

**Downward Social Comparison and State Anxiety:
The Role of Self-Relevance Anxiety**

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Abstract

This study investigates whether downward social comparison (DSC) reduces state anxiety and whether this effect is moderated by self-relevance. In a between-subjects quasi-experimental design, 58 university students were classified into high or low self-relevance groups, randomly assigned to either a DSC or neutral condition, and completed pre- and post-task anxiety assessments. Contrary to predictions, DSC increased anxiety ($M = 2.79$, $SD = 5.43$) while the neutral condition reduced it ($M = -2.62$, $SD = 7.65$), $F(1, 54) = 9.59$, $p < .001$. Neither the main effect nor the moderating effect of self-relevance was supported. Findings suggest DSC may heighten anxiety by triggering self-referential thinking and perceived vulnerability, even in low self-relevance contexts, whereas neutral tasks may reduce it through distraction. These results challenge the assumption that DSC is protective and highlight the need to examine how comparisons impact individuals' well-being.

Keywords: social comparison, anxiety, self-relevance, self-referential thinking, university students

Introduction

Anxiety is an emotion marked by feelings of apprehension and physical tension, often triggered by anticipated threats (APA, 2018). It is associated with negative outcomes such as poor physical health, sleep disturbances, and impaired cognitive performance, undermining academic functioning (Tan et al., 2023). According to the American College Health Association (2018), 63.4% of over 88,000 U.S. college students reported overwhelming anxiety in the past year. This rise is often attributed to university-related stressors, including academic demands, social pressures, and financial concerns, occurring during the transition into adulthood. In response to these challenges, individuals may turn to social comparison as a strategy for emotion regulation and regaining a sense of control (Buunk et al., 2005).

Social Comparison (SC)

Festinger (1954) proposed that individuals compare themselves to others to evaluate their abilities, especially when objective standards are unavailable. For instance, a student who receives a B may assess their adequacy by comparing to their peers' grades.

SC can occur in two directions: upward (USC) — comparing to those perceived as better off, and downward (DSC) — comparing to those perceived as worse off. While USC can be motivating when success seems attainable (Gürel et al., 2020; Lockwood & Kunda, 1997), it can also increase anxiety and reduce self-esteem, especially among socially anxious individuals (Aspinwall & Taylor, 1993; Mitchell & Schmidt, 2014). In contrast, DSC has been shown to serve as a psychological buffer, helping individuals cope with stress, enhance self-esteem, and maintain emotional well-being (Wills, 1987). For example, Nie et al. (2024) found that those engaging in DSC reported greater awareness of personal strengths.

Additionally, a meta-analysis by McCarthy and Morina (2019) confirmed that the SC plays a role in mental health by maintaining symptoms of anxiety. Supporting this, Antony et al. (2005) found that while USC increased anxiety, DSC reduced it, even among socially anxious individuals, highlighting DSC's potential as an emotion regulation strategy.

Self-Relevance in SC

Self-relevance, defined as the degree to which a comparison domain aligns with an individual's self-concept, can significantly influence the emotional impact of social comparisons. People are generally more sensitive to self-relevant cues; for instance, simply hearing one's own name can readily capture attention (Sui & Rotshtein, 2019). As a result, comparisons in personally meaningful areas tend to elicit stronger emotional responses.

Tesser's Self-Evaluation Maintenance (SEM) model (1988) provides a theoretical foundation for this idea. According to the model, SC evokes strong emotional reactions when they involve domains that are highly self-relevant. In such cases, the comparison process becomes more salient, increasing the likelihood of negative emotions when others perform better than us in areas that matter to our self-concept. Applied to DSC, this suggests that individuals may be more likely to engage in DSC within self-relevant domains when feeling vulnerable, as a strategy to protect their self-esteem and preserve a positive self-concept.

In this study, self-relevance is defined as the extent to which a particular domain (e.g., academics, social status) is personally meaningful as it reflects a central aspect of an individual's identity (Berkman et al., 2019). As such, its interaction with comparison direction is key to predicting how SC affects anxiety levels.

Research Gap

Most literature on SC has focused on USC, particularly in online environments. For instance, exposure to idealized Facebook posts has been linked to lower self-esteem and negative self-evaluations (Vogel et al., 2014). In contrast, DSC has received comparatively less attention, even though emerging evidence suggests it may function as a coping strategy that fosters self-acceptance and gratitude (Nie et al., 2024).

