**Intrapersonal Interplay between Depressive Symptoms and Self-Esteem: Connection with**

**Self-Concept Clarity**

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## Abstract

This study explores the relationship between depressive symptoms, implicit self esteem, and explicit self esteem. Self-concept clarity was intended to be measured but left out of cohort 1, it has been included in further waves of cohort 1 and will be inclued in further cohorts tested. This manuscript uses data from a sample of 14 US-based adults to examine how depression relates to implicit and explicit self-esteem. The preliminary results suggest a significant relationship between self-esteem and depression, with the implication for the early detection and treatment of depressive symptoms.

*Keywords*: depression, self-esteem, self-concept clarity

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**Depression**

Depression is a highly common mental health condition impacting 18.4% of the adult US

population in 2020, with impact defined as ever having been diagnosed by a healthcare provider

(Lee et al., 2023). Currently, the typical treatment for depression is a combination of

psychotherapy and medication, or just one of the two. Psychotherapy itself has been shown to

have a large impact on the reduction of depression symptom severity and a moderate impact on

self-esteem (SE) associated with depression post-treatment (Bhattacharya et al., 2023). This

begins to demonstrate the relationship between SE and depressive symptoms. Clinically, in

patients with major depressive disorder (MDD) with suicidal ideation (SI), explicit (conscious)

SE was significantly lower than in healthy controls and patients with MDD without SI (Yin et

al., 2021). It was also demonstrated that both the size and direction of the discrepancy in SE were

significantly associated with the severity of depressive symptoms (Yin et al., 2021). These

findings demonstrated that diminished SE, meaning high implicit (unconscious) and low explicit

SE, was associated with the highest SI scores and thus could aid in the early detection of

depression and SI formation. In general, lower SE in individuals with depressive symptoms is

often associated with SI (Franck et al., 2007). These results especially make it distinct that the

discrepancy between implicit and explicit SE, more specifically high implicit and low explicit

SE, might be only shown in currently depressed individuals with SI. Alternatively, low implicit

and low explicit SE is shown in currently depressed individuals without SI. Although our current

study employs the Center for Epidemiologic Studies Depression Scale (CES-D), which does not

test for SI, it will be informative to see how the differences in depressive symptoms as measured

impact the discrepancies between implicit and explicit SE. Typically, difference score models

have been used to analyze the discrepancy between implicit and explicit SE measures; Visser

(2024) used polynomial regression analysis to delve further into these predictors of depressive

symptoms. Their results demonstrate that depression increases while explicit SE decreases;

however, depressive symptoms are almost unaffected by variations in implicit SE (Visser, 2024).

This complicates the findings of previous research in terms of the role of implicit SE, we hope to

resolve this convolution through the measurement of an additional covariate. Through the use of

the implicit association test (IAT), differences in unconscious perceptions of both the self and

others have been demonstrated in people with depression. In prior research on the self-IAT,

healthy controls responded faster to both positive self and others than negative self and others

but participants with MDD did not show this pattern (Yao, 2023). Instead, the MDD participants

exhibited significantly smaller later-positive potential under positive self and other schema. This

suggests that depression in general leads patients not only to negative patterns of thinking but

associations in regards to the self and others. Another form of implicit association common to

depression is that of self-depressed associations, in which the individual associates themselves

with elements of depression. Higher self-depressed associations are a risk factor for the

recurrence of MDD and pose a potential treatment target (Rnic, 2023). In individuals with

depression currently and remitted individuals, the remitted individuals demonstrated a weaker

automatic self-association with depression than people currently experiencing the disorder,

however, the remitted individuals still exhibited stronger automatic self-depressed associations

than the healthy controls (Glashouwer & De Jong, 2010). This demonstrates the importance of

identifying the covariate in SE since automatic self-association is influential in the development

and maintenance of depressive symptoms.

**Self-esteem and self-concept clarity**

Explicit SE is the deliberate and conscious evaluation a person conducts of themselves, and can be indicative of positive mental health when relevant to their intrapersonal environment. In contrast, implicit SE is the often unconscious automatic way in which a person feels about themselves. Differentiating implicit and explicit SE is important since they have separate underlying mechanisms and thus may have different effects on one's SE as a whole. Two models have been proposed in how SE relates to depression called the scar and vulnerability models of depression. The former hypothesis is that depressive symptoms leave a scar on the implicated individual, and the latter is that low SE contributes to depressive symptoms (Steiger et al., 2015). Prior research, however, demonstrated that the vulnerability model is susceptible to inaccurately portraying causal effects due to their correlational nature (Sorjonen, 2022). Further, a third model called reciprocal risk, in which SE and depressive symptoms influence each other, conflates the generalizable results on predictors of depressive symptoms (Johnson et al., 2016). In general, findings have not been consistent with any singular model of predicting depressive symptoms, producing variable literature on SE. This discourse is intriguing, suggesting there may be a covariate in the relationship between depressive systems and SE. We are proposing self-concept clarity (SCC) as this covariate. SCC is a structural component of the self-concept; the degree to which self-beliefs are internally consistent, stable, and confidently defined. Individually, SCC can mediate depression and upward social comparison (Butzer & Kuiper, 2006), and correlate with increased levels of psychological adjustment (Bigler et al., 2001). Additionally, a low score of SCC is independently associated with low SE (Campbell et al., 1996). Since inconsistencies between explicit and implicit SE can be accounted for by simultaneously evaluating self-deception as shown by recent research (Uziel & Cohen, 2020), SCC may represent the other end

as a mediator of SE and depressive symptoms. A disagreement in SE distinguished by low implicit and high explicit SE may be predictive of both low SCC as well as depressive symptoms through multivariate modeling. This suggests that SCC may be the missing variable in the explanation of SE differences for people with depressive symptoms. Our aim to analyze SE discrepancy and SCC may prove to supply a target for the treatment of depression symptoms prior to the formation of a mental health condition.

