

PSC 202

SYRACUSE UNIVERSITY

INTRODUCTION TO POLITICAL ANALYSIS

EXAM REVIEW

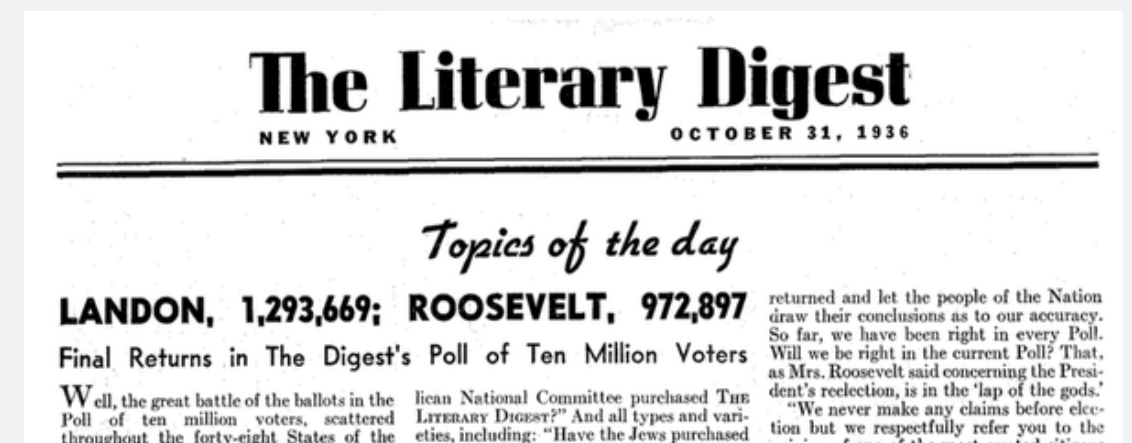
FINISHING UP EXPERIMENTS

HOUSEKEEPING

- **Friday: Problem Set 9 due**
 - **We'll drop the lowest of problem sets 1-9**
- **Monday: Exam 3**
- **Friday next week (Dec 15): Final problem set due**
 - **5% of class grade**

THIS WILL NOT BE ON THE EXAM

- When conducting a study, collection of data is important
 - Do:
 - Population/census, random sample
 - Don't:
 - Send out questionnaires
 - Hope people fill them out and submit them, while not offering any incentive for people to actually do that
 - Get low response rate and self-selected sample
 - Use the results of the self-selected sample to make important decisions



AND YET...

Student Access in EvaluationKIT

For students, completing feedback forms in EvaluationKIT is easy to do. There are multiple access points:

- Access form(s) in the Course Feedback widget on the Blackboard main page
- Log in to **coursefeedback.syr.edu** with netID and password
- Click on the EvaluationKIT link in invitation or reminder emails to login and view available feedback forms from a phone or computer
- Click the EvaluationKIT Login button below:

EvaluationKIT Login

FEEDBACK TIME

coursefeedback.syr.edu



**Response rate of 85% or
more: Extra participation
credit for class**



TODAY

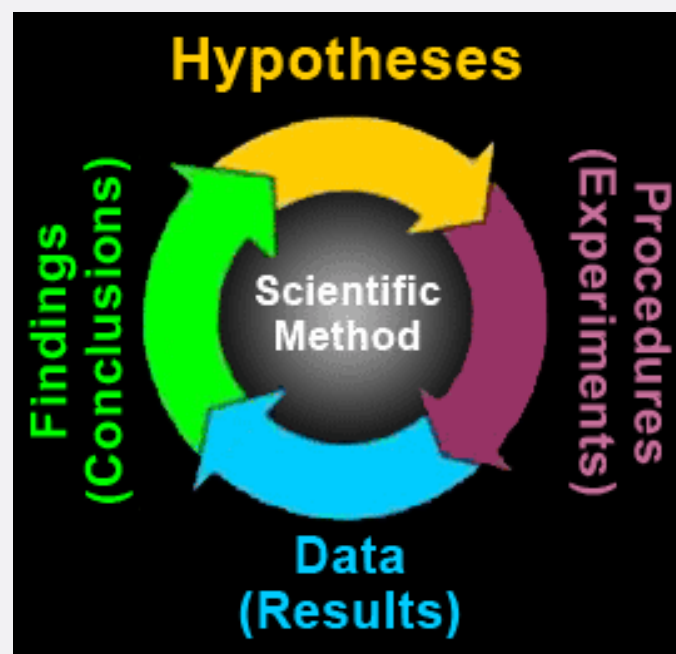
- **Big Picture Review**
- **Exam Review**
 - **Finishing up experiments**

