# Effects of Intensive Short-Term Dynamic Psychotherapy on Depression: A Reanalysis of Heshmati et al.'s Data

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Abstract

**Objective:** This study presents a reanalysis of data from a randomized controlled trial examining the effects of Intensive Short-Term Dynamic Psychotherapy (ISTDP) versus waitlist control on depressive symptoms and proposed mechanisms in individuals with treatment-resistant depression. **Method:** The original trial randomized 86 Iranian adults with treatment-resistant depression to either ISTDP (20 sessions over 10 weeks) or waitlist control. Depression and process measures (emotional repression, negative affect, distress) were assessed at baseline, post-treatment (10 weeks), and 3-month follow-up. Linear mixed-effects models analyzed trajectories; mediation and cross-lagged analyses examined mechanisms. **Results:** A significant Time × Treatment interaction emerged for depression ($p < .001$). ISTDP participants showed large reductions from baseline to post-treatment ($M$ = -8.40, $p < .001$) with continued improvement through follow-up ($M$ = -12.87, $p < .001$), while waitlist controls showed minimal change. Between-group effect sizes reached $d = 2.50$ (95% CI [1.88, 3.11]) at follow-up. Process measures showed comparable or larger effects ($d$ = 1.96 to 2.95). Mediation analyses revealed that distress reduction accounted for 54% of depression improvement, though this finding requires cautious interpretation due to conceptual overlap. Contrary to theoretical expectations, emotional repression and negative affect changes did not significantly mediate outcomes. Cross-lagged analyses indicated that process and depression changes occurred concurrently rather than sequentially. **Conclusion:** This reanalysis confirms large beneficial effects of ISTDP on depression in treatment-resistant depression. However, ISTDP appears to create broad, simultaneous therapeutic change rather than working through specific sequential mechanisms, challenging theoretical assumptions about how this treatment operates.

*Keywords:* depression, psychotherapy, ISTDP, treatment-resistant depression, reanalysis

Word count: X

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# Results

## Participant Characteristics

Table 1 presents baseline demographic and clinical characteristics by treatment condition. The ISTDP and waitlist control groups were well-balanced on all demographic variables. The sample had a mean age of 36.90 years ($SD = 11.73$), with 61.6% female participants. Most participants were currently receiving antidepressant medication (79.1%) and had previously failed a mean of 1.8 antidepressant trials ($SD = 0.9$).

## Missing Data

Of the 258 total observations (86 participants × 3 time points), 22 observations (8.5%) had missing depression scores due to participant dropout. Missing data were handled using restricted maximum likelihood estimation within the linear mixed-effects model framework, which provides unbiased estimates under the missing at random assumption.

## Primary Outcome: Depression Trajectories

Figure 1 displays the depression trajectories for both treatment groups across the three assessment points. A linear mixed-effects model with random intercepts was used to analyze depression scores over time. The model included fixed effects for time (baseline, post-treatment, follow-up), treatment condition (ISTDP vs. waitlist control), and their interaction.

The Time × Treatment interaction was statistically significant at both post-treatment, , and follow-up, . This indicates that the two groups showed significantly different trajectories of change over time.

Table 1

*Baseline Demographic and Clinical Characteristics by Treatment Condition*

| Characteristic | ISTDP | Waitlist Control |
|---|---|---|
| Age, M (SD) | 36.5 (12.3) | 37.3 (11.3) |
| Gender, % | | |
| Male | 34.9 | 41.9 |
| Female | 65.1 | 58.1 |
| Marital status, % | | |
| Single | 39.5 | 25.6 |
| Married | 51.2 | 60.5 |
| Widowed/Divorced | 9.3 | 14.0 |
| Education, % | | |
| High school | 41.9 | 34.9 |
| Undergraduate | 37.2 | 48.8 |
| Graduate | 20.9 | 16.3 |
| Employment status, % | | |
| Employed | 41.9 | 65.1 |
| Unemployed | 46.5 | 23.3 |
| Retired | 11.6 | 11.6 |
| Socioeconomic status, % | | |
| Low | 14.0 | 16.3 |
| Middle | 65.1 | 65.1 |
| High | 20.9 | 18.6 |
| Previous antidepressant trials, M (SD) | 1.81 (1.01) | 1.86 (0.89) |
| Currently receiving medication, % | | |
| Yes | 76.7 | 81.4 |
| No | 23.3 | 18.6 |