However, several important gaps remain. First, existing research has largely concentrated on social media contexts, overlooking real-world domains such as academics or career preparation. Second, while DSC's potential to reduce anxiety has been noted, its effects in everyday, non-adversarial situations remain underexplored. Third, although theory suggests that self-relevance shapes how comparisons are processed, its moderating role has not been systematically examined. Finally, current literature relies heavily on correlational designs, limiting our ability to draw causal conclusions about the psychological effects of SC.

Present Study and Hypotheses

To address these gaps, our study examines whether DSC reduces state anxiety and if this effect is moderated by self-relevance. Moving beyond prior research that has focused primarily on social media, this study examines university students in everyday contexts, thereby enhancing ecological validity. Using a between-subjects quasi-experimental design, this study aims to provide stronger causal insights into the effects of DSC on anxiety. The following hypotheses are proposed:

H₀: There is no difference in anxiety reduction between participants who engage in DSC and those in the neutral condition, and self-relevance does not moderate this effect.

H₁: Participants who engage in DSC will experience greater reductions in state anxiety compared to those in the neutral condition, and this effect will be stronger for participants with higher self-relevance of the comparison domains.

This reflects the idea that DSC is more effective when comparisons involve personally meaningful domains, such as academics, social life, extracurriculars, and work, which are closely tied to students' identity and well-being. To ensure content validity, these domains were selected based on student self-fulfilment theory (Shutenko, 2015), which emphasizes learning, achievement, and social integration as core to student meaning-making.

By identifying when DSC is most effective, this study contributes to a more targeted understanding of DSC as a coping strategy. Findings may inform low-cost, psychologically grounded interventions to manage anxiety among university students, especially in highly competitive academic environments where stress and self-evaluative pressures are common.

Method

Participants

A priori power analysis indicated a required sample size of 128 ($d = 0.25$, $\alpha = .05$, power = .80). Due to resource constraints, 58 undergraduates (ages 20–25; $M = 22.24$, $SD = 1.22$) from a university in Singapore participated in the study. All provided informed consent and were debriefed online via Qualtrics.

Exclusion Criteria

Participants were required to be aged between 18 and 35 and currently enrolled as undergraduates to meet the inclusion criteria. Of the 97 individuals who initially completed the screening questionnaire, 39 were excluded for the following reasons: not meeting these criteria (n = 1), missing responses on the self-relevance measure (n = 13), incomplete responses (n = 6), missing key data (n = 3), or failure to complete the follow-up (n = 16). This resulted in a final sample of 58 participants included in the analysis.

Measures

DSC Condition vs. Neutral Task Condition

Participants were randomly assigned to either a DSC or neutral condition. Those in the DSC group read a fabricated profile of a struggling student (Appendix A), while those in the neutral group read a factual passage about sloths (Appendix B), selected for its emotionally neutral and non-social content to serve as a control task. The texts were matched for word count and readability. After reading, participants completed four items on a 4-point Likert-scale as a manipulation check, assessing perceived comparison, pity, and self-reflection. Only perceived comparison and self-reflection were analyzed (Appendix C).

Self-relevance

Self-relevance was measured using eight study-developed items across academics, social life, work, and extracurriculars (two items each), rated on an 8-point scale. Items were embedded in a 16-item questionnaire with eight distractors from Robson's Self-Concept Scale, presented in random order (Appendix D).

State Anxiety

The Spielberger State Anxiety Inventory (STAI-S; 20 items, 4-point scale) was administered pre- and post-task (Appendix E). The scale includes nine reverse-scored items and has established reliability and validity (Barnes et al., 2002; Kabacoff et al., 1997).

Design and Procedure

The study employed a 2 (Condition: DSC vs. neutral) \times 2 (Self-relevance: high vs. low) between-subjects quasi-experimental design to examine the effect of DSC on anxiety and whether this effect is moderated by self-relevance. Condition was the independent variable, and self-relevance served as a measured moderator. The dependent variable, change in state anxiety, calculated as the difference between post- and pre-task STAI scores.

Initial screening data ($N = 97$) were collected during reading week via Qualtrics from students enrolled in an upper-level psychology lab course and their peers. Participants completed a self-relevance questionnaire developed for this study. Based on total scores, they were categorized into high or low self-relevance groups using a median split (median = 36; scores $\geq 36 =$ high, $< 36 =$ low), ensuring approximately equal group sizes.