SCIENCE

- **Science is not about what you study, but about how you study it**
 - **It's about the procedure you use to conduct testing**

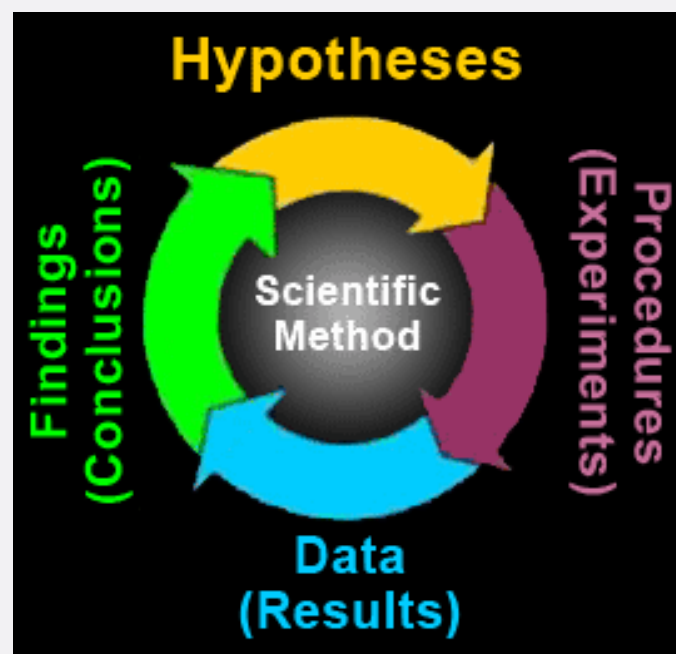
SCIENTIFIC PROCESS

- **Formulate research question**
- **Propose explanation/theory, hypotheses**
- **Data collection process**
- **Use data to evaluate hypotheses**
- **Reassess explanation**



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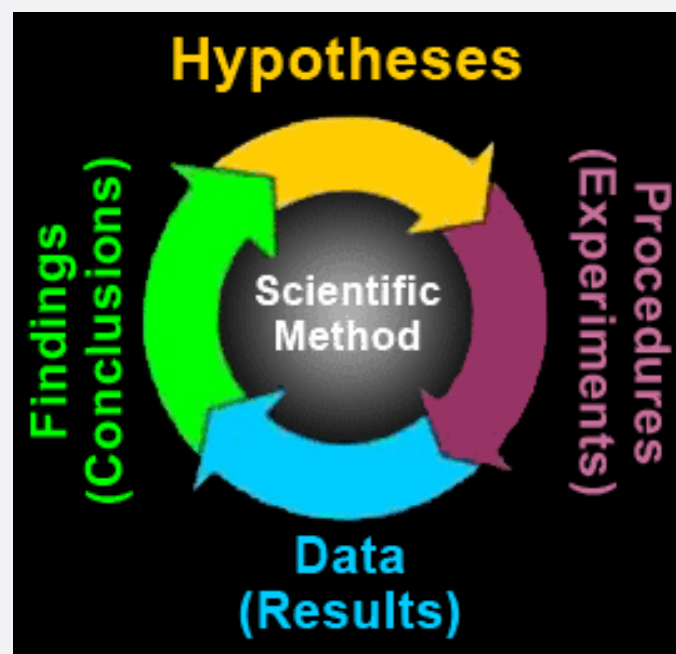


HURDLES TO CAUSALITY

- Is there a credible causal mechanism that connects X to Y ?
- Can we rule out the possibility that Y could cause X ?
- Is there covariation between X and Y ?
- Have we controlled for all confounding variables (Z) that might make the association between X and Y spurious?