## Methods

### Participants

Approval has been received from the University of Chicago Biological Sciences Division IRB (#24-1945). Participants will be recruited through Prolific (Prolific.com) and will comprise of 60 US-based adults, both male and female sex, between the ages of 18 and 65. Over-recruitment may be needed to ensure that 60 participants complete each of the three sessions. We will request Prolific to provide a racially and ethnically representative sample of participants based on U.S. census data. Participants and their respective responses will be screened by Prolific for data quality. Prolific.com will identify and select participants with one inclusion criteria; having provided valid responses to previous surveys on their website. The cohort 1 wave 1 sample included 14 participants.

### Procedures & Measures

Demographic information, questionnaires, and online testing assessments will be gathered by Prolific.com after it identifies eligible participants. The independent factors tested will be self-concept clarity measured by the Self-Concept Clarity Scale (Campbell et al., 1996), implicit self-esteem measured by the Self-Esteem Implicit Association Test (IAT) ((Franck et al., 2007); Greenwald & Farnham, 2000), and explicit self-esteem measured by the Rosenberg Self-

Esteem Scale (Rosenberg, 1965). The Self-Concept Clarity Scale measures participants' self-beliefs by indicating on a Likert scale of 1 being strongly disagreeing to 5 strongly agreeing, a series of 12 statements such as 'My beliefs about myself seem to change very frequently'. The Self-Esteem IAT assesses self-esteem implicitly by measuring the automatic associations of the self with negative and positive valences. The Rosenberg Self-Esteem Scale measures participants' self-esteem explicitly by designating whether they agree with, on a Likert scale of 1 being strongly agree to 4 being strongly disagree, a series of 10 statements including 'On a whole, I am satisfied with myself'. The dependent factor tested will be depression symptoms as measured by the Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977). The CES-D evaluates the severity of depression symptoms during the past week through a series of 20 statements rated on a Likert scale from 'rarely or none of the time' to 'most or all of the time'. Both dependent and independent variables will be measured at three time points: baseline (time 1), one-week past baseline (time 2), and two-weeks past baseline (time 3). Participants will receive $12 an hour for their participation in each wave of this study, with participants who complete all three waves receiving a $12 bonus. Strengths include time efficiency in recruitment and study administration through the use of Prolific, as well as access to a more diverse pool of participants. Further strength is in the repeated measures, which control for individual sources of variance in the data. Limitations of this study are that it will be conducted remotely, therefore environmental factors influencing participants' completion, and the quality of responses cannot be controlled for. Additionally, the large amount of measures included may prove to exhaust participants leading to some failing to complete all three time points. This potential limitation is accounted for in participant recruitment by over-recruiting. Further, there being no eligibility

criteria regarding mental health conditions and not collecting lifetime/current mental health

conditions in demographics limits our ability to conduct a subgroup analysis regarding diagnosis.

## Results

**Table 1**

*Summary of Depression Scores and Explicit Self Esteem Scores*

| CES-D Total Score | Depression Level | Rosenberg Total Score | Explicit Self-Esteem Level |
|---|---|---|---|
| 16.00 | Mild Depression | 22.00 | Normal Self-Esteem |
| 27.00 | High Depression | 20.00 | Normal Self-Esteem |
| 26.00 | High Depression | 21.00 | Normal Self-Esteem |
| 30.00 | High Depression | 14.00 | Low Self-Esteem |
| 7.00 | No Depression | 28.00 | High Self-Esteem |
| 15.00 | No Depression | 17.00 | Normal Self-Esteem |

Note. CES-D = Center for Epidemiologic Studies Depression Scale; SE = Self-Esteem.

**Table 2**

*Summary of Rosenberg Scores*

| Depression Level | Explicit Self-Esteem Level |
|---|---|
| Mild Depression | Normal Self-Esteem |
| High Depression | Normal Self-Esteem |
| High Depression | Normal Self-Esteem |

| Depression Level | Explicit Self-Esteem Level |
| --- | --- |
| High Depression | Low Self-Esteem |
| No Depression | High Self-Esteem |
| No Depression | Normal Self-Esteem |