*Note.* ISTDP = Intensive Short-Term Dynamic Psychotherapy. N = 86

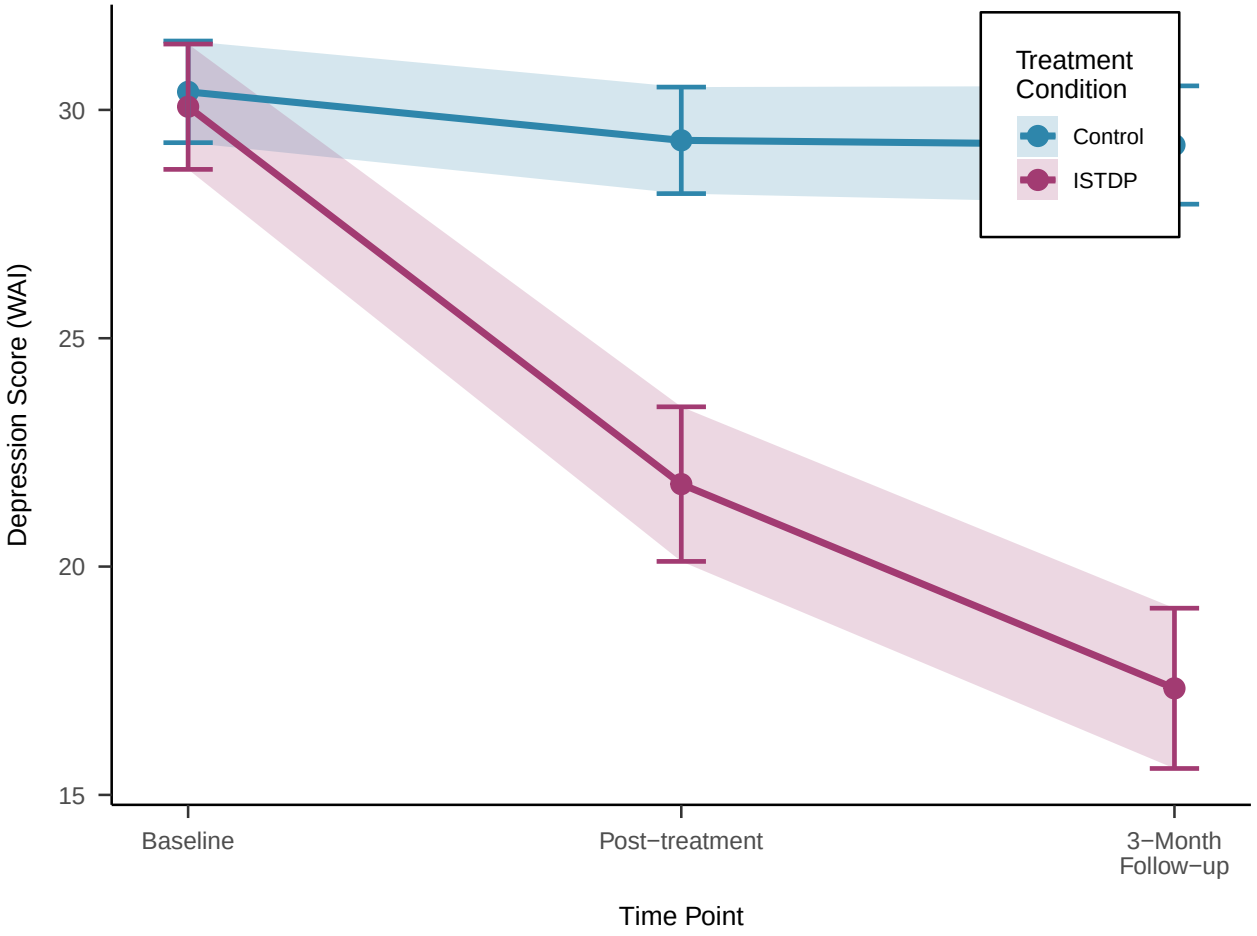


*Figure 1*. Mean depression trajectories by treatment condition. Error bars represent 95% confidence intervals. ISTDP = Intensive Short-Term Dynamic Psychotherapy.

