

# Adverse Childhood Experiences: Longitudinal outcomes in the context of risk and intervention

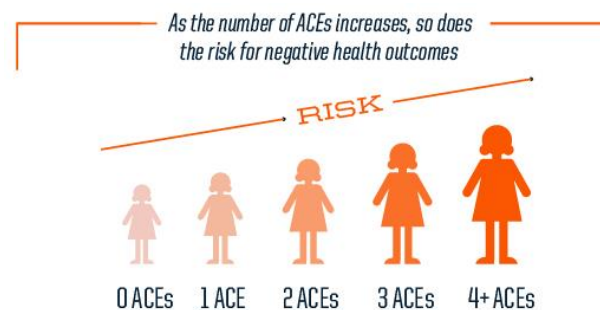
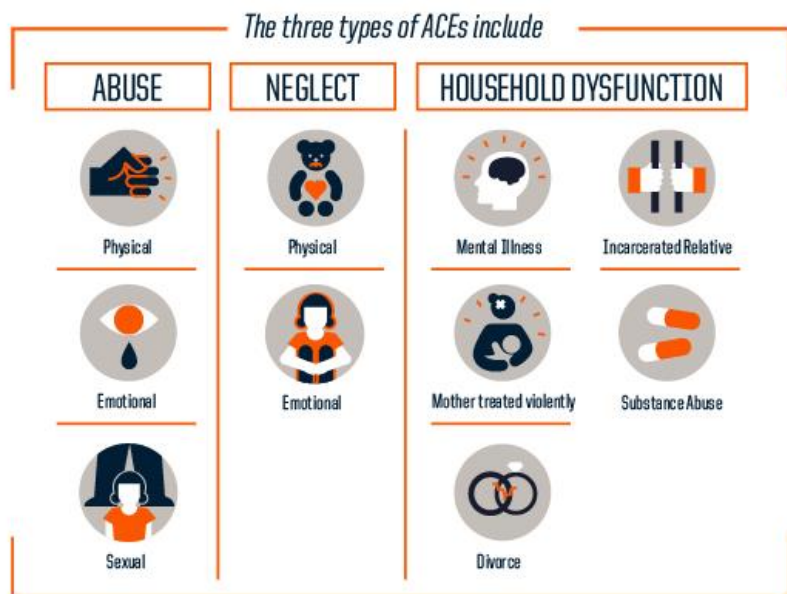
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ALISON GIOVANELLI, ARTHUR J REYNOLDS, CHRISTINA F MONDI,  
AND SUH-RUU OU

# Adverse Childhood Experiences (ACEs)

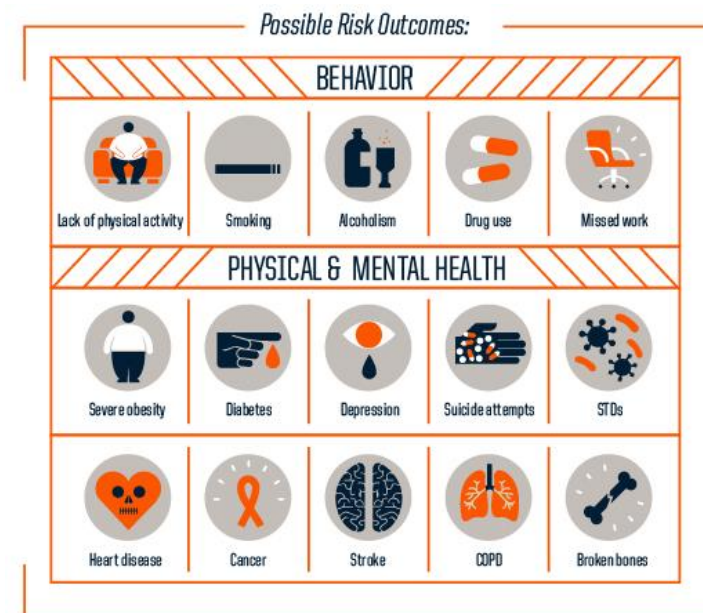
## TRADITIONAL CONCEPTUALIZATION OF ACES (KAISER/CDC)

- Abuse, Neglect, & Household Dysfunction



## TRADITIONALLY EXAMINED OUTCOMES

- Behavior & Physical/Mental Health



Graphics: Robert Wood Johnson Foundation

# Original ACE sample: Not exactly diverse

- The original ACE research participants:
  - <10% African American
  - 75% white
  - >75% had some college or were college graduates
  - Nearly half over 60 years of age
- Of those, men, non-whites, less educated, and less financially secure participants evinced poor outcomes at higher rates, but sample sizes of some of these groups were relatively small (Anda & Felitti,

Demographic information is from the entire ACE Study sample (n=17,337).

Demographic Information for CDC-Kaiser ACE Study Participants, Waves 1 and 2.

Demographic Information	Percent (N = 17,337)
<b>Gender</b>	
Female	54.0%
Male	46.0%
<b>Race/Ethnicity</b>	
White	74.8%
Hispanic/Latino	11.2%
Asian/Pacific Islander	7.2%
African-American	4.5%
Other	2.3%
<b>Age (years)</b>	
19-29	5.3%
30-39	9.8%
40-49	18.6%
50-59	19.9%
60 and over	46.4%
<b>Education</b>	
Not High School Graduate	7.2%
High School Graduate	17.6%
Some College	35.9%
College Graduate or Higher	39.3%

# Where does poverty fit in?

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## **In childhood:**

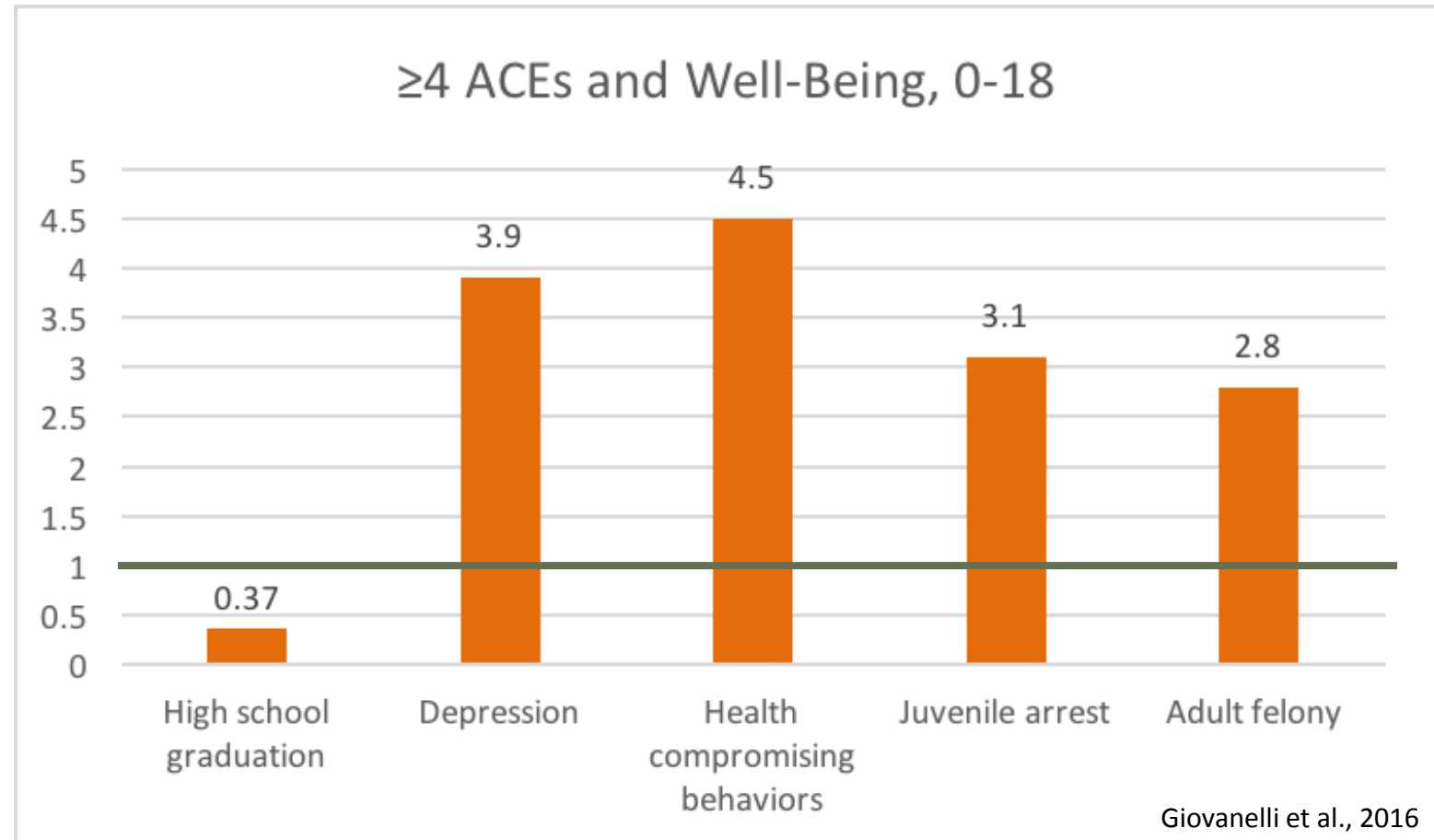
- High poverty contexts can amplify the effects of adverse experiences
- Certain circumstances that are a result of poverty can *be* adverse experiences
  - Not being able to afford adequate food or medical care
  - Living in a high-crime neighborhood
    - Witnessing or being the victim of a violent crime

## **In adulthood:**

- Research has linked broader measures of well-being, like educational attainment and crime, to adversity as well

# Generalizing to non-white and higher neighborhood poverty populations

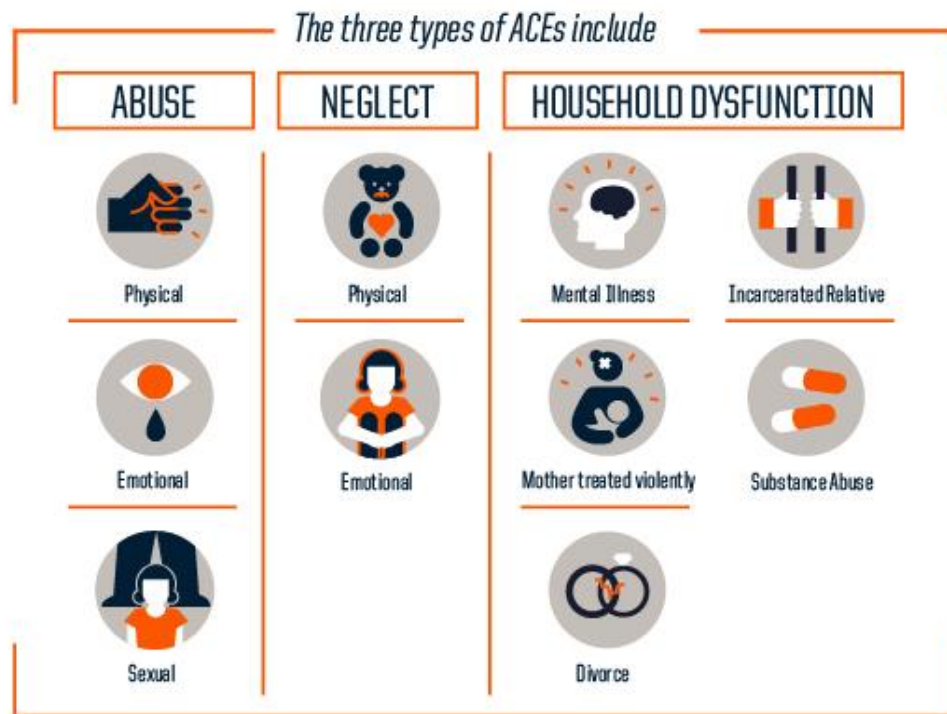
- Previous research with the current, higher-risk sample (Giovannelli, Reynolds, Mondì, & Ou, 2016) showed strong ACE effects, suggesting generalization



# Adverse Childhood Experiences (ACEs)

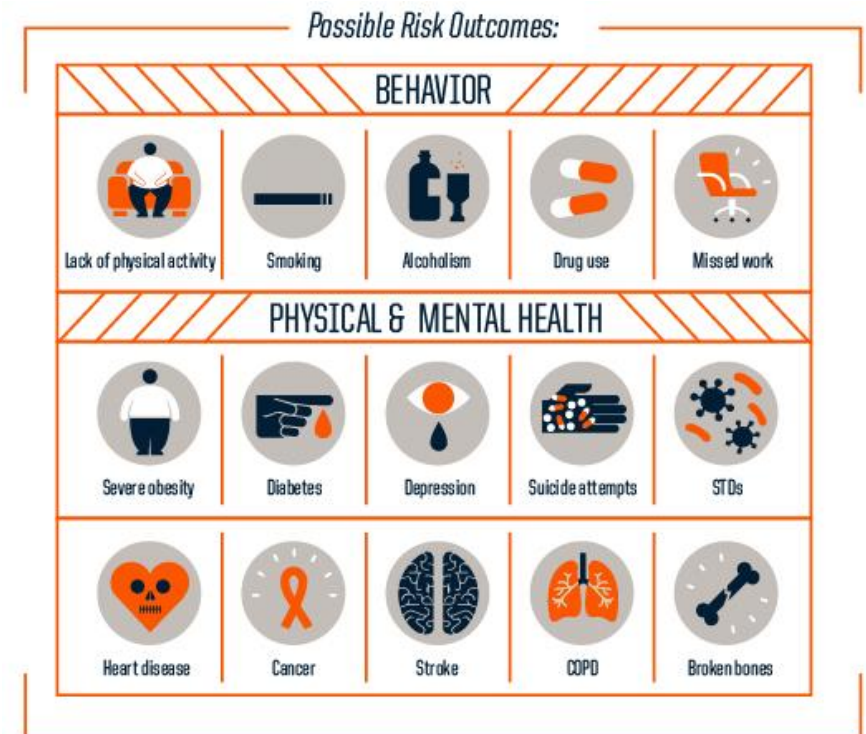
## TRADITIONAL CONCEPTUALIZATION OF ACES (KAISER/CDC)

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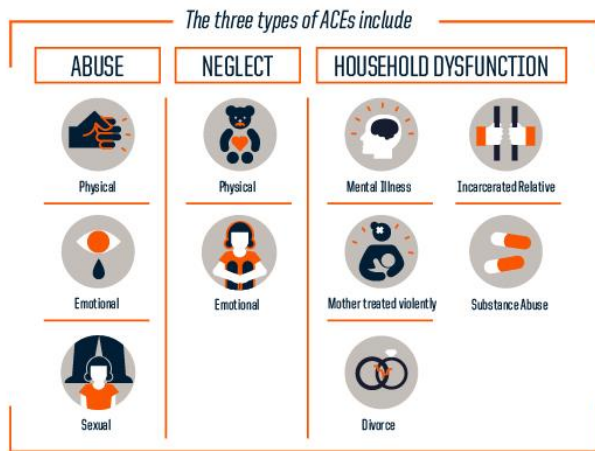


