subjective appraisals of stress, which can be influenced by personality traits, coping tendencies, and emotional awareness. Variability in these factors may conceal the relationship between cognitive reappraisal and perceived stress.

While the primary analysis did not confirm the hypothesis, the follow-up analysis suggests that cognitive reappraisal can still be an effective strategy for managing perceived stress, particularly for women. The exploratory analysis focusing on women revealed a significant negative relationship between cognitive reappraisal and perceived stress, indicating that higher levels of cognitive reappraisal were associated with lower levels of perceived stress. This result is consistent with prior research emphasizing the role of cognitive reappraisal as an effective strategy for decreasing stress^{23, 26}. Specifically, it supports findings that women, who are generally more likely to engage in cognitive reappraisal, tend to experience better emotional outcomes^{19, 22}. Although cognitive

¹⁹ Nolen-Hoeksema, *Emotion Regulation and Psychopathology*, 161–187.

²⁰ Brody and Fischer, *The Socialization of Gender Differences in Emotional Expression*, 24–47.

²¹ Conley, Travers, and Bryant, *Promoting Psychosocial Adjustment and Stress Management*, 75–86.

²² Chaplin, *Gender and Emotion Expression*, 14–21.

²³ Gross and John, *Individual Differences in Two Emotion Regulation Processes*, 348–362.

²⁴ Garnefski and Kraaij, *Relationships between Cognitive Emotion Regulation Strategies and Depressive Symptoms*, 1659–1669.

²⁵ Troy, Shallcross, and Mauss, *A Person-by-Situation Approach to Emotion Regulation*, 2505–2514.

²⁶ Moore, Zoellner, and Mollenholt, *Are Expressive Suppression and Cognitive Reappraisal Associated with Stress-Related Symptoms*, 993–1000.

reappraisal may not have a universal effect across all students, women who frequently use cognitive reappraisal may find it more effective in managing perceived stress during the transition to university. This highlights that individual and contextual factors, such as gender and socialization, may play a crucial role in the effectiveness of emotion regulation strategies. It is essential to interpret these findings with caution as this analysis was not part of the original design and excluded male participants due to the unequal gender distribution in the sample.

The hypothesis that gender moderates the relationship between cognitive reappraisal and perceived stress was not supported. Prior research suggests that women are socialised to engage in adaptive emotional expression and regulation strategies, which may enhance the benefits of cognitive reappraisal^{27, 28}. However, in this study, the small number of male participants ($n = 7$) and the considerable variability in their responses reduced the statistical power to detect meaningful interaction effects. Additionally, in contexts where environmental stressors affect both genders equally, such as the shared academic and social demands of university life, the hypothesized gender differences in the relationship between cognitive reappraisal and perceived stress may be less pronounced. Moreover, Aldao et al.²⁹ found that while cognitive reappraisal is generally adaptive, its effectiveness is moderated by individual differences in emotional awareness, coping flexibility, and the presence of other strategies. In the present study, these individual differences were not explicitly measured, which limits our understanding of how factors like emotional clarity or the suitability of strategy use in specific situations might have influenced the results. These interaction findings should be interpreted with caution, as they may reflect the impact of sample imbalance and variability rather than true gender differences.

Several alternative explanations could account for the lack of significant findings. First, other emotion regulation strategies, such as expressive suppression or problem-solving, may have played a more substantial part in managing stress during the transition to university. For example, problem-solving, a proactive strategy, could directly address stressors like time management or assignment deadlines, reducing perceived stress. Aldao et al.²⁹ suggests that emotion regulation strategies interact in complex ways, and focusing solely on cognitive reappraisal may oversimplify these dynamics. Finally, individual differences in the habitual use or situational appropriateness of cognitive reappraisal were not assessed in this study but may significantly influence its effectiveness³⁰.

The findings of this study should be considered within the context of several limitations. First, the unequal gender distribution (7 men, 92 women) skewed the dataset, making it unrealistic to carry out the proposed analysis with balanced gender comparisons. The variability among men participants likely contributed to the lack of significant findings in the primary analysis, particularly for interaction effects. Second, the self-report measures used for cognitive reappraisal and perceived stress could have introduced biases, such as

²⁷ Chaplin, *Gender and Emotion Expression*, 14–21.

²⁸ Nolen-Hoeksema, *Emotion Regulation and Psychopathology*, 161–187.

