Eating Disorders, Social Connection Barriers, and Work-Life Balance

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Outline

- How Do Different Factors of Social Well-Being Affect Disordered Eating Tendencies?
  - Personalities Traits?
  - Social Phobia and Social Anxiety?
  - Loneliness?

- Is feeling "too busy" a significant barrier to social connection?
  - How does perceived business affect loneliness
  - Do the metrics line up with reported socialization time?
  - What other reported barriers, if any, affect social connection?

- Social dynamics of work-life balance and burnout.
  - Does working from home (WFH) decrease burnout exhaustion levels?
  - Does lower exhaustion coincide with positive accomplishment?

Emotional Eating (EE) Scored

Uncontrolled Eating (EE) Scored

Cognitive Restraint (CR) Scored
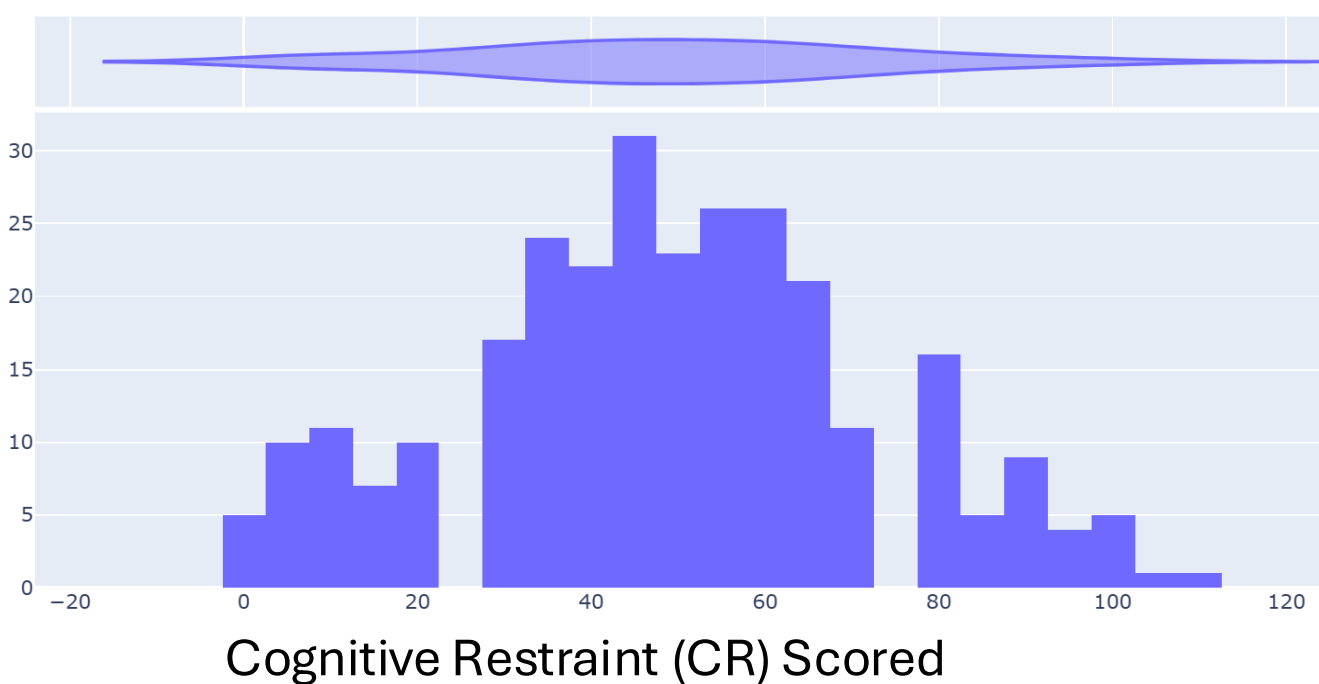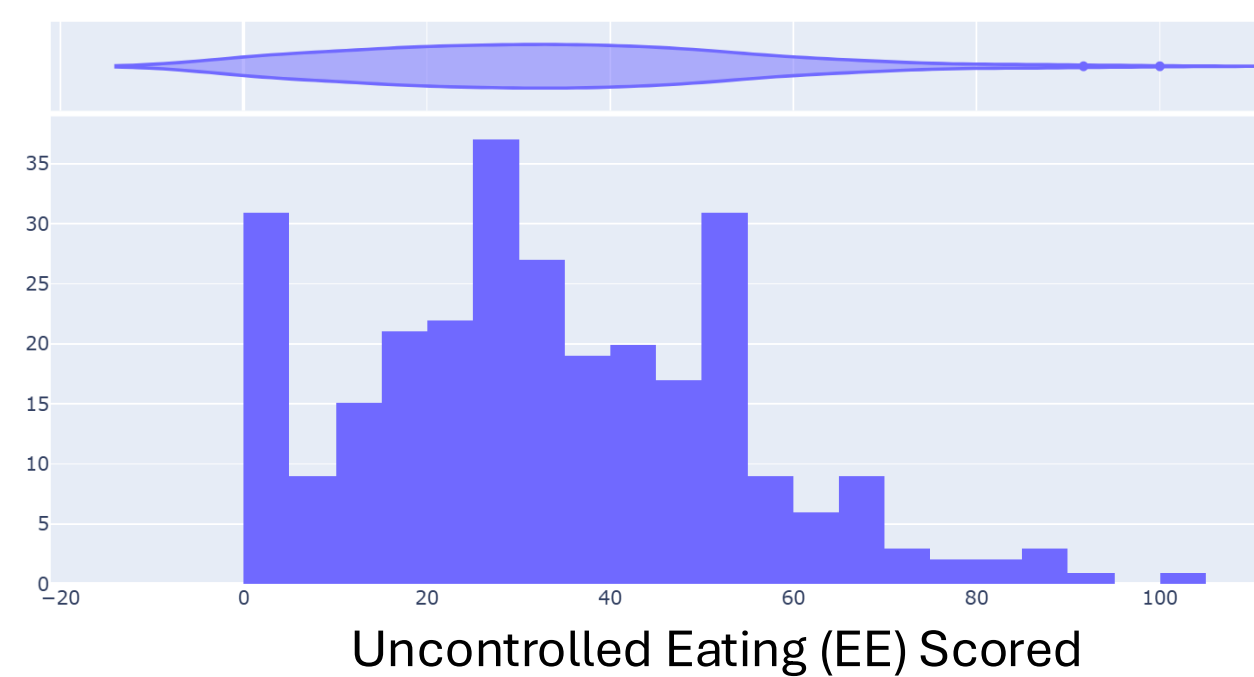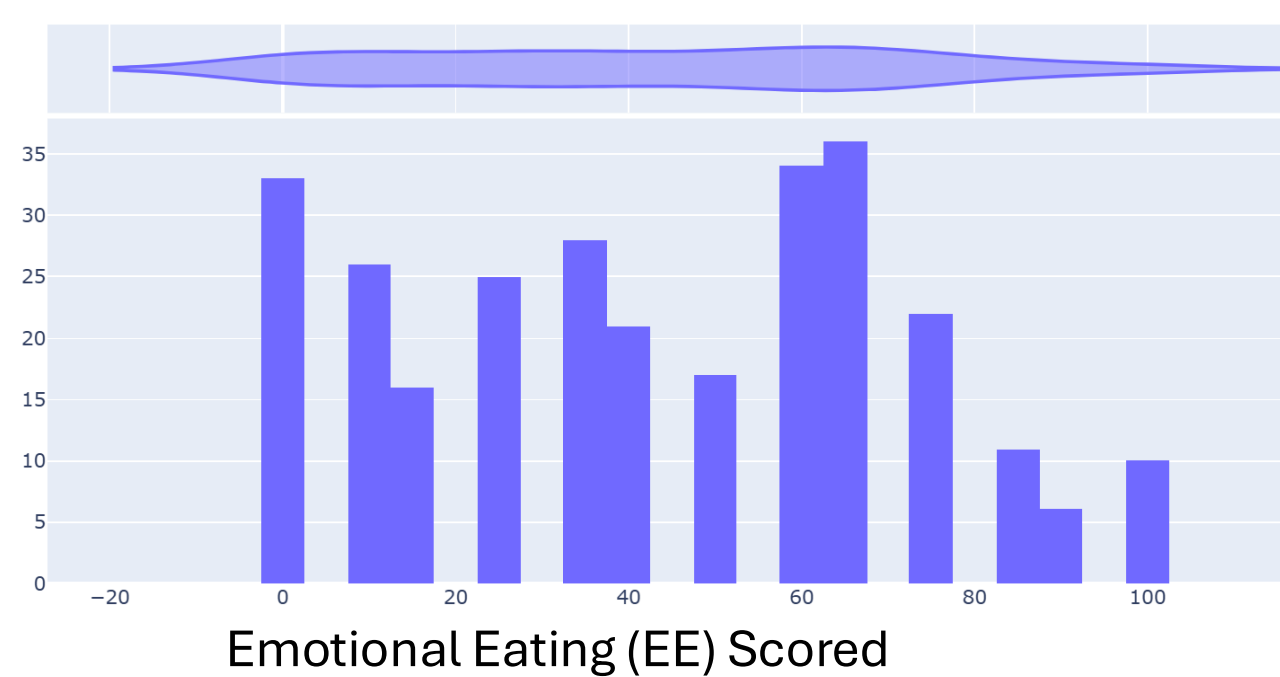
How Do Different Factors of Social Well-Being Affect Disordered Eating Tendencies?

