PSC 202

SYRACUSE UNIVERSITY

# INTRODUCTION TO POLITICAL ANALYSIS

## MORE HYPOTHESIS TESTING WITH ONE CONFOUNDER

# NEXT SEMESTER

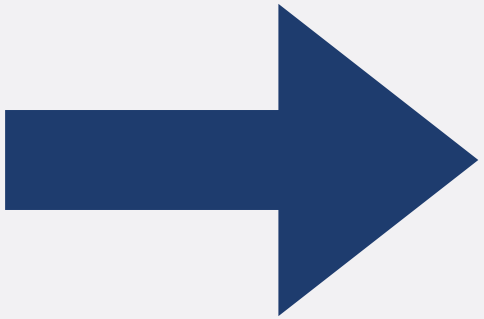
- Some courses to consider:
  - PSC 300 Black Feminist Politics
  - PSC 300 Comparative Free Speech
  - PSC 300 Making Democracy Work
  - PSC 303 The Development of the American State
  - PSC 319 Gender & Politics
  - PSC 325 Constitutional Law II
  - PSC 347 Politics of Russia

# NEXT SEMESTER

- PSC 400 Data Analytics for Political Science
  - Data and data analysis increasingly important
  - You'll learn how to conduct data analysis yourself
  - Topics: finding data, data cleaning and data manipulation, data visualization, and data analysis.
  - Learn to use R (statistical program) R

# LAST TIME

Partisanship (X)



Afghanistan position (Y)

# LAST TIME

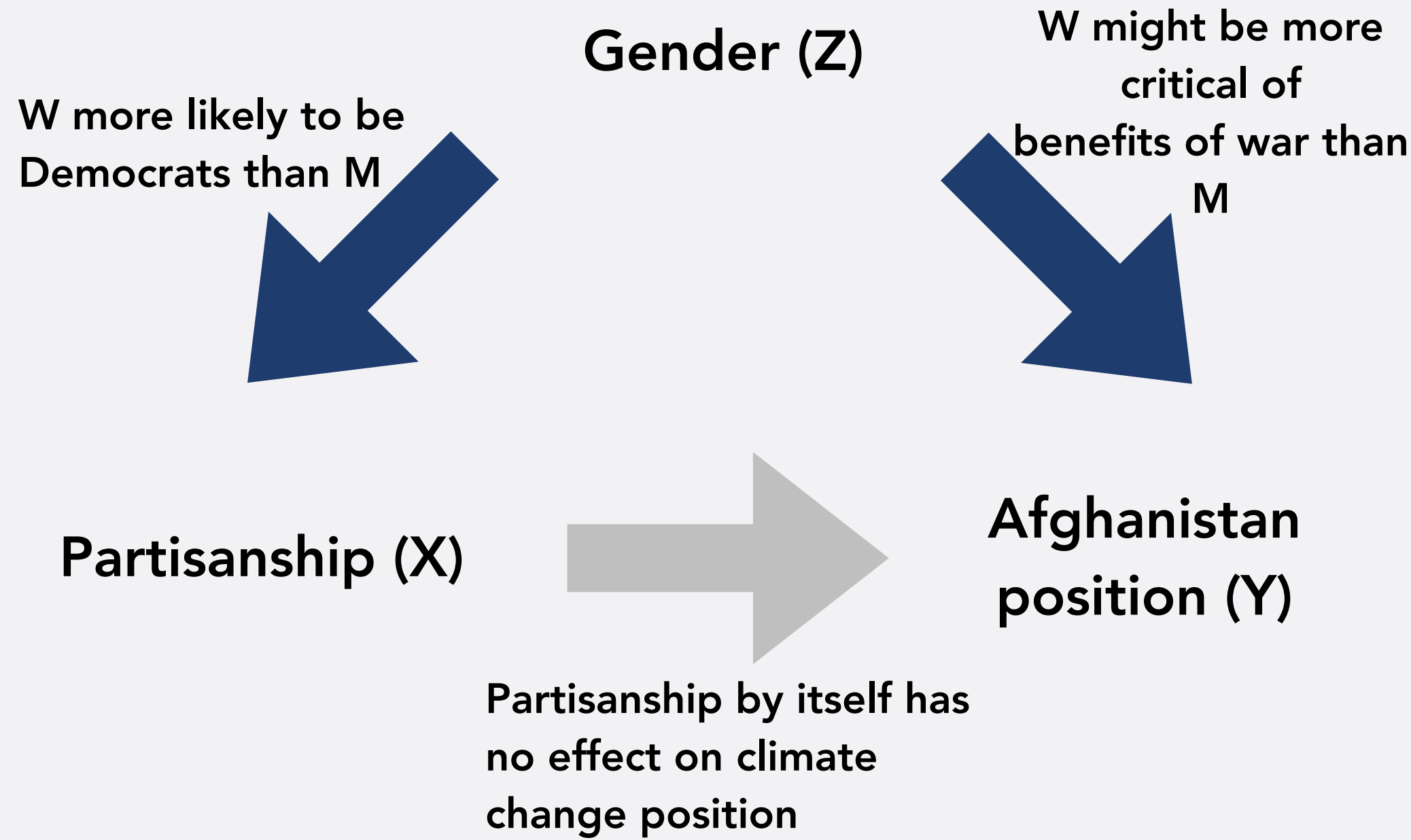
| | Democrats | Not Democrats | Total |
|---|---|---|---|
| Agree | 19.2% (10) | 41.4% (12) | 27.2% (22) |
| Disagree | 80.8% (42) | 58.6% (17) | 72.8% (59) |
| Total | 100% (52) | 100% (29) | 100% (81) |

# LAST TIME

| | Democrats | Not Democrats | Total |
|---|---|---|---|
| Agree | 19.2% (10) | 41.4% (12) | 27.2% (22) |
| Disagree | 80.8% (42) | 58.6% (17) | 72.8% (59) |
| Total | 100% (52) | 100% (29) | 100% (81) |

22.2%

# CONFOUNDER?


Gender (Z)
W more likely to be Democrats than M
W might be more critical of benefits of war than M
Partisanship (X)
Afghanistan position (Y)
Partisanship by itself has no effect on climate change position

# CONTROLLED COMPARISON TABLE

Afghanistan war was beneficial

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Dem | Non-Dem | Total | Dem | Non-Dem | Total |
| Agree | | | | | | |
| Disagree | | | | | | |
| Total | | | | | | |