Two weeks later, participants who met the eligibility criteria completed the main study online via Qualtrics. After providing informed consent, participants completed a baseline measure of state anxiety. Then, they were randomly assigned to either the DSC or neutral condition within their self-relevance group, ensuring equal distribution of high and low self-relevance participants across both conditions. Then, participants read the assigned task and completed the post-task anxiety measure and a manipulation check. The final sample consisted of 58 participants (29 per condition, with 15 high self-relevance and 14 low self-relevance in each).

Statistical Analysis

All analyses were conducted in R. A 2 \times 2 between-subjects ANOVA tested the main effects of condition and self-relevance on state anxiety change scores, as well as their interaction to evaluate the moderating role of self-relevance. Independent t -tests assessed the manipulation check, group differences in self-reflection, and the effect of self-relevance within the DSC condition. Normality and homogeneity assumptions were evaluated using Shapiro-Wilk and Levene's tests. All tests used $\alpha = .05$.

Results

To evaluate the effectiveness of the manipulation, an independent t -test was conducted on perceived comparison scores. The Shapiro-Wilk test was non-significant, $p = .09$, indicating normality, and Levene's test confirmed homogeneity of variance, $F(1, 56) = 0.00$, $p = .96$. Participants in the DSC condition ($M = 6.6$, $SD = 1.2$) scored significantly

higher than those in the neutral condition ($M = 5.2, SD = 1.3$), $t(56) = 4.19, p < .001$, confirming successful manipulation (see Table 1).

Self-reflection was examined using an independent t -test. Levene’s test confirmed homogeneity of variance, $F(1, 56) = 0.99, p = .32$. Although the Shapiro–Wilk test was significant, $p < .001$, visual inspection of the Q-Q plot showed no substantial deviations from normality (see Figure 1). Participants in the DSC group ($M = 2.6, SD = 1.1$) reported significantly greater self-reflection than those in the neutral condition ($M = 1.8, SD = 1.0$), $t(56) = 3.12, p = .003$ (see Table 1).

Figure 1

Q-Q Plot Assessing Normality of Self-Reflection Scores by Condition

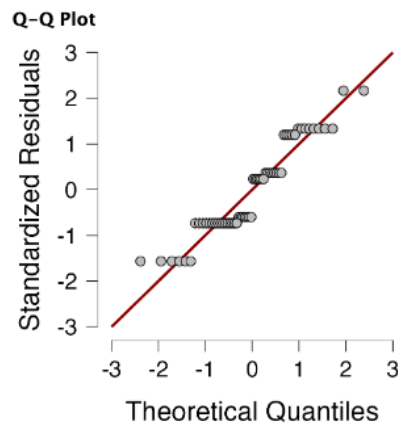


Table 1

Means and Standard Deviations for Comparison (Manipulation Check) and Self-reflection Variables by Condition

Variable	DSC		Neutral		$t(56)$	p
	M	SD	M	SD		
Comparison	6.6	1.2	5.2	1.3	4.19	<.001

Self-reflection	2.6	1.1	1.8	1.0	3.12	.003
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Note: The Comparison variable was computed by reverse-coding the item “I think I am worse-off than Bob” and summing it with “I think I am better-off than Bob.” Scores could range from 2 to 8, with higher scores indicating stronger perceived superiority over Bob. Self-reflection was assessed with the item “To what extent did you think about your own situation as you read the excerpt?”

An independent *t*-test examined differences in perceived superiority across self-relevance levels within the DSC group. Levene’s test confirmed homogeneity of variance, $F(1, 27) = 2.98, p = .10.$, and the Shapiro–Wilk test indicated that residuals were normally distributed, $p = .07$. No significant difference in perceived superiority was found between the high ($M = 6.9, SD = 0.9$) and low self-relevance groups ($M = 6.3, SD = 1.4$), $t(27) = 1.51, p = .142$, suggesting that self-relevance did not significantly influence perceived superiority (see table 2).

Table 2

Means and Standard Deviations of Comparison Scores by Self-Relevance Group Among DSC Participants

Variable	Self-Relevance				<i>t</i> (27)	<i>p</i>
	High		Low			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Comparison	6.9	0.9	6.3	1.4	1.51	.142

Note. Self-relevance groups were formed using a median split among DSC participants (median = 36; scores ≥ 36 = high, < 36 = low). Higher Comparison scores reflect greater perceived superiority over Bob.