- **The Big Three Factors of Disordered Eating Behavior**
  - o Scored between 0 to 100 by the Three Factor Eating Questionnaire

Factors of Social Wellbeing

o **Personality: the Big Five Traits Inventory (Numerically Scored)**

➢ Openness to experience

➢ Conscientiousness

➢ Extraversion

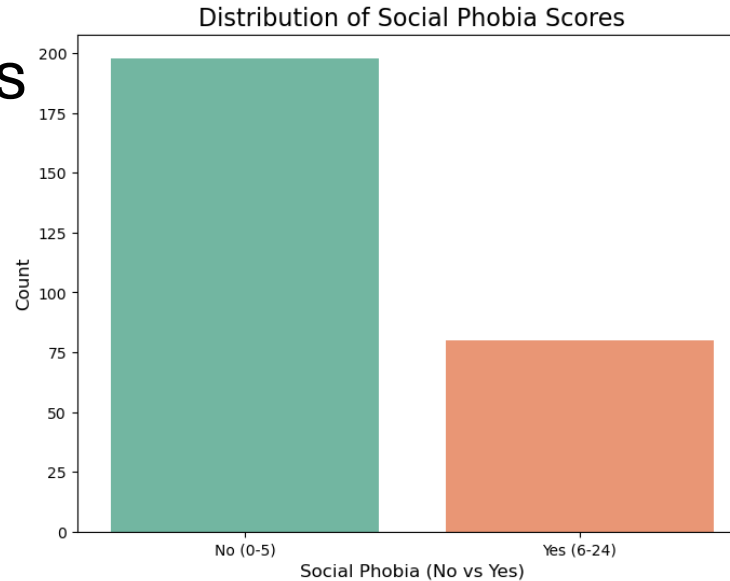➢ Agreeableness

➢ Neuroticism

Data Wrangling:
Mapping the Three Eating Factor Scores, Dropping all missing data

Dataset used:
2023 Cross-Sectional Study
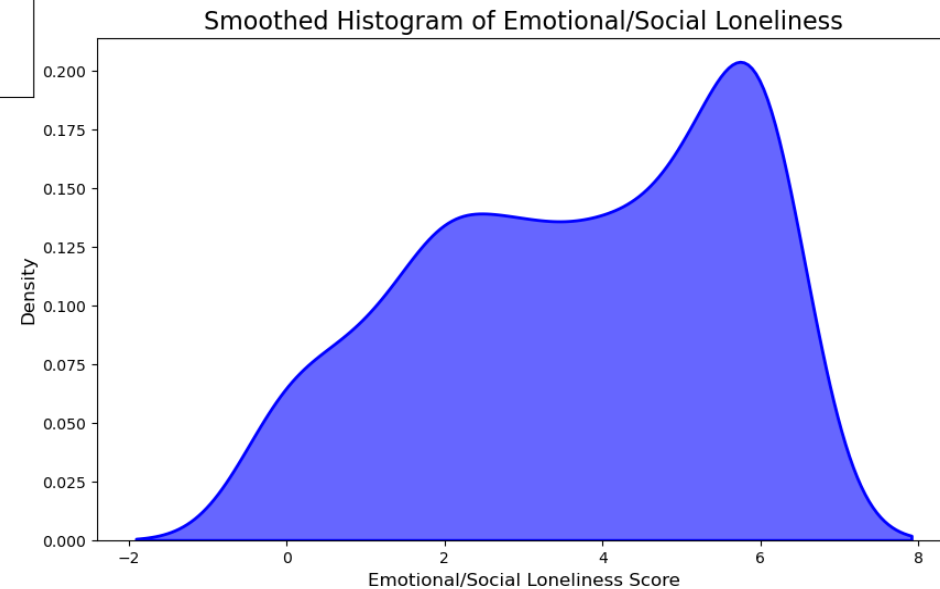

Distribution of Social Phobia Scores

o **Social Phobic or Not?**

• Categorized as Yes or No

• PSYCH_social_phobia_scale_score_y_n

o **Emotional/Social Loneliness?**

• Numerically Scored

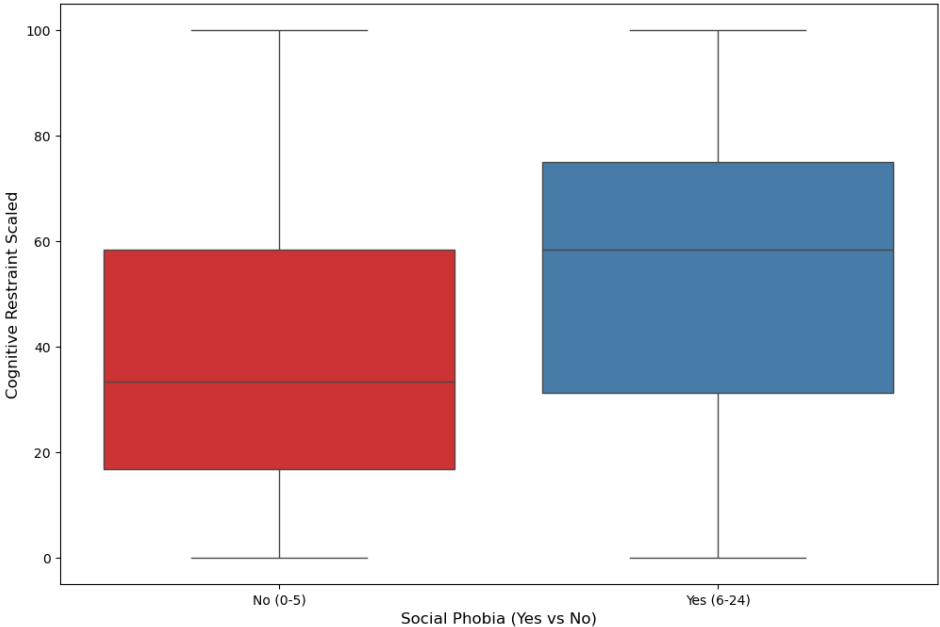• LONELY_dejong_emotional_social_loneliness_scale_score