Graphics: Robert Wood Johnson Foundation

# Adverse Childhood Experiences (ACEs)

## EXPANDED CONCEPTUALIZATION

- Abuse, Neglect, & Household Dysfunction

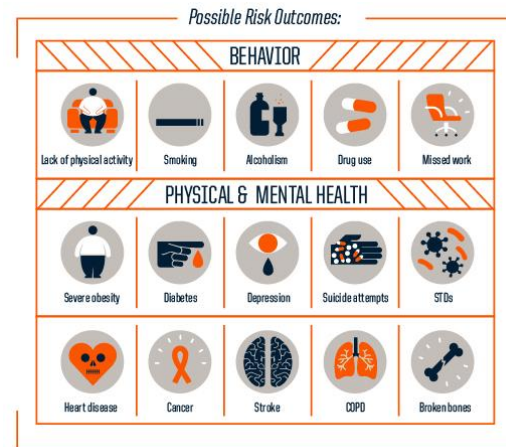


+ broader environmental ACEs



## EXPANDED OUTCOMES

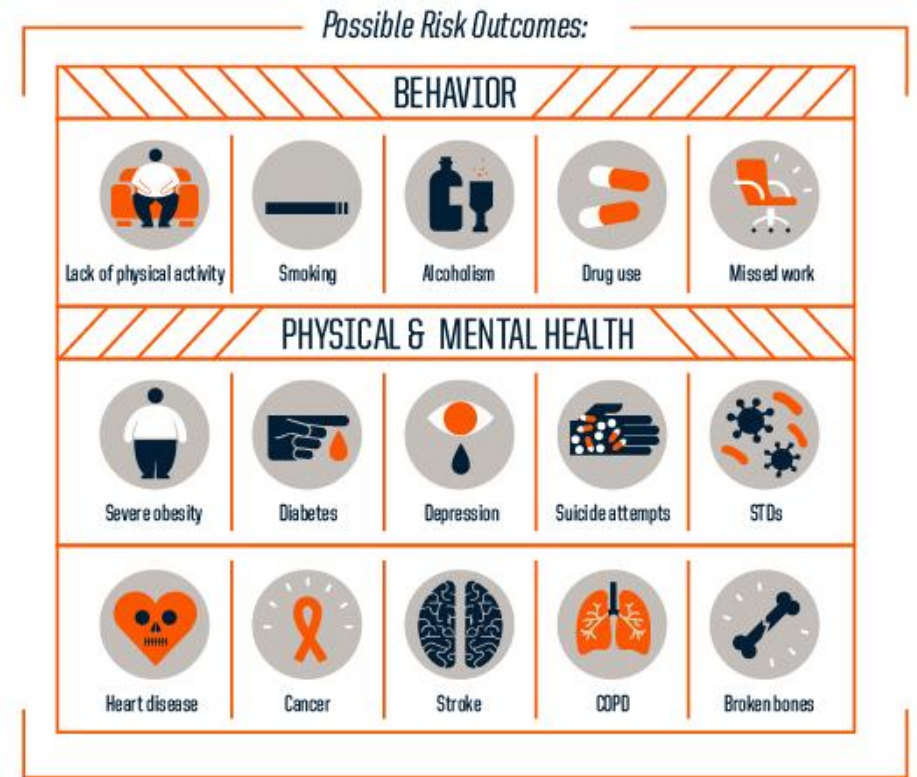
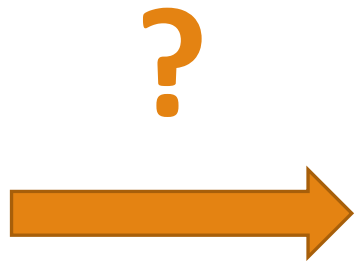
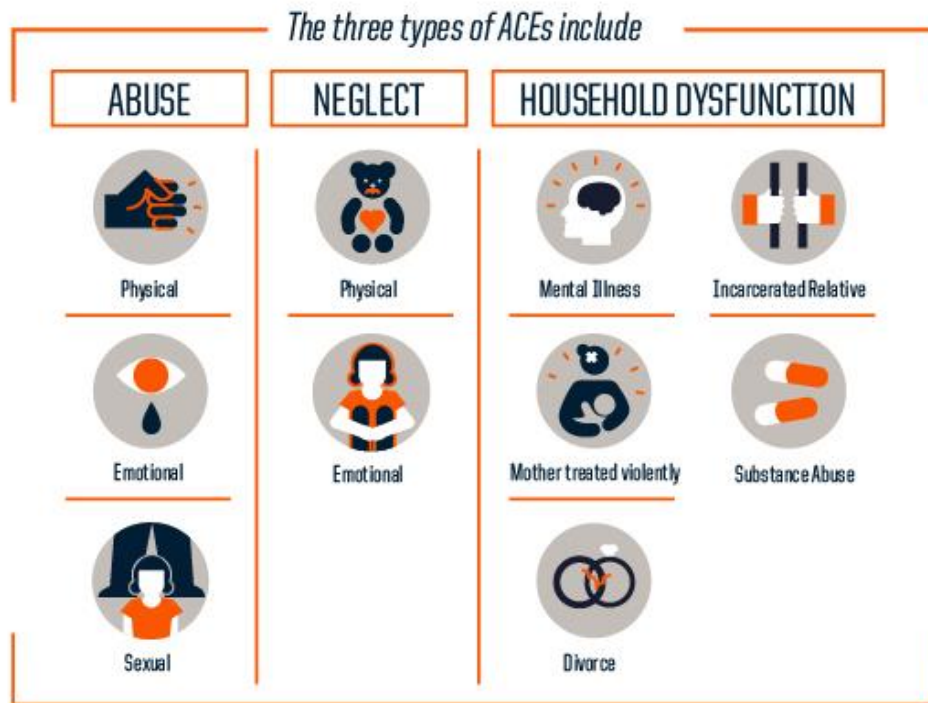
- Behavior & Physical/Mental Health



+ broader measures of well-being



# What now?





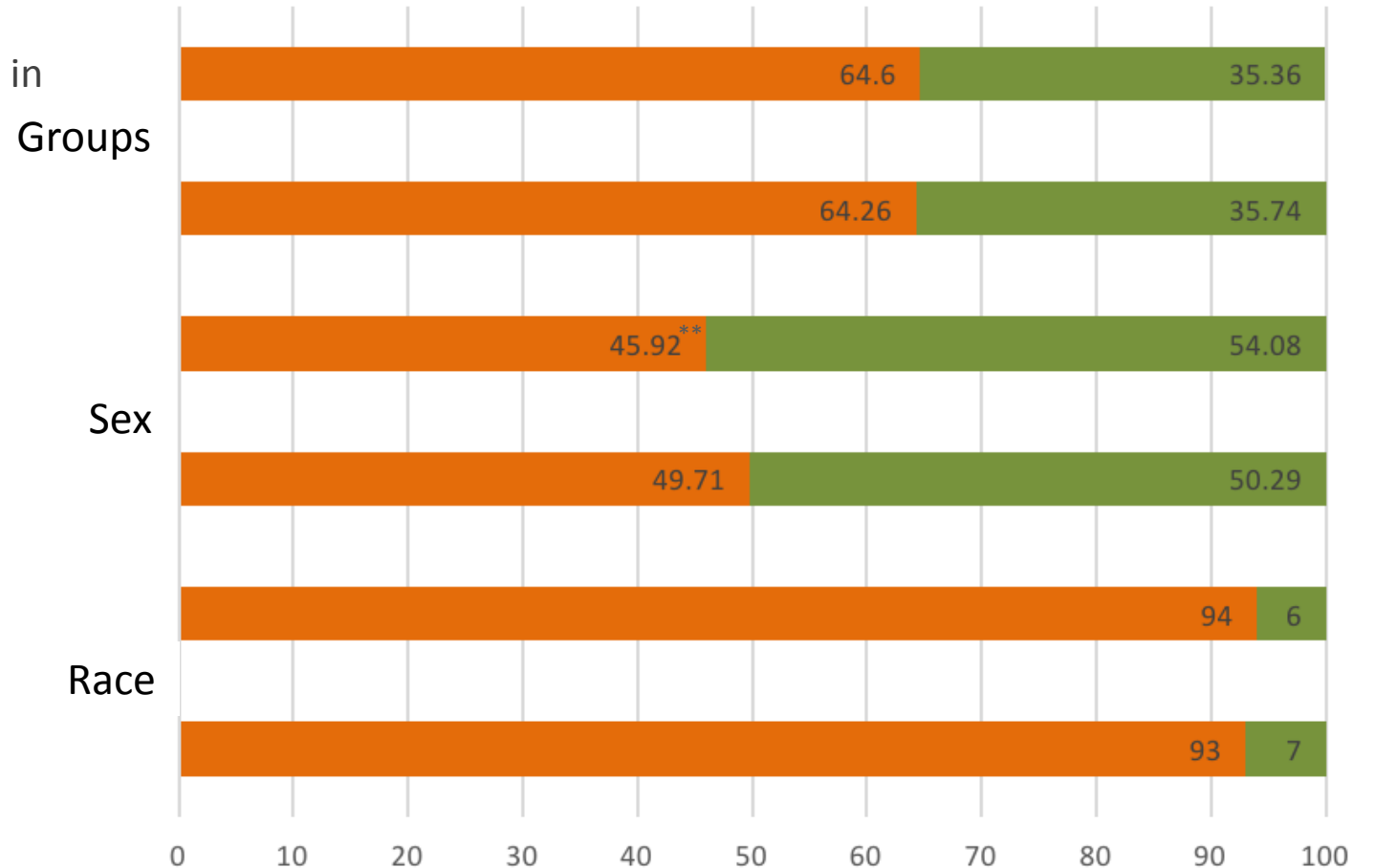
# Chicago Longitudinal Study sample

## Original sample

- 1,539 children beginning preschool at age 3 in 1983-1984 or age 4 in 1984-1985
  - (CPC = 989; Comparison group = 550)
- Matched group, quasi-experimental design
  - Born in 1980
  - Resided in high poverty neighborhoods
  - Attended Chicago Public Schools
- 93% African-American; 7% Latino
- 49.7% male, 50.3% female

## Current sample

- 1,202 participants with ACE data
  - Retrospective data gathered at 22-24
  - Administrative data collected from 0-18
- 94% African-American, 6% Latino
- 45.9% male, 54.1% female



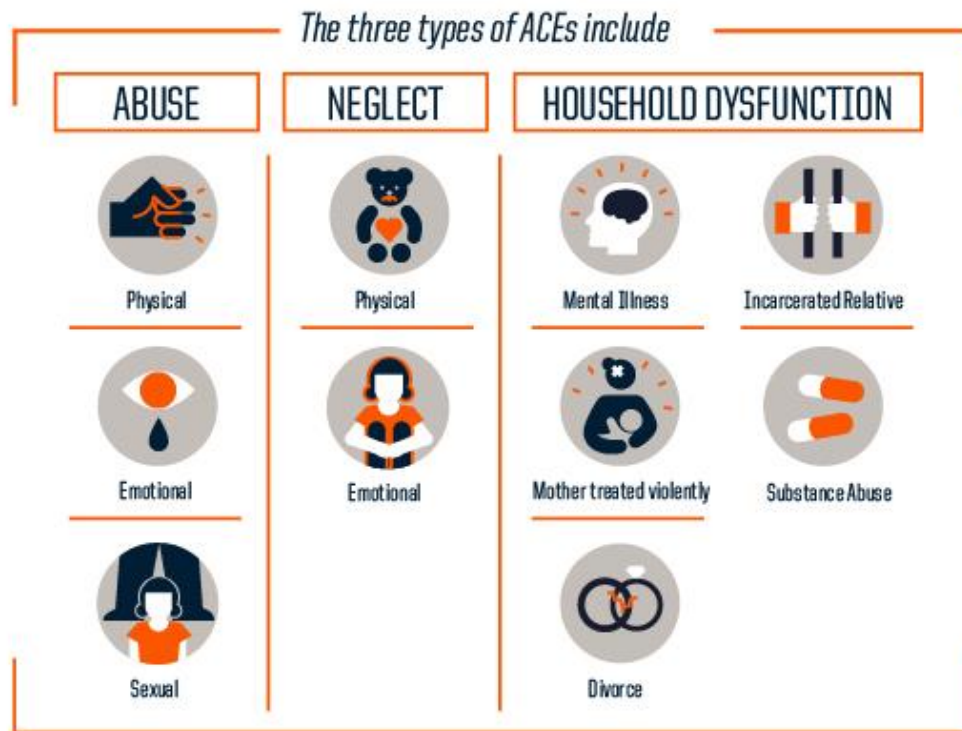
# Primary Research Questions:

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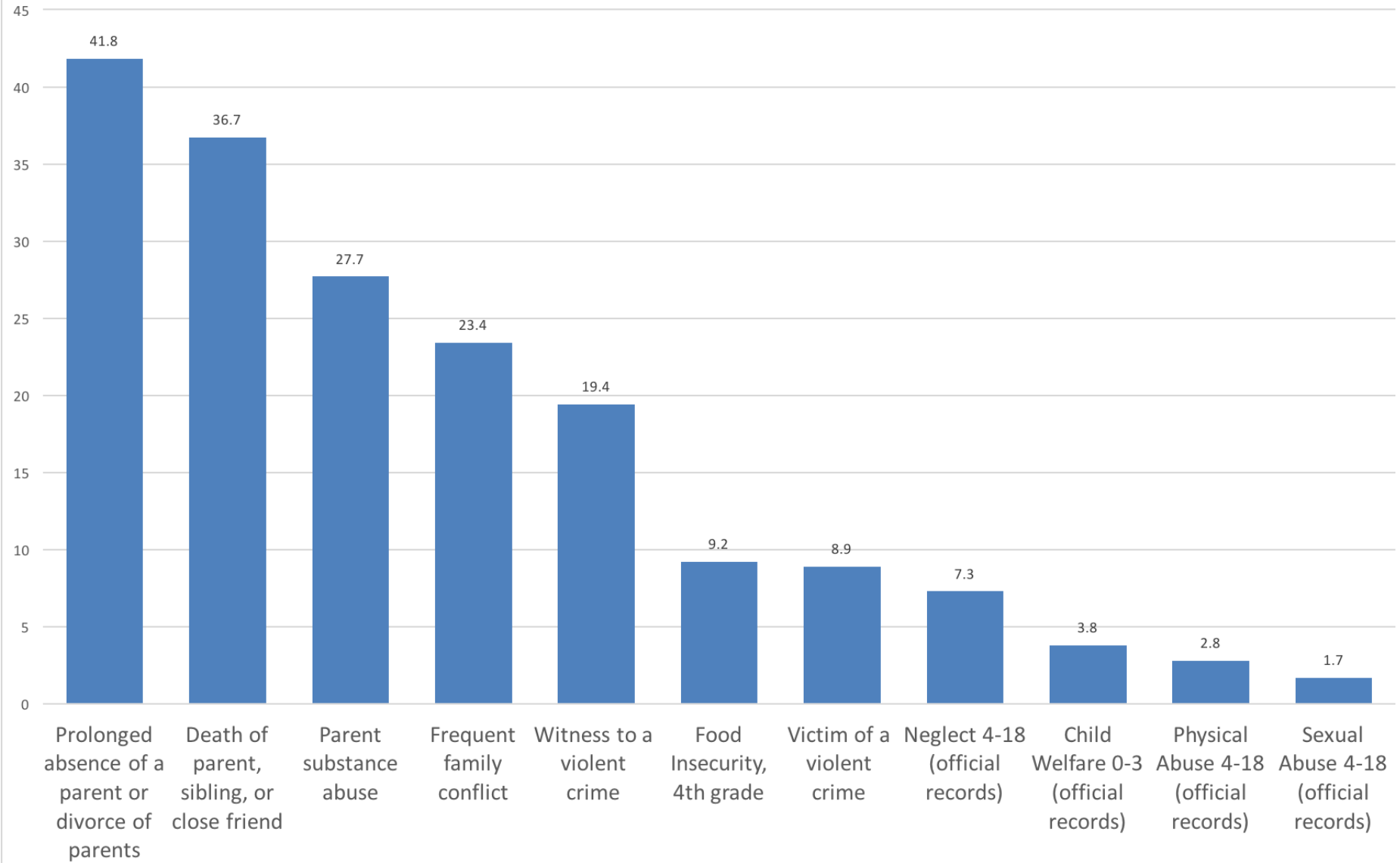
1. Do cumulative ACEs predict **well-being** in a primarily African American sample?
2. Are associations between cumulative ACEs and outcomes in adulthood strongest for **males** and for participants attending schools in the **highest poverty neighborhoods**?
3. Do 5 Hypothesis Model (5HM) mediators **explain the effects of ACEs**?