**Figure 1**

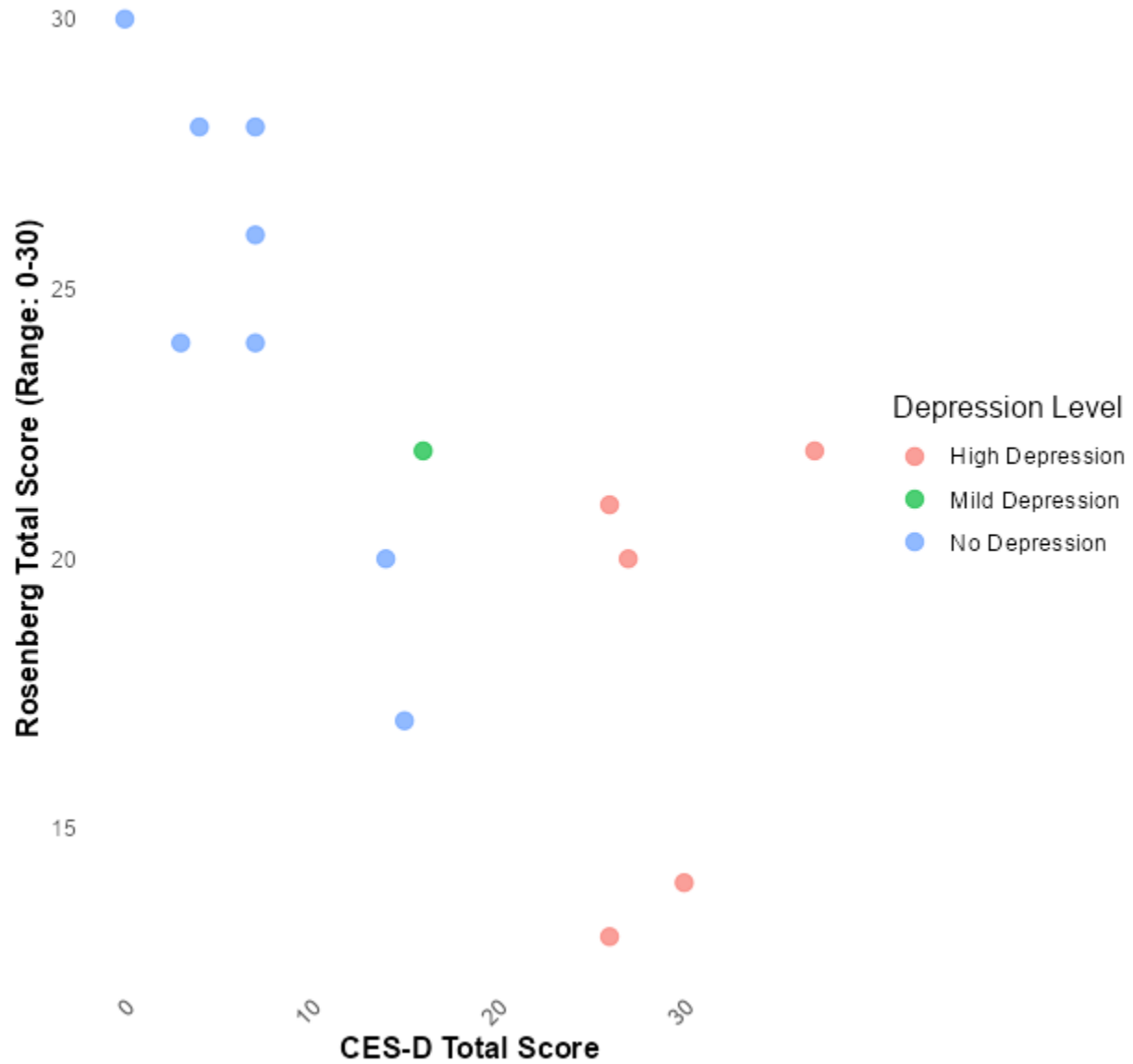*Distribution of CES-D Scores*
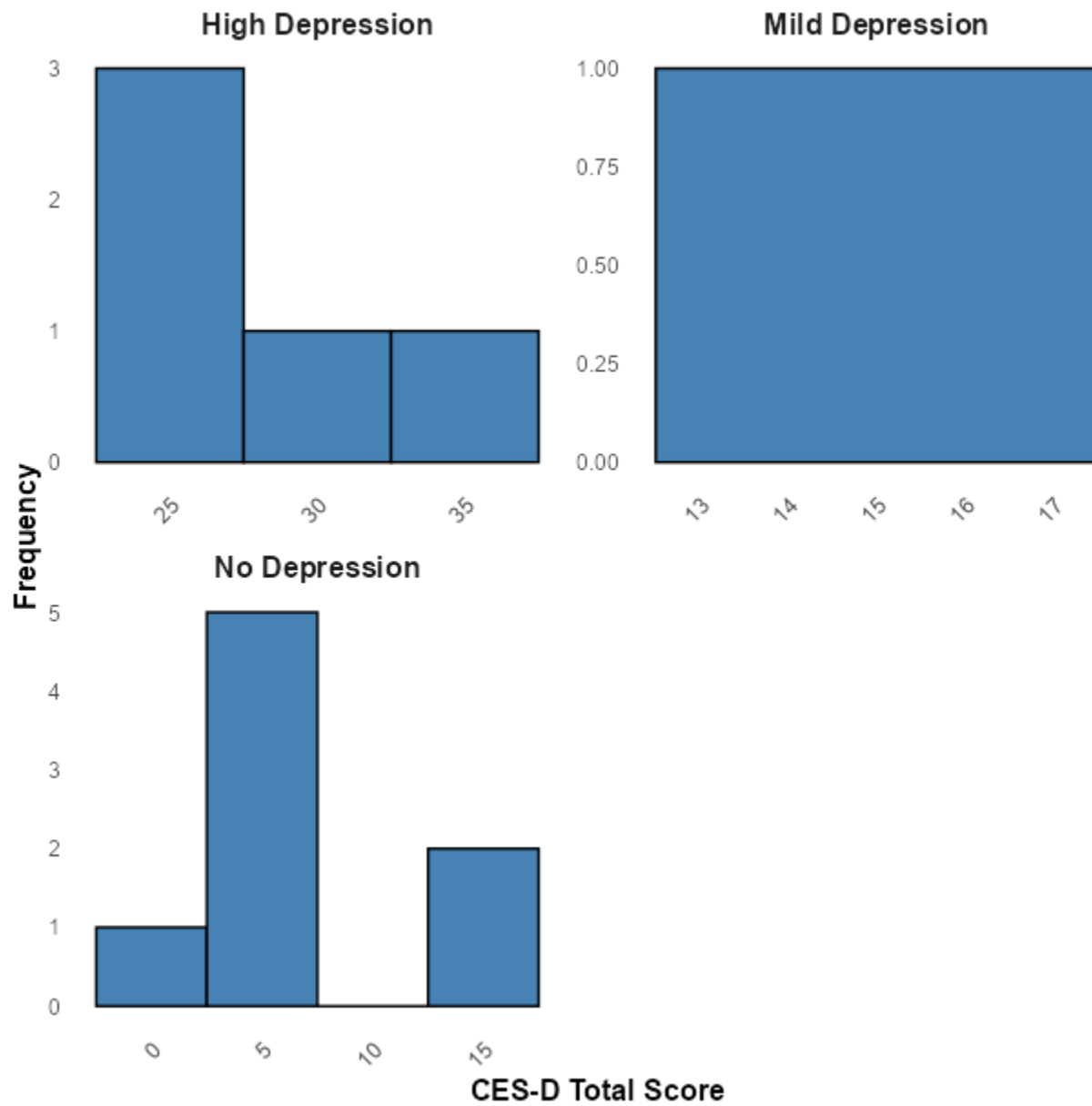
**Figure 2**