²⁹ A. Aldao, S. Nolen-Hoeksema, and S. Schweizer, *Emotion-Regulation Strategies across Psychopathology: A Meta-Analytic Review*, in *Clinical Psychology Review* 30, no. 2 (2010): 217–237, <https://doi.org/10.1016/j.cpr.2009.11.004>

³⁰ B. Q. Ford, P. Lam, O. P. John, and I. B. Mauss, *The Psychological Health Benefits of Accepting Negative Emotions and Thoughts: Laboratory, Diary, and Longitudinal Evidence*, in *Journal of Personality and Social Psychology* 115, no. 6 (2018): 1075–1092, <https://doi.org/10.1037/pspp0000157>

social desirability, recall bias or response consistency effects³¹. In particular, response consistency effects may have occurred if participants attempted to maintain consistency in their answers across related items, which could have inflated or distorted the observed relationship between cognitive reappraisal and perceived stress, reducing the accuracy of the findings. Future studies could incorporate a broader range of emotion regulation strategies and employ mixed-method approaches (e.g., combining self-reports with behavioural or physiological measures) to provide a more holistic understanding of stress and coping. Moreover, participants were predominantly women (93%), Dutch (64.7%) and psychology students (99%) which limits the generalizability of the findings to broader populations. Finally, including situational assessments of stress controllability, such as assessing whether participants perceive stressors as manageable or unmanageable, may help clarify when cognitive reappraisal is most effective.

Future research should address these limitations by employing more balanced gender samples and exploring the interaction between gender, emotion regulation, and perceived stress in other transitional contexts, such as starting a new job or moving to a different city. Additionally, research should investigate the role of cultural influences by examining how societal norms and expectations shape the relationship between gender, stress, and emotion regulation across diverse populations. Moreover, exploring the biological mechanisms underpinning stress and coping, such as the role of hormonal fluctuations or neural activity during emotion regulation, could provide valuable insights into gender-specific patterns. Finally, research could examine how emotion regulation and stress affect academic and social outcomes, such as performance and adjustment, thus informing the design of targeted interventions to support students throughout important life transitions.

To conclude, the present study investigated the relationship between cognitive reappraisal, gender, and perceived stress in first-year university students. While the primary analysis did not find significant relationships between cognitive reappraisal, gender, and perceived stress, an additional exploratory analysis focusing on women revealed a significant negative association between cognitive reappraisal and perceived stress. This indicates that, although cognitive reappraisal may not have demonstrated a universal effect across the entire sample, it may still be an important strategy for managing perceived stress, particularly for women. These findings highlight the complexity of stress and emotion regulation during major life transitions, emphasizing the importance of considering contextual and individual factors when investigating the effectiveness of emotion regulation strategies. Given this, it is important for future research to build on these findings and further explore the effects of cognitive reappraisal to contribute to the broader understanding of stress and well-being in young adults.

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³¹ P. M. Podsakoff, S. B. MacKenzie, J.-Y. Lee, and N. P. Podsakoff, *Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies*, in *Journal of Applied Psychology* 88, no. 5 (2003): 879–903, <https://doi.org/10.1037/0021-9010.88.5.879>

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Appendix A

Items and Instructions for Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them, and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

For each question choose from the following alternatives:

0 - never 1 - almost never 2 - sometimes 3 - fairly often 4 - very often

1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous and stressed?
4. In the last month, how often have you felt confident about your ability to handle your personal problems?
5. In the last month, how often have you felt that things were going your way?
6. In the last month, how often have you found that you could not cope with all the things that you had to do?
7. In the last month, how often have you been able to control irritations in your life?
8. In the last month, how often have you felt that you were on top of things?
9. In the last month, how often have you been angered because of things that happened that were outside of your control?
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

- First, reverse your scores for questions 4, 5, 7, and 8. On these 4 questions, change the scores like this: 0 = 4, 1 = 3, 2 = 2, 3 = 1, 4 = 0.
- Now add up your scores for each item to get a total. My total score is _____.
- Individual scores on the PSS can range from 0 to 40 with higher scores indicating higher perceived stress.
 - Scores ranging from 0-13 would be considered low stress.
 - Scores ranging from 14-26 would be considered moderate stress.
 - Scores ranging from 27-40 would be considered high perceived stress.

Appendix B

Emotion Regulation Questionnaire (ERQ)

Gross & John

The Emotion Regulation Questionnaire is designed to assess individual differences in the habitual use of two emotion regulation strategies: cognitive reappraisal and expressive suppression.

Citation

Gross, J.J., & John, O.P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, 85, 348-362.

Instructions and Items

We would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. The questions below involve two distinct aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

1-----2-----3-----4-----5-----6-----7
strongly neutral strongly
disagree agree

1. ____ When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about.
2. ____ I keep my emotions to myself.
3. ____ When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about.
4. ____ When I am feeling positive emotions, I am careful not to express them.
5. ____ When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm.
6. ____ I control my emotions by not expressing them.
7. ____ When I want to feel more positive emotion, I change the way I'm thinking about the situation.
8. ____ I control my emotions by changing the way I think about the situation I'm in.
9. ____ When I am feeling negative emotions, I make sure not to express them.
10. ____ When I want to feel less negative emotion, I change the way I'm thinking about the situation.

Note

Do not change item order, as items 1 and 3 at the beginning of the questionnaire define the terms "positive emotion" and "negative emotion".

Scoring (no reversals)

Reappraisal Items: 1, 3, 5, 7, 8, 10; Suppression Items: 2, 4, 6, 9.