# Predictors: ACEs

- Abuse, Neglect, & Household Dysfunction + broader environmental ACEs

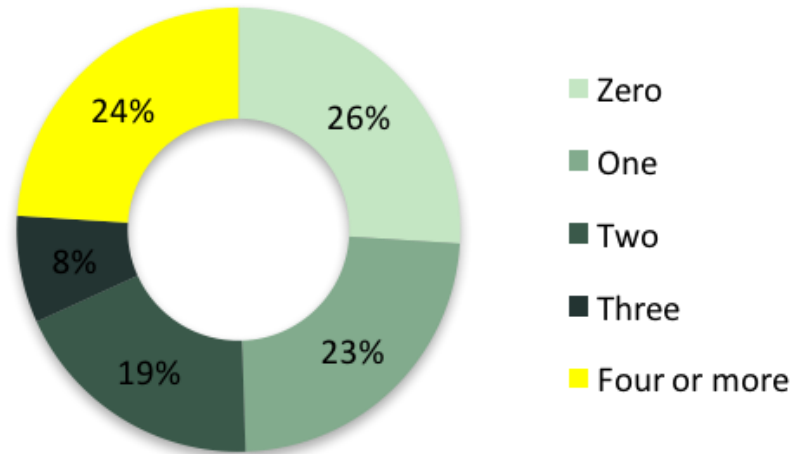


## Prevalence of ACE indicators in the CLS Sample, birth to 18



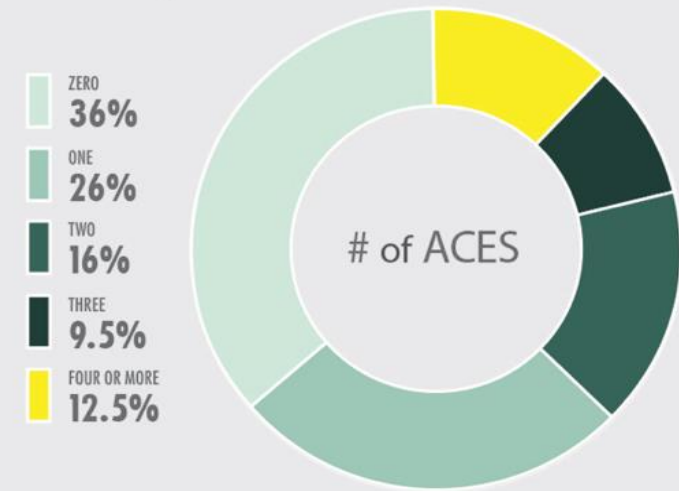
# ACE Prevalence: Current Sample vs Kaiser/CDC

How Common are ACES?  
Chicago Longitudinal Study Sample

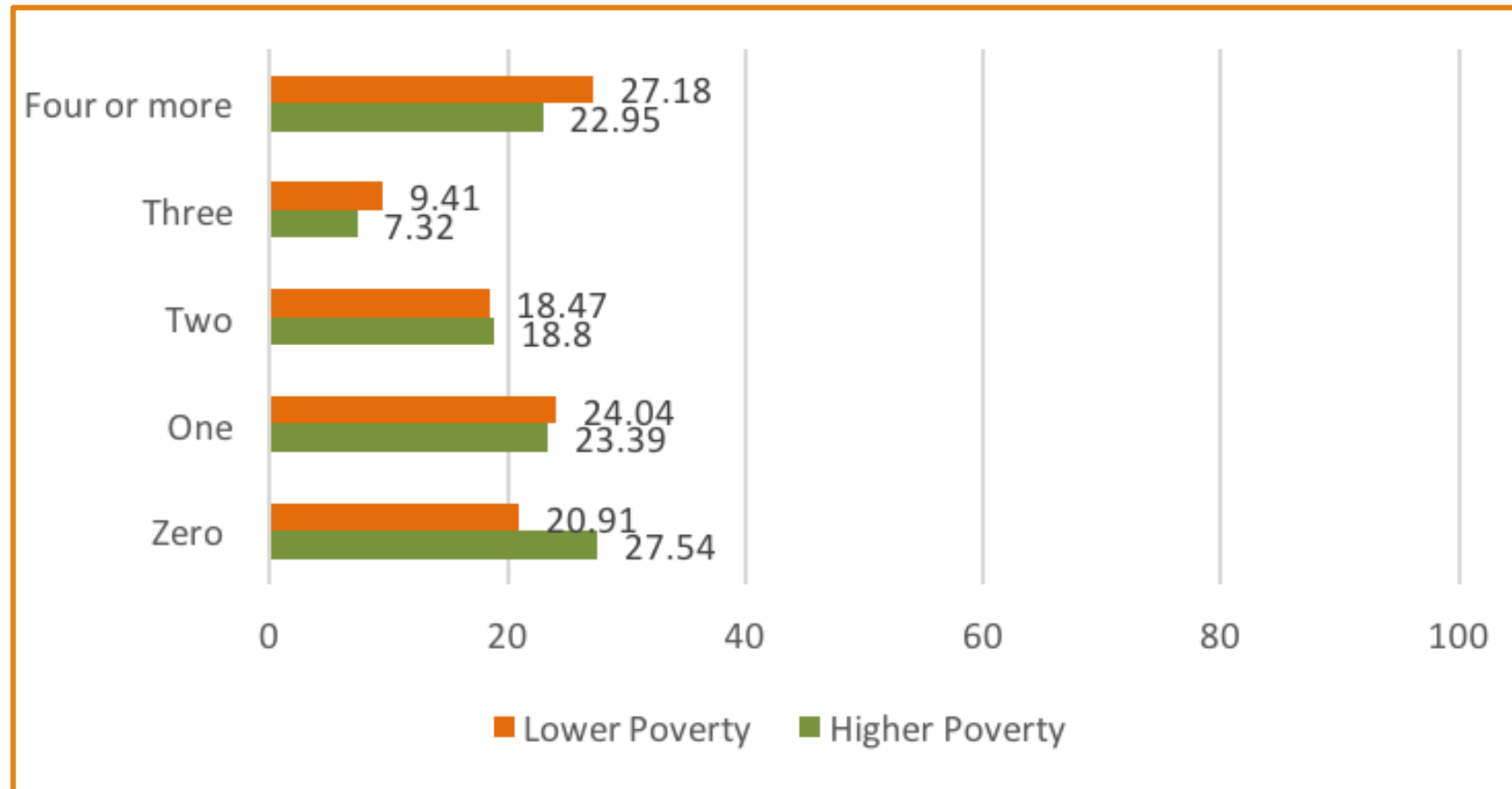


How Common are ACES?

ACE Study



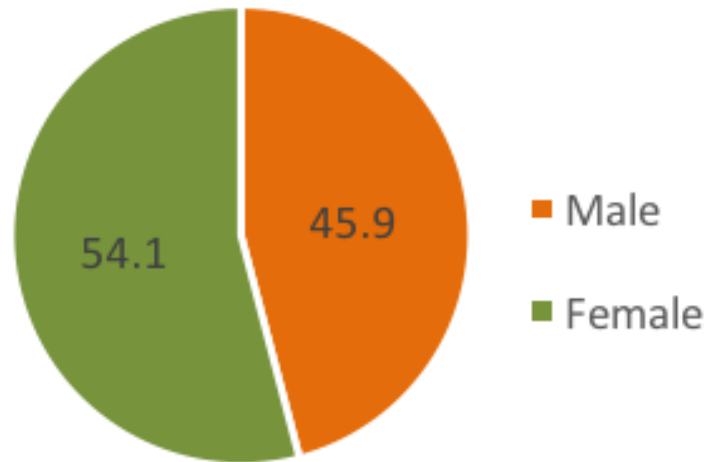
# ACE prevalence by neighborhood poverty



# Subgroups

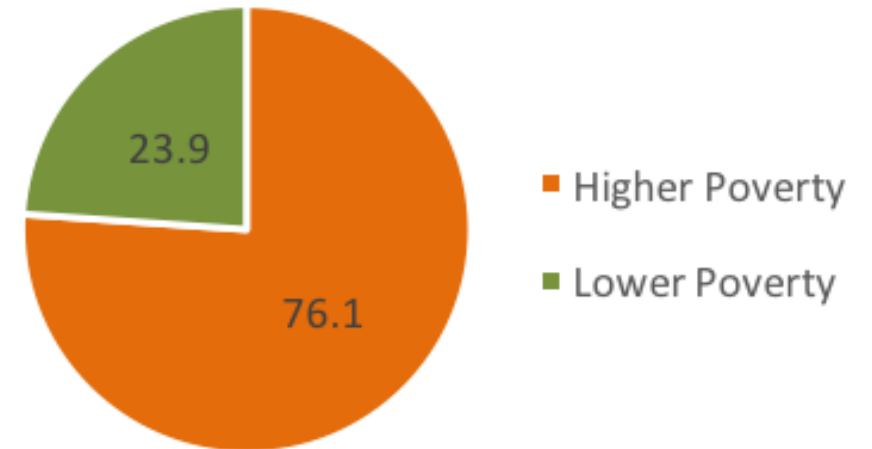
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## SEX



## NEIGHBORHOOD POVERTY

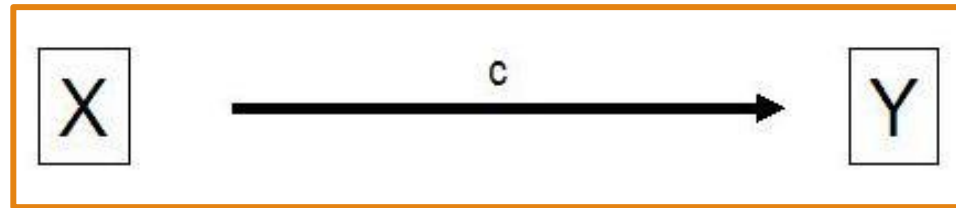
Participants in school neighborhoods with  $\geq 60\%$  poverty vs all other



# Mediation

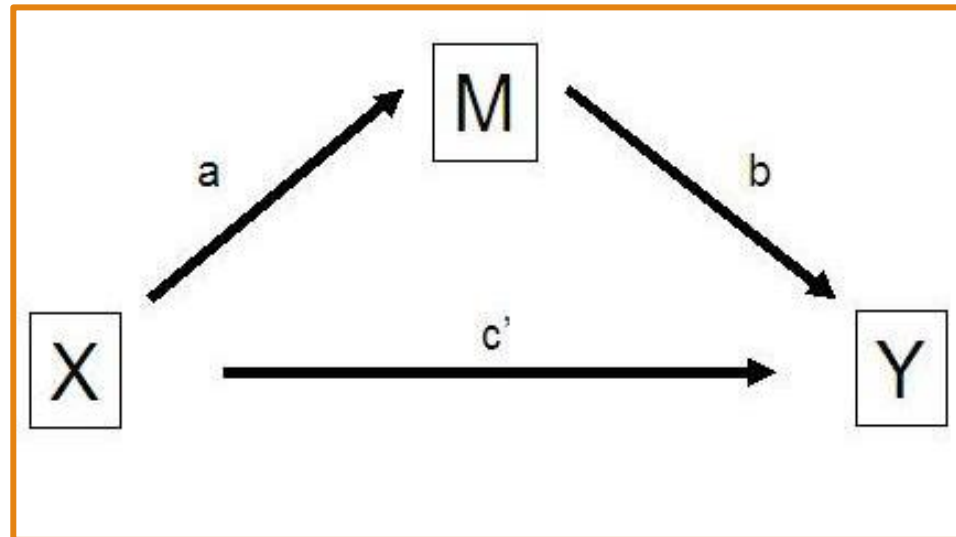
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≥4 ACEs



Smoking (yes/no)

≥4 ACEs



Smoking (yes/no)

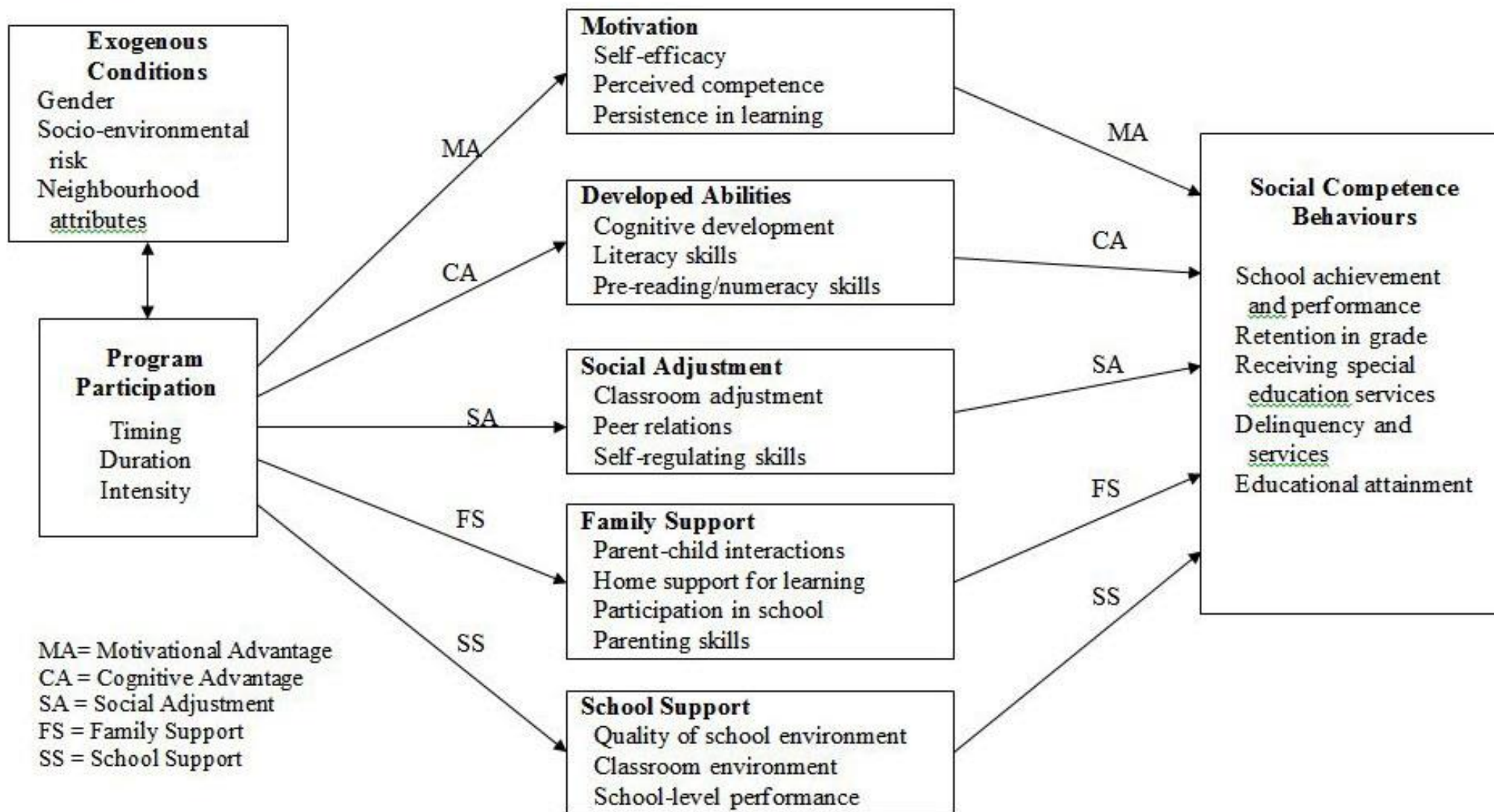
(Kenny, 2016)