# CONTROLLED COMPARISON TABLE

Afghanistan war was beneficial

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Dem | Non-Dem | Total | Dem | Non-Dem | Total |
| Agree | 18.9% (7) | 41.2% (7) | 25.9% (14) | | | |
| Disagree | 81.1% (30) | 58.8% (10) | 74.1% (40) | | | |
| Total | 100% (37) | 100% (17) | 100% (54) | | | |

22.3%

# CONTROLLED COMPARISON TABLE

Afghanistan war was beneficial

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Dem | Non-Dem | Total | Dem | Non-Dem | Total |
| | 22.3% | | | 21.7% | | |
| Agree | 18.9% (7) | 41.2% (7) | 25.9% (14) | 20.0% (3) | 41.7% (5) | 29.6% (8) |
| Disagree | 81.1% (30) | 58.8% (10) | 74.1% (40) | 80.0% (12) | 58.3% (7) | 70.4% (19) |
| Total | 100% (37) | 100% (17) | 100% (54) | 100% (15) | 100% (12) | 100% (27) |

- Partial effect of gender, "controlling for" gender

# GENDER AND EVALUATION

- So even if we take gender into account, partisanship *still* has effect on evaluations of Afghanistan involvement
  - Among both men and women, non-Democrats are more likely to see benefits

# HOW DOES THIS HELP?

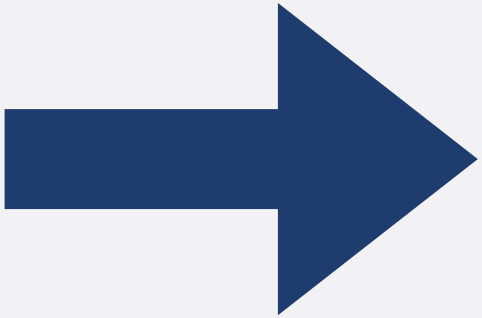
- Is there a credible causal mechanism that connects X to Y?
- Can we rule out the possibility that Y could cause X?
- Is there covariation between X and Y?
- Have we controlled for all confounding variables (Z) that might make the association between X and Y spurious?

# HOW DOES THIS HELP?

- Logic of control
- What is the relationship between X and Y when we control for *one* confounder?
  - Ultimate goal: What is the relationship between X and Y when we control for *many* confounders?

# PARTISANSHIP & GUN CONTROL

Partisanship (X)



Support for gun control (Y)

# PARTISANSHIP & GUN CONTROL

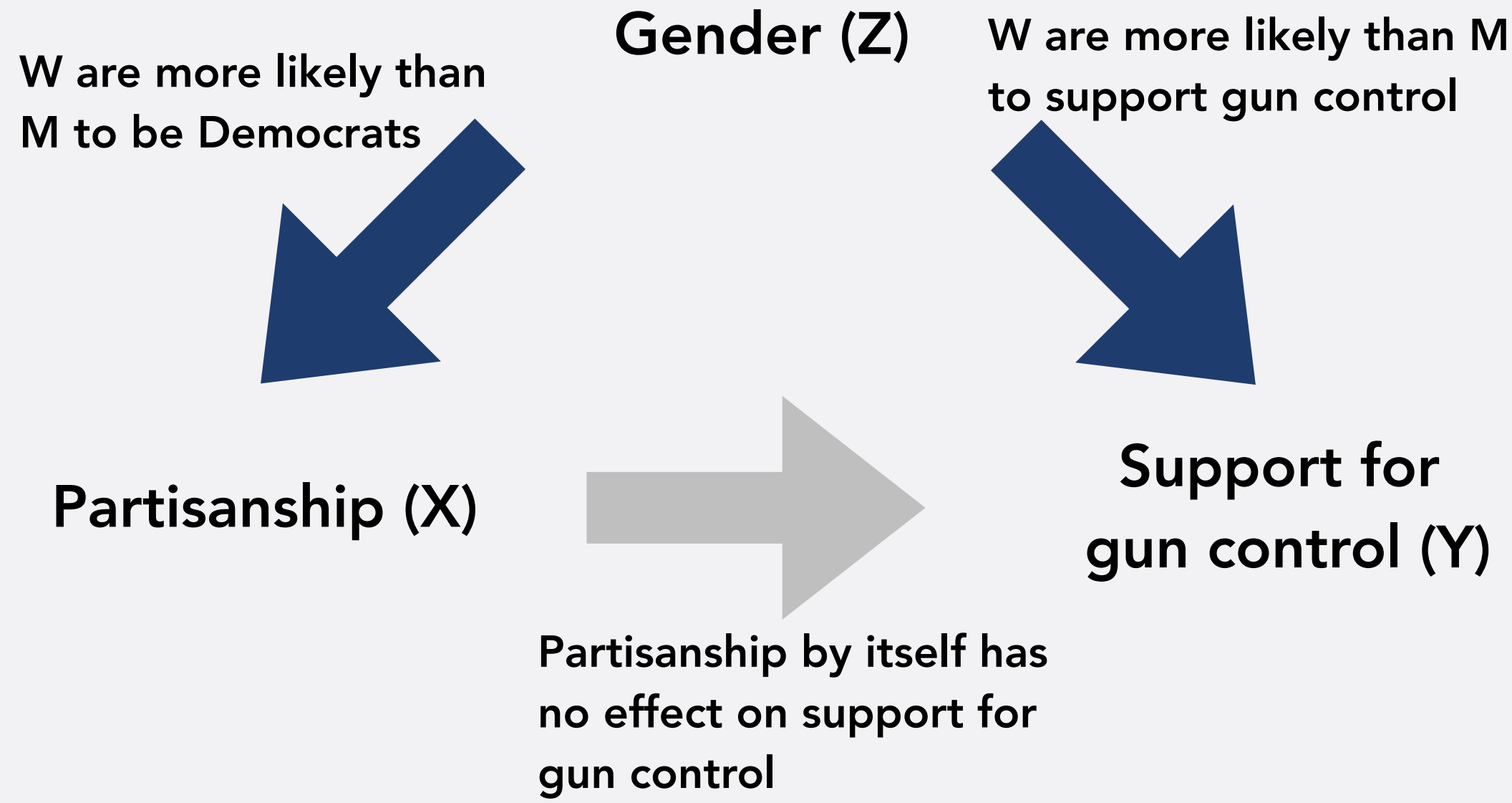
| | Democrats | Republicans | Total |
|---|---|---|---|
| Stricter Gun Control | 58% (7) | 42% (5) | 50% (12) |
| Not Stricter Gun Control | 42% (5) | 58% (7) | 50% (12) |
| Total | 100% (12) | 100% (12) | 100% (24) |