Smoothed Histogram of Emotional/Social Loneliness

Emotional Eating Tendency Linear Regression analysis

	coef	std err	t	P>|t|
Intercept	53.6905	13.084	4.104	0.000
C(PSYCH_social_interactions_anxiety_scale_score_y_n)[T.Yes (7-24)]	-11.4764	6.031	-1.903	0.058
C(PSYCH_social_phobia_scale_score_y_n)[T.Yes (6-24)]	13.8719	6.414	2.163	0.032
NUTRITION_cooking_and_food_provisioning_action_scale_structure_score	-3.3405	1.212	-2.756	0.006
PSYCH_social_phobia_scale_score	-1.1341	0.615	-1.843	0.067
PSYCH_big_five_inventory_conscientious_score	-0.7421	0.258	-2.874	0.004
LONELY_dejong_emotional_social_loneliness_scale_score	2.6614	0.972	2.739	0.007
PSYCH_big_five_inventory_neurotic_score	0.8848	0.290	3.048	0.003
PSYCH_social_interactions_anxiety_scale_score	0.6179	0.612	1.009	0.314

- Lonelier people are more prone to emotional eating.

- Being more Neurotic also increases Emotional Eating.

- Being more Conscientious Reduces Emotional Eating.

- **But the Most Impactful of all?** Being Social Phobic. Almost **14** points increase on average!

Uncontrolled Eating Tendency Linear Regression analysis

|	coef	std err	t	P>|t|
Intercept	79.2806	9.531	8.319	0.000
NUTRITION_cooking_and_food_provisioning_action_scale_structure_score	-3.3428	0.821	-4.074	0.000
LONELY_dejong_emotional_social_loneliness_scale_score	1.9558	0.575	3.403	0.001
PSYCH_big_five_inventory_conscientious_score	-0.7565	0.170	-4.451	0.000
PSYCH_big_five_inventory_open_score	-0.3130	0.164	-1.906	0.058

- It's easier for Lonelier people to binge eat.
- But being more Conscientious reduces binge eating.

Cognitive Restraint Tendency Linear Regression analysis

	coef	std err	t	P>|t|
Intercept	28.4759	9.846	2.892	0.004
C(PSYCH_social_phobia_scale_score_y_n)[T.Yes (6-24)]	-10.3870	3.310	-3.138	0.002
HEALTH_hampson_good_health_practices_scale_score	9.3287	2.392	3.900	0.000
NUTRITION_cooking_and_food_provisioning_action_scale_attitude_score	-3.3419	1.140	-2.932	0.004
LONELY_dejong_emotional_loneliness_sub_scale_score	2.7543	1.263	2.181	0.030

- Lonelier people are also more prone to restrictive eating.

- **PLOT TWIST**: Social Phobic People are **much less likely** to control their eating??
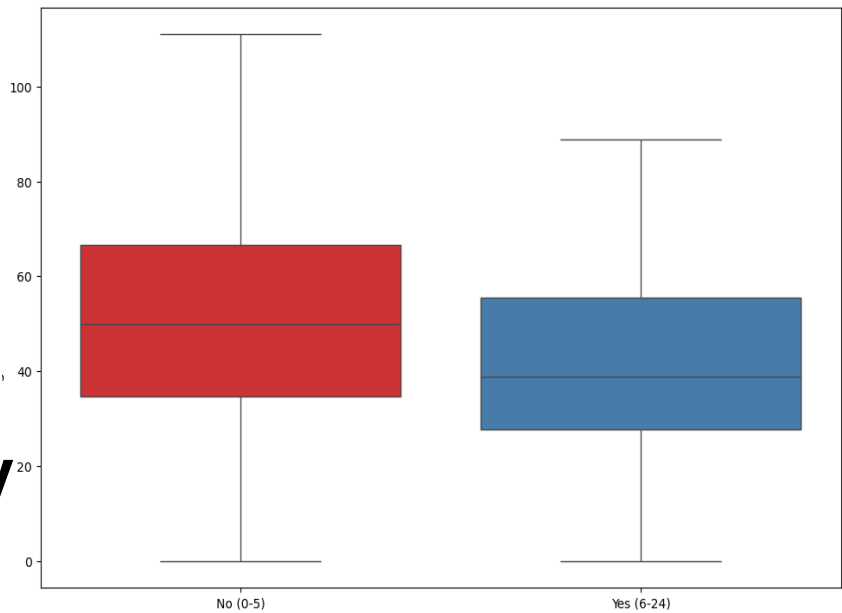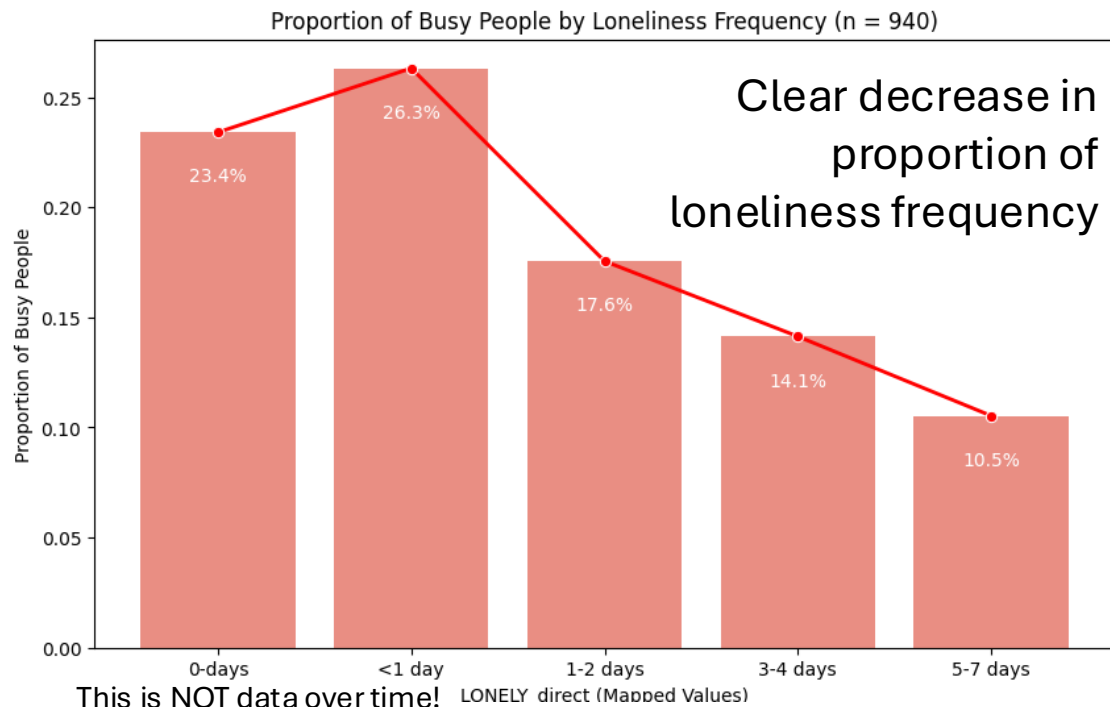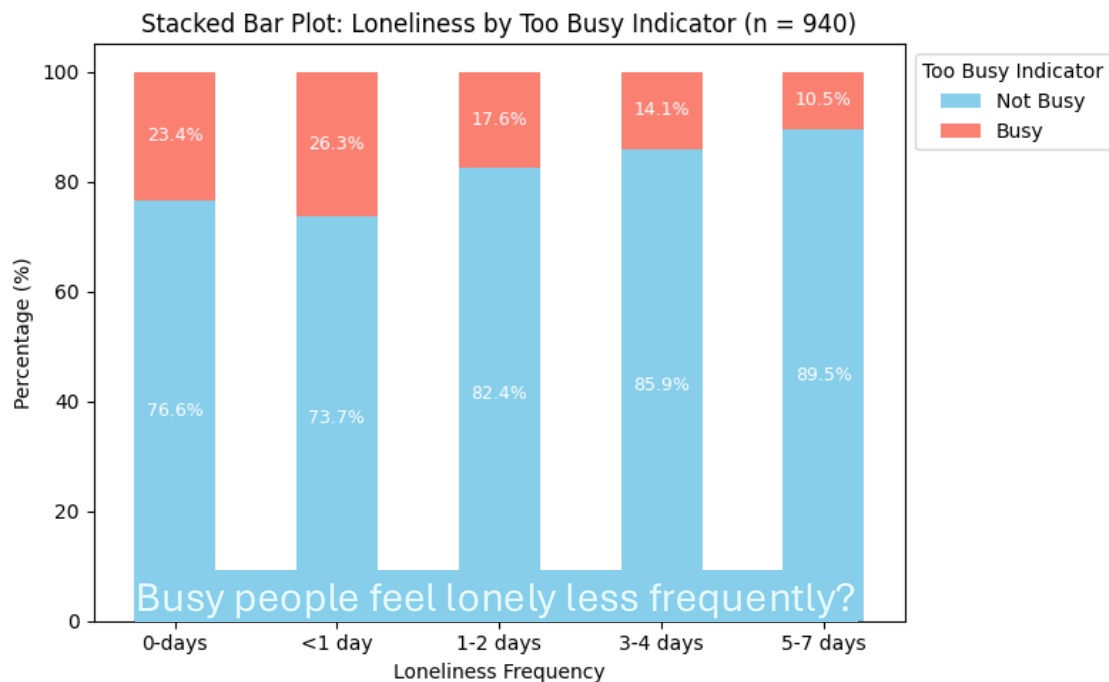
Findings & Explanations