Baseline anxiety scores were examined to assess initial group differences and to screen for any extreme values prior to the manipulation (see Figure 2). A two-way

ANOVA was conducted to examine changes in state anxiety, with condition and self-relevance as between-subjects factors. Levene's test supported homogeneity of variance, $F(3, 54) = 1.85, p = .15$, and although the Shapiro–Wilk test was significant, $p < .001$, visual inspection of the Q-Q plot showed no major deviations (see Figure 3). Given equal sample sizes and variance homogeneity, ANOVA was considered appropriate.

There was a significant main effect of the condition, $F(1, 54) = 9.59, p < .001$, with participants in the DSC condition ($M = 2.79, SD = 5.43$) showing greater reductions in anxiety than those in the neutral condition ($M = -2.62, SD = 7.65$). The main effect of self-relevance was not significant, $F(1, 54) = 0.76, p = .39$. To test for the moderation of self-relevance, the interaction effect between condition and self-relevance was examined. The interaction was not significant, $F(1, 54) = 3.11, p = .08$, indicating that self-relevance did not significantly moderate the effect of condition on changes in state anxiety. Descriptive statistics are shown in Table 3; ANOVA results are presented in Table 4, and a visual plot of change scores is shown in Figure 4.

Figure 2

Boxplot of Baseline Anxiety Scores by Condition with Individual Data Points

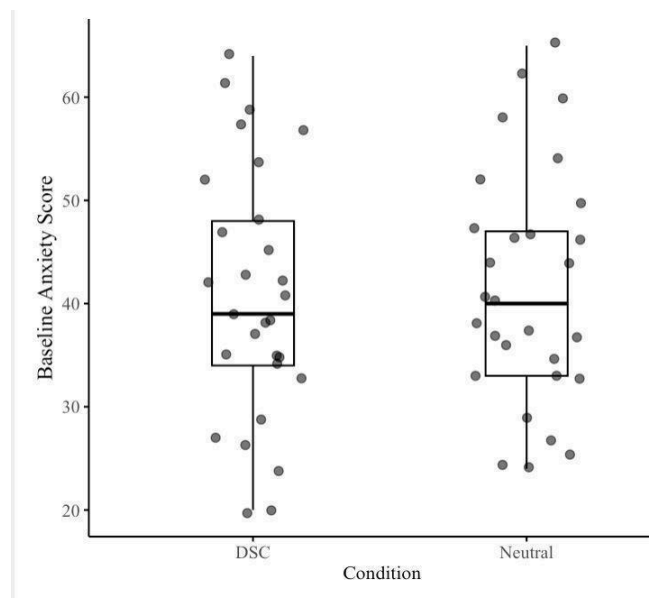


Figure 3

Q–Q Plot Assessing Normality of State Anxiety Change Scores by Condition and Self-Relevance Group

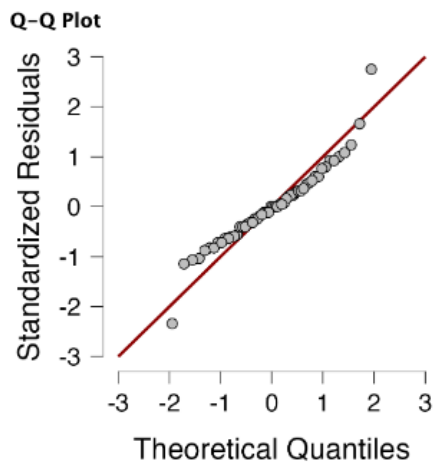


Table 3

Means and Standard Deviations of Change in State Anxiety by Condition and Self-Relevance Group

Condition	Self-Relevance				Overall (Condition)	
	High		Low		<i>M</i>	<i>SD</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
DSC	3.53	7.20	2.00	2.54	2.79	5.43
Neutral	-4.80	7.76	-0.29	7.05	-2.62	7.65

Note. Overall (Condition) values represent the mean and standard deviation of state anxiety change scores for all participants within each condition, calculated from raw data.