# ZERO-ORDER EFFECT

| | Democrats | Republicans | Total |
|---|---|---|---|
| Stricter Gun Control | 58% (7) | 42% (5) | 50% (12) |
| Not Stricter Gun Control | 42% (5) | 58% (7) | 50% (12) |
| Total | 100% (12) | 100% (12) | 100% (24) |

16%

# CONFOUNDER?


Gender (Z)
W are more likely than M to be Democrats
W are more likely than M to support gun control
Partisanship (X)
Support for gun control (Y)
Partisanship by itself has no effect on support for gun control

# PARTISANSHIP & GUN CONTROL

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Dem | Rep | Total | Dem | Rep | Total |
| Stricter Gun Control | | | | | | |
| Not Stricter Gun | | | | | | |
| Total | | | | | | |

# PARTISANSHIP & GUN CONTROL

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Dem | Rep | Total | Dem | Rep | Total |
| Stricter Gun Control | 75% (6) | 75% (3) | 75% (9) | | | |
| Not Stricter Gun | 25% (2) | 25% (1) | 25% (3) | | | |
| Total | 100% (8) | 100% (4) | 100% (12) | | | |

# PARTISANSHIP & GUN CONTROL

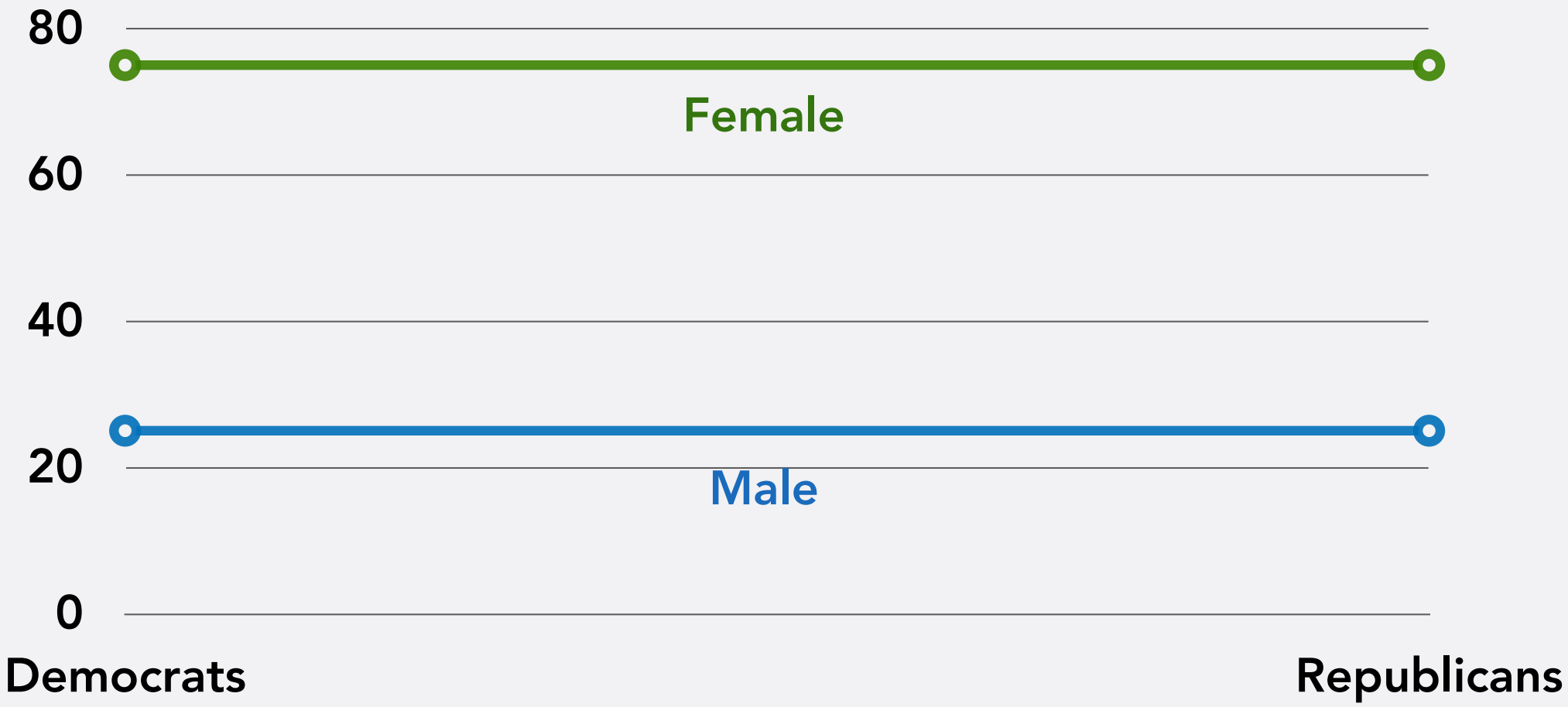
| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Dem | Rep | Total | Dem | Rep | Total |
| Stricter Gun Control | 75% (6) | 75% (3) | 75% (9) | 25% (1) | 25% (2) | 25% (3) |
| Not Stricter Gun | 25% (2) | 25% (1) | 25% (3) | 75% (3) | 75% (6) | 75% (9) |
| Total | 100% (8) | 100% (4) | 100% (12) | 100% (4) | 100% (8) | 100% (12) |

# PARTISANSHIP & GUN CONTROL

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Dem | Rep | Total | Dem | Rep | Total |
| | 0% | | | 0% | | |
| Stricter Gun Control | 75% (6) | 75% (3) | 75% (9) | 25% (1) | 25% (2) | 25% (3) |
| Not Stricter Gun | 25% (2) | 25% (1) | 25% (3) | 75% (3) | 75% (6) | 75% (9) |
| Total | 100% (8) | 100% (4) | 100% (12) | 100% (4) | 100% (8) | 100% (12) |