**Estimated Marginal Means.** Table 2 presents the estimated marginal means for depression scores at each time point by treatment condition. At baseline, the groups did not differ significantly in depression levels, $t(131.2) = 0.34$, $p = .734$, Cohen's $d = 0.08$, 95% CI [-0.35, 0.51].

However, at post-treatment, ISTDP participants showed significantly lower depression scores than waitlist controls, $t(144.9) = 7.64$, $p < .001$, Cohen's $d = 1.68$, 95% CI [1.15, 2.22], representing a large effect. This between-group difference increased further at 3-month follow-up, $t(144.9) = 12.03$, $p < .001$, Cohen's $d = 2.50$, 95% CI [1.88, 3.11], representing a very large effect.

Table 2

*Estimated Marginal Means for Depression Scores by Treatment Condition and Time Point*

| | ISTDP | | | Waitlist Control | | |
|---|---|---|---|---|---|---|
| Time Point | *M* | *SE* | 95% CI | *M* | *SE* | 95% CI |
| Baseline | 30.07 | 0.68 | [28.73, 31.41] | 30.40 | 0.68 | [29.06, 31.73] |
| Post-treatment | 21.67 | 0.71 | [20.26, 23.08] | 29.29 | 0.70 | [27.92, 30.67] |
| 3-Month Follow-up | 17.20 | 0.71 | [15.79, 18.61] | 29.19 | 0.70 | [27.81, 30.56] |

*Note.* Values are estimated marginal means from the linear mixed-effects model with random intercepts. CI = 95\% confidence interval. ISTDP = Intensive Short-Term Dynamic Psychotherapy.

**Within-Group Changes.** For ISTDP participants, depression scores decreased significantly from baseline to post-treatment ($M_{\text{diff}} = 8.40$, $SE = 0.62$, $p < .001$) and continued to decrease from baseline to 3-month follow-up ($M_{\text{diff}} = 12.87$, $SE = 0.62$, $p < .001$). Additional improvement occurred between post-treatment and follow-up ($M_{\text{diff}} = 4.47$, $SE = 0.63$, $p < .001$).

In contrast, waitlist control participants showed minimal change in depression scores across all time points (all $p$s $> .10$), with no significant differences between baseline and post-treatment ($M_{\text{diff}} = 1.10$, $p = .156$), baseline and follow-up ($M_{\text{diff}} = 1.21$, $p = .110$), or post-treatment and follow-up ($M_{\text{diff}} = 0.10$, $p = .984$).

**Effect Sizes.** Figure 2 displays the between-group effect sizes (Cohen's $d$) at each time point. Effect sizes increased substantially over time, from negligible at baseline ($d = 0.08$, 95% CI [-0.35, 0.51]) to large at post-treatment ($d = 1.68$, 95% CI [1.15, 2.22]) and very large at 3-month follow-up ($d = 2.50$, 95% CI [1.88, 3.11]).