- Loneliness contributes to all three factors.
  - Less social connections leads to unhealthy relationship with food in general

- Social Phobic indivduals are much are less likely to restrict eating, much more prone to emotional eating.
  - Less enagaged in social situations --> less desire to regulate body shape --> less control over eating
  - Being alone more often -->A setting that promotes emotional eating

- Being more Conscientious Reduces Emotional Eating AND Binge eating.
  - Hardworking and Responsible --> Healthier, More positive mindset

Limitations

- All other personalitility traits: NULL Finding

  - Relationship more complictaed

  - Other factors need to be investigated

Stacked Bar Plot: Loneliness by Too Busy Indicator (n = 940)

Too Busy Indicator
- Not Busy
- Busy

Loneliness Frequency	Busy	Not Busy
0-days	23.4%	76.6%
<1 day	26.3%	73.7%
1-2 days	17.6%	82.4%
3-4 days	14.1%	85.9%
5-7 days	10.5%	89.5%

Busy people feel lonely less frequently?

Proportion of Busy People by Loneliness Frequency (n = 940)

	0-days	<1 day	1-2 days	3-4 days	5-7 days
Proportion	23.4%	26.3%	17.6%	14.1%	10.5%

Clear decrease in proportion of loneliness frequency

This is NOT data over time!

Does perceived busyness have a negative effect on perceived loneliness?

How do we measure and compare busyness to loneliness?

- Use direct responses to how often they feel lonely

- Compare against those who answered they are "too busy" as a perceived barrier to social connection

Performing a Chi-squared test results in strong correlation:

- Chi-square statistic (x^2): 16.77
- Degrees of freedom (df): 4
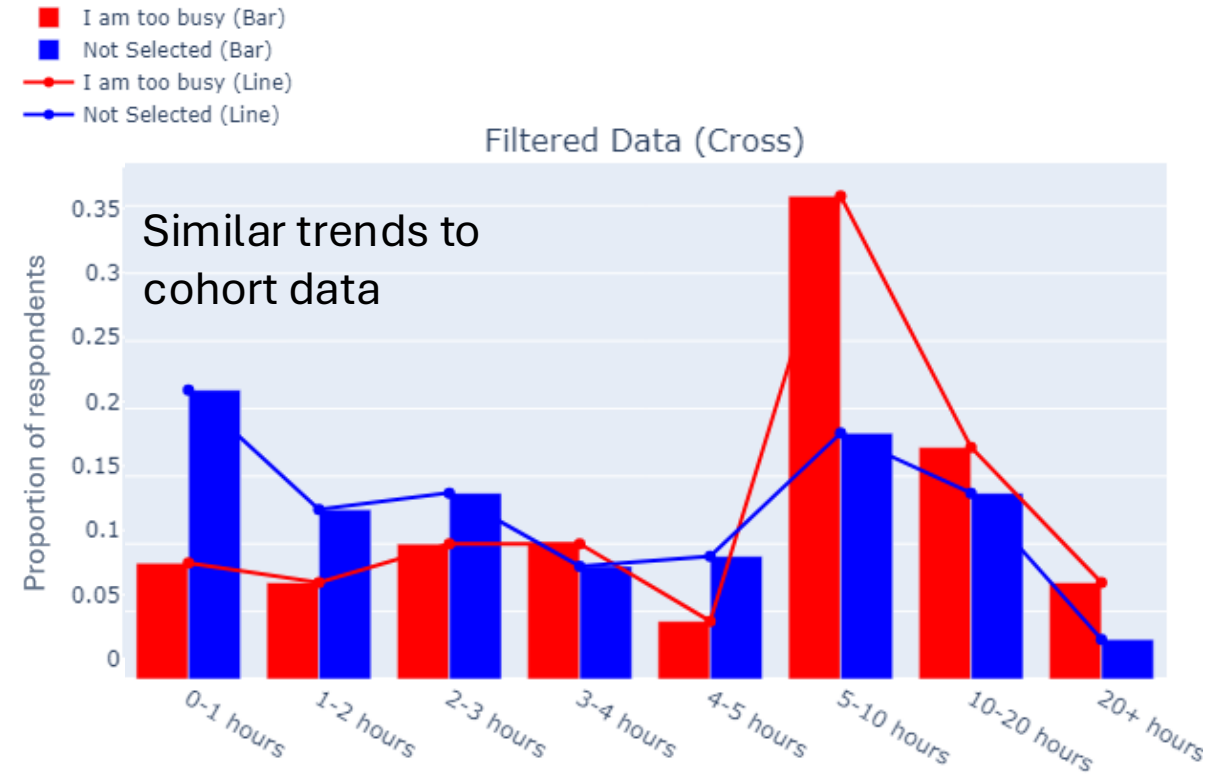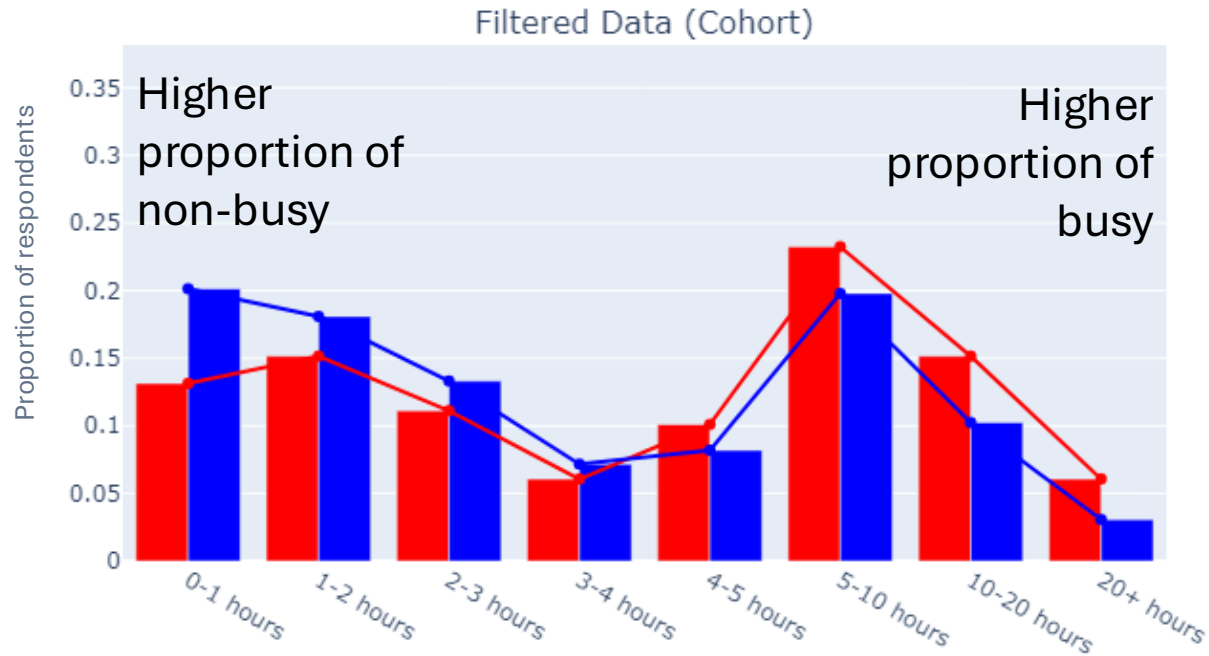- P-value: 0.0021 (Statistically significant!)