*Rosenberg Self-Esteem Scale Distribution*
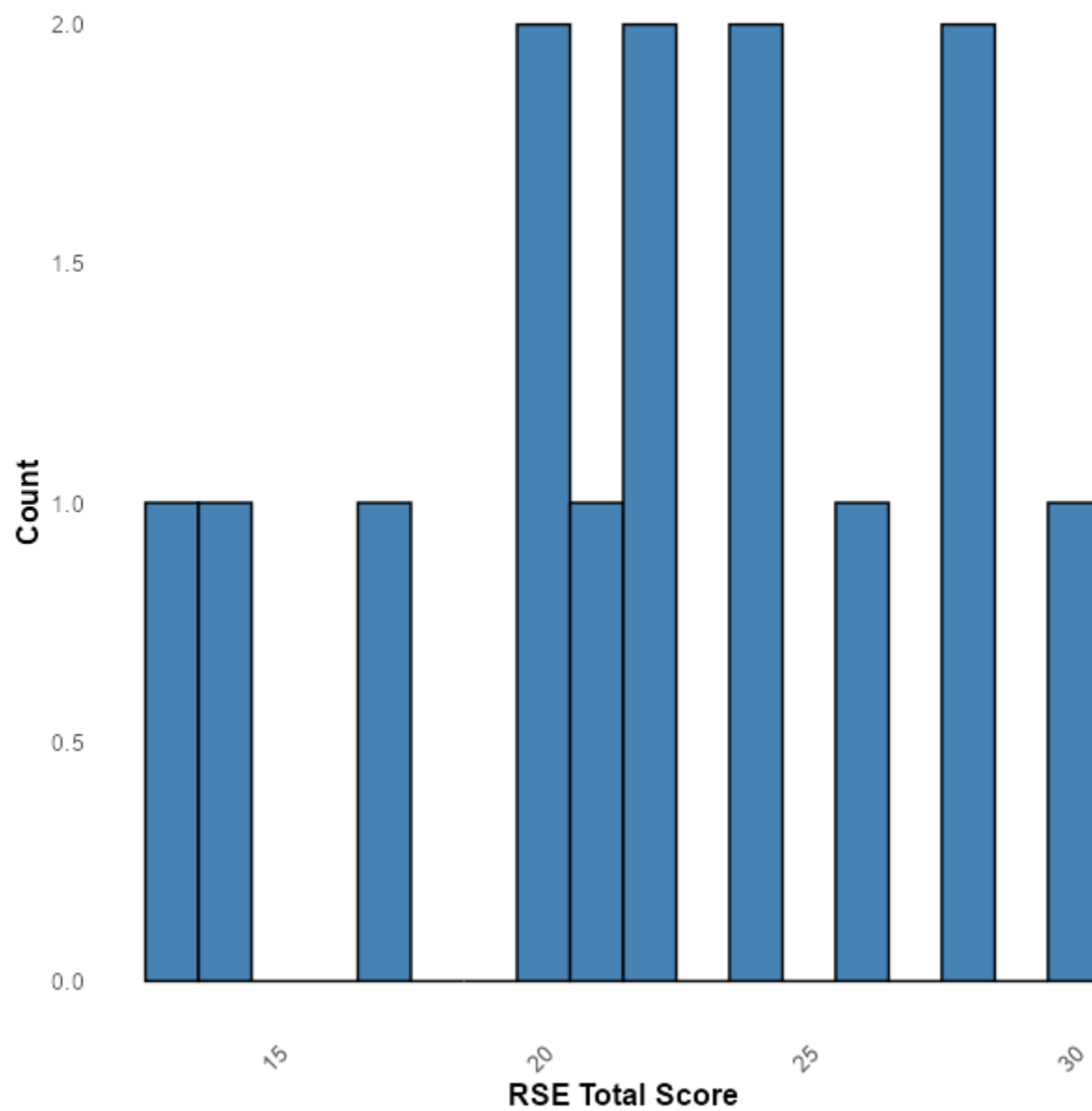
**Figure 3**