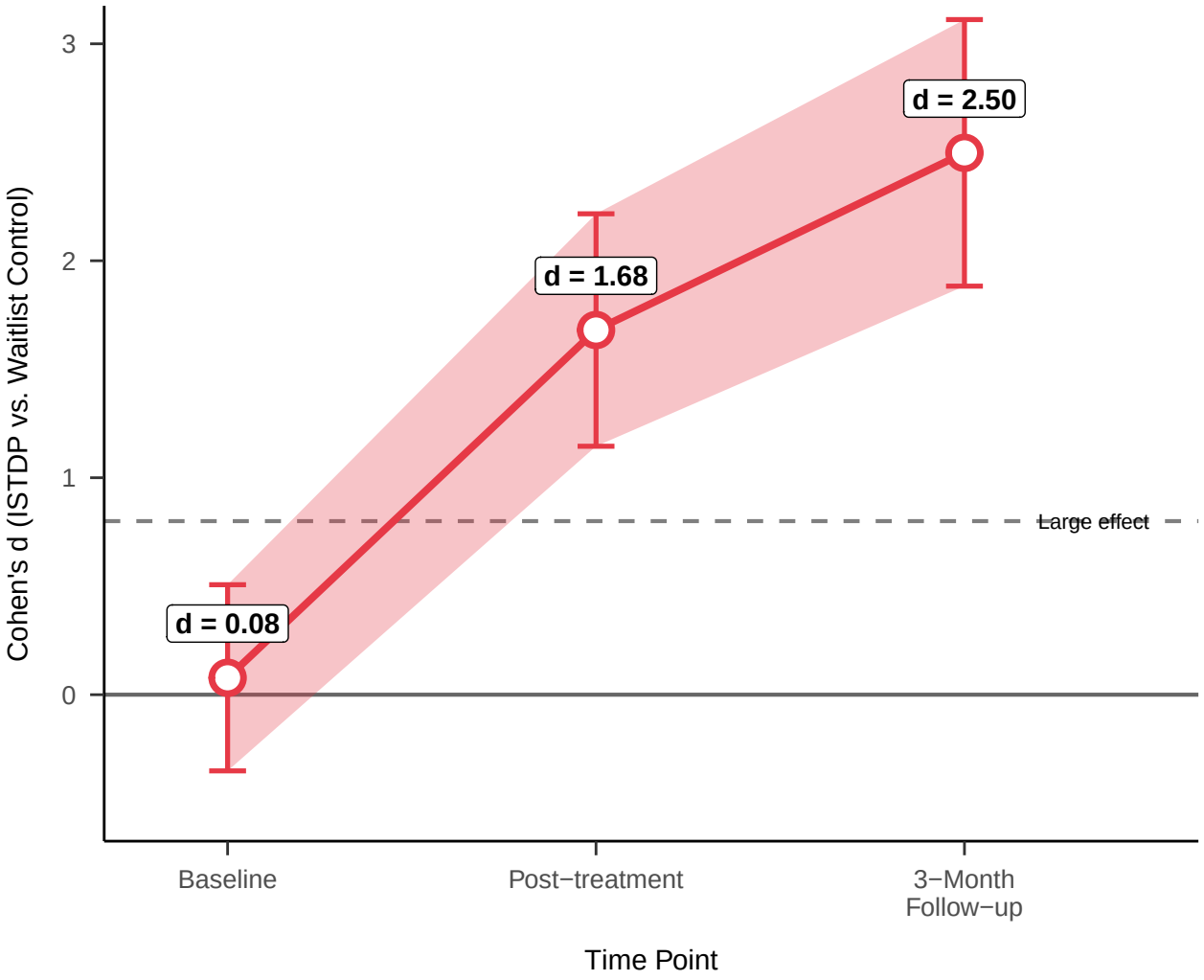


*Figure 2*. Between-group effect sizes (Cohen's d) over time with 95% confidence intervals. Positive values indicate lower depression in the ISTDP group compared to waitlist control. The dashed line represents the threshold for a large effect (d = 0.80).

### Model Diagnostics

The random intercept variance was 12.59, indicating substantial between-person variability in baseline depression levels. The residual variance was 7.04. Visual inspection of residual plots (not shown) indicated acceptable model fit, with approximately normally distributed residuals and homogeneous variance across predicted values.

Having established that ISTDP produces large, sustained reductions in depression, we next examined whether these improvements operate through changes in theoretically-relevant process measures, including emotional repression, defensiveness, and negative affect—key targets of ISTDP theory.

### Process Measure Changes

ISTDP theory proposes that depression improvement occurs through reducing emotional repression and defensiveness. We examined four theoretically-relevant process measures: Emotional Repression (WAI Repressive/Restraint Composite), Negative Affect (PANAS), overall Distress, and Suppression of Aggression. Linear mixed-effects models with random intercepts were fit for each process measure using the same analytical approach as the primary depression outcome.