With ordinal regression, we get the same results:

Ordered model (lonely freq ~ busy/not busy)

LONELY FREQ	COEF	STD ERR	Z	P>|Z|
0 days	-0.5207	0.145	-3.601	0.000
< 1 day	-1.5076	0.089	-16.932	0.000
1 - 2 days	0.2224	0.058	3.821	0.000
3 - 4 days	0.1169	0.058	2.022	0.043
5 - 7 days	0.3907	0.072	5.420	0.000

Low p-values indicate evidence against random chance!

Comparison of Time Spent Socializing: Cohort vs Cross

Legend: I am too busy (Bar), Not Selected (Bar), I am too busy (Line), Not Selected (Line)

Filtered Data (Cohort): Higher proportion of non-busy; Higher proportion of busy

Filtered Data (Cross): Similar trends to cohort data

Surprising or not? People who view being busy as a social barrier are less lonely

Does this hold trend hold for socialization time?

Let's take a closer look at how many hours per week busy and non busy people spend socializing with their friends.
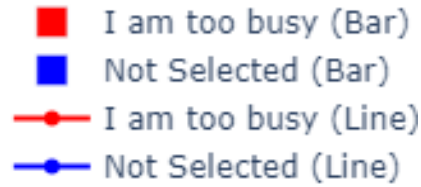
Comparing reported time spent socializing, busy people also get more socialization time.

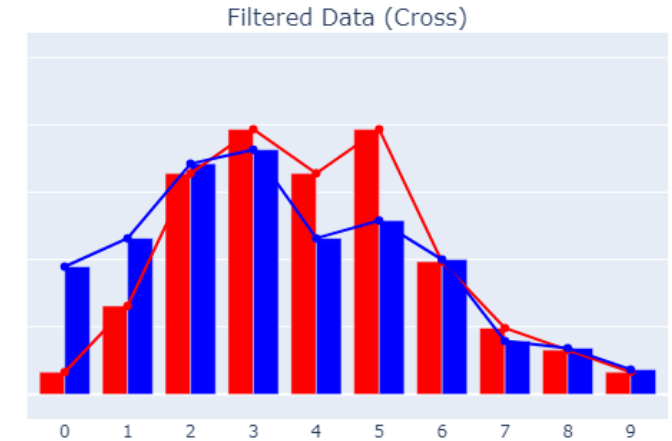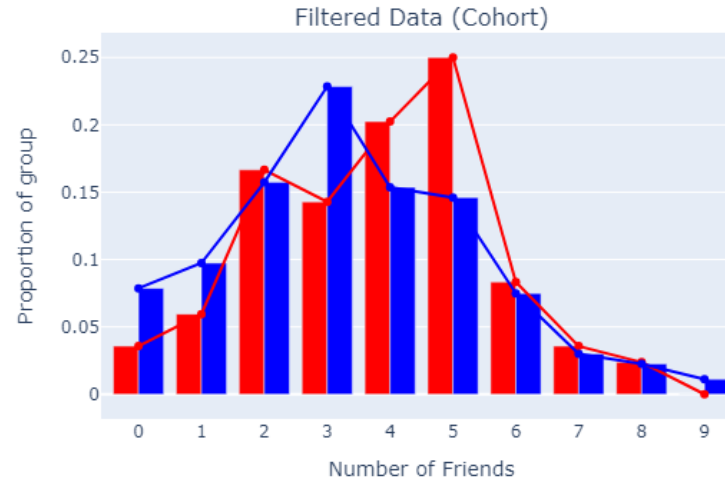Is there a reason as to why they are getting "more" connection despite identifying busyness as a barrier?

Are there other factors?

Well yes.
It turns out, busy people are busy for a reason.

Potentially, feeling too busy is synonymous with having more social responsibility.
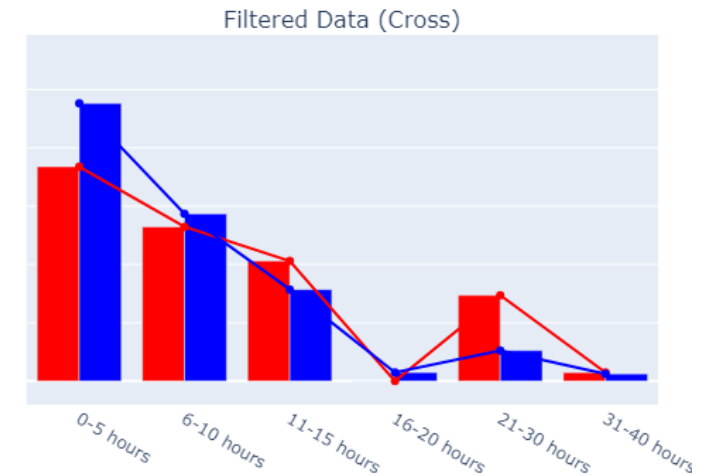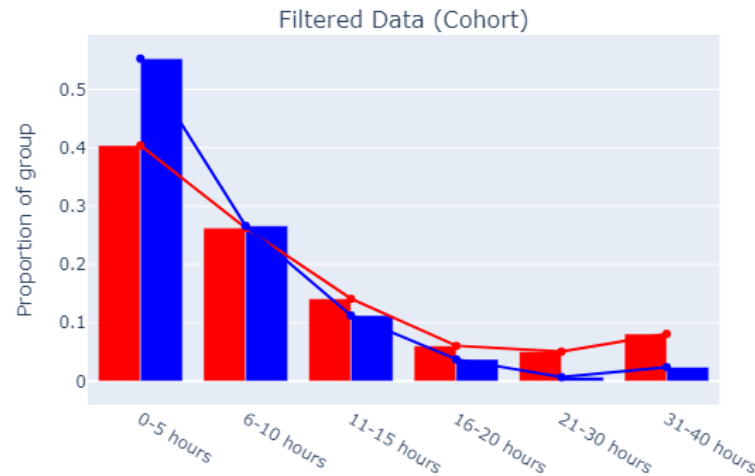
Those who identified busyness as a barrier to social connection, on average, are more ambitious with their preferred socialization time despite having, on average, a higher number of close friends.