- Partial effect of partisanship, "controlling for" gender

# SPURIOUS RELATIONSHIP



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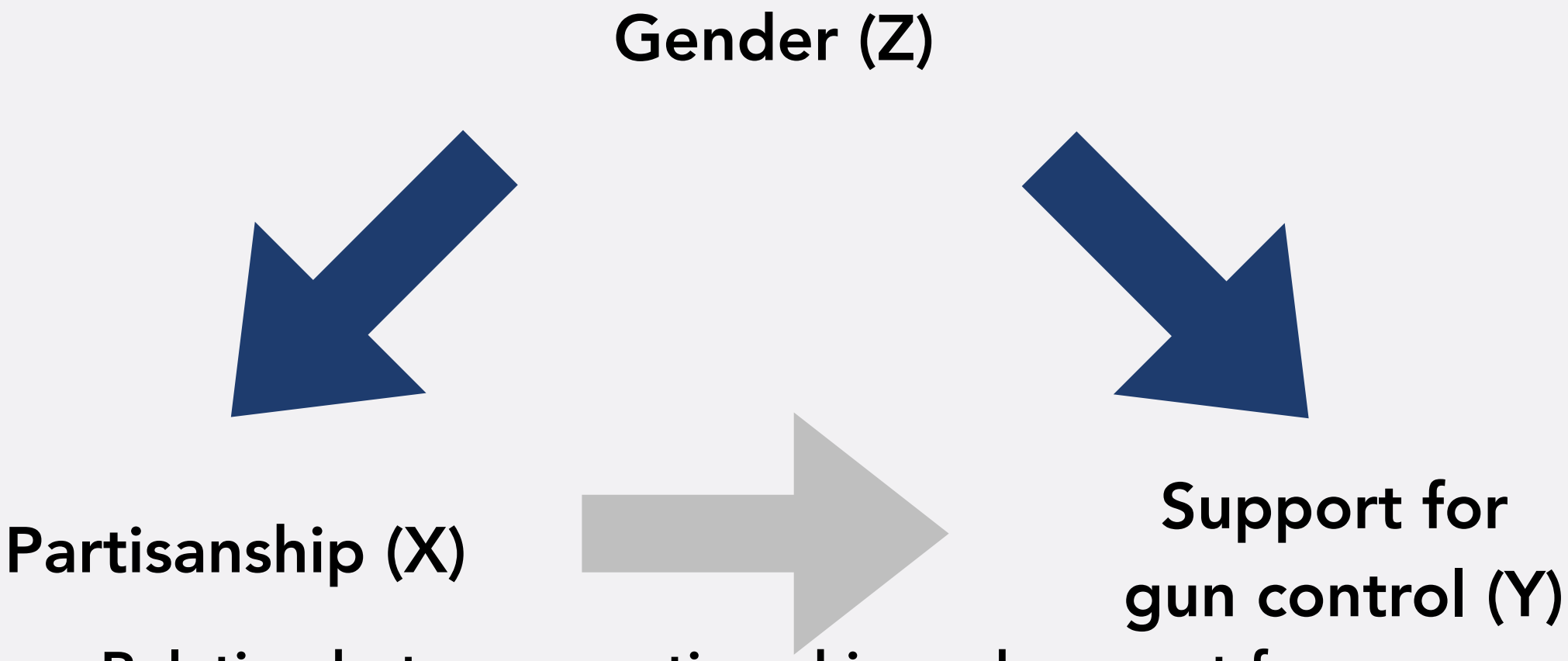



- Relation between partisanship and support for gun control was *spurious*
  - Caused by compositional differences
  - Once we "control for" gender, no *independent* effect of partisanship

# A DIFFERENT EXAMPLE

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Dem | Rep | Total | Dem | Rep | Total |
| Stricter Gun Control | 66% (4) | 50% (3) | 58% (7) | 33% (2) | 17% (1) | 25% (3) |
| Not Stricter Gun | 33% (2) | 50% (3) | 42% (5) | 66% (4) | 83% (5) | 75% (9) |
| Total | 100% (6) | 100% (6) | 100% (12) | 100% (6) | 100% (6) | 100% (12) |

- What are the controlled effects?

# PARTIAL EFFECTS

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Dem | Rep | Total | Dem | Rep | Total |
| | 16% | | | 16% | | |
| Stricter Gun Control | 66% (4) | 50% (3) | 58% (7) | 33% (2) | 17% (1) | 25% (3) |
| Not Stricter Gun | 33% (2) | 50% (3) | 42% (5) | 66% (4) | 83% (5) | 75% (9) |
| Total | 100% (6) | 100% (6) | 100% (12) | 100% (6) | 100% (6) | 100% (12) |

# WHAT WE FIND...

- **Even though women are more likely to support gun control than men...**

# WHAT WE FIND...

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Dem | Rep | Total | Dem | Rep | Total |
| Stricter Gun Control | 66% (4) | 50% (3) | 58% (7) | 33% (2) | 17% (1) | 25% (3) |
| Not Stricter Gun | 33% (2) | 50% (3) | 42% (5) | 66% (4) | 83% (5) | 75% (9) |
| Total | 100% (6) | 100% (6) | 100% (12) | 100% (6) | 100% (6) | 100% (12) |

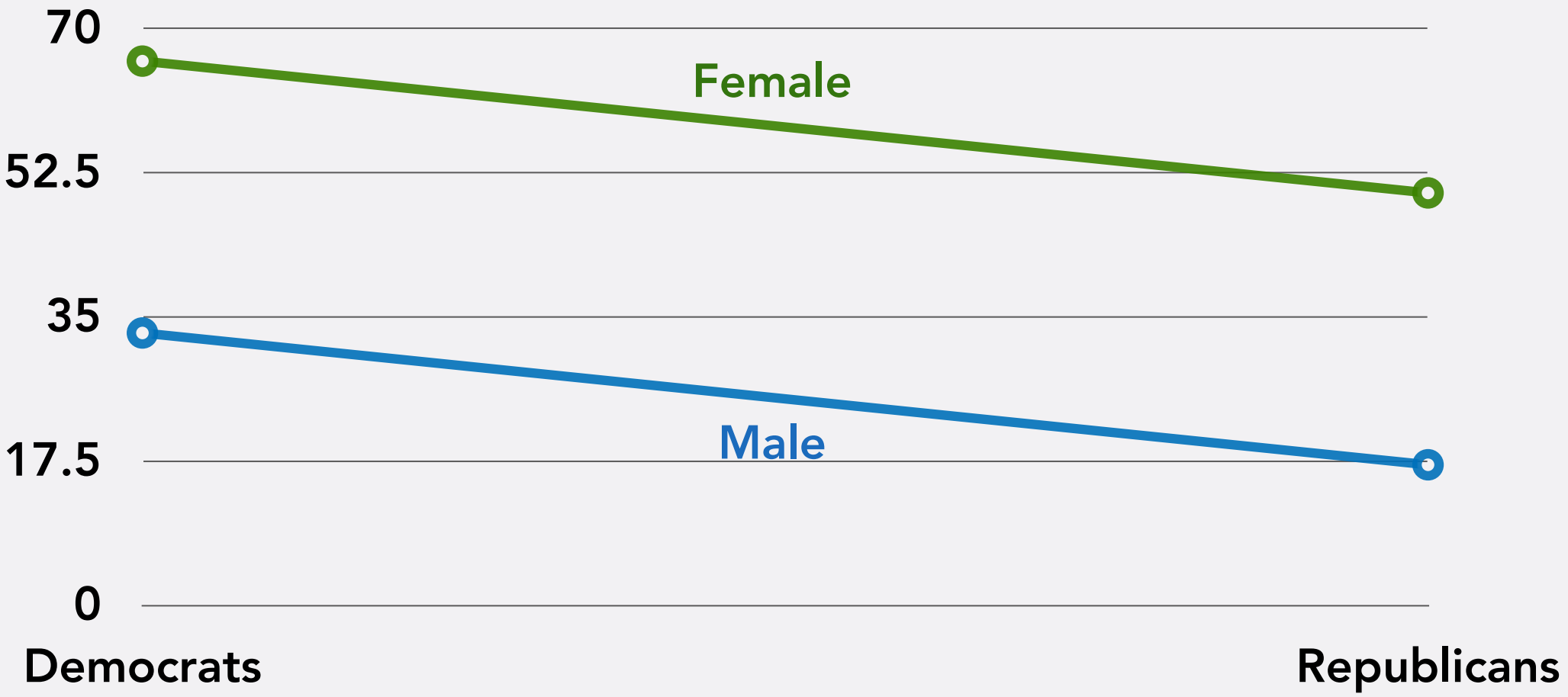
# WHAT WE FIND...