*Implicit Association Test Score Distribution*
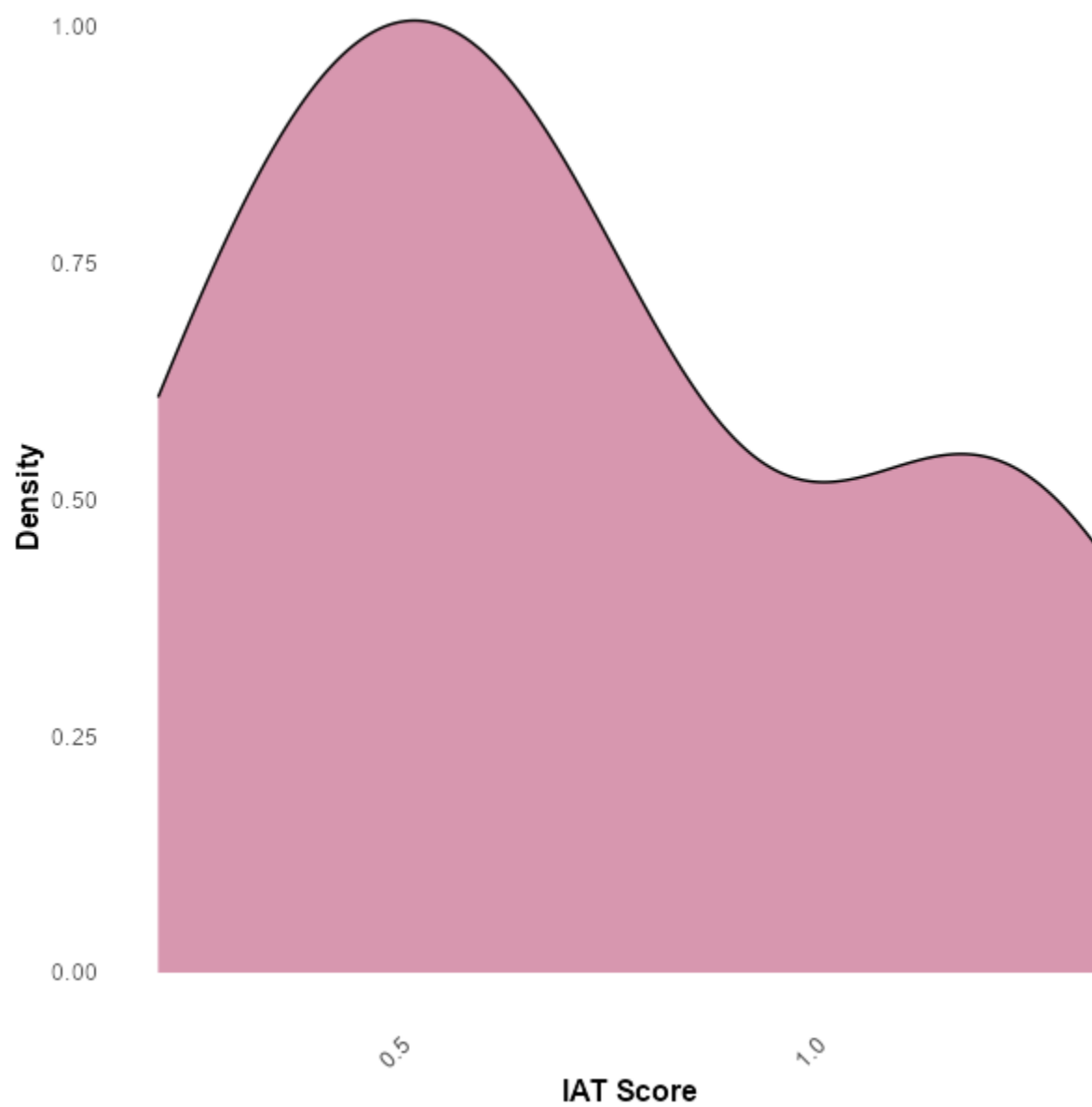
**Figure 4**