All four process measures showed highly significant Time × Treatment interactions (all $p$s $< .001$), indicating that ISTDP produced differential changes compared to waitlist control. Figure 3 displays the trajectories for these key process measures alongside depression.

Effect sizes for process measures at 3-month follow-up were comparable to or exceeded the depression effect. Emotional Repression showed a very large effect ($d = 2.76$), as did Negative Affect ($d = 1.96$), Distress ($d = 2.95$), and Suppression of Aggression ($d = 2.75$).

Importantly, changes in these process measures were strongly correlated with depression change in the ISTDP group. From baseline to follow-up, depression change

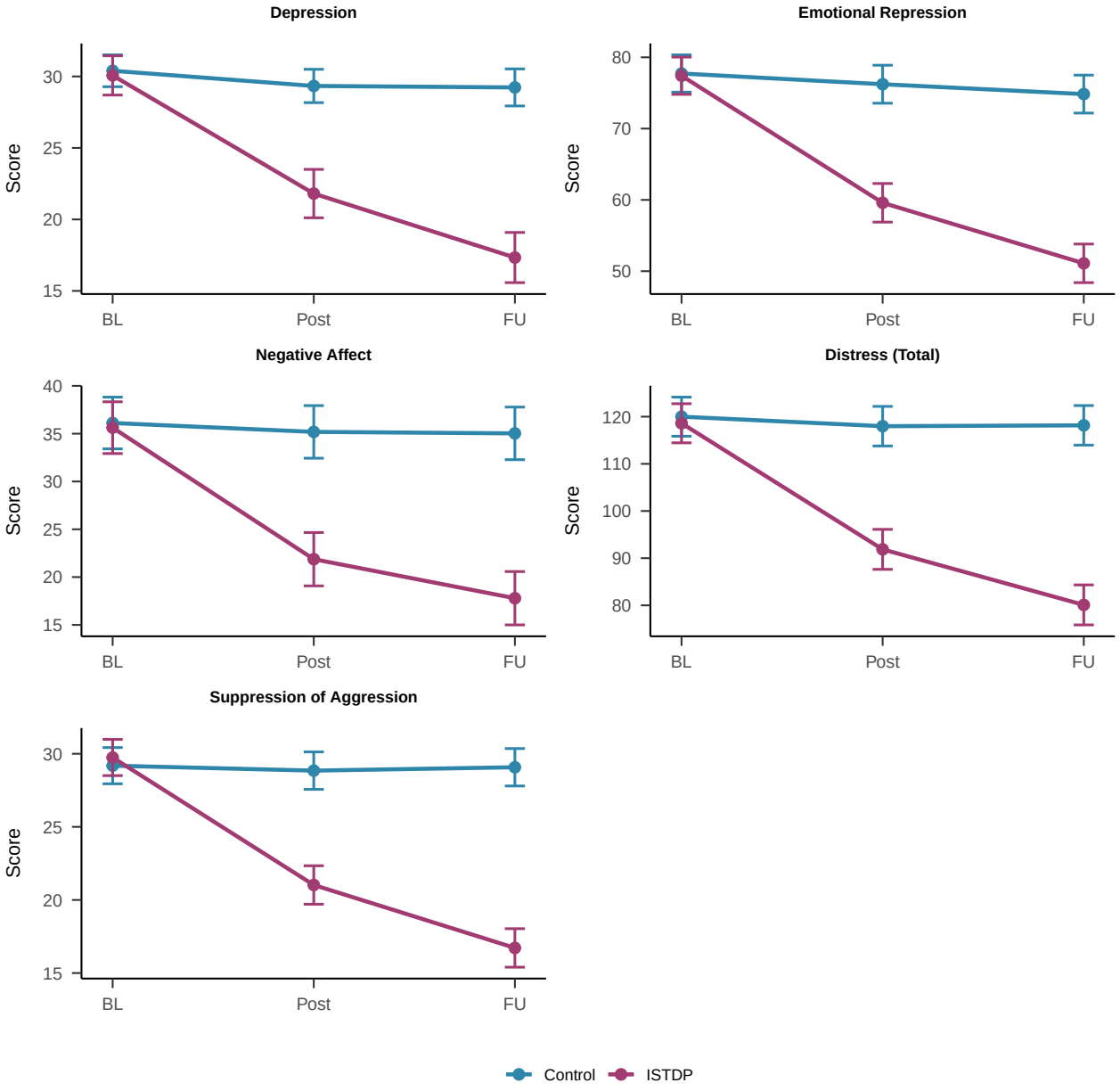


*Figure 3*. Trajectories for depression and key process measures by treatment condition. Error bars represent 95% confidence intervals. ISTDP = Intensive Short-Term Dynamic Psychotherapy; WAI-RRC = Weinberger Adjustment Inventory Repressive/Restraint Composite; PANAS = Positive and Negative Affect Schedule.

showed strong correlations with Distress change ($r = 0.70$), Negative Affect change ($r =$ -0.19), and Emotional Repression change ($r = 0.03$), suggesting these processes may be closely linked to therapeutic improvement.

### Mechanisms: Mediation Analyses

While ISTDP clearly affected hypothesized process measures, the critical question is whether these changes *mediate* (explain) depression improvement. We tested whether changes in process measures from baseline to post-treatment predicted depression at 3-month follow-up (controlling for baseline depression), using bootstrap mediation analysis with 5,000 resamples.

**Distress.** Changes in overall distress significantly mediated depression improvement, with an indirect effect of -6.34, 95% CI [-11.07, -3.08], $p = < .001$, accounting for 53.9% of the total treatment effect. However, this finding must be interpreted cautiously as the Distress composite includes the Depression subscale itself, creating conceptual overlap between mediator and outcome.

**Emotional Repression.** Contrary to theoretical expectations, changes in emotional repression did not significantly mediate depression improvement, indirect effect = -1.84, 95% CI [-5.41, 1.00], $p = .246$. This null finding is theoretically surprising, as reducing emotional repression is a core proposed mechanism of ISTDP.