- Even though women are more likely to support gun control than men...
- Partisanship still has an independent effect on attitudes among both men and women

# WHAT WE FIND...

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Dem | Rep | Total | Dem | Rep | Total |
| | 16% | | | 16% | | |
| Stricter Gun Control | 66% (4) | 50% (3) | 58% (7) | 33% (2) | 17% (1) | 25% (3) |
| Not Stricter Gun | 33% (2) | 50% (3) | 42% (5) | 66% (4) | 83% (5) | 75% (9) |
| Total | 100% (6) | 100% (6) | 100% (12) | 100% (6) | 100% (6) | 100% (12) |

# ADDITIVE RELATIONSHIP



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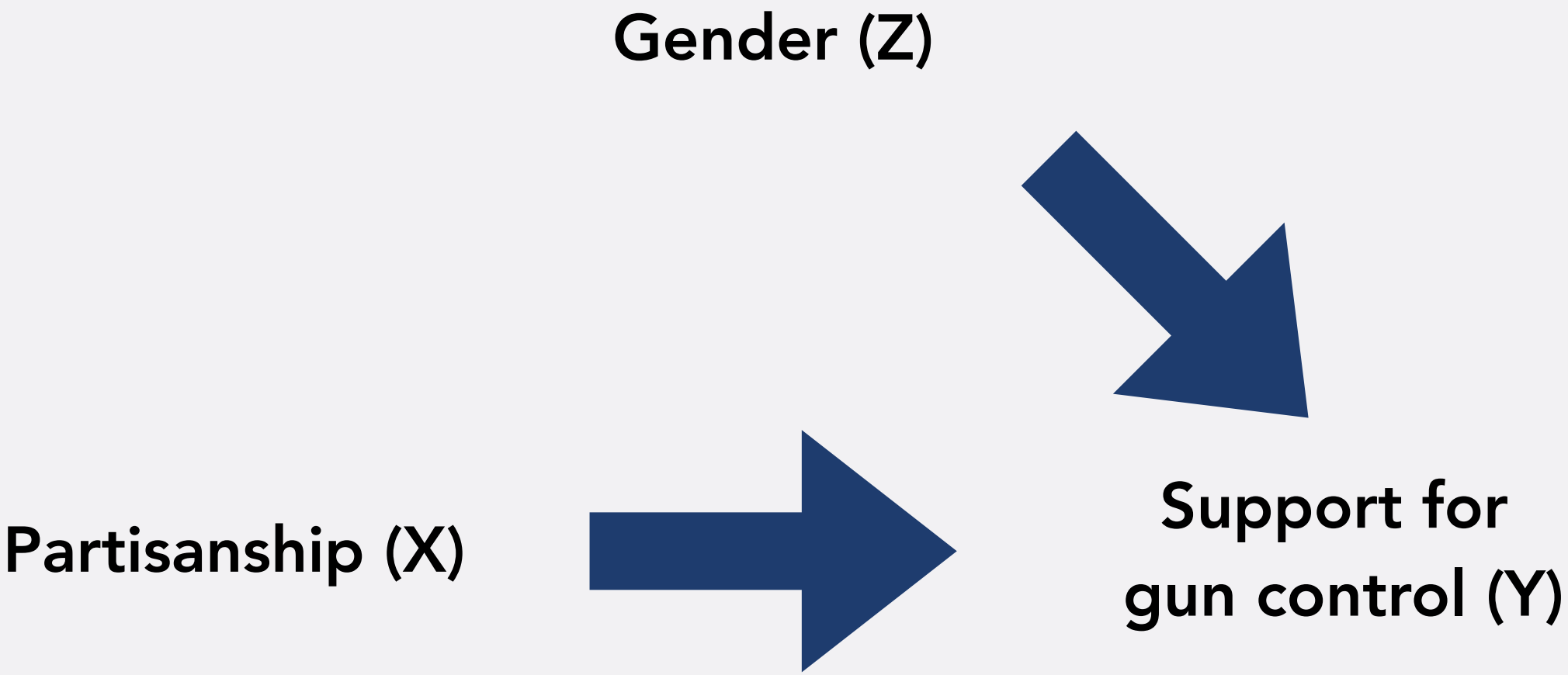


- Both partisanship *and* gender determine gun control attitudes

# YET ANOTHER EXAMPLE

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Dem | Rep | Total | Dem | Rep | Total |
| Stricter Gun Control | 57% (4) | 50% (2) | 55% (6) | 60% (3) | 38% (3) | 46% (6) |
| Not Stricter Gun | 43% (3) | 50% (2) | 45% (5) | 40% (2) | 62% (5) | 54% (7) |
| Total | 100% (7) | 100% (4) | 100% (11) | 100% (5) | 100% (8) | 100% (13) |

# PARTIAL EFFECTS

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Dem | Rep | Total | Dem | Rep | Total |
| | | 7% | | | 22% | |
| Stricter Gun Control | 57% (4) | 50% (2) | 55% (6) | 60% (3) | 38% (3) | 46% (6) |
| Not Stricter Gun | 43% (3) | 50% (2) | 45% (5) | 40% (2) | 62% (5) | 54% (7) |
| Total | 100% (7) | 100% (4) | 100% (11) | 100% (5) | 100% (8) | 100% (13) |

# WHAT WE FIND...

- **Even though women are more likely to support gun control than men…**

# WHAT WE FIND...

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Dem | Rep | Total | Dem | Rep | Total |
| Stricter Gun Control | 57% (4) | 50% (2) | 55% (6) | 60% (3) | 38% (3) | 46% (6) |
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# WHAT WE FIND...