Table 4

Two-Way ANOVA Summary Table for Change in State Anxiety

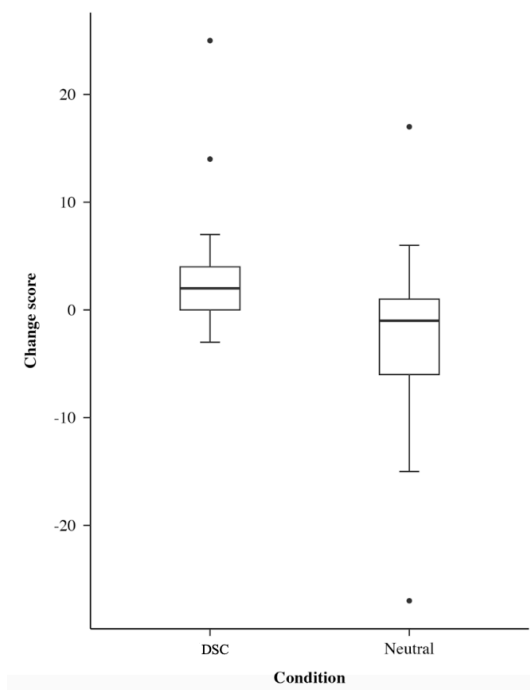
Parameter	<i>df</i>	<i>MSE</i>	<i>F</i>	<i>p</i>
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Condition	1, 54	42.57	9.59	< .001
Self-Relevance	1, 54	42.57	0.76	.389
Condition x Self-Relevance	1, 54	42.57	3.11	.083

Note. *df* = degrees of freedom; *MSE* = mean square error.

Figure 4

Boxplot of Change in State Anxiety Scores by Condition



Note. Positive values indicate increases in state anxiety (post-task minus pre-task), while negative values indicate reductions. Participants in the DSC condition showed greater reductions in anxiety compared to those in the neutral condition. The line inside each box represents the median; whiskers indicate the range, and dots represent individual data points or outliers.

Discussion

Contrary to the assumption that DSC serves an anxiety-buffering function, our study found that DSC was associated with a relative increase in anxiety. Conversely, the neutral task condition unexpectedly reduced anxiety. Moreover, the self-relevance did not moderate the effect of DSC on anxiety. To explain the anxiety-inducing effect of DSC, we propose two psychological mechanisms: heightened self-referential thinking (i.e., relating external information to oneself) and perceived instability in the comparison domain.

First, encountering someone worse off may trigger self-referential thinking. Our self-reflection check confirmed that participants in the DSC condition engaged in more self-focused reflection than those in the neutral condition. This suggests they “mapped” the target’s negative outcome onto themselves, particularly in personally relevant domains like academics or career. As many were approaching graduation, thoughts like “that could happen to me” may have increased their perceived vulnerability and anxiety (Lockwood, 2022). This process can also expose gaps between the actual and “ought” self, who a person is versus who they believe they should be. According to self-discrepancy theory (Higgins, 1989), greater gaps are linked to greater anxiety. Thus, DSC may amplify feelings of inadequacy and internal pressure to meet personal standards.

Second, perceived changeability in the comparison domain may reduce the protective effect of DSC. Prior research found that seeing sicker peers increased patients’ distress by highlighting the possibility that their own condition could deteriorate (Buunk et al., 1990). Similarly, students may perceive their academic or career standing as fragile. For example, high-achieving students may worry about maintaining performance, while those in internships may feel uncertain about post-graduation outcomes. In this study, reading about peers struggling in academics or careers may have made participants feel vulnerable and reduced their confidence in maintaining their current status. This can make DSC feel more like a cautionary warning, thus potentially heightening anxiety (Halliwell, 2012).

Interestingly, the neutral task led to a decrease in anxiety, despite not being designed to influence emotions. One explanation is that it did not prompt self-referential thinking as discussed above, thus avoiding anxiety-inducing evaluations. It may also have served as a cognitive distraction. According to Response Styles Theory, distraction reduces anxiety by disrupting rumination (Nolen-Hoeksema, 1993). This effect was likely amplified by timing,

as data collection took place during Weeks 8 and 9, which coincide with exam and assignment submission periods for most students at the university. While individual stress levels may have varied depending on exact exam schedules, this period is generally characterized by heightened academic stress, which made participants more responsive to calming, non-evaluative tasks.

