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Does Daylight Savings Time Lead to More Time Exercising?

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Does Daylight Saving Time Lead to More Time Exercising

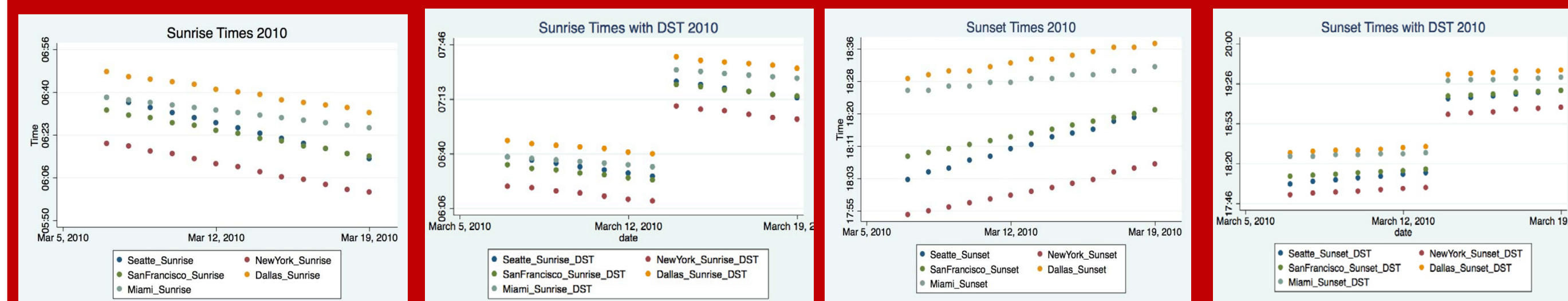
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Background

- The federal Physical Activity Guidelines recommends that adults engage in at least 150 min/week of moderate-intensity or 75 min/week of vigorous-intensity aerobic physical activity, and muscle strengthening activities at least twice a week
- In the 2011 only 20 percent of adult Americans successfully met both of these guidelines, and over 50 percent met neither (NCHS 2012).
- Hundreds of private and public organizations including the CDC and the AMA have come together to promote policy ideas that would improve American's exercising habits
 - increasing funding for parks and sports programs
 - Requiring that roadway spending include money for accommodating bikes and pedestrians
- However, many of the policies proposed have the potential to be very costly and critics question how effective they will ultimately be at increasing physical activity
- Many studies have investigated correlates of adult and child physical activity, finding that individuals in the south spend more time exercising than their northern counterparts, and that more Americans workout in the evening than in the morning.

Daylight Savings Time

- Daylight Savings Time (DST) is a common energy conservation policy that pushes the clock forward by 1 hour in the spring and back by one hour in the fall.
 - In the spring, the sun to rise and set 1 hour later - late afternoons and evenings are warmer and brighter



Objectives

- Investigate how DST impacts the amount of time individuals spend doing aerobic physical activities (APAs).

Methods

Regression Discontinuity Design (RDD)

- Because seasonal variation in temperature, daylight, recreation, and work may confound the effect of DST on exercise, I employ a RDD

$$Y_i = \alpha_i + \tau \cdot D_i + \beta_1 \cdot z_i + \beta_2 \cdot D_i \cdot z_i + \gamma \cdot X_i + e_i$$

- Yi represents the minutes of time spent in APAs
- zi measures the days from the DST transition
- Xi is a matrix of demographic, household, and weather covariates
- RDD equations over a range of 5 days (excluding weekends) on each side of the DST transition

Difference and Difference (DID)

- We can also estimate how DST affects APAs by taking advantage of the policy change that occurred after 2006::

$$Y_i = \beta_0 + \beta_1 W_{2i} + \beta_2 T_i + \beta_3 W_{2i} T_i + \gamma X_i + e_i$$

- Y is the number of minutes spent in APAs
- W2 is a dummy variable for the week after the DST transition and measures factors that may cause changes in Y even in the absence of the DST
- T is a dummy variable for the treatment group
- Xi is a matrix of other covariates identical

Results and Discussion

RDD

Table 3. RDD Results: Spring DST Transition

Variables	(1)	(2)
	Total APAs	APAs 4pm8pm
DST	15.141* (8.047)	13.454* (7.562)
Observations	956	956
R ²	0.070	0.060

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4. RDD Results: Fall DST Transition

Variables	(1)	(2)
	Total APAs	APAs 4pm8pm
DST	12.392 (42.367)	-1.914 (39.837)
Observations	956	956
R ²	0.068	0.057

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

- As a result of the spring transition to DST, the average adult spends 15 more minutes in APAs.
- There is not a significant change in APAs after the fall transition off of DST.

DID

Table 5. Logit DID Results: Spring DST Transition

Variables	(1)	(2)
	Total APAs	APAs 4pm8pm
Week 2	-0.587 (0.394) [0.024]	-0.433 (0.394) [0.032]
Treatment	-0.640* (0.347) [0.029]	-0.644* (0.353) [0.052]
Week 2*Treatment	0.827* (0.489) [0.037]	0.724 (0.491) [0.058]
Observations	606	606

Standard errors in parentheses
Marginal effects (dy/dx where y = p(VOA)) in brackets

Table 6. Logit DID Results: Fall DST Transition

Variables	(1)	(2)
	Total APAs	APAs 4pm8pm
Week 1	0.737 (0.468) [0.063]	0.737 (0.466) [0.095]
Treatment	-0.039 (0.269) [0.003]	-0.099 (0.272) [0.011]
Week 1*Treatment	-0.909 (0.643) [0.045]	-0.827 (0.641) [0.068]
Observations	606	606

Standard errors in parentheses
Marginal effects (dy/dx where y = p(VOA)) in brackets

- As a result of the spring transition to DST, the average adult 4 percent more likely to participate in APAs
- There is not a significant change in the probability of APAs as a result of the fall transition off of DST.