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S371

Final Report

Characteristics of the sample:

Our survey had a response rate of about 20% (N=282 of about 1400 invitations sent). The sample seems to be representative of the IUB population in terms of credit hours (mean of 15.2 in sample, 14.6 in the population), residency (65.4% in-state in the sample, 63.4% in-state in the population) and mostly age. Though the mean age of the sample is close to the mean age of the population (20.3 years and 20.6 years respectively), there is an over-representation in the sample of respondents less than 20 years of age (46% in the sample vs 34.3% in the population). There is also some response bias caused by over and under-representation in the different Colleges. The University Division, Kelley, and HPER students are under-represented in the sample, while the COAS, SPEA and Others are over-represented. Males are also under-represented in the sample, and females are over-represented. There is also some racial bias that may be caused by category mismatch In the population information, there is no "multi-racial" option, though there is in IUSES. African-Americans, Hispanics and Foreign/international student are under-represented in the sample. Finally, students with loans are over-represented in the sample (about 48% in the sample compared to 37% in the population). Overall, though, it doesn't appear as though many of the biases are so skewed as to make the data unusable. The biggest gap is that between students holding loans, which is about a 10% difference from the population.

Univariate inferential statistics:

acts_12m_9: "During the past 12 months, how often have you done each of the following activities? Never, sometimes, often, or very often? (Recycled cans, bottles, or paper products)"
z=1.96
P=.25 (combined "Never" and "Sometimes" categories from the above variable into a dummy variable).
estimated SE=$\sqrt{(.25\times.75)\div 295}=.0252$

$$\Pi=.25\pm 1.96(.0252)=.25\pm.0493$$

$$.20\leq\Pi\leq.299$$

We can say with 95% confidence that between about 20% and 30% of IUB undergraduates recycled infrequently ("Sometimes") or not at all ("Never") in the past 12 months.

Variables (bivariate inferential):

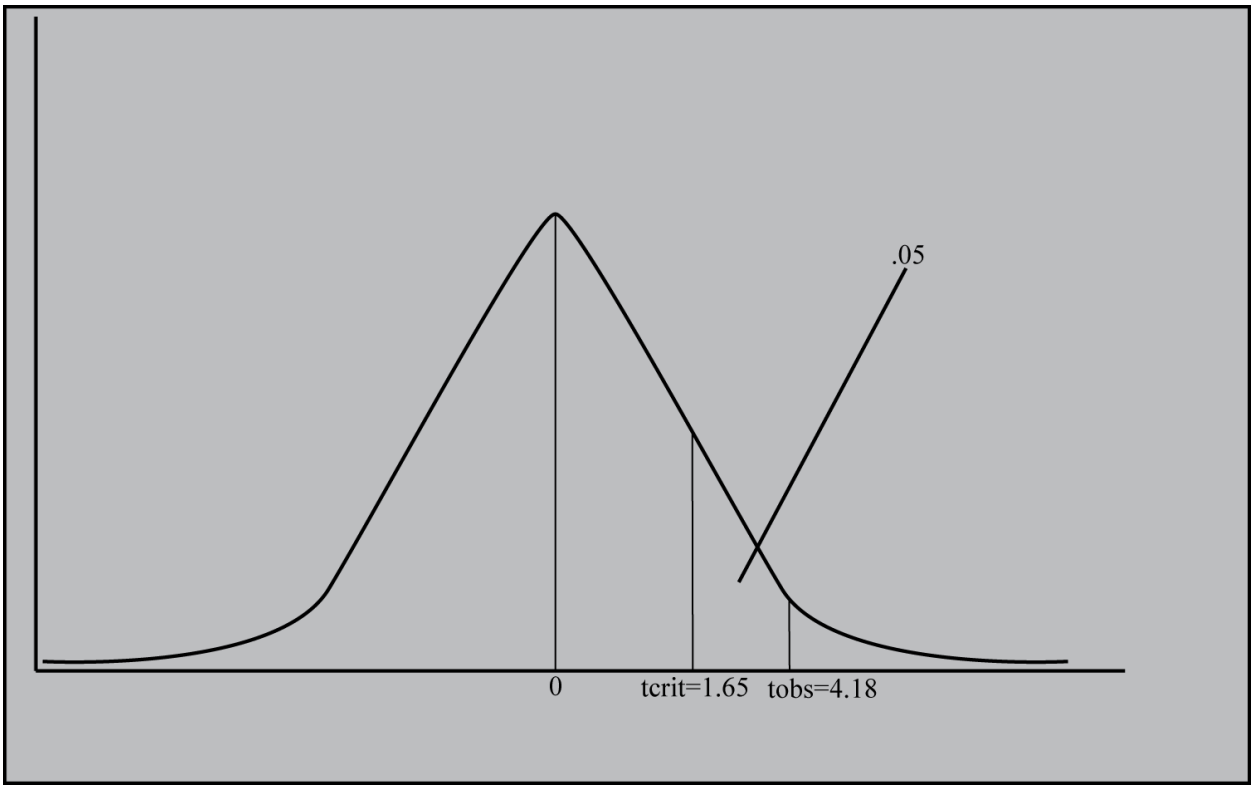
Our dependent variable is current recycling habits (acts_12m_9: "During the past 12 months, how often have you done each of the following activities? Never, sometimes, often, or very often?"). Since it is qualitative we created a dummy variable coding the choice "Never" as 0 and the choices "Sometimes", "Often", and "Very Often" as 1.