Based on Tesser's Self-Evaluation Maintenance (SEM) model, we expected DSC to reduce anxiety more in highly self-relevant domains. However, the interaction was not significant. A follow-up independent *t*-test also showed no significant difference in perceived superiority of the target between high and low self-relevance groups within the DSC condition. One possible explanation is that, even when participants viewed the domains as low in self-relevance, they may have still identified with the target due to a shared student identity. This social identification may have made the comparison feel personally meaningful, blurring distinctions between high and low self-relevance. Besides, although the SEM model applies similar explanatory mechanisms to both USC and DSC, it was originally developed to explain USC. Our findings suggest that self-relevance may operate differently in the context of DSC, highlighting a need for further research in this area.

Limitations and Future Directions

This study has several limitations. First, while we aimed for content validity in developing the self-relevance measure, the absence of a validated scale limited its psychometric validation. Moreover, as self-relevance was measured rather than experimentally manipulated, causal claims about its moderating role are limited. Although the two-week gap between assessing self-relevance and the main task was relatively short, participants' life circumstances during this period could have affected the stability of self-relevance as a moderator. Next, while Q-Q plot inspection showed no major deviations from normality, this method carries some subjectivity despite being widely accepted in psychological research.

Then, the small sample size and use of convenience sampling reduced the generalizability and statistical power of the findings, increasing the risk of Type II errors. Additionally, the online format and fabricated profile may not evoke the same emotional engagement of DSC as real-life interactions, limiting its ecological validity. Furthermore, missing data were handled through case deletion, which reduced sample size and may have

biased results if the missingness was systematic. Missingness mechanisms could include Missing Completely at Random (MCAR), Missing at Random (MAR), or Missing Not at Random (MNAR) (Rubin, 1976). To improve the robustness of the analysis, future studies should explore missingness patterns and consider techniques such as multiple imputation or maximum likelihood estimation (Enders, 2022).

Finally, although change scores offer an intuitive measure of pre–post differences, they can be vulnerable to distortions. Participants with high initial anxiety may show limited increases due to ceiling effects, and extreme scores may shift toward the average due to regression to the mean. These issues can obscure true intervention effects and reduce statistical power. Future studies might use ANCOVA with baseline anxiety as a covariate to better isolate the impact of the manipulation while accounting for initial differences.

Despite these limitations, the findings offer initial evidence that downward social comparison can reduce anxiety in the short term. Since self-relevance did not significantly moderate the effect of DSC, future studies could investigate other individual differences, such as trait anxiety, to better identify who is most susceptible to the negative effects of DSC. Future research should examine how other forms of SC, such as upward and lateral comparisons, affect anxiety. This would clarify whether the anxiety linked to DSC is uniquely driven by perceived vulnerability or if other comparison types also elevate anxiety through different psychological pathways. Finally, longitudinal designs could provide insight into whether repeated exposure to SC, such as across an academic semester, has cumulative effects on anxiety and academic outcomes, or whether habitual engagement in DSC over time predicts elevated baseline anxiety.

Conclusion

Our findings suggest that when participants perceive their situation as fragile or uncertain, engaging in DSC may increase anxiety regardless of self-relevance. Meanwhile, a neutral task led to a relative decrease in anxiety. This has important implications for academic settings. For example, educators should be cautious with remarks like “you’re doing better than others,” as such comparisons may unintentionally heighten anxiety rather than reduce it. More effective strategies may involve non-comparative approaches, such as completing basic puzzles or describing a neutral scene, that may help interrupt anxious thought patterns. These results suggest the importance of recognizing how social comparison may unintentionally

arise in academic environments and of designing student support approaches that foster well-being while minimizing anxiety.

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Supplementary Materials

Appendix A

Profile of a Struggling University Student

Some days, Bob wondered if university was a mistake. At 27 years old, two years into a degree he still hadn't declared, he was barely holding onto a 2.0 GPA—just enough to avoid academic probation, but nowhere near enough to feel secure. Even pass/fail modules felt like a struggle. Group projects were exhausting. While his classmates seemed to manage just fine, Bob stayed silent, hoping no one would notice how little he had to contribute.

Meanwhile, his old classmates were moving forward, bit by bit. Some had landed internships, others were at least making friends and being involved in extracurriculars, padding their resumes with experiences he couldn't relate to. Nothing groundbreaking—but compared to Bob, who had nothing to show for his time here, they seemed miles ahead. Another Friday night passed in his room, scrolling through job postings he wasn't qualified for, wondering if he'd ever catch up.