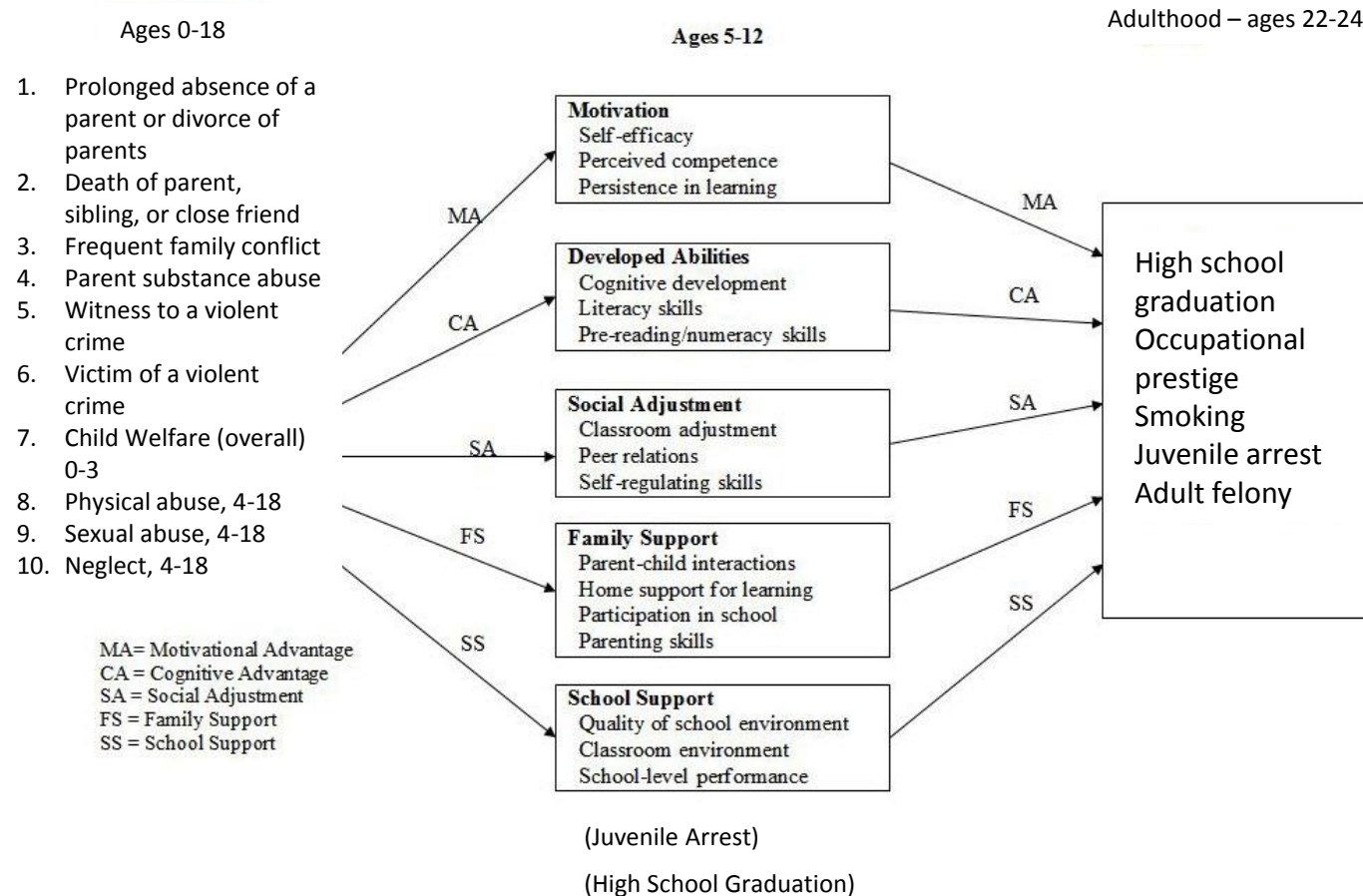
**Early Childhood**  
Ages 3-9

**Ages 5-12**

**Adolescence**  
Ages 12-



# Mediators: 5 Hypothesis Model (Reynolds & Ou, 2016)



# Mediators

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- Examination of mechanisms of effects aids intervention design by identifying malleable environmental conditions (e.g., school quality) that can be modified to improve children's success. These factors then can be manipulated to improve outcomes for affected children (Reynolds, Ou, & Topitzes, 2004).
- **Cognitive Advantage**
  - Iowa Test of Basic Skills, Kindergarten and 8<sup>th</sup> grade
- **Social Adjustment**
  - Teacher-rated classroom socio-emotional adjustment, grades 1-6
  - Teacher-rated task orientation and frustration tolerance, grades 6-7
- **Family Support**
  - Parent involvement in school and at home, elementary school
- **School Support**
  - Magnet school attendance and number of school moves, grades 4-8
- **Motivational Advantage**
  - School commitment, grades 5-6

# Outcome Measures

## Education

- High school graduation

## Health

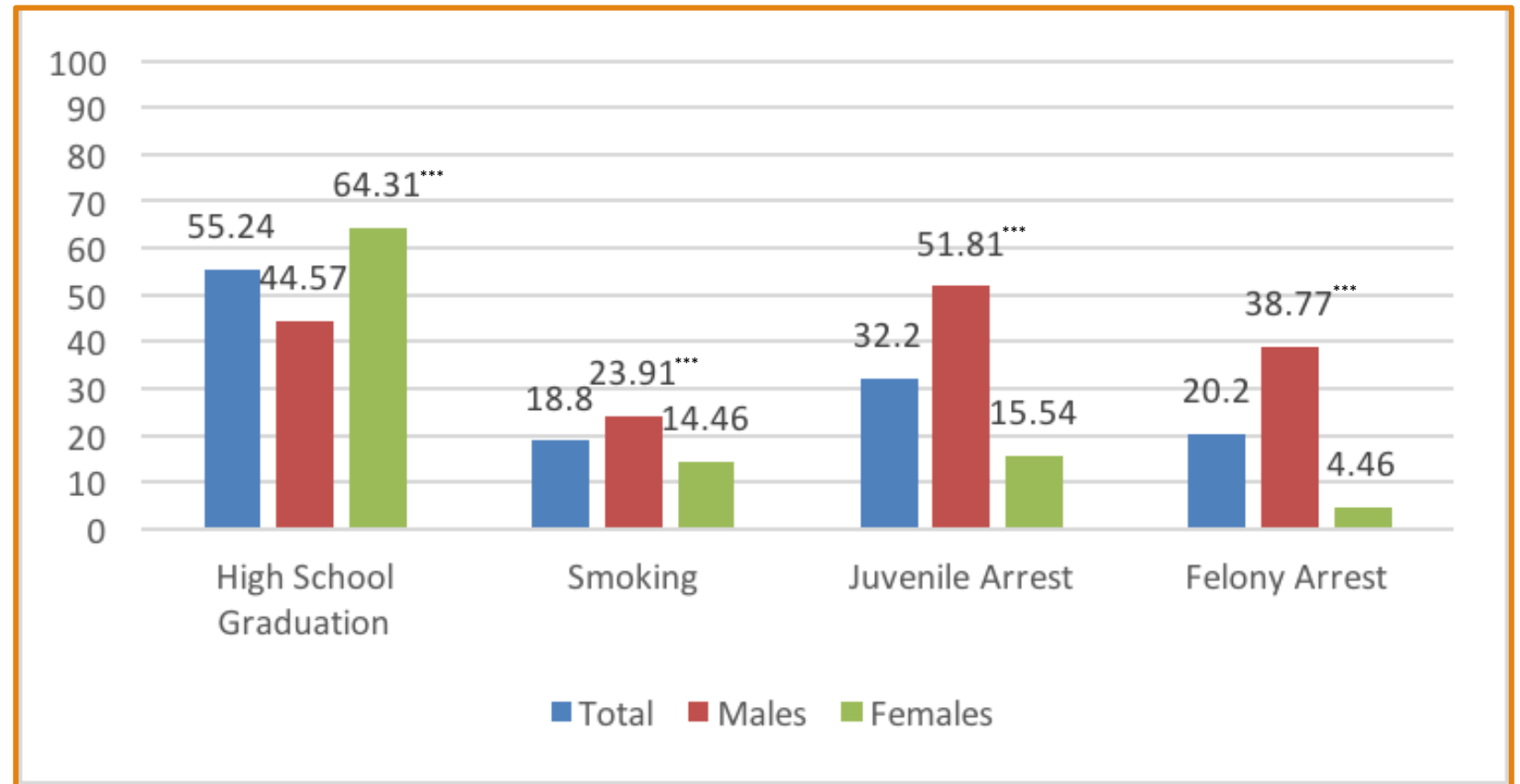
- Smoking

## Criminal justice system involvement

- Juvenile arrest
- Adult felony

## Socioeconomic well-being

- Occupational prestige
  - Continuous (0-8)
  - Dichotomized ( $\geq 4$ )

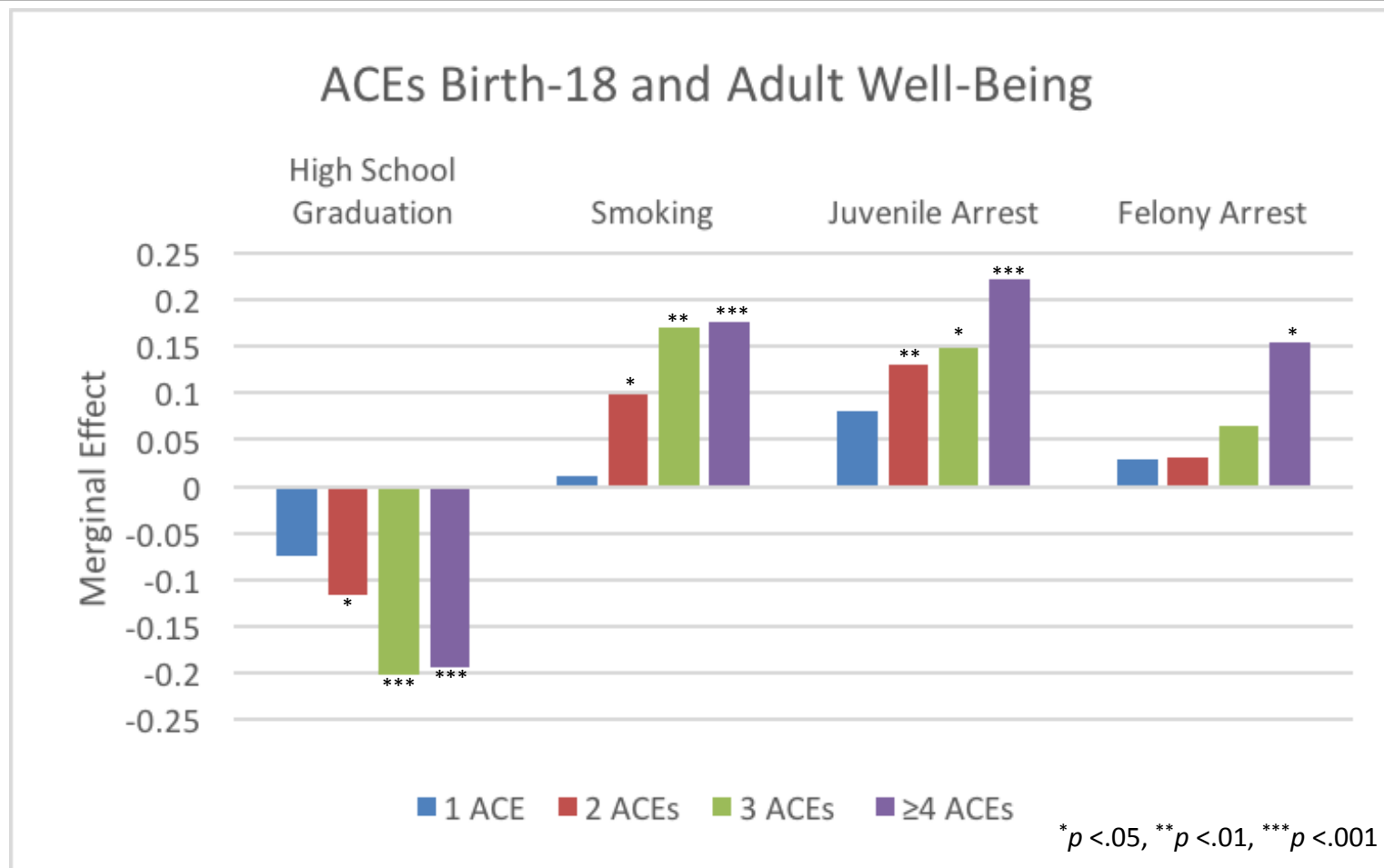


# Research Question 1

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Do cumulative ACEs predict **well-being** in a primarily African American sample?

