New Paper

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Why did we start? Because chocolate. What did we do? Ate chocolate. What did we find? It's delicious. What does it all matter? It's obvious!

Keywords: heterogeneity, uncertainty, variation, multilevel model, statistics, visualization

1. Background

Let's face it. Chocolate is delicious, and it seems impossible that it might not be good for you. However, the science is unclear, at least for some outcomes.(1)

2. Methods

We recruited students who thought they were coming for training in reproducible research methods as a pre-text for eating chocolate in the morning. We measured their happiness using our established, validated index.

We calculated some descriptive statistics and ran a simple linear regression model, shown in Equation 1:

$$y_{it} = \beta_0 + \beta_1 * Treated + \beta_2 * Period + \epsilon_{it} \quad (1)$$

We also explored a model with a product term, but not because p>0.05 in the previous model. Honest.

3. Results

Descriptive statistics are shown in Table 1

Period	Treatment	Mean	SD
Pre	Control	9.9	8.1
Pre	Treated	9.8	6.9
Intervention	Control	14.8	6.9
Intervention	Treated	17.7	7.4
Post	Control	20.2	7
Post	Treated	25.3	7.3

Estimates from the regression analysis are shown in Table 2. Regression results clearly show that chocolate increases happiness. We can see that the overall happiness index

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for the chocolate group was 4.67 units higher in the post period relative to the change over the same period in the control group [95% CI: 3.66, 5.68].

	(1)	(2)
(Intercept)	8.523	9.888
	(0.380)	(0.461)
treatedTreated	2.620	-0.110
	(0.380)	(0.652)
periodIntervention	6.433	4.940
	(0.466)	(0.652)
periodPost	12.919	10.317
	(0.466)	(0.652)
treatedTreated × periodIntervention		2.986
		(0.922)
treatedTreated × periodPost		5.205
		(0.922)
Num.Obs.	1500	1500
R2	0.353	0.367
R2 Adj.	0.352	0.365
AIC	10251.4	10223.5
BIC	10277.9	10260.7
Log.Lik.	-5120.692	-5104.743
RMSE	7.35	7.27

Regression results clearly show that chocolate increases happiness, but if you aren't convinced please see Figure 1.

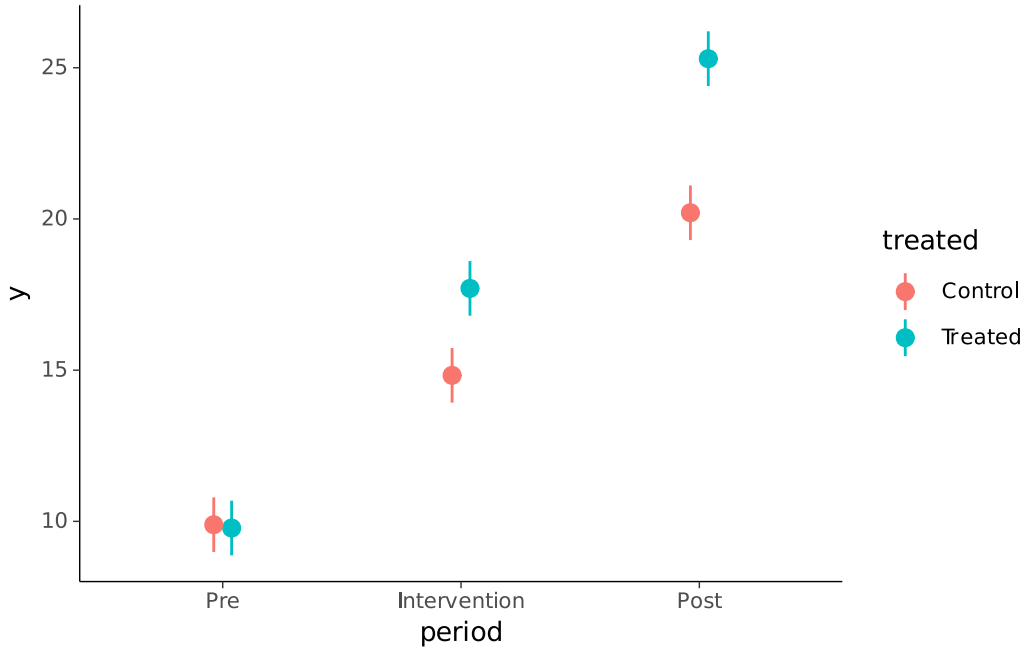

Figure 1: Predicted happiness index from interaction model.

4. Discussion

We think this is convincing. But it may not matter for policy since another randomized trial showed that many participants switched groups mid-study because of their personal chocolate preferences.(2)

5. References

1. Chan K. A clinical trial gone awry: The Chocolate Happiness Undergoing More Pleasantness (CHUMP) study. Canadian Medical Association Journal [Internet]. 2007 Dec 4 [cited 2024 Nov 8];177(12):1539–41. Available from: http://www.cmaj.ca/cgi/doi/10.1503/cmaj.071161

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1. Chan K. A clinical trial gone awry: The Chocolate Happiness Undergoing More Pleasantness (CHUMP) study. Canadian Medical Association Journal [Internet]. 2007 Dec 4 [cited 2024 Nov 8];177(12):1539–41. Available from: http://www.cmaj.ca/cgi/doi/10.1503/cmaj.071161

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