He tried telling himself that grades weren't everything, that university was more than just academics. But even socially, he was adrift. He never really had a social life, had skipped major events, avoided clubs, and never lived on campus—he couldn't afford it. His resume was blank, his social circle nonexistent. At lunch, he sat alone, surrounded by buzzing groups of students who were happily chatting away.

At 27 years old, Bob still wasn't sure where he belonged. Maybe he never had, and he wondered if he ever would.

Appendix B

Factual Passage About Sloths

Bob the sloth—the adorable and lethargic animal living in treetops—depends on the health and survival of Central and South American tropical forests. It spends much of its life in the canopy, snoozing and remaining hidden from predators.

Bob lives a solitary life and travels from tree to tree using canopy vines. Located in places such as Brazil and Panama, species like Bob need healthy forests to survive. Bob has an extremely low metabolic rate, which means it moves at a languid, sluggish pace through the trees. On average, it travels 41 yards per day—less than half the length of a football field.

Bob munches on leaves, twigs and buds. A low metabolic rate means it can survive on relatively little food; it takes days for it to process what other animals can digest in a matter of hours. Sloths are strong swimmers. Bob will sometimes drop down from their treetop perches into water and use its extended arms to propel through the water.

Sloths like Bob spend a majority of their time up in the canopy, coming down only one time per week to relieve themselves. The trees provide natural protection from predators such as jaguars and eagles; it's safer for them to remain motionless and camouflaged off the ground. They will, however, venture down on rare occasions to find more food or a mate.

Appendix C

Manipulation Check

Recall the profile of Bob as you answer the following questions:

1. I feel pity/bad for Bob.
2. I think I am better-off than Bob.
3. I think I am worse-off than Bob.
4. To what extent did you think about your own situation while reading about Bob?

Note. Participants responded to each item based on the profile of Bob. Responses were recorded using a 4-point Likert scale (1 = Not at all, 4 = Very much). The items “I think I am better-off than Bob” and “I think I am worse-off than Bob” were used to compute the *Comparison* score (after reverse-coding the latter). “To what extent did you think about your own situation while reading about Bob?” was analyzed as a measure of *Self-reflection*. The item “I feel pity/bad for Bob” was included for exploratory purposes but was not analyzed.

Appendix D

Self-Relevance and Masked Questionnaire Items

Academic Domain	<ol style="list-style-type: none">1. My academics are important to me.2. I base my identity on my academic achievements.
Social Domain	<ol style="list-style-type: none">1. <i>My social life plays a crucial role in shaping my identity and sense of self.</i>2. The quality of my social life is important to me.
Work Domain	<ol style="list-style-type: none">1. My profession defines me.2. Career forms an important part of my identity.
Extracurricular Domain	<ol style="list-style-type: none">1. Participating in non-academic activities contributes to my sense of identity.2. My engagement in non-academic activities is something I value.
Masked items	<ol style="list-style-type: none">1. I have control over my own life.2. I'm easy to like.3. There are lots of things I'd change about myself if I could.4. When I'm successful, there's usually a lot of luck involved.5. If a task is difficult, that just makes me all the more determined.6. I often feel humiliated.7. I often worry about what other people are thinking about me.8. I can like myself even when others don't.

Note. Self-relevance items were developed specifically for this study. Masked items were adapted from Robson (1989) and were not included in the analyses. All 16 items were presented in randomized order. Responses were recorded on an 8-point Likert scale (0 = Completely Disagree, 7 = Completely Agree).

Appendix E

State-Trait Anxiety Inventory – State Anxiety Subscale (STAI-S)

Read each statement and select the appropriate response to indicate how you feel right now, that is, at this very moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

1. I feel calm
2. I feel secure
3. I feel tense
4. I feel strained
5. I feel at ease
6. I feel upset
7. I am presently worrying over possible misfortunes
8. I feel satisfied
9. I feel frightened
10. I feel uncomfortable
11. I feel self-confident
12. I feel nervous
13. I feel jittery
14. I feel indecisive
15. I am relaxed
16. I feel content
17. I am worried
18. I feel confused
19. I feel steady
20. I feel pleasant

Note. Participants rated each item on a 4-point Likert scale (1 = Not at all, 4 = Very much so). Reverse-scored items include 1, 2, 5, 8, 11, 15, 16, 19, and 20. Adapted from Spielberger, Gorsuch, & Lushene (1983).