# Research Question 1



# Effect Sizes, 3 and $\geq 4$ ACE groups

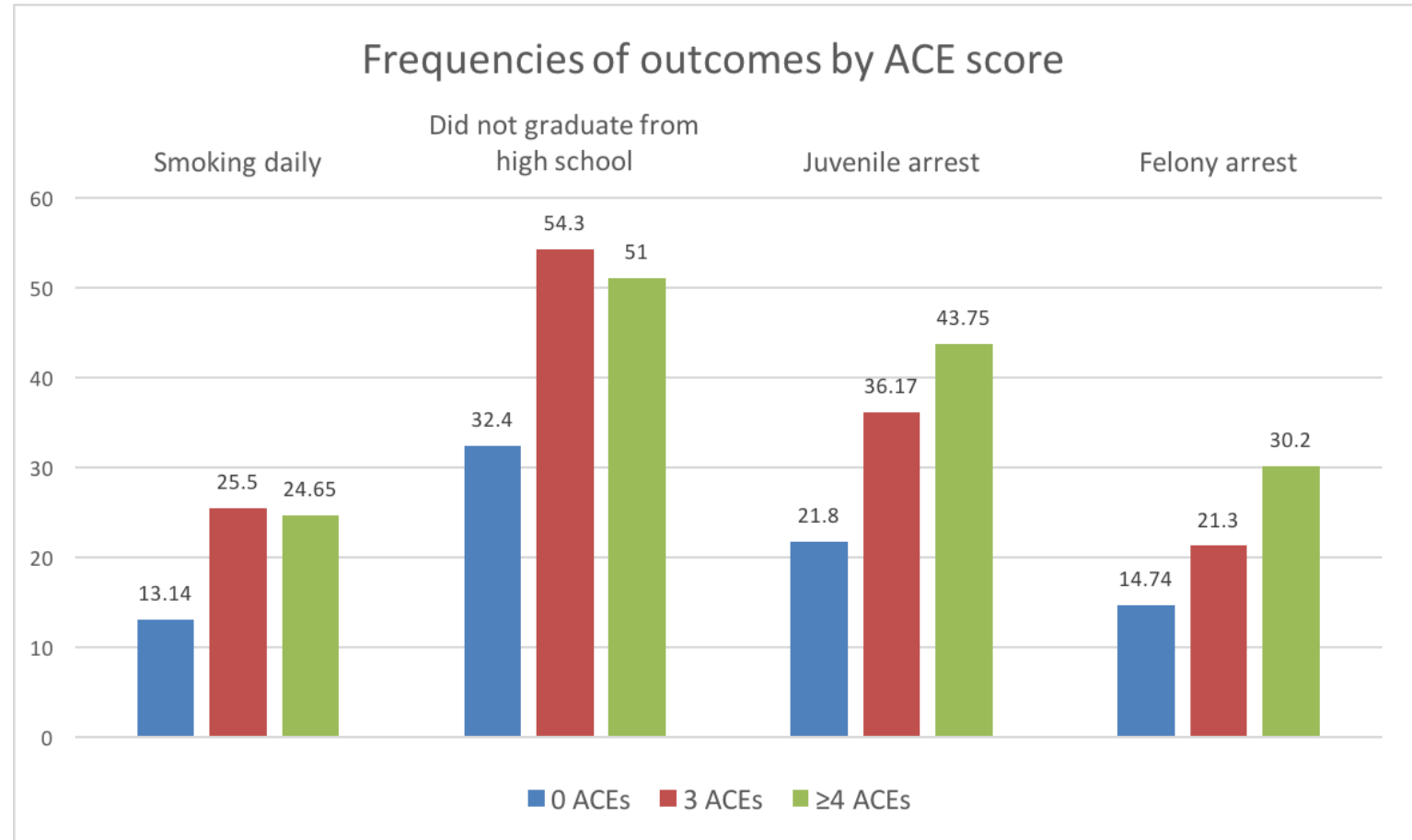
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Outcome	Effect Size for 3 ACE group	Effect Size for $\geq 4$ ACE group
High School Graduation	<b>-.41</b>	<b>-.39</b>
Smoking	<b>.32</b>	<b>.45</b>
Juvenile Arrest	<b>.43</b>	<b>.48</b>
Felony Arrest	--	<b>.39</b>

*Note:* Effect size conventions: Small = .2, Medium = .5, Large = .8

# Percentage Point Differences in Outcomes

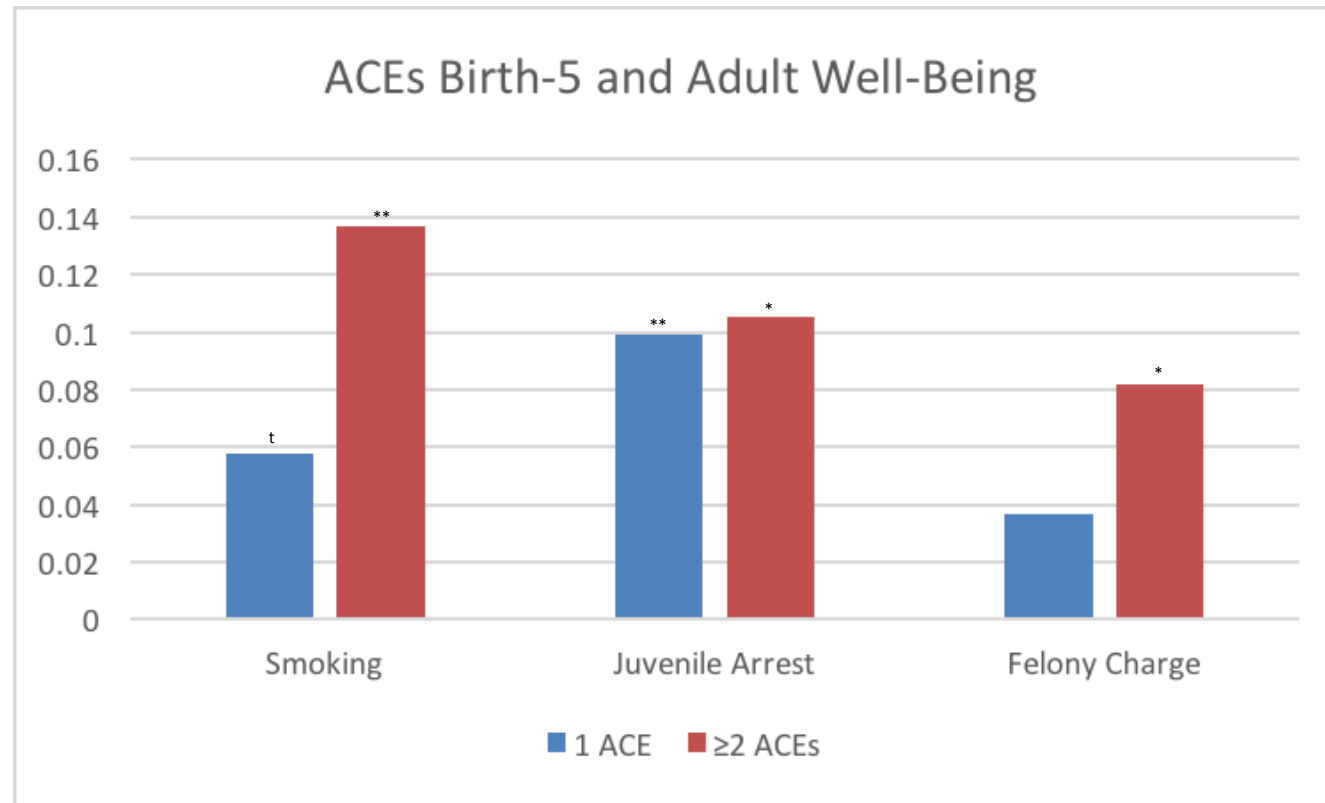
- 3 and  $\geq 4$  ACE groups had significantly higher rates of all outcomes when compared to 0 ACE group.
- $\geq 4$  ACE group had significantly higher rates of juvenile arrest and felony arrest.





# Timing: Looking at just birth-5

Do cumulative ACEs predict **well-being** in a primarily African American sample?



<sup>t</sup> $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

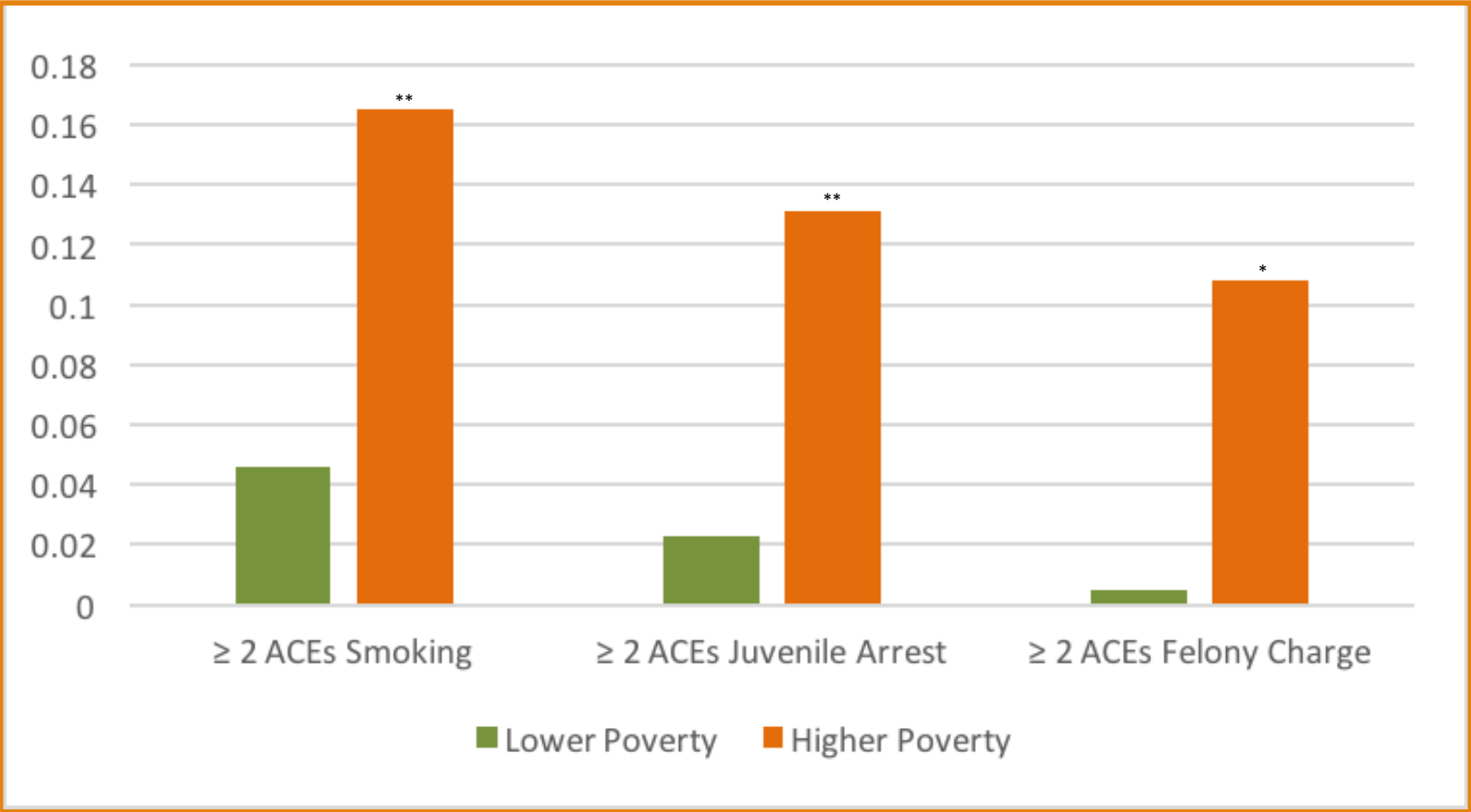
# Effect Sizes, $\geq 2$ ACE group

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Outcome	Effect Size for $\geq 2$ ACE group
Smoking	<b>.23</b>
Juvenile Arrest	<b>.34</b>
Felony Arrest	<b>.21</b>

*Note:* Effect size conventions: Small = .2, Medium = .5, Large = .8

# Subgroup differences by neighborhood poverty, 0-5

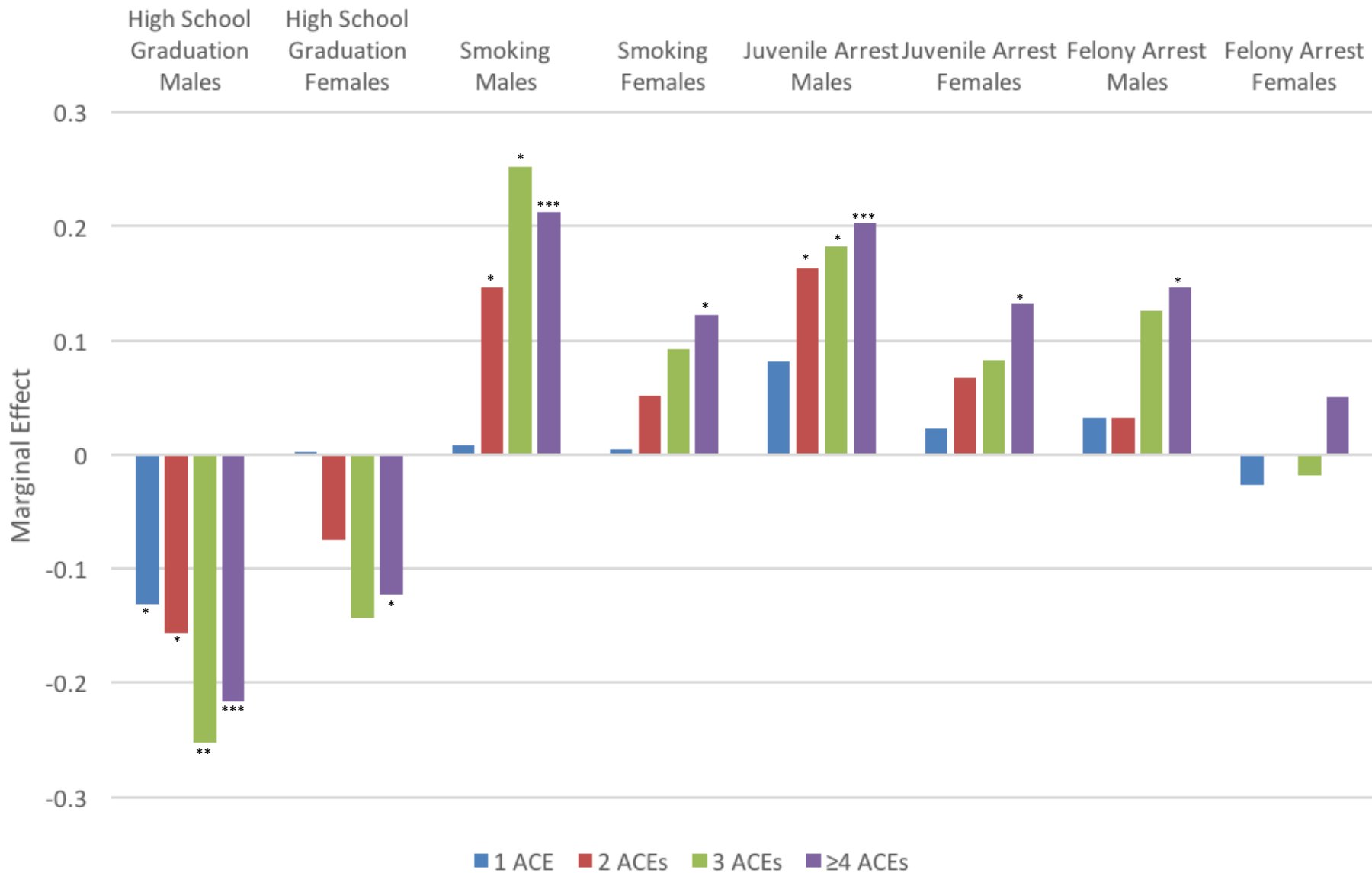


# Research Question 2

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Are associations between cumulative ACEs and outcomes in adulthood strongest for **males** and participants in the **highest poverty neighborhoods**?