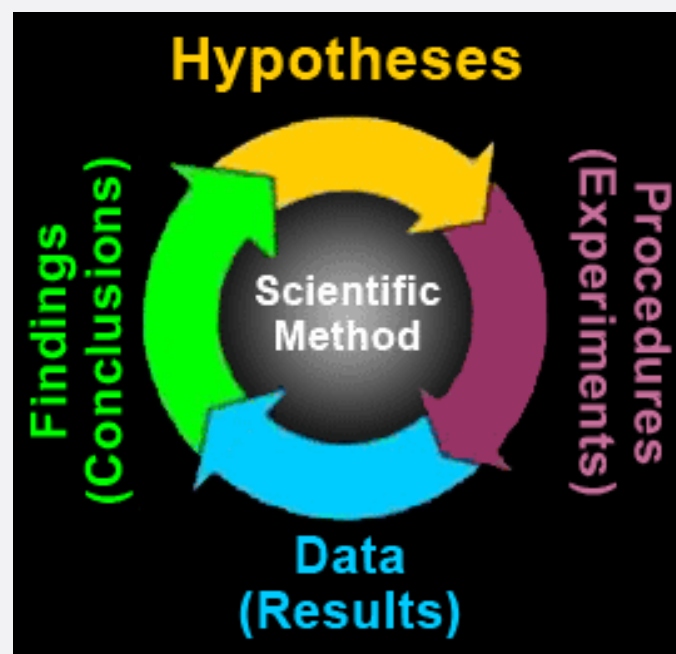
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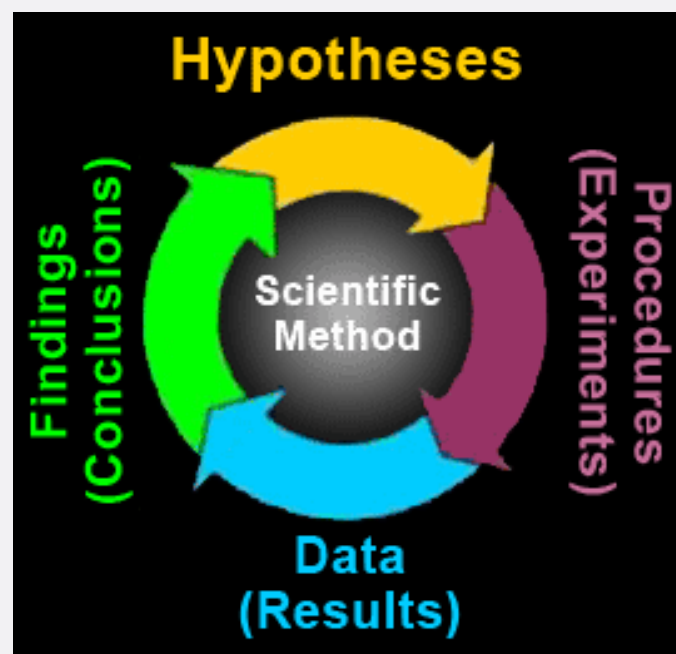


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TODAY

- **Big Picture Review**
- **Exam Review**
 - Finishing up experiments

EXAM

- **Monday: Exam #3**
 - Can bring a calculator (no phone etc.)
 - Allowed to bring one single-page letter-size (8.5x11) sheet with you. Front side only. What you put on it is up to you, but it has to be your own.
- **If you take exams at CDR, please sign up now!**

STUDENT HOURS

- **Next Monday: 9-10:30 and 1:30-3**
- **332 Eggers or Zoom**
 - **Zoom info on syllabus**

EXAM

- **Material covered**
 - **Everything from Nov 1 (Hypothesis Testing with Samples) to today**