- Even though women are more likely to support gun control than men…
- Partisanship still has an independent effect on attitudes among both men and women

# WHAT WE FIND...

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Dem | Rep | Total | Dem | Rep | Total |
| Stricter Gun Control | 57% (4) | 50% (2) | 55% (6) | 60% (3) | 38% (3) | 46% (6) |
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| Total | 100% (7) | 100% (4) | 100% (11) | 100% (5) | 100% (8) | 100% (13) |

# WHAT WE FIND...

- Even though women are more likely to support gun control than men…
- Partisanship still has an independent effect on attitudes among both men and women
- But these effects are of different size!
  - The effect of partisanship is stronger among men than among women

# WHAT WE FIND...

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Dem | Rep | Total | Dem | Rep | Total |
| | 7% | | | 22% | | |
| Stricter Gun Control | 57% (4) | 50% (2) | 55% (6) | 60% (3) | 38% (3) | 46% (6) |
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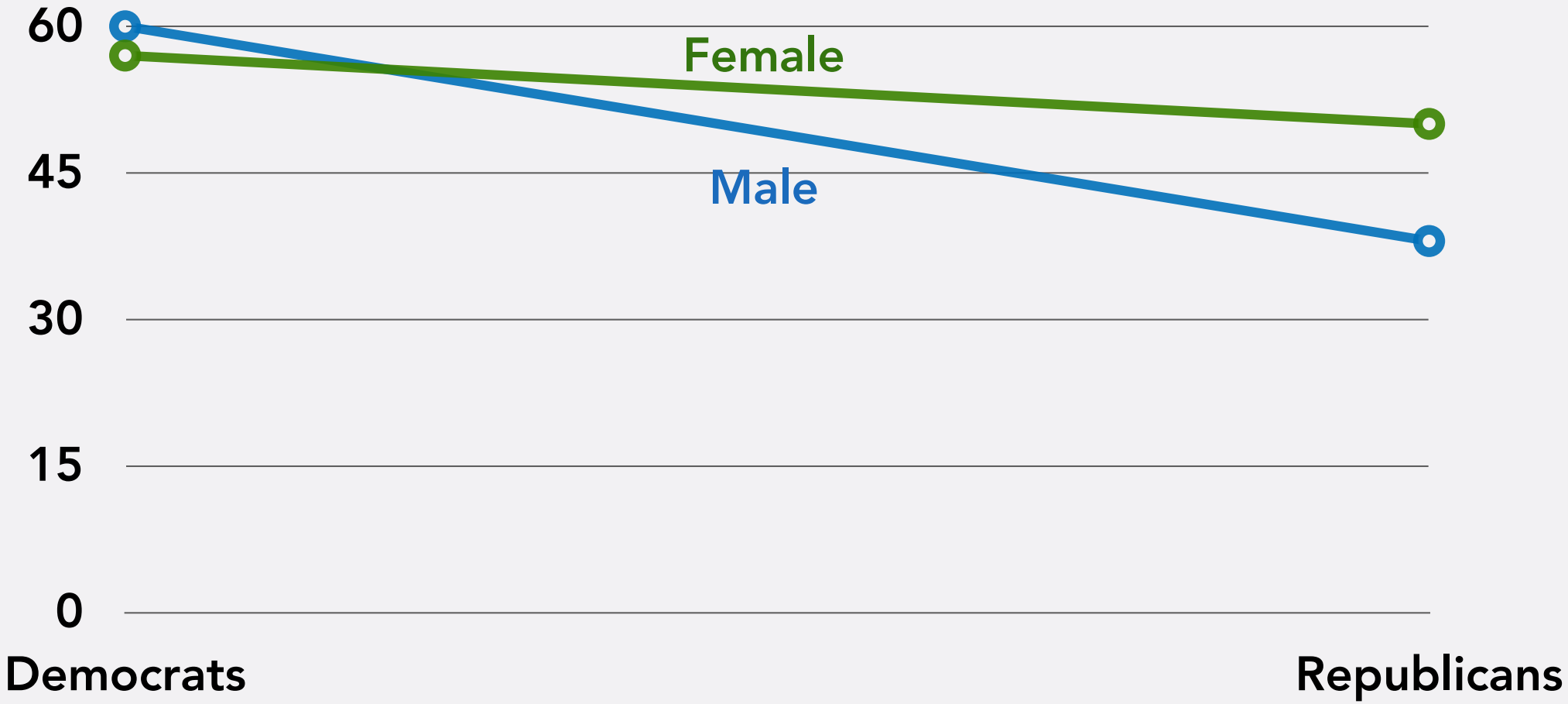
# INTERACTIVE RELATIONSHIP