## Male vs. Female, ACEs 0-18



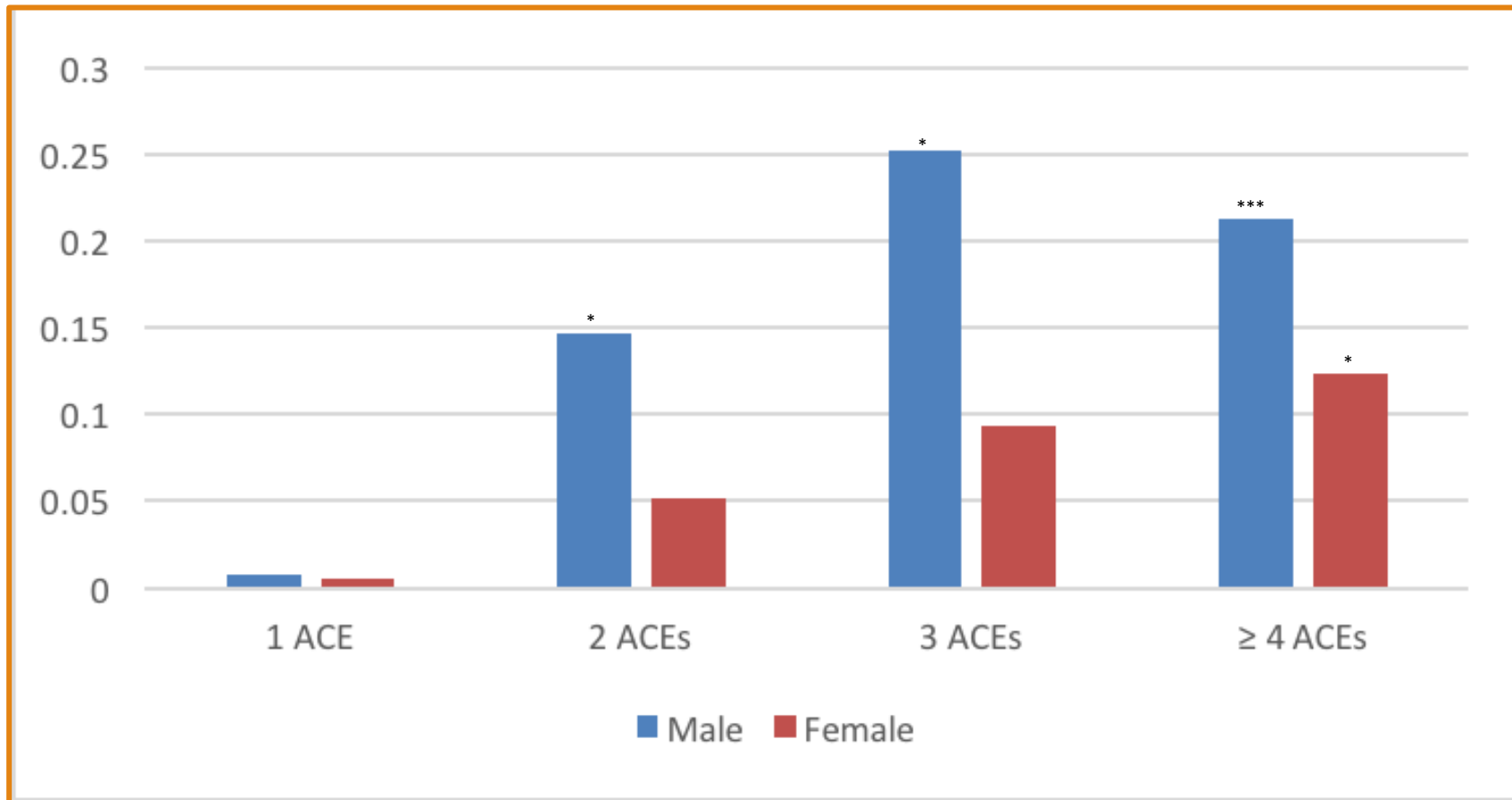
\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

# Male vs. Female, ACEs 0-18

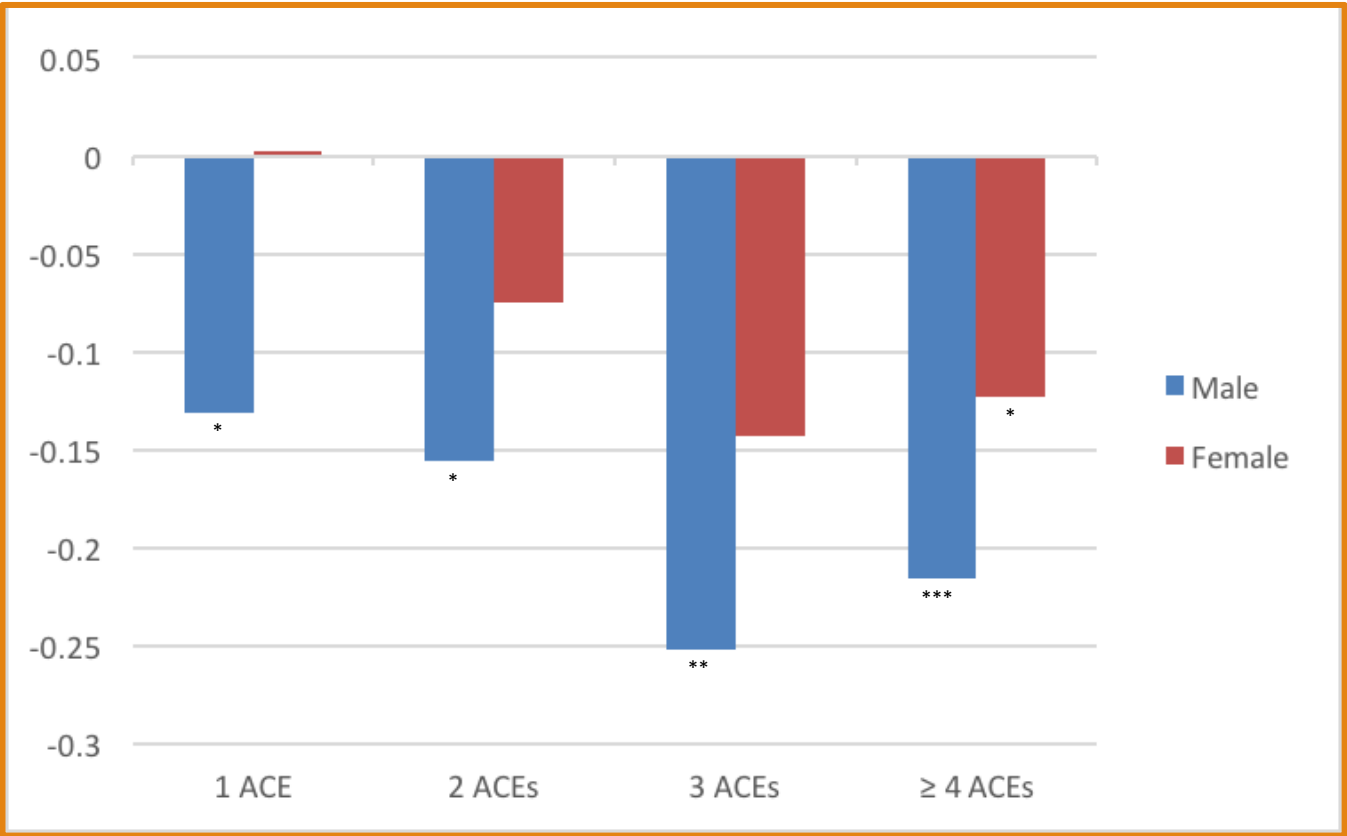


\*p < .05, \*\*p < .01, \*\*\*p < .001

# Subgroup differences by sex: ACEs on smoking



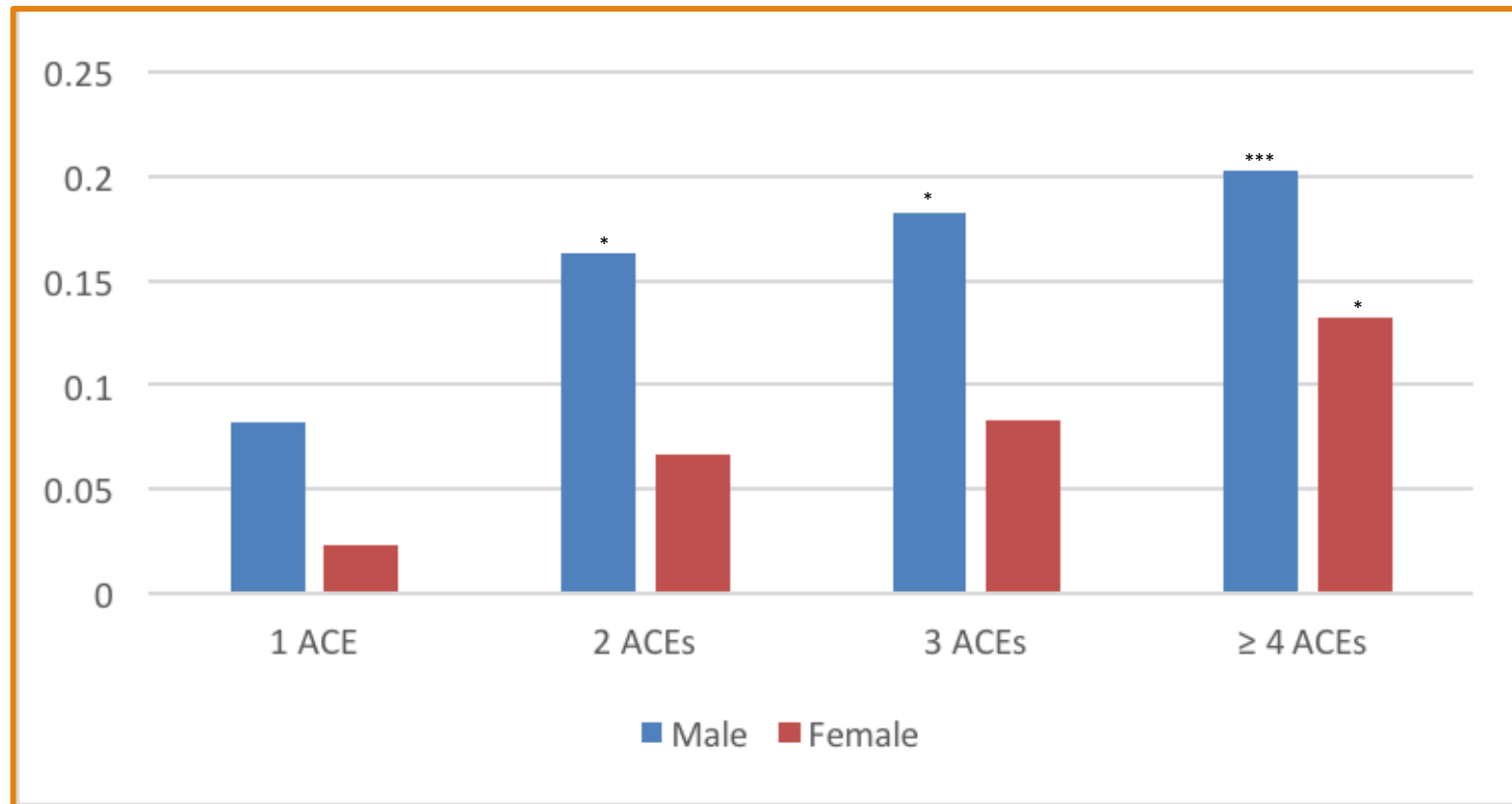
# Subgroup differences by sex: ACEs on High school graduation