HURDLES TO CAUSALITY

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BIVARIATE RELATIONSHIPS

Independent Variable

Dependent Variable

		Independent Variable	
		Nominal/Ordinal	Interval
Dependent Variable	Nominal/Ordinal	Cross-Tabulation	Not In This Class...
	Interval	Mean Comparison	Correlation Coefficient, Linear Regression

USING SAMPLES

- **Bivariate relationship between two variables in sample**
- **Is this a real relationship that we would find in the population as well, or is it something that only shows up in our sample?**

HYPOTHESIS

- H_0 : In the population, there is *no relationship* between dependent and independent variable
 - If there is a difference in the sample, it is due to random sampling error
- H_A : There *is* a relationship between the independent and dependent variable in the population

ERRORS

	There Is A Relation In The Population	There Is No Relation In The Population
We Conclude There Is A Relation	✓	✗ Type I
We Conclude There Is No Relation	✗ Type II	✓

ERRORS

	There Is A Relation In The Population	There Is No Relation In The Population
We Conclude There Is A Relation	✓	<div>X Type I in at most 5% of cases</div>
We Conclude There Is No Relation	<div>X Type II</div>	✓

IDEA

- We start out thinking H_0 is true
 - No relationship between X and Y in population
- We ask: If H_0 is true, how likely is it that a random sample would produce an effect as large (or larger) than the one we have observed in our sample?
 - If less than 5% ($p < 0.05$): we reject H_0
 - If more than 5% ($p > 0.05$): we don't reject H_0

HOW?

- **Compute t-value**

$$t = \frac{H_A - H_0}{\text{Standard Error}}$$

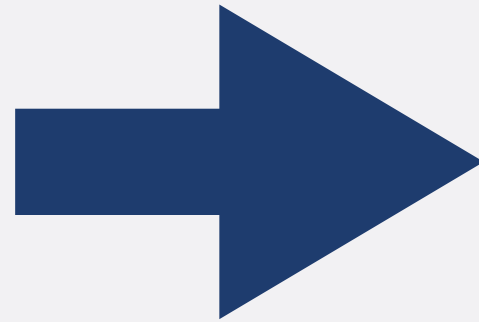
- **If $t < -1.96$ or $t > 1.96$: We reject H_0**

HURDLES TO CAUSALITY

- Is there a credible causal mechanism that connects X to Y ?
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BIVARIATE RELATIONSHIP

Partisanship



Feeling safer if
more armed security

- **Zero-order effect: Non-Democrats are 8 percentage points more likely to feel safer with more armed security than Democrats**

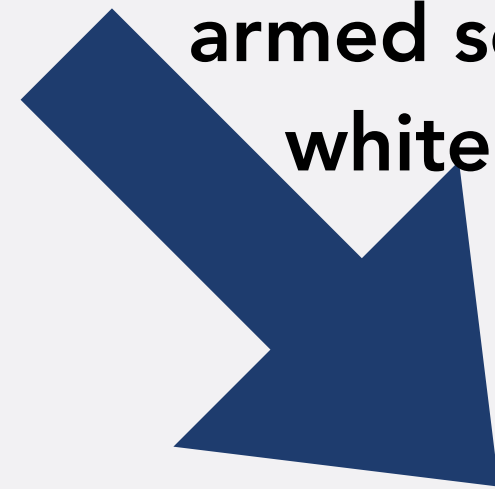
MAYBE THIS IS GOING ON?

Non-white students
more likely to be
Democrats than white
students

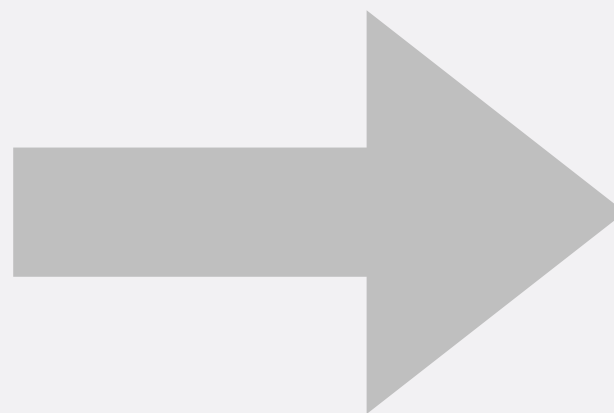


Race (Z)