Our independent variable is childhood recycling habits (fam_act_1: "When you were growing up, how often did your family do the things listed below--never, sometimes, often, or very often?"). We created a dummy variable and coded "Never" and "Sometimes" as 0 and "Often" and "Very Often" as 1.

We believe that students with more exposure to recycling may already be in the habit of recycling and do it more often than those who did not grow up recycling. We can't imagine that respondents who grew up in families that recycled would recycle less than students who did not, so we have a strong expectation that the relationship will be in one direction.

Analysis:

Hypothesis Test: H_a: $\beta>0$, H_0: $\beta\leq 0$
We're using the t-distribution since we don't know $\sigma\varepsilon$ and the sampling distribution of sample slopes since we're dealing with β.
$t_{crit}=1.65$
$t_{obs}=4.18$



We must reject H_0, since t_{obs} falls within the critical region.
p=.001

We find support for our claim that students with more exposure to recycling habits while growing up, recycled more often in the last 12 months than those who did not recycle while growing up. It's unlikely that the slope we observed (b=1.4) was due just to chance. In fact, there's less than a 1% chance that this slope is due to chance variation. So at the .05 level of significance, there is a statistically significant association between the an IUB student's exposure to recycling as a child and their current recycling habits in the last year.

We found a positive slope, meaning that IUB students who grew up in households that recycled "Often" or "Very Often" are more likely to have recycled "Often" or "Very Often" in the last 12 months.

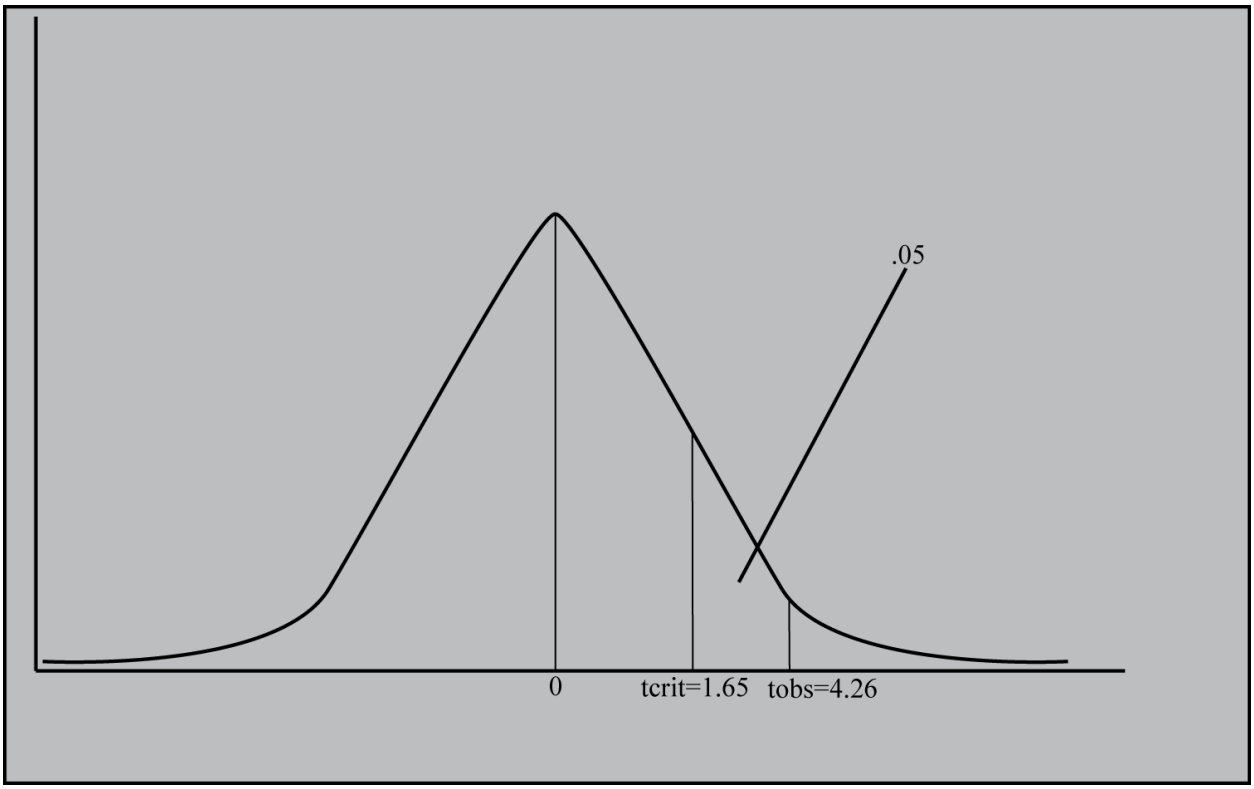
About 6% of the total variation of recycling during the last 12 months can be accounted for by the frequency students' families recycled during their childhood.