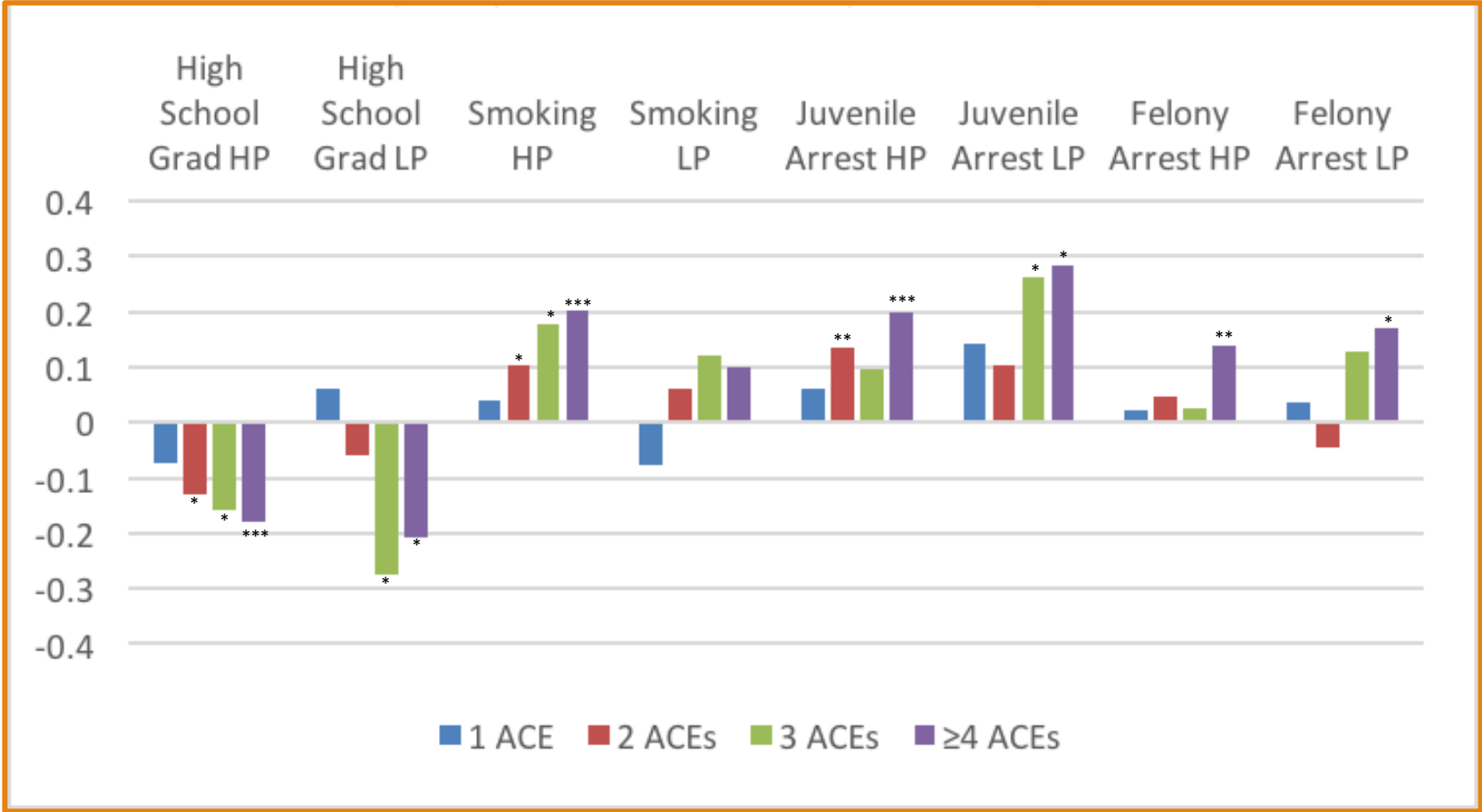


# Subgroup differences by sex: ACEs on juvenile arrest

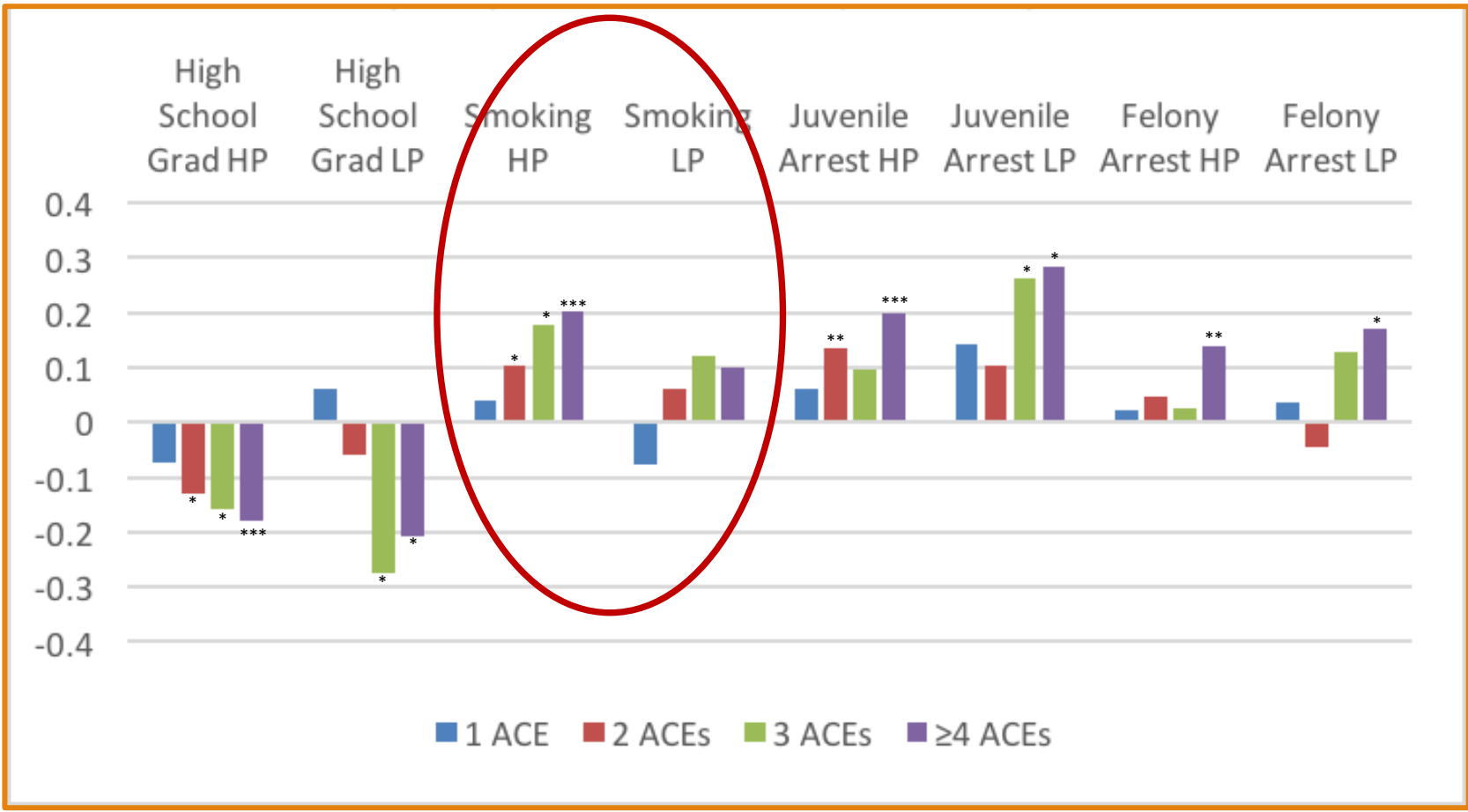
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# Subgroup differences by neighborhood poverty

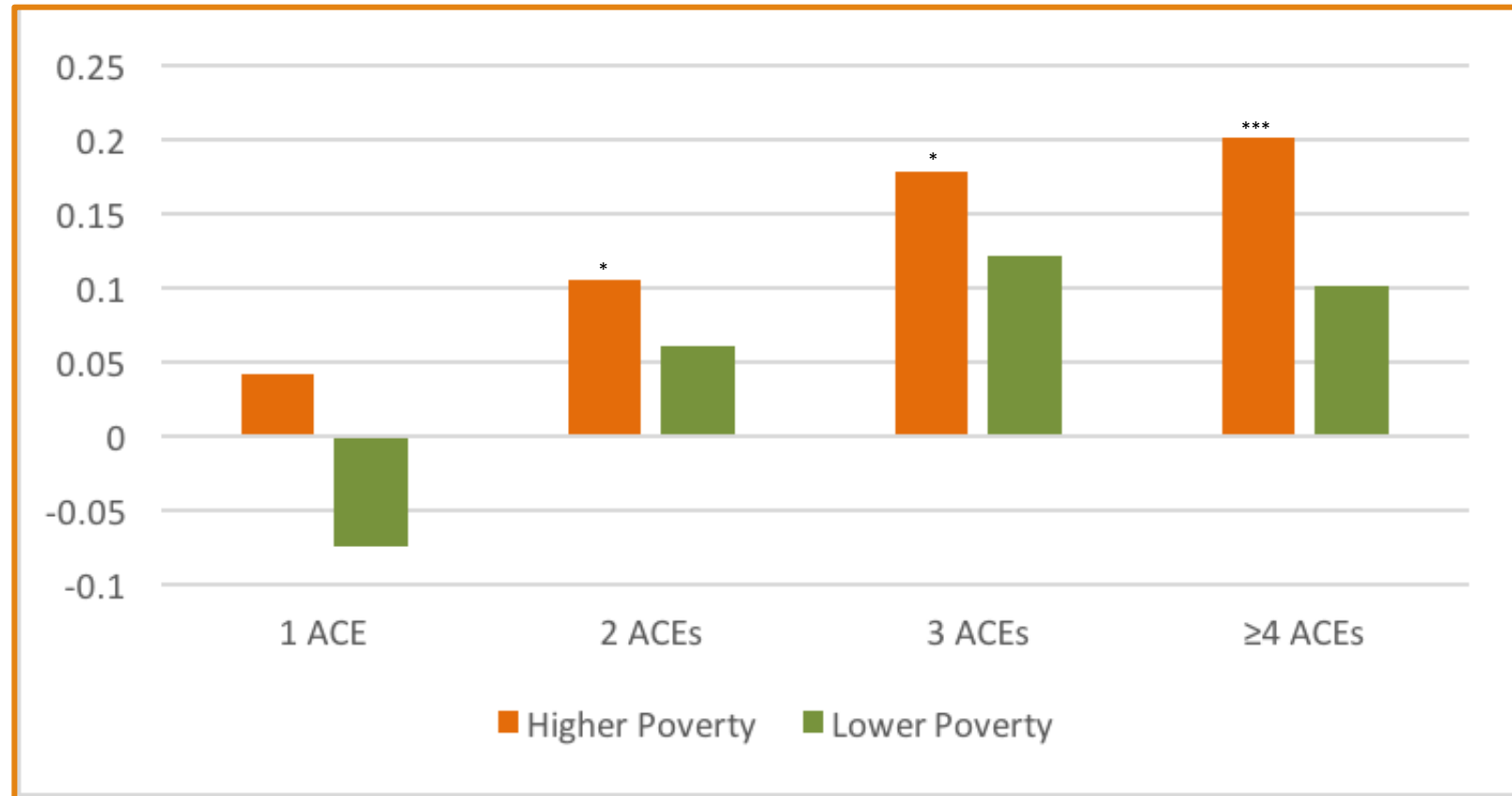


# Subgroup differences by neighborhood poverty



# Subgroup differences by neighborhood poverty: $\geq 4$ ACEs on smoking

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# Research Question 3

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Do 5 Hypothesis Model (5HM) mediators **help to explain the effects of ACEs?**

# Percent Reduction

Example:

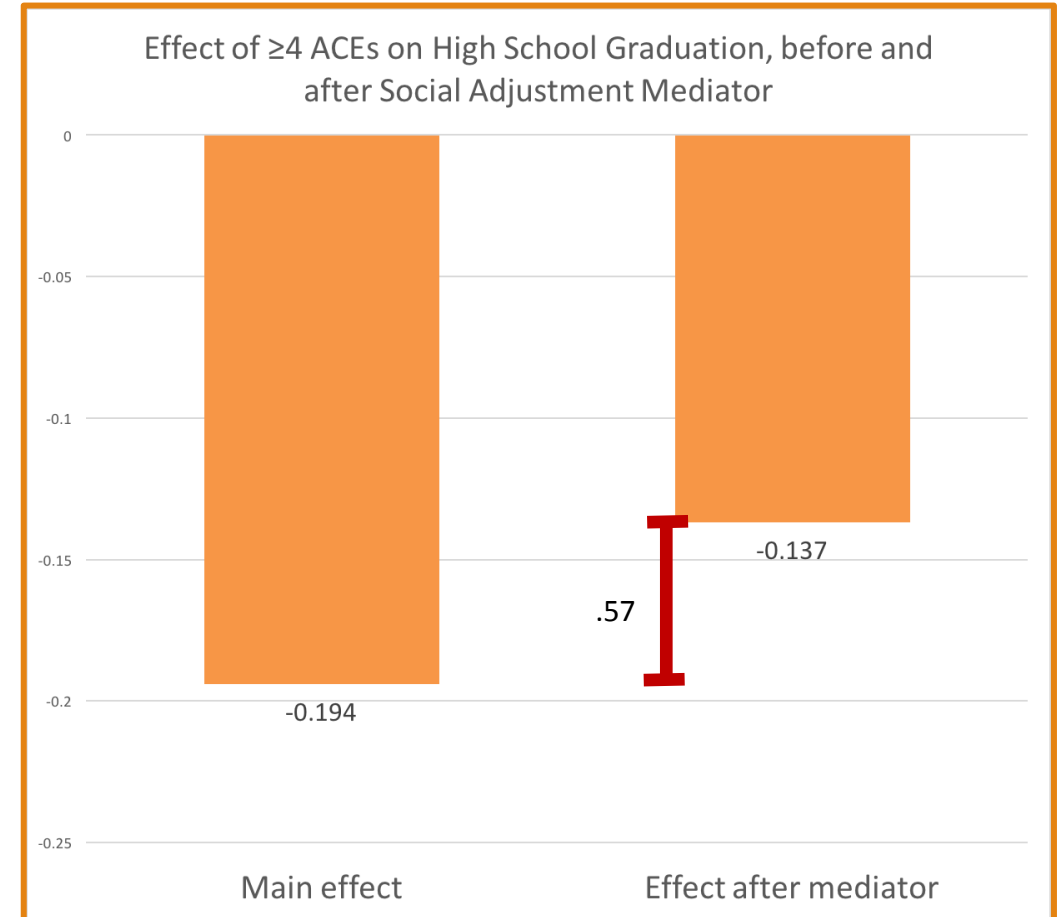
Effect of  $\geq 4$  ACEs on High School Graduation: **-.194**

Effect of  $\geq 4$  ACEs on High School Graduation when social adjustment mediators added into the model: **-.137**

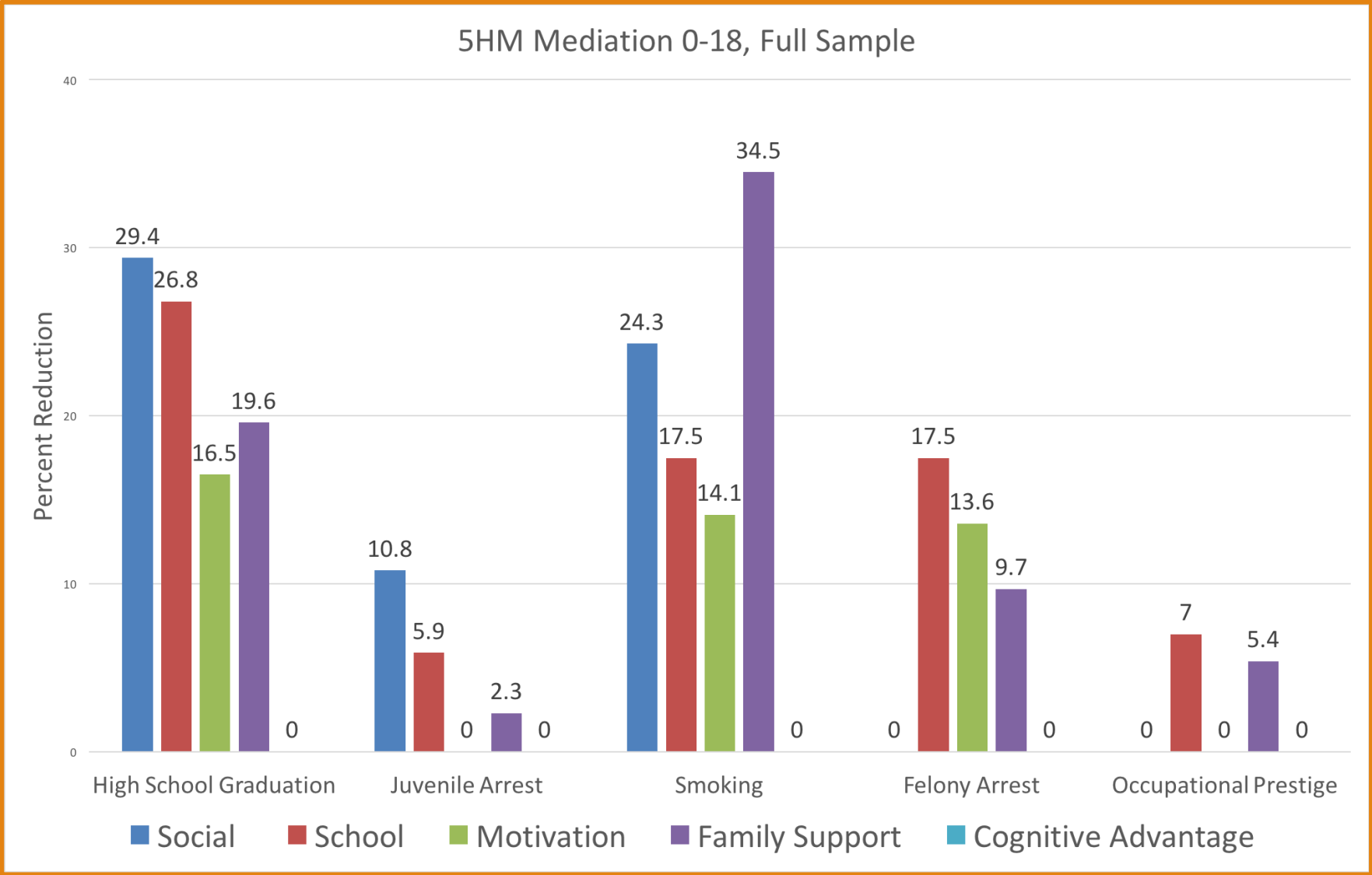
Percent reduction [percent of effect of  $\geq 4$  ACEs explained by social adjustment factors] =