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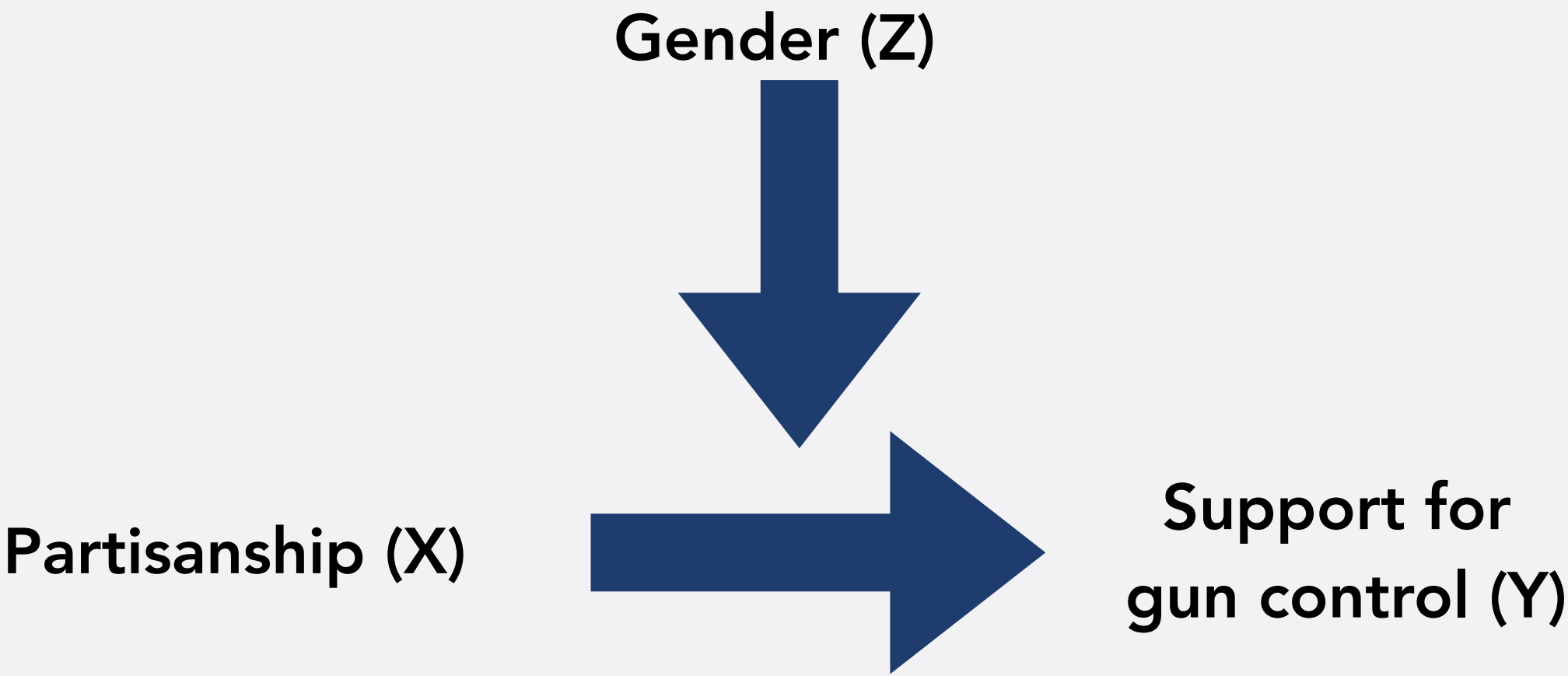


- Gender determines how much partisanship affects gun control attitudes

# WHAT HAVE WE LEARNED?

- Want to know: Is there an effect of X on Y?
  - Zero-order relationship not 0? Great!
  - But what about Z?
- Learned: How to check if X has an *independent* effect on Y, controlling for Z
  - Spurious relationship
  - Additive relationship
  - Interactive relationship

# NOW...

- How can we tell whether a relation is spurious, additive, or interactive?

# HOW CAN WE TELL WHICH ONE?

1. Are all controlled/partial effects zero or very close to zero?
   - Yes? ⇒ relationship between x and y is *spurious*
   - No? ⇒ either additive or interactive
2. Are all controlled/partial effects approximately the same size?
   - Yes? ⇒ *additive* relationship
   - No? ⇒ *interactive* relationship

# BACK TO OUR SURVEY

Afghanistan war was beneficial

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Dem | Non-Dem | Total | Dem | Non-Dem | Total |
| | 22.3% | | | 21.7% | | |
| Agree | 18.9% (7) | 41.2% (7) | 25.9% (14) | 20.0% (3) | 41.7% (5) | 29.6% (8) |
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# BACK TO OUR SURVEY