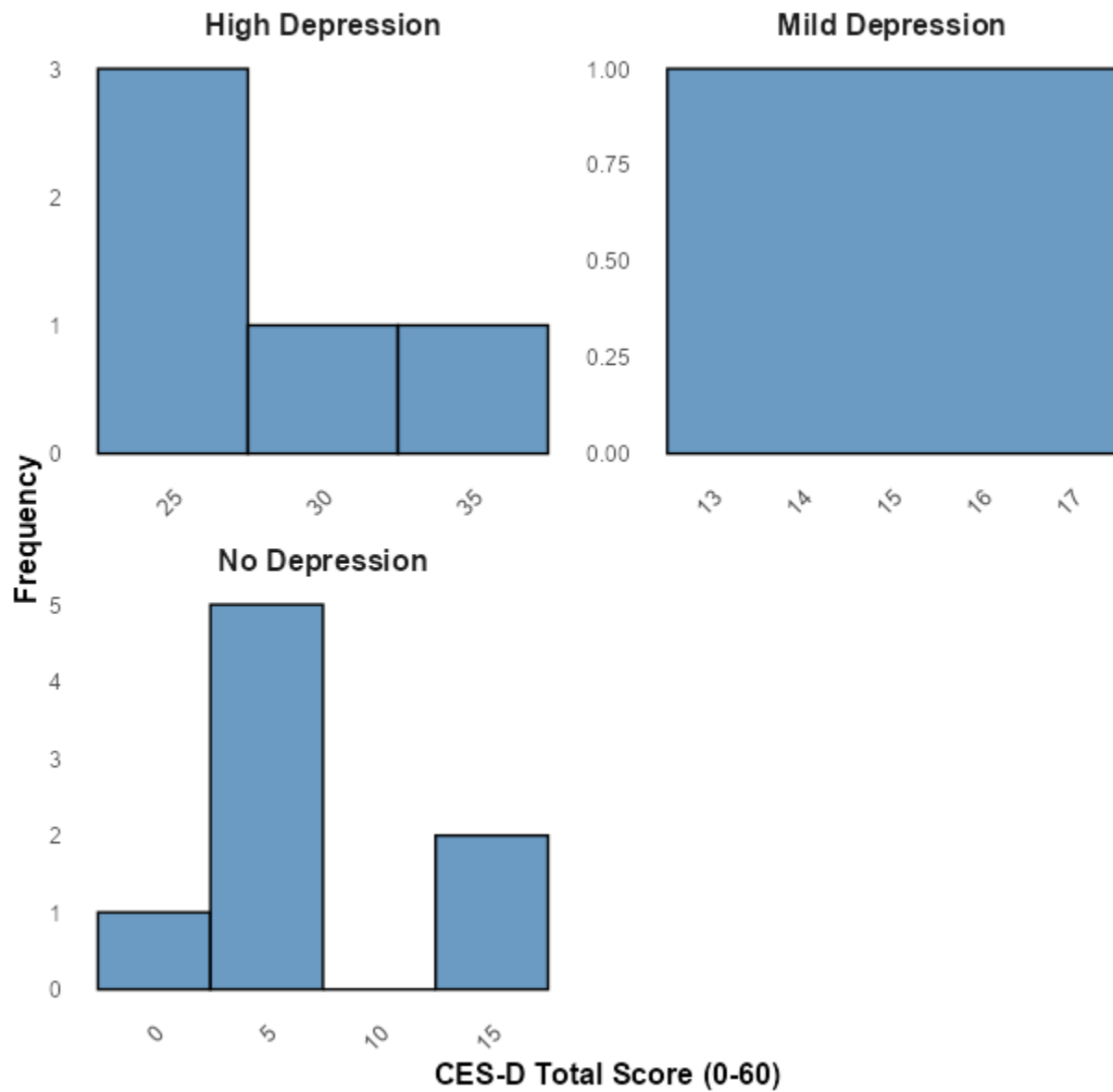*Rosenberg Scores by Depression Level*
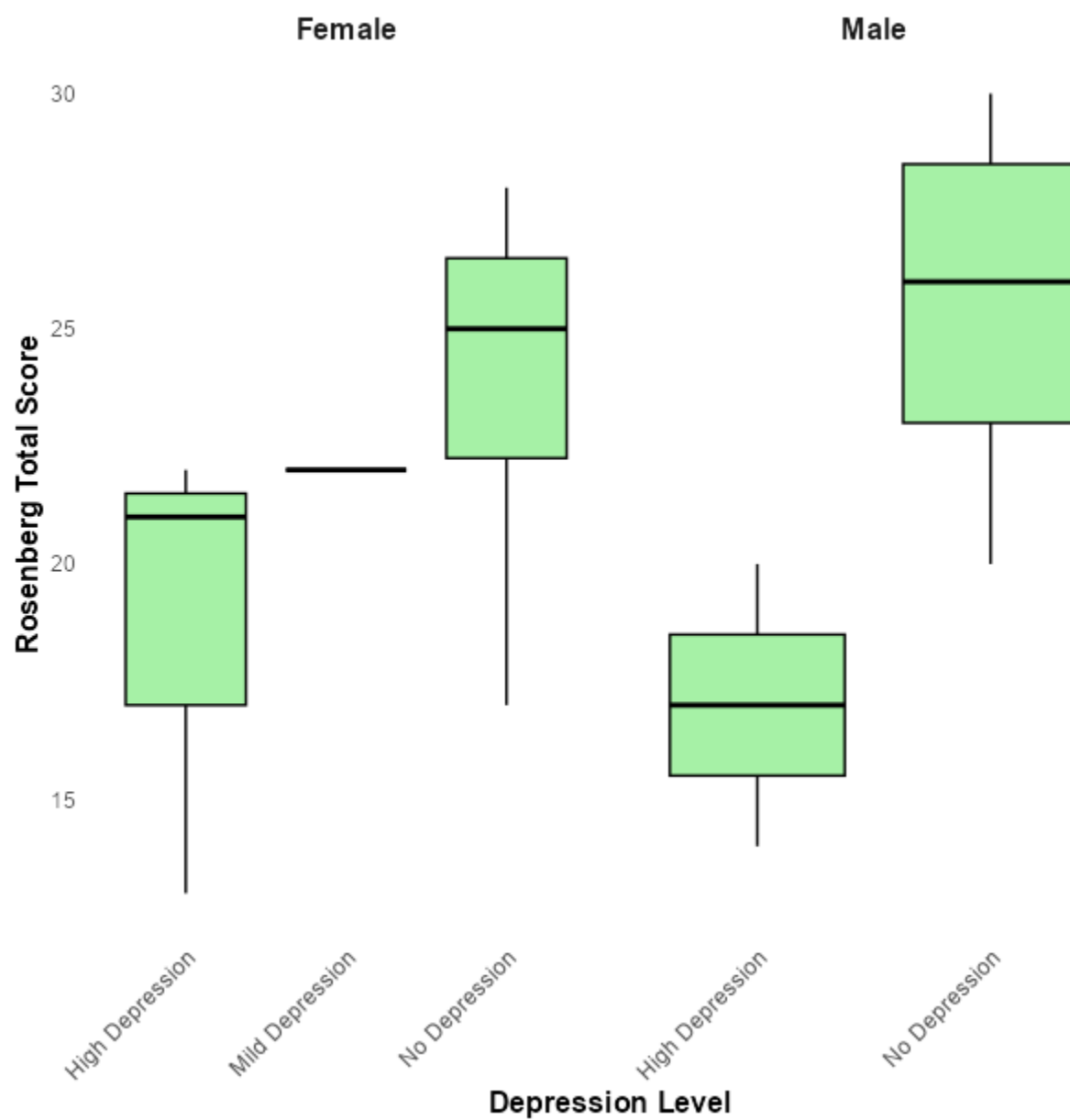
**Figure 5**