Perhaps this is because being exposed as a child to the benefits of recycling has an everlasting effect on future recycling habits, increasing the chances that one will recycle as an adult.

Multivariate inferential:

In our multivariate analysis we're controlling for whether or not a student has access to recycling of bottles or cans where they live. Our assumption is that, for students with access to recycling where they live, the practice will be easier, and so they will be more likely to recycle bottles or cans. Regardless, we still feel that this association will not negate the original association between childhood exposure to recycling and current recycling habits. Here we hope to test for a net effect of childhood exposure to recycling. We recoded the variable cbrecy into a dummy variable, using "No" or "Don't Know" as the reference category (since we thought both answers would lead to a likelihood of not recycling) and "Yes" as the 1 category.

Hypothesis test for x_2
H_a: $\beta_2 > 0$, H_0: $\beta_2 \leq 0$
t_{crit}: 1.65
t_{obs}: 4.26



We must reject H_0, since t_{obs} falls within the critical region.
p=.001

Our results support the new claim that students with access to recycling (bottles and cans), are more likely to recycle these items. It's unlikely that the slope we found

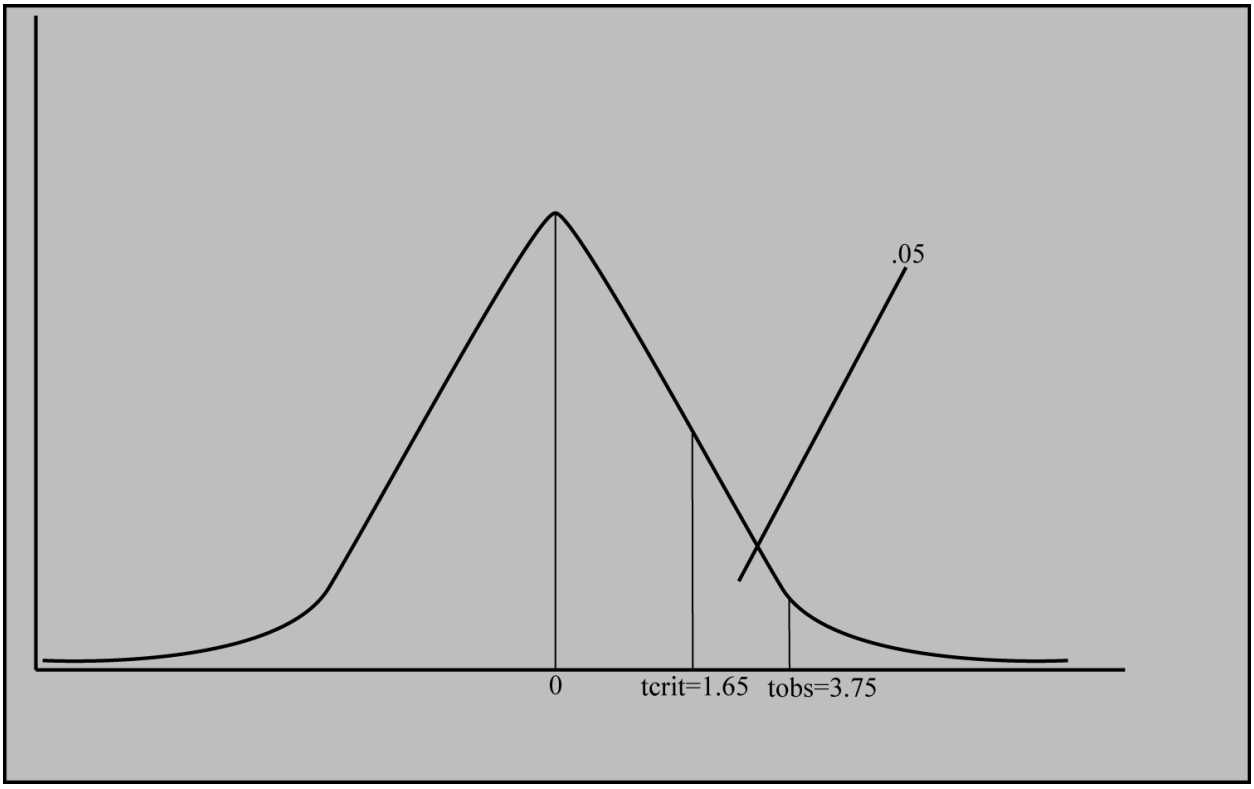
(b_2=1.253) was due just to chance. In fact, there's less than a 1% chance that this slope is due to chance variation.

So at the .05 level of significance, controlling for ones childhood recycling habits, there is still a statistically significant association between the IUB students access to recycling and their recycling habits.

We found a positive slope, meaning that IUB students with access to recycling where they live are more likely to have recycled at all in the past twelve months.

This is perhaps because students with access to recycling where they live do it more simply because it's there and easier than going to a local facility.

Hypothesis retest for x_1:
H_a: $\beta_1>0$, H_0: $\beta\leq 0$
t_{crit}: 1.65
t_{obs}:3.75



We must reject H_0 since t_{obs} is in the critical region
p=.001