**Negative Affect.** Changes in negative affect also did not significantly mediate depression improvement, indirect effect = 1.51, 95% CI [-0.52, 3.87], $p = .149$, despite showing strong concurrent correlations with depression change ($r = -0.52$).

### Temporal Precedence

The disconnect between large treatment effects on process measures, strong concurrent correlations, yet null mediation findings, prompted examination of temporal dynamics.

Table 3

*Mediation Analysis Results for Key Process Measures*

| Mediator | Indirect Effect [95% CI] | Proportion Mediated | p |
|---|---|---|---|
| Distress (Total) | -6.34 [-11.07, -3.08] | 53.9% | 0.000 |
| Emotional Repression | -1.84 [-5.41, 1.00] | 15.6% | 0.246 |
| Negative Affect | 1.51 [-0.52, 3.87] | -12.8% | 0.149 |

*Note.* Indirect effects estimated using bootstrap mediation analysis with 5,000 resamples. CI = 95\% bias-corrected and accelerated confidence interval. All models control for baseline depression.

Cross-lagged analyses tested whether process measures at baseline predicted depression at post-treatment (controlling for baseline depression and treatment), and vice versa.

Results revealed no clear temporal precedence. For Distress, neither direction showed significant effects (process → depression: $t$ = -0.24, $p$ = .808; depression → process: $t$ = 0.50, $p$ = .619). Similarly, Emotional Repression (process → depression: $t$ = -1.68, $p$ = .098) and Negative Affect (process → depression: $t$ = 1.25, $p$ = .217) showed no evidence that process changes preceded depression changes.

This pattern suggests that process measures and depression change *concurrently* rather than sequentially. Rather than a specific mechanism where process changes lead to depression improvement (Treatment → Process → Depression), ISTDP appears to create simultaneous change across multiple domains (Treatment → Process AND Depression). This explains why mediation analyses failed to identify clear sequential pathways despite large treatment effects and strong concurrent associations.

## References

## Supplementary Materials

The complete dataset and analysis code are publicly available on the Open Science Framework at https://doi.org/10.17605/OSF.IO/75PU8.