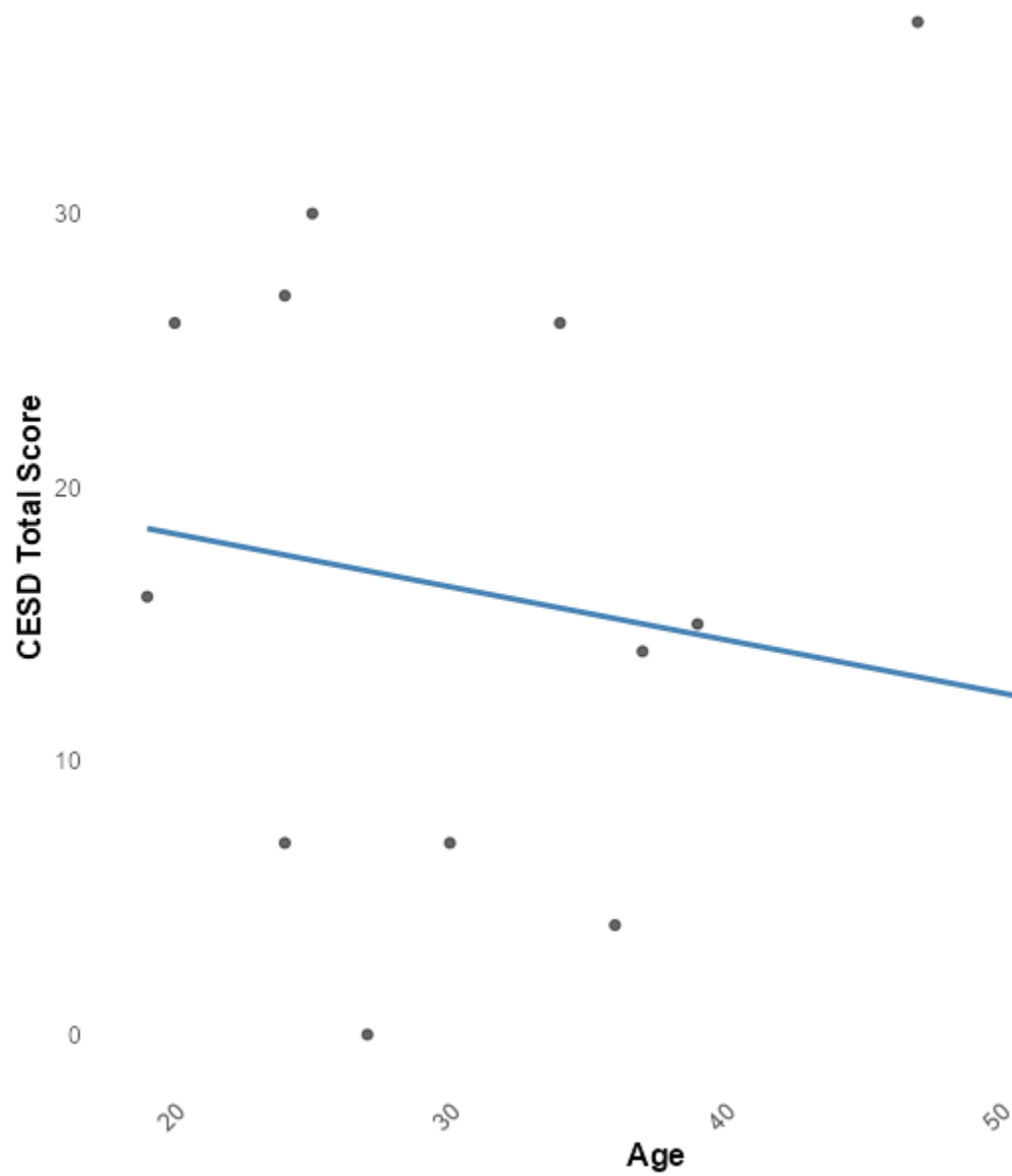*Rosenberg Scores vs. CES-D Scores*



Note: higher Rosenberg total scores indicate higher self-esteem.

**Figure 6**

*Distribution of CES-D Scores by Depression Level*



Note. CES-D = Center for Epidemiologic Studies Depression Scale.