So, do busy people fulfill their social needs?

Not quite... They simply have a greater social need to fulfil.

Changing the metric to consider difference between preferred and actual social time, we see busy people experience no difference.

Combined Proportional Distribution of the Gap Between Preferred and Actual Social Time

Busy group has more spread-out data, indicating higher variability, but similar mean and distribution

Legend:
- Non-busy (n = 639)
- Average (n = 2653)
- Busy (n = 154)

X-axis: Time gap in hours (Preferred - Actual)
Y-axis: Proportion of people
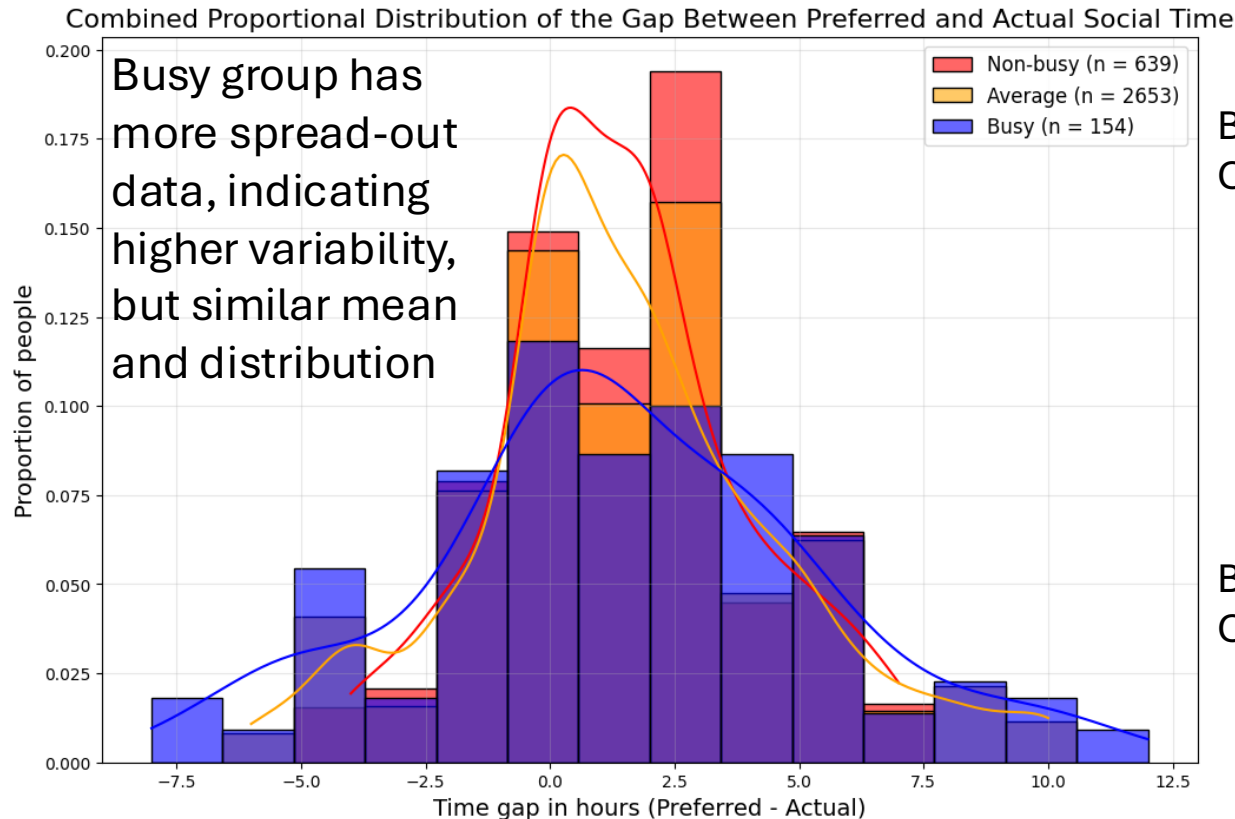
OLS Regression Results (Social time ~ Busy/Not busy)

INDICATOR	COEF	STD ERR	T	P>|T|	[0.025	0.975]
Busy	6.3605	0.464	13.697	0.000	5.449	7.272
Not busy	-1.8488	0.516	-3.580	0.000	-2.863	-0.8335

Baseline:
Change:

Significant evidence

People who identify busyness as a barrier to social connection do not experience a significant difference in social fulfilment but DO experience more social time.

OLS Regression Results (Gap time ~ Busy/Not busy)

INDICATOR	COEF	STD ERR	T	P>|T|	[0.025	0.975]
Not busy	2.3050	0.398	5.788	0.000	1.524	3.086
Busy	0.1726	0.470	0.367	0.714	-0.750	1.095

Baseline:
Change:

No significant evidence

So then, what ARE the barriers to social connection?
What actually changes this time gap?

Reported barriers to social connection sorted by P-Value (Scientific Notation)

Correlation between "gap" in preferred socialization time and listed barriers

Statistically significant barriers! Most likely not by random chance.

Variable	P-Value	Coefficient
CONNECTION_social_barriers_shy	0.024	1.043e+00
CONNECTION_social_barriers_alienated	0.039	9.336e-01
CONNECTION_social_barriers_nervous	0.047	8.941e-01
CONNECTION_social_barriers_no_people	0.087	8.014e-01
CONNECTION_social_barriers_no_invitations	0.100	7.607e-01
CONNECTION_social_barriers_too_stressed	0.108	7.400e-01
CONNECTION_social_barriers_nothing_to_do	0.124	6.806e-01
CONNECTION_social_barriers_small_living_space	0.147	6.567e-01
CONNECTION_social_barriers_work_too_much	0.224	5.455e-01
CONNECTION_social_barriers_too_busy	0.263	5.119e-01
CONNECTION_social_barriers_family_responsibilities	0.341	4.330e-01
CONNECTION_social_barriers_covid	0.734	-1.675e-01

Hours of change in "gap" per week

Social anxiety is the primary barrier to social connection

Obvious or not, the only statistically significant perceived barriers to social connection are those directly relating to social anxiety.

What does this mean?
Be conducive of a supportive and inclusive environment to promote positive social connection and to reduce these perceived barriers.

What does this tell us and why is it important?

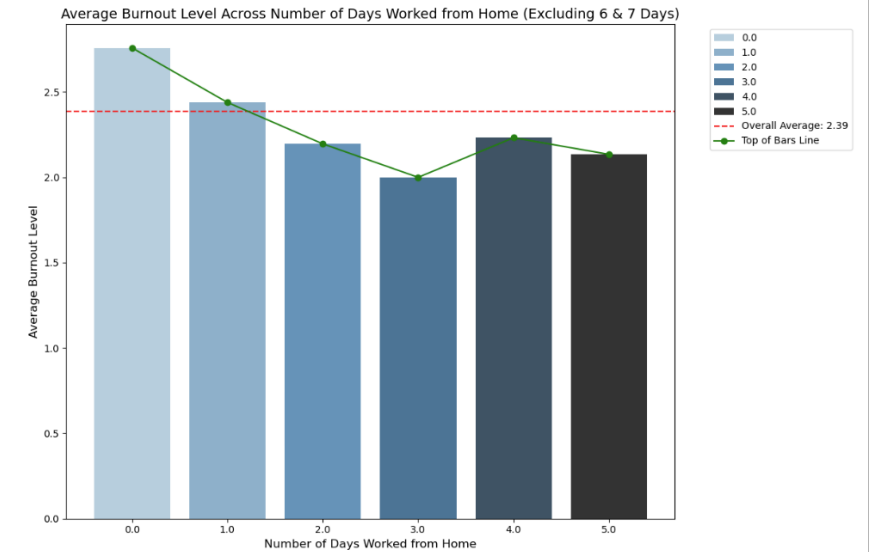|	
Loneliness is NOT the same as social fulfilment	• You can still desire more social connection despite experiencing differing feelings of loneliness
There is no evidence that perceiving being busy as a barrier to social connection affects the amount of social time one achieves	• Those who feel busy may feel less lonely due to having less time to relax • No statistical evidence for a direct effect in social fulfilment
Social anxiety is the most prevalent barrier to social connection among Canadians	• To lower barriers to social connection, promote a positive, inclusive, and inviting environment for others.