The positive slope we found indicates that for students, growing up in households that recycled "Often" or "Very Often" was associated with an increase in recycling at all in the last 12 months.There is enough evidence to support our original claim that childhood exposure to recycling affects current recycling habits of IUB students. It is

unlikely that the slope we observed (b_1=1.355) was due just to chance. In fact, there is less than a 1% chance that the slope is the result of chance variation.

So, controlling for whether or not students have access to recycling where they live, there is still a statistically significant association between IUB students' childhood exposure to recycling and whether or not they recycled in the last 12 months.

Overall:

Both of our claims turned out to be correct. There is a statistically significant association between IUB students' access to recycling where they live and the whether or not they recycle, as well as an association between growing up in households that recycled "Often" or "Very Often". Overall, we were correct in predicting that there would be a net effect of childhood exposure to recycling on current recycling habits in the IUB student population.

When we add access to recycling bottles, cans and paper products to the regression equation, the explanatory power of the model increases moderately, since r^2 increases from .059 to .112.

11.2 % of the variation across frequency of recycling during the past 12 months in the IUB population can be explained by both frequency of recycling in their family household as children and access of recycling at their place of residents.

act_12m:-Recycled cans, bottles, or paper products

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	14	4.2	4.7	4.7
	Sometimes	60	18.1	20.3	25.1
	Often	102	30.7	34.6	59.7
	Very often	119	35.8	40.3	100.0
	Total	295	88.9	100.0	
Missing	System	37	11.1		
Total		332	100.0		

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	304.384[a]	.053	.079

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	famdummy	1.126	.285	15.605	1	.000	3.082
	Constant	.442	.214	4.278	1	.039	1.556

a. Variable(s) entered on step 1: famdummy.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	285.549[a]	.112	.168

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	famdummy	1.114	.297	14.101	1	.000	3.047
	cbrecydummy	1.253	.294	18.156	1	.000	3.502
	Constant	-.228	.269	.721	1	.396	.796

a. Variable(s) entered on step 1: famdummy, cbrecydummy.