**Figure 7**

*Regression of CESD Total on Age*

**Table 3**

*Descriptive Statistics for Numeric Variables*

| Statistic | Value |
|---|---|
| Mean CES-D Score | 15.64 |
| Standard Deviation of CES-D Score | 11.68 |
| Mean Rosenberg Self-Esteem Score | 22.07 |
| Standard Deviation of Rosenberg Self-Esteem Score | 5.11 |

**Table 4**

*Frequency and Proportion of Depression Levels*

| Depression Level | Frequency | Proportion |
|---|---|---|
| High Depression | 5 | 0.36 |
| Mild Depression | 1 | 0.07 |
| No Depression | 8 | 0.57 |

The mean CES-D score was 15.6428571 ($SD = 11.6790881$). The mean Rosenberg score was 22.0714286 ($SD = 5.1060189$). An ANOVA was calculated to demonstrate the imapct of depression level on CES-D scores, results should be obvious since coming from the same measure ($F = 30.1359864$, $p = 3.4403805^{-5}$, $\eta^2 = 0.8456616$). As anticipated and assumed, the effect size ($\eta^2 = 0.8456616$) shows a large effect of depression level on CES-D scores. A linear regression was perfomed which demonstrated that age was not a significant predictor of

the occurance of depressive symptoms ($\beta$ = -0.1935682, $p$ = 0.497248, 95% CI [-0.7960293, 0.4088929]). Finally, a correlation analyses was perfomed between the Rosenberg Self-Esteem scores and the CES-D scores, which portrayed a significant negative relationship ($r$ = -0.7206088, $p$ = 0.0036437, 95% CI [-0.9051232, -0.3076601]). This shows that lower depressive symptoms are associated with higher self-esteem.[1] The CES-D score distribution by depression level is visualized in Figure (**ref?**)(fig-CESD-score-distribution). The relationship between CES-D scores and Rosenberg Self-Esteem scores is shown in Figure (**ref?**)(fig-RSES-versus-CESD-total). Descriptive statistics for this sample's numeric variables are presented in Table (**ref?**)(tbl-numeric-summary-stats), and the proportion and frequency of the demonstrated depression levels in the CES-D are given in Table (**ref?**)(tbl-non-numeric-summary-stats).The variety of Rosenberg Self-Esteem scores present in the sample is shown in Figure (**ref?**)(fig-RSES-score-distribution), and the Implicit Association Test (IAT) scores are exhibited in Figure (**ref?**)(fig-IAT-score-distribution). The connection between CES-D depression levels and Rosenberg scores, stratified by gender, is portrayed in Figure (**ref?**)(fig-RSES-versus-CESD-level). A regression of CES-D total scores on age is represented in Figure (**ref?**)(fig-CESD-total-versus-age).The summary of depression scores with corresponding explicit self-esteem scores is given in Table (**ref?**)(tbl-summary-of-depression-and-self-esteem), and the summary of Rosenberg scores with their corresponding CES-D depression level is given in Table (**ref?**)(tbl-explicit-self-esteem).

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[1] The CES-D is a scale that ranges from 0 to 60, with the higher scores indicating higher severity of depressive symptoms.

**Discussion**

The results suggest a significant relationship between depression and self-esteem. There was a mean score of 15.6428571 in the CES-D, signifying moderate levels of depressive symptoms present in this sample. This effect size ($\eta^2 = 0.8456616$) shows a huge impact of depression level on overall CES-D scores. In regards to a relationship between age and depressive symptoms, a linear regression analysis was performed. This demonstrated that age was not a significant predictor of depression symptoms ($\beta = -0.1935682$, $p = 0.497248$). This demonstrates that age is not significantly predictive of depressive symptoms in this sample.. The correlation analysis showed a negative relationship between CES-D scores and Rosenberg Self-Esteem values ($r = -0.7206088$, $p = 0.0036437$, 95% CI [-0.9051232, -0.3076601]). This is consistent with prior research (Franck et al., 2007; Yin et al., 2021).

Psychedelic-assisted psychotherapy, particularly those employing the use of 5-HT2A receptor agonists, for individuals with NPD is a long-term objective of the study this proposal is branching off of. The multivariate analysis of depression symptoms alongside self-esteem and self-deception can aid in justifying of this intervention for individuals with NPD. Previous research on how this intervention can be beneficial for individuals with depression symptoms can further support these suggestions. Public data from the National Survey on Drug Use and Health demonstrates that recreational LSD usage in US adults with major depression in the past calendar year significantly increased in comparison to adults without major depression (Walsh et al., 2023). This indicates through government-obtained data how many individuals may be self-medicating their depressive symptoms through the use of LSD, a 5-HT2A receptor agonist, pointing toward the potential psychiatric benefits the hallucinogenic substance possesses. LSD has also been shown to have the potential to be used in conjunction with psychotherapy by a

placebo-controlled trial whose results indicated suggestibility is enhanced while under the influence of this hallucinogen (Carhart-Harris et al., 2014). This source points towards the benefits of LSD when used in psychotherapy for more significant outcomes for patients. In regards to the easing of NPD symptoms, classic serotonergic psychedelics like LSD have been demonstrated to increase the experience of empathy and connectedness, however, it should be noted that the participants in this study were not people with NPD (van Mulukom et al., 2020). This demonstrates the potential of 5-HT2A receptor agonists to be a potential treatment for people with NPD. The use of this intervention has the potential to achieve improvement of both depression and NPD symptoms.

This cohort measured:

- Depression

- Implicit Self-Esteem

- Explicit Self-Esteem

Future cohorts will also measure:

- Self-Concept Clarity
**bold does not belong in APA7 lol**

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