Afghanistan war was beneficial

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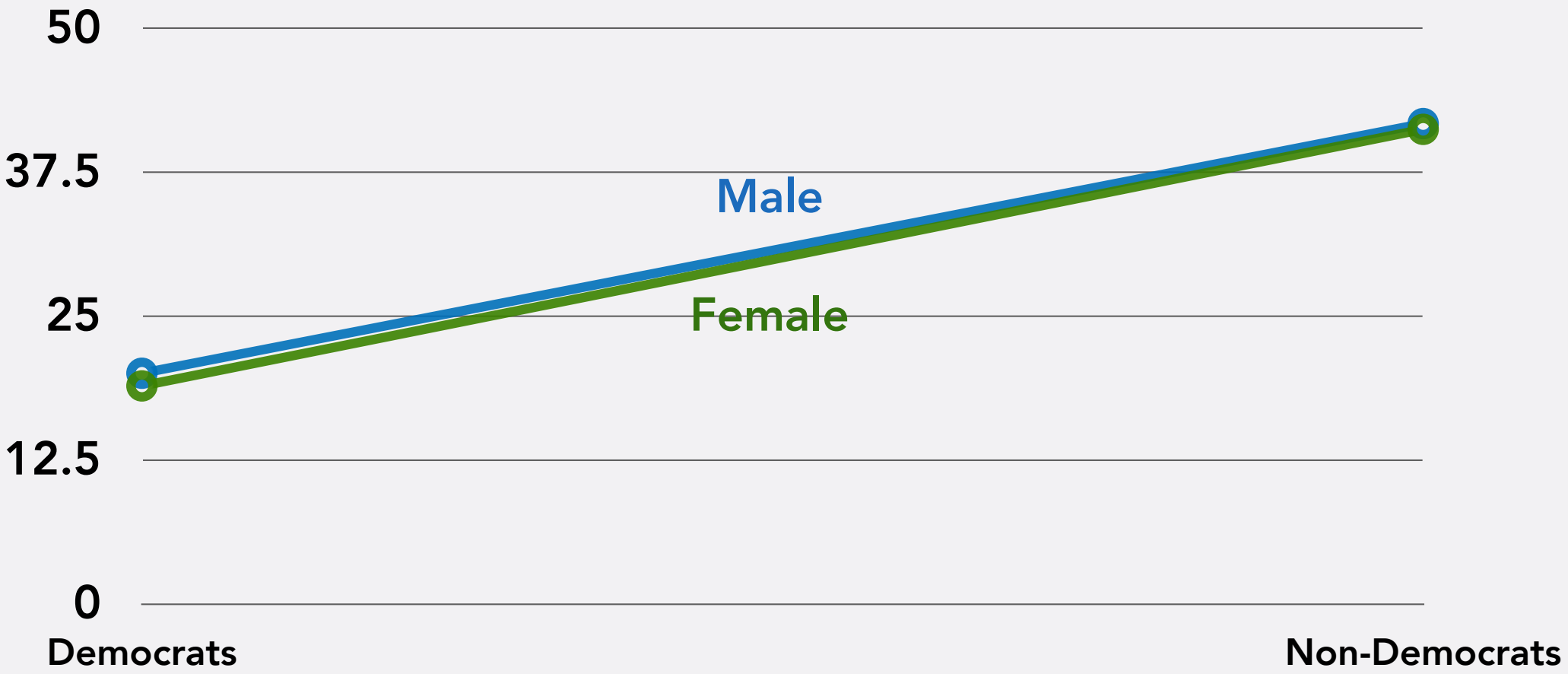
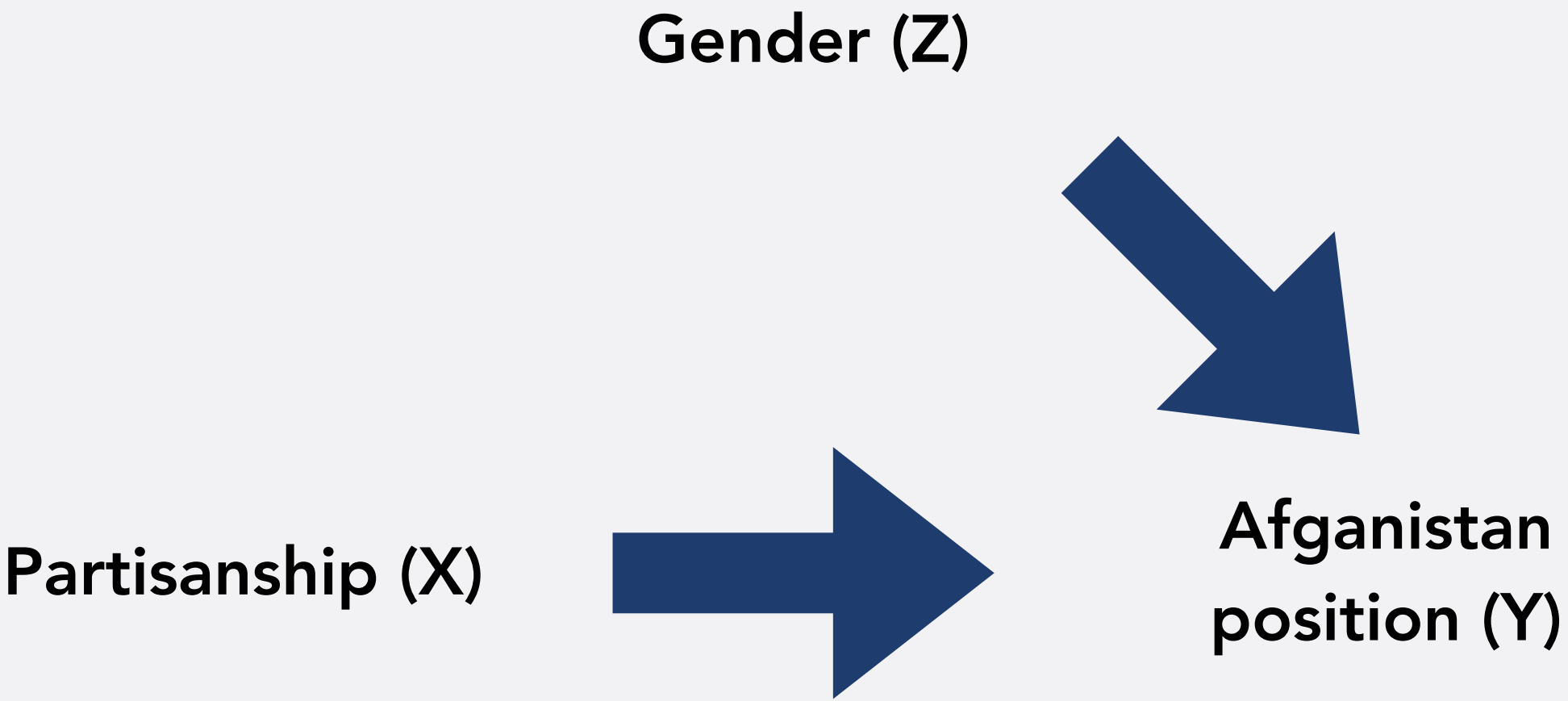
1. Are all controlled/partial effects zero or very close to zero?
   - Yes? ⇒ relationship between x and y is *spurious*
   - No? ⇒ either additive or interactive
2. Are all controlled/partial effects approximately the same size?
   - Yes? ⇒ *additive* relationship
   - No? ⇒ *interactive* relationship

# ADDITIVE RELATIONSHIP



# ADDITIVE RELATIONSHIP




- Both partisanship *and* gender determine Y
- Although gender has a very small independent effect

# EXERCISE

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Car | No Car | Total | Car | No Car | Total |
| Support Highway | (3) | (1) | (4) | (2) | (1) | (3) |
| Oppose Highway | (1) | (3) | (4) | (2) | (3) | (5) |
| Total | (4) | (4) | (8) | (4) | (4) | (8) |

# EXERCISE

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Car | No Car | Total | Car | No Car | Total |
| Support Highway | 75% (3) | 25% (1) | 50% (4) | 50% (2) | 25% (1) | 37.5% (3) |
| Oppose Highway | 25% (1) | 75% (3) | 50% (4) | 50% (2) | 75% (3) | 62.5% (5) |
| Total | 100% (4) | 100% (4) | 100% (8) | 100% (4) | 100% (4) | 100% (8) |

# EXERCISE

| | Female | | | Male | | |
|---|---|---|---|---|---|---|
| | Car | No Car | Total | Car | No Car | Total |
| | 50% | | | 25% | | |
| Support Highway | 75% (3) | 25% (1) | 50% (4) | 50% (2) | 25% (1) | 37.5% (3) |
| Oppose Highway | 25% (1) | 75% (3) | 50% (4) | 50% (2) | 75% (3) | 62.5% (5) |
| Total | 100% (4) | 100% (4) | 100% (8) | 100% (4) | 100% (4) | 100% (8) |

# EXERCISE

1. Are all controlled effects zero or very close to zero?
   - Yes? ⇒ relationship between x and y is spurious
   - No? ⇒ either additive or interactive
2. Are all controlled effects approximately the same size?
   - Yes? ⇒ additive relationship
   - No? ⇒ interactive relationship