Appendix C

Table A1 Normality of residuals

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PSS_Total	.123	99	<.001	.981	99	.170

a. Lilliefors Significance Correction

Table A2 Lavene's test of homogeneity of variances

Tests of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
PSS_Total	Based on Mean	.324	1	97	.571
	Based on Median	.353	1	97	.554
	Based on Median and with adjusted df	.353	1	95.551	.554
	Based on trimmed mean	.327	1	97	.569

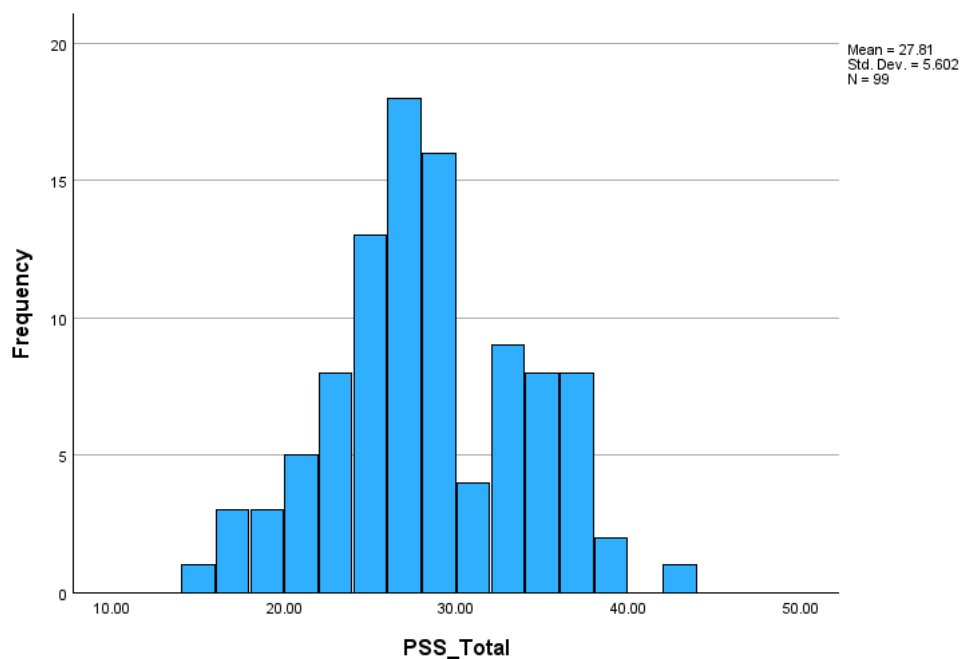


Figure A1 Histogram of residuals

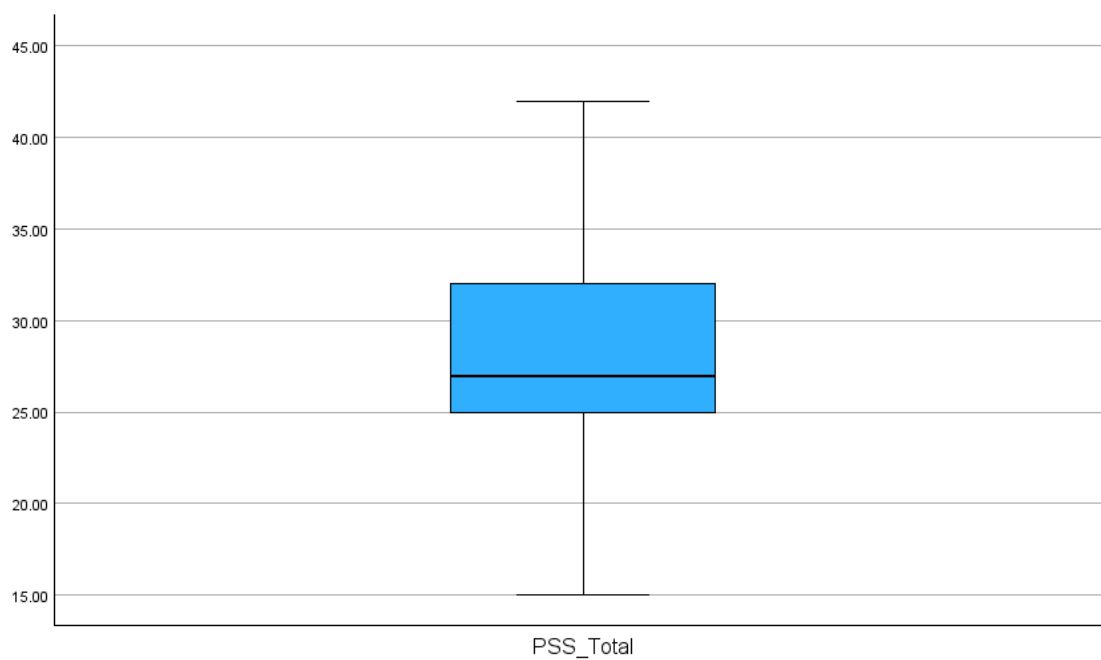


Figure A2 Boxplot of perceived stress scores