Non-white students
more likely to not
feel safer with
armed security than
white students



Partisanship (X)



Feeling safer if
more armed
security (Y)

Partisanship by itself has
no effect on feeling safer

TERMINOLOGY

- **Controlled effect**: relationship between an independent variable (X) and a dependent variable (Y) within one value of another independent variable (Z)

CONTROLLED COMPARISON TABLE

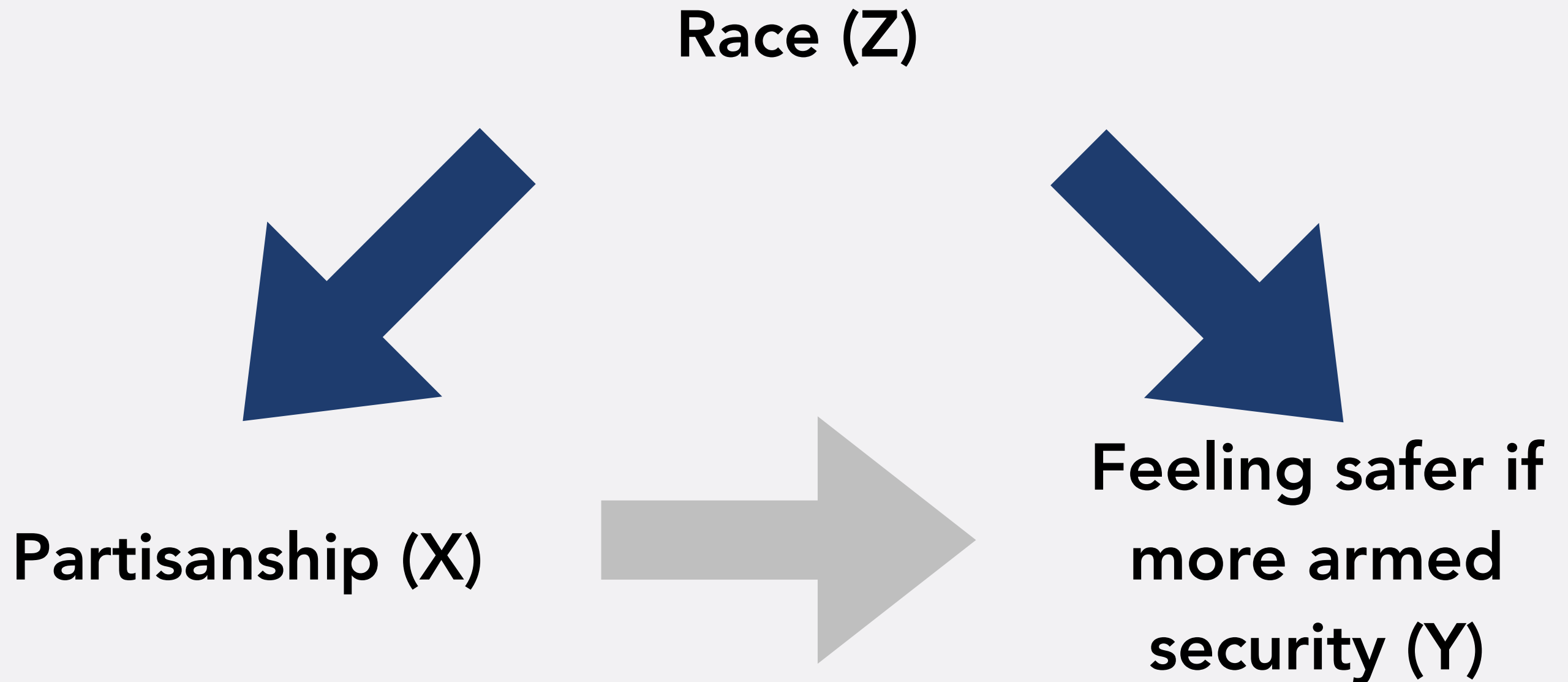
More Armed Security

White				Non-White		
	Dem	Non-Dem	Total	Dem	Non-Dem	Total
	19%			14%		
Feel Safer	42%	61%	48%	40%	54%	45%
	(15)	(11)	(26)	(8)	(7)	(15)
Not Feel Safer	58%	39%	52%	60%	46%	55%
	(21)	(7)	(28)	(12)	(6)	(18)
Total	100%	100%	100%	100%	100%	100%
	(36)	(18)	(54)	(20)	(13)	(33)