Analysis #3

Does Working From Home Impact Burnout?

Based on preliminary findings on a mapped burnout categorical variable.

- Does working from home (WFH) decrease burnout exhaustion levels?
  - Based on systematic (numeric) scores and questions sourced from the Maslach Burnout Inventory.

- What other workplace dynamics might impact exhaustion?
  - Identify factors that lead to exhaustion and interpret the practical implications.

- Can we limit exhaustion AND feel accomplished?
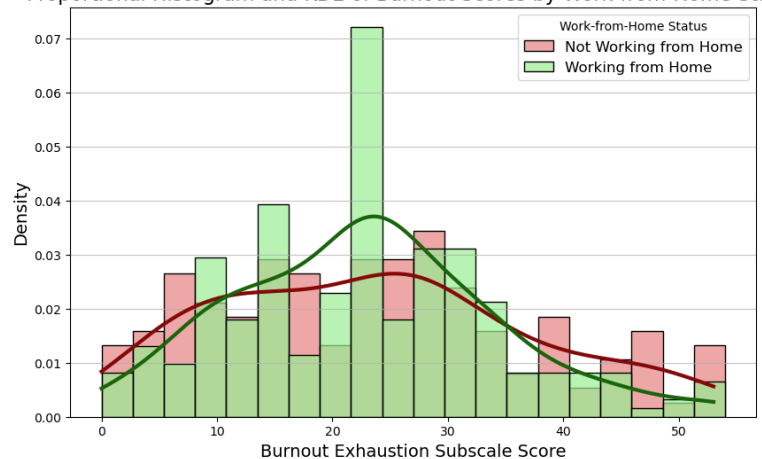 - Numeric burnout metric scores.
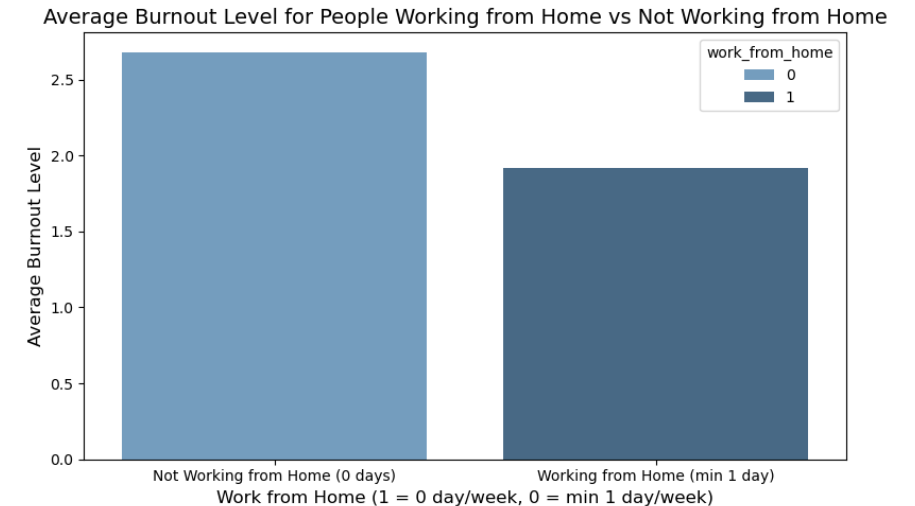
Normalized Histogram and KDE of Burnout Scores by Sleep Priority Indicator
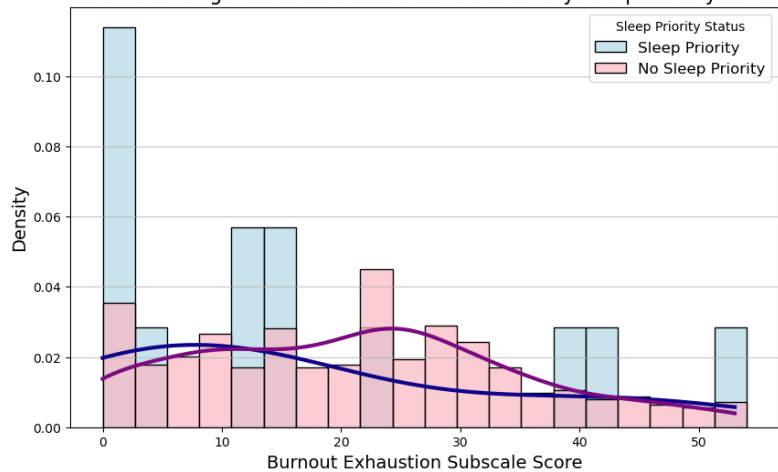
Proportional Histogram and KDE of Burnout Scores by Work-from-Home Status

Self-Prioritization & Exhaustion

- Working from home and prioritizing sleep reduce exhaustion.

- Although predictable, longer shifts lead to more exhaustion.

- Evidently, working from home and sleep are beneficial for **personal health**; but how does this fare in workplace culture?

OLS Regression Results — Outcome Variable: Exhaustion (WELLNESS_maslach_burnout_exhaustion_subscale_score)						
	coeff	std error	t	P > |t|	[0.025	0.975]
const	22.481	0.539	41.689	0.000	21.424	23.538
sleep_priority_indicator	-1.2646	0.455	-2.781	0.005	-2.156	-0.373
work_from_home_indicator	-2.104	0.331	-6.356	0.000	-2.752	-1.455
WORK_shift_length	0.2197	0.060	3.675	0.000	0.103	0.337

*Missing data was handled by imputing medians/modes across variables.*
All data is filtered by cross-sectional responses, excluding 2023 submissions.
*Quick survey responses were filtered out.*

Work Place Dynamics — Accomplishment

- Can we prioritize personal well-being **AND** feel accomplished in the workplace?

- Inverse relationship for WFH.
  - Not working from home leads to increased accomplishment.

- Inverse relationship for sleep.
  - Not prioritizing sleep leads to a better sense of accomplishment.

- Well-being or Accomplishment?
  - **Disparity between what to prioritize!**
  - A more comparative standpoint needs to be taken to form validated inference.