CONTROLLED EFFECT

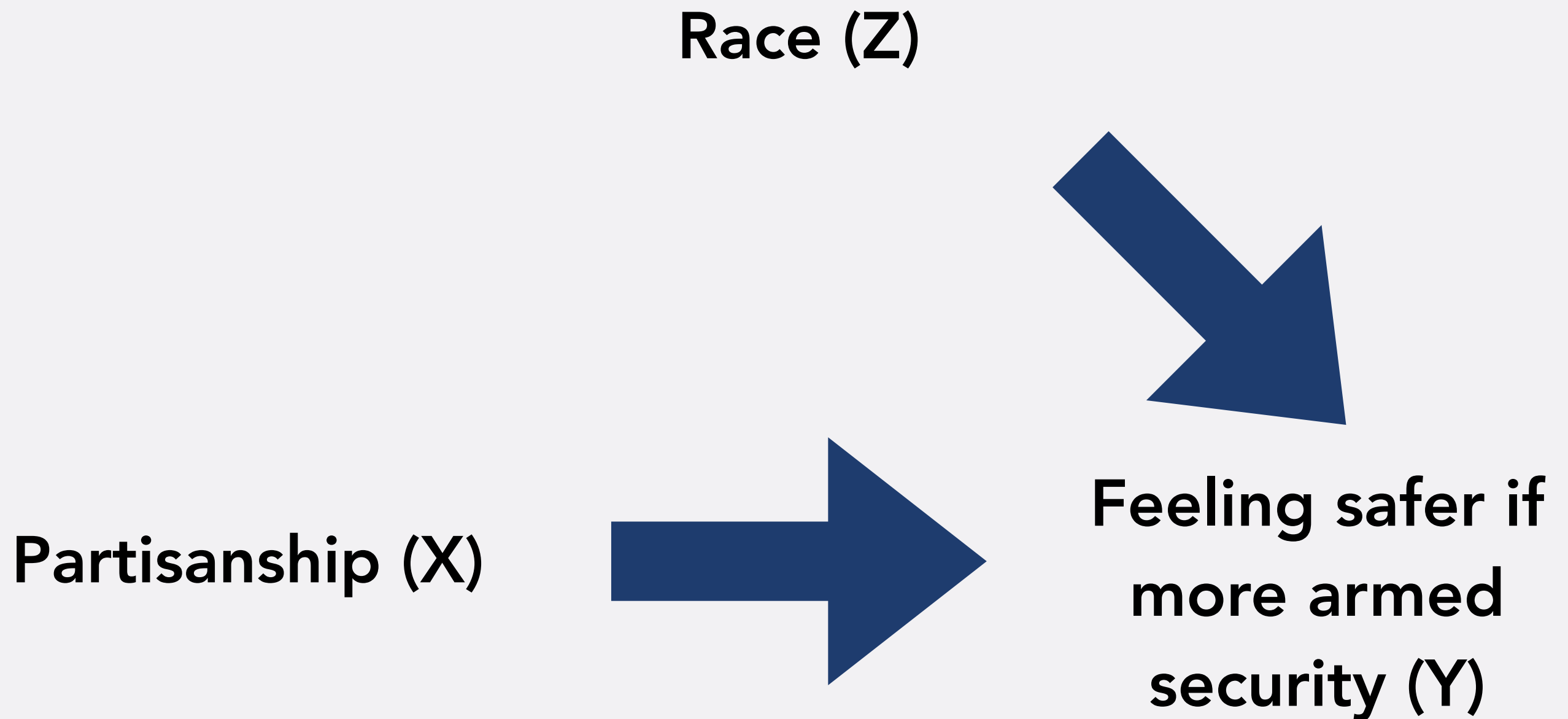
- Even when looking just among white students, and just among non-white, partisanship still has an effect on safety feelings
- Effect of partisanship holds when “controlling for” race