Normalized Histogram and KDE of Burnout Accomplishment Scores by Sleep Priority Indicator
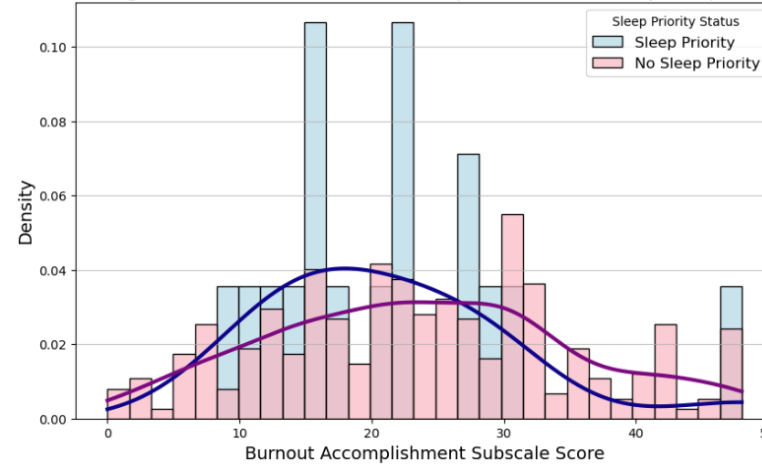
Proportional Histogram and KDE of Accomplishment Scores by Work-from-Home Status
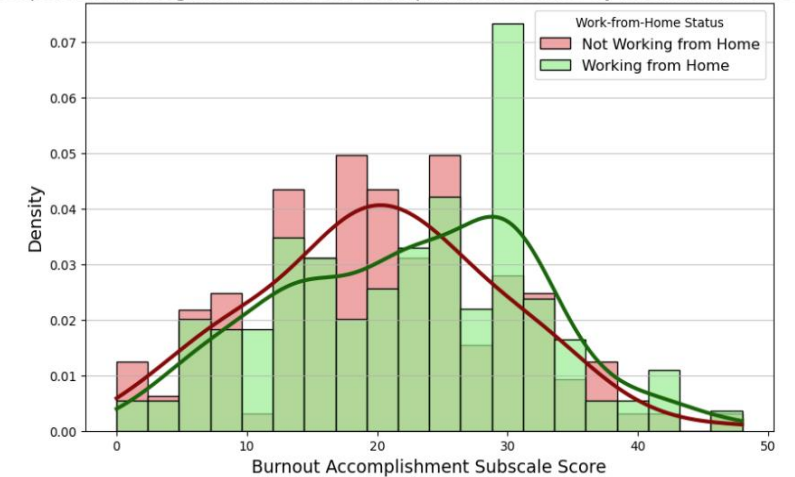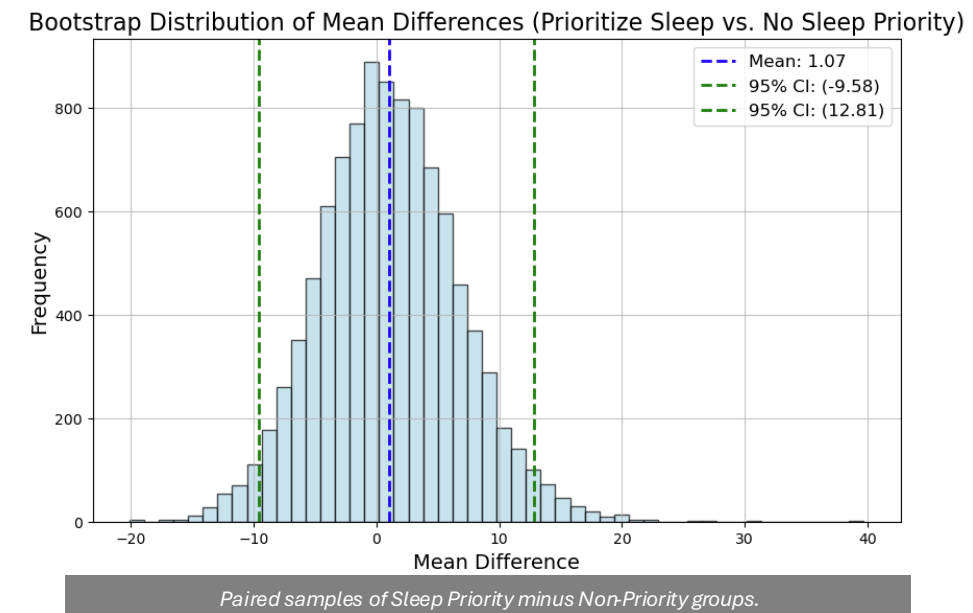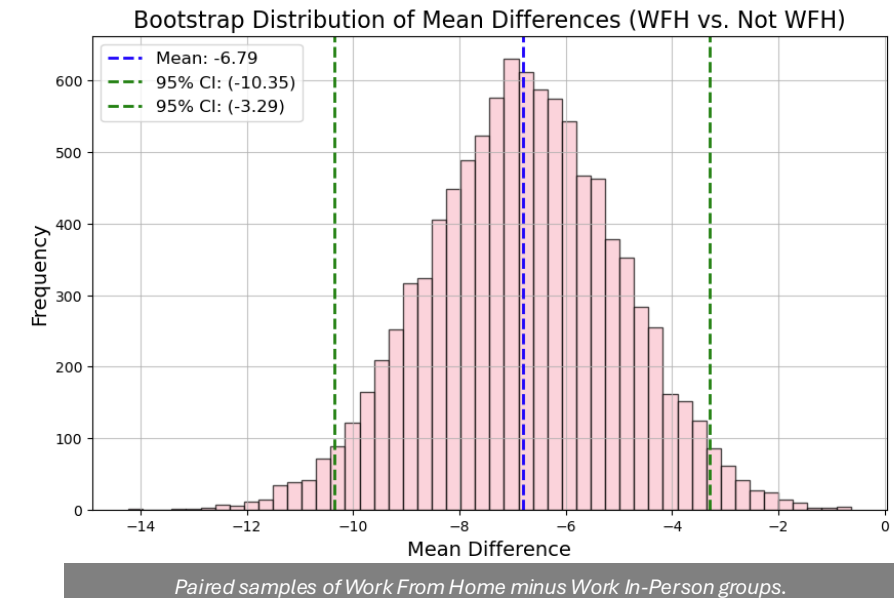
OLS Regression Results — Outcome Variable: Accomplishment (WELLNESS_maslach_burnout_accomplishment_subscale_score)						
	coeff	std error	t	P > |t|	[0.025	0.975]
const	25.415	0.369	68.827	0.000	24.691	26.139
no_sleep_priority_indicator	1.222	0.335	3.647	0.000	0.565	1.878
no_work_from_home_indicator	1.967	0.203	9.678	0.000	1.569	2.366
WORK_shift_length	-0.476	0.052	-9.247	0.000	-0.577	-0.375

Relative Comparisons: Exhaustion vs. Accomplishment

- New Metric — Accomplishment-Exhaustion Subscore:
  - Difference between Accomplishment and Exhaustion in a given observation.

- Lower Work From Home Accomplishment-Exhaustion Scores.
  - There is something more socially accomplishing about working with others that working from home lacks.

- No relative significance between sleep prioritization and Accomplishment-Exhaustion.

Distributions were split into paired samples. The mean difference refers to the difference in Accomplishment-Exhaustion subscores between groups.

Bootstrap Distribution of Mean Differences (WFH vs. Not WFH)

Mean: -6.79
95% CI: (-10.35)
95% CI: (-3.29)

Paired samples of Work From Home minus Work In-Person groups.

Bootstrap Distribution of Mean Differences (Prioritize Sleep vs. No Sleep Priority)

Mean: 1.07
95% CI: (-9.58)
95% CI: (12.81)

Paired samples of Sleep Priority minus Non-Priority groups.

Analysis #3 Conclusions

F1. Those who Work from Home (WFH) are less exhausted. → **F2. Those who don't WFH are more accomplished.** → **C. Those who don't WFH have a higher relative sense of accomplishment to exhaustion compared to those who do WFH.**

F1. Those who prioritize sleep are less exhausted. → **F2. Those who don't prioritize sleep are more accomplished.** → **C. Sleep may not be a factor in the relative Accomplishment-Exhaustion Subscore.**

Overall Limitations

Several Research Questions have large amount of missing data,

Inferred causation; true relationship might be more complicated

Some suppressor variables are required to achieve significant findings

Acknowledgements