SPURIOUS RELATIONSHIP



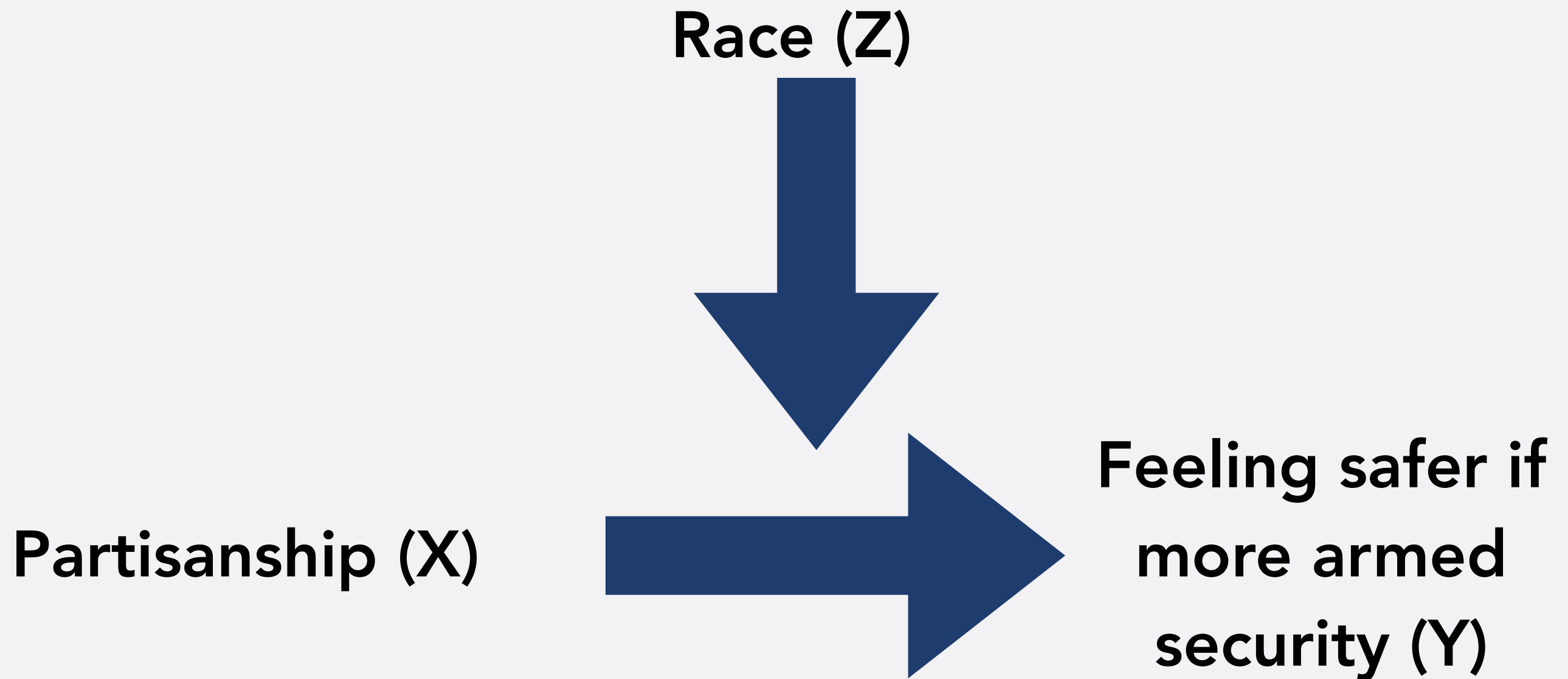
- Once we control for race, no independent effect of partisanship
- All controlled effects zero or close to zero

ADDITIVE RELATIONSHIP



- Both partisanship *and* race determine Y
- Controlled effects not zero and of roughly same size

INTERACTIVE RELATIONSHIP



- Race determines how much partisanship affects Y
- Controlled effects not zero and of different size

MULTIPLE REGRESSION

- **Another way to control for potential confounding variables: multiple regression**
 - **Allows us to control for many potential confounders**

DV: APPROVAL OF J. BIDEN

	Coefficient	Standard Error	T-Value
Intercept	68.6	33.0	2.08
Liberal-Conservative	-0.28	0.11	-2.51
Age	-0.55	1.71	-0.32
Gender (Male)	-0.29	4.72	-0.06

EFFECT OF LIB/CONS

- Coefficient: -0.28
- Interpretation: For every one point increase on the liberal-conservative scale, the evaluation of J. Biden decreases by 0.28 points, *holding all other variables constant*

EFFECT OF LIB/CONS

$$t = \frac{H_A - H_0}{\text{Standard Error}}$$

$$t = \frac{-0.28 - 0.00}{0.11} = -2.55$$

- We reject H_0 , so effect of liberal-conservative on evaluation is significant at the 5% level

DV: APPROVAL OF J. BIDEN

	Coefficient	Standard Error	T-Value
Intercept	68.6	33.0	2.08
Liberal-Conservative	-0.28	0.11	-2.51
Age	-0.55	1.71	-0.32
Gender (Male)	-0.29	4.72	-0.06

EFFECT OF GENDER

- Coefficient: -0.29
 - Where female is coded 0 and male coded 1
- Interpretation: If someone is male, their evaluation of J. Biden is expected to be 0.29 points lower than if someone is female, *holding all other variables constant*

EFFECT OF GENDER

- **t-value: -0.06**
- **We do not reject H_0 , so effect of gender on evaluation is not significant at the 5% level**

DV: APPROVAL OF J. BIDEN

	Coefficient	Standard Error	T-Value
Intercept	68.6	33.0	2.08
Liberal-Conservative	-0.28	0.11	-2.51
Age	-0.55	1.71	-0.32
Gender (Male)	-0.29	4.72	-0.06

PREDICTED VALUE

- **Evaluation = $68.6 - 0.28 * \text{Lib/Cons} - 0.55 * \text{Age} - 0.29 * \text{Gender (Male)}$**
- **Expected approval for someone who is:**
 - **50 on Lib/Cons scale**
 - **22 years old**
 - **Male**

PREDICTED VALUE

- **Evaluation = $68.6 - 0.28 * \text{Lib/Cons} - 0.55 * \text{Age} - 0.29 * \text{Gender (Male)}$**
- **Expected approval for someone who is:**
 - **50 on Lib/Cons scale**
 - **22 years old**
 - **Male**
- **Evaluation = $68.6 - 0.28 * 50 - 0.55 * 22 - 0.29 * 1$
= 42.2**

OBSERVATIONAL RESEARCH DESIGN

- **Linear regression is (usually) used in observational research design**
 - **Takes data as we find it in the world**
 - **Regression isolates the independent effect of X on Y, controlling for other variables (=potential alternative explanations)**

OBSERVATIONAL RESEARCH DESIGN

- **Can never be sure we controlled for all potential alternative explanations**
 - **Potentially low internal validity**

EXPERIMENTAL RESEARCH DESIGN

- Researchers *actively decide* assignment of the independent variable
- Treatment and control groups
 - Subjects randomly allocated

EXPERIMENTAL RESEARCH DESIGN

- On average, treatment and control group are the same on *every* variable we can think of
 - *Except* on the independent variable of interest, where researcher assigns treatment and control
 - Unlikely that differences in Y between treatment and control groups caused by other variables
 - High internal validity

EXPERIMENTAL RESEARCH DESIGN

- **Different types of experiments**
 - **Field experiment**
 - **Lab experiment**
 - **Survey experiment**

ISSUES WITH EXPERIMENTS

- **May lack external validity**
- **Ethics issues**
- **Cannot study many things we are interested in experimentally**