$$.194 - .137 / .194$$

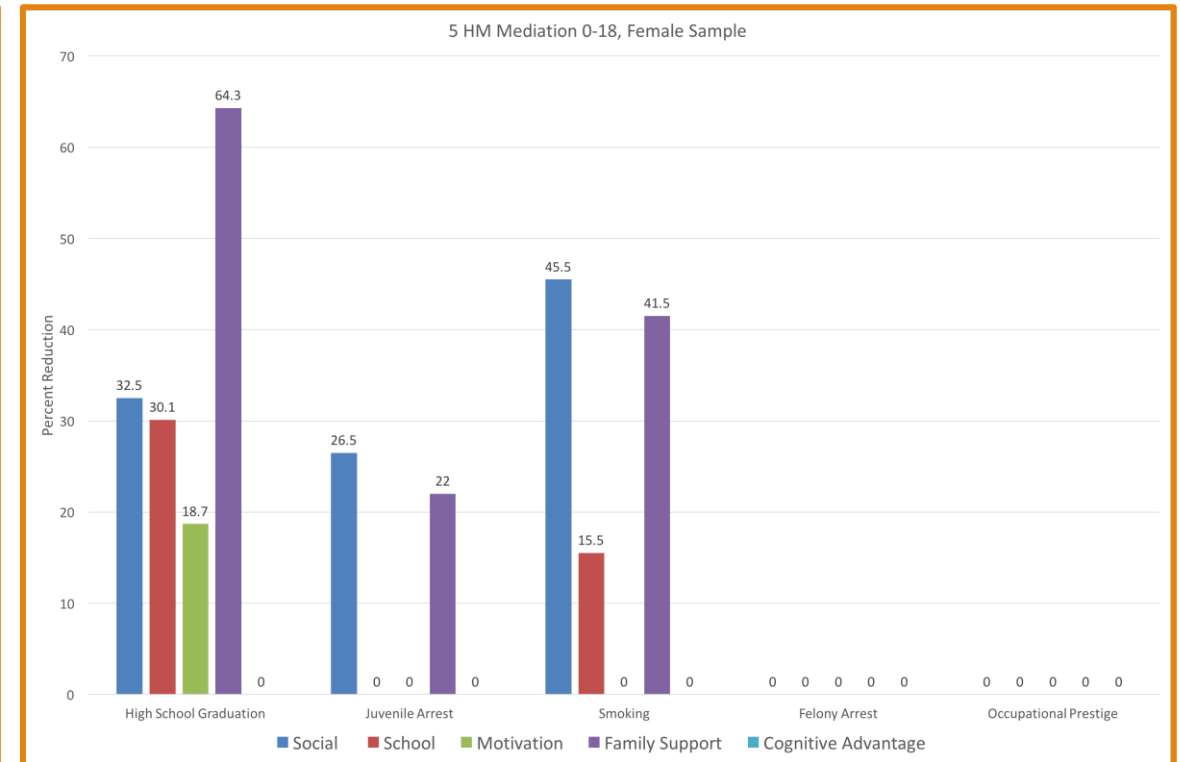
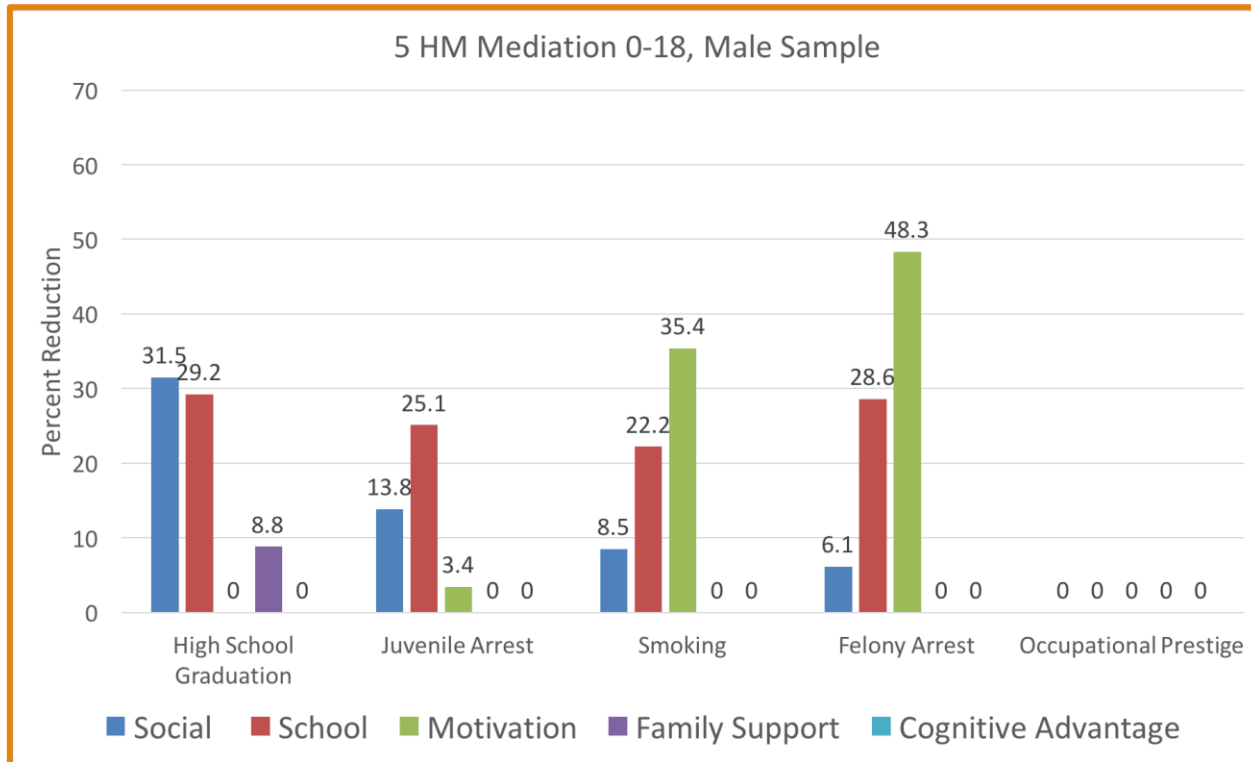
$$.57 / .194 = 29.4\%$$



# Individual Mediation Effects by Mediator, ≥4 ACEs



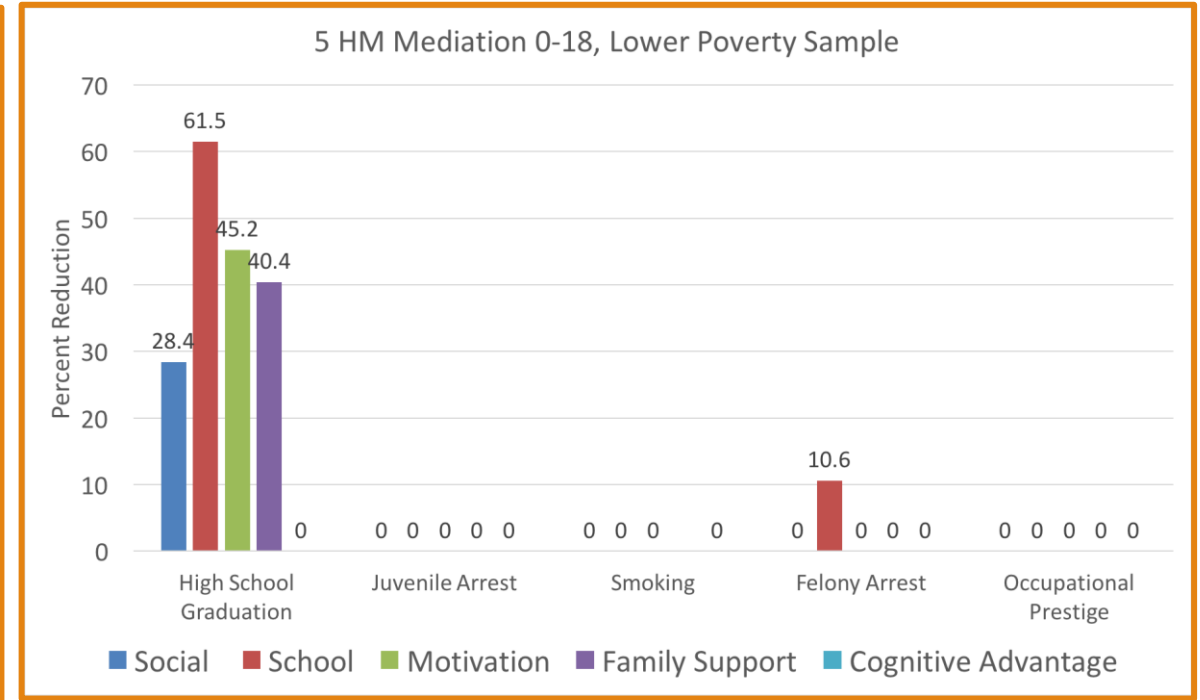
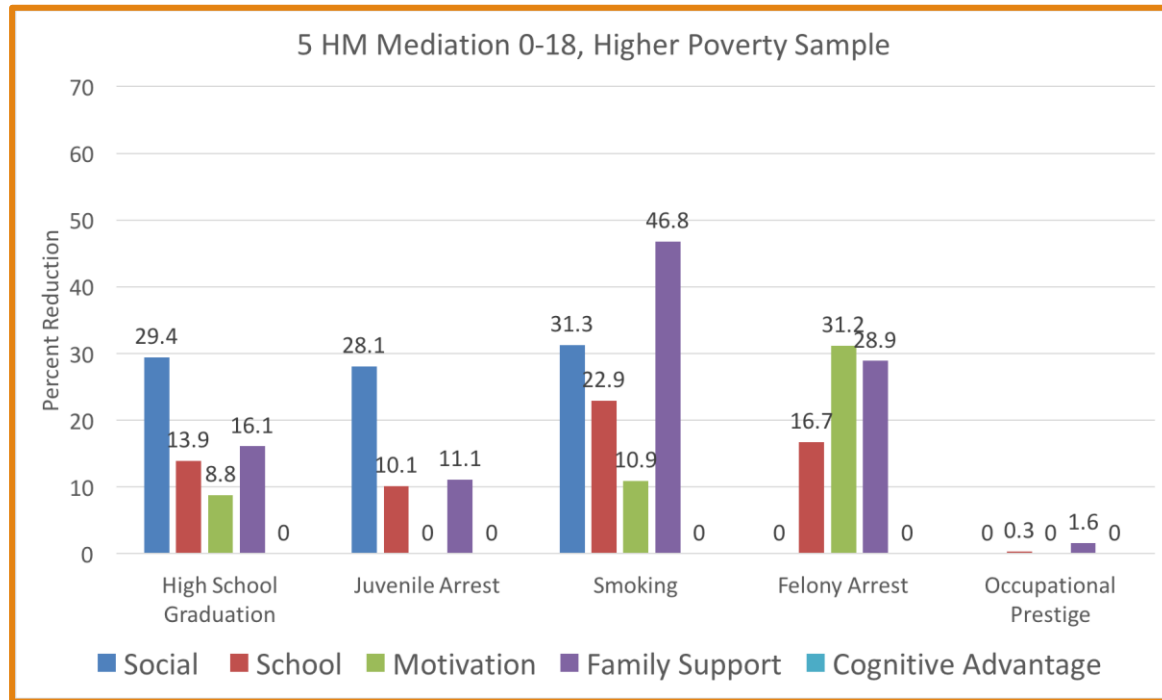
# Individual Mediation Effects by Sex, $\geq 4$ ACE groups



- Mediators partially explained effects of childhood and adolescent ACEs on both males and females

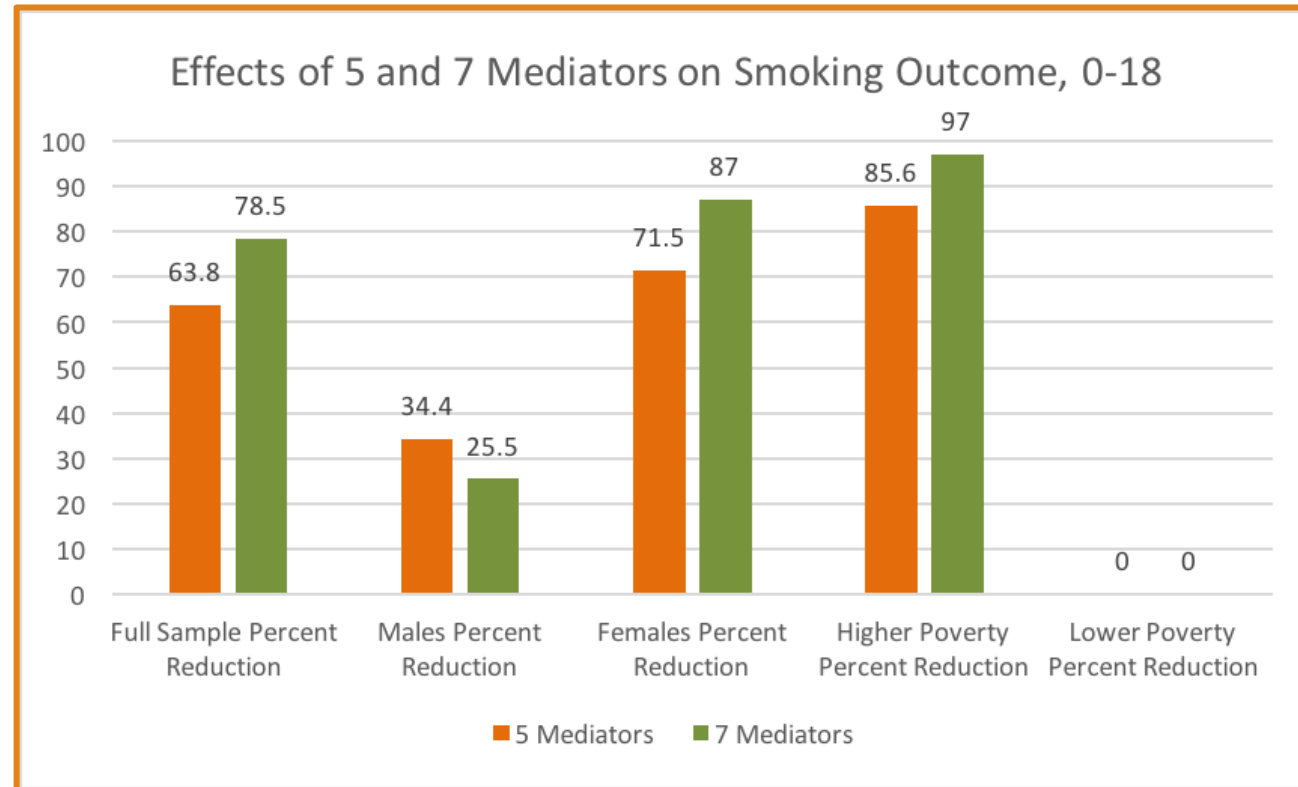


# Individual Mediation Effects by Neighborhood Poverty, $\geq 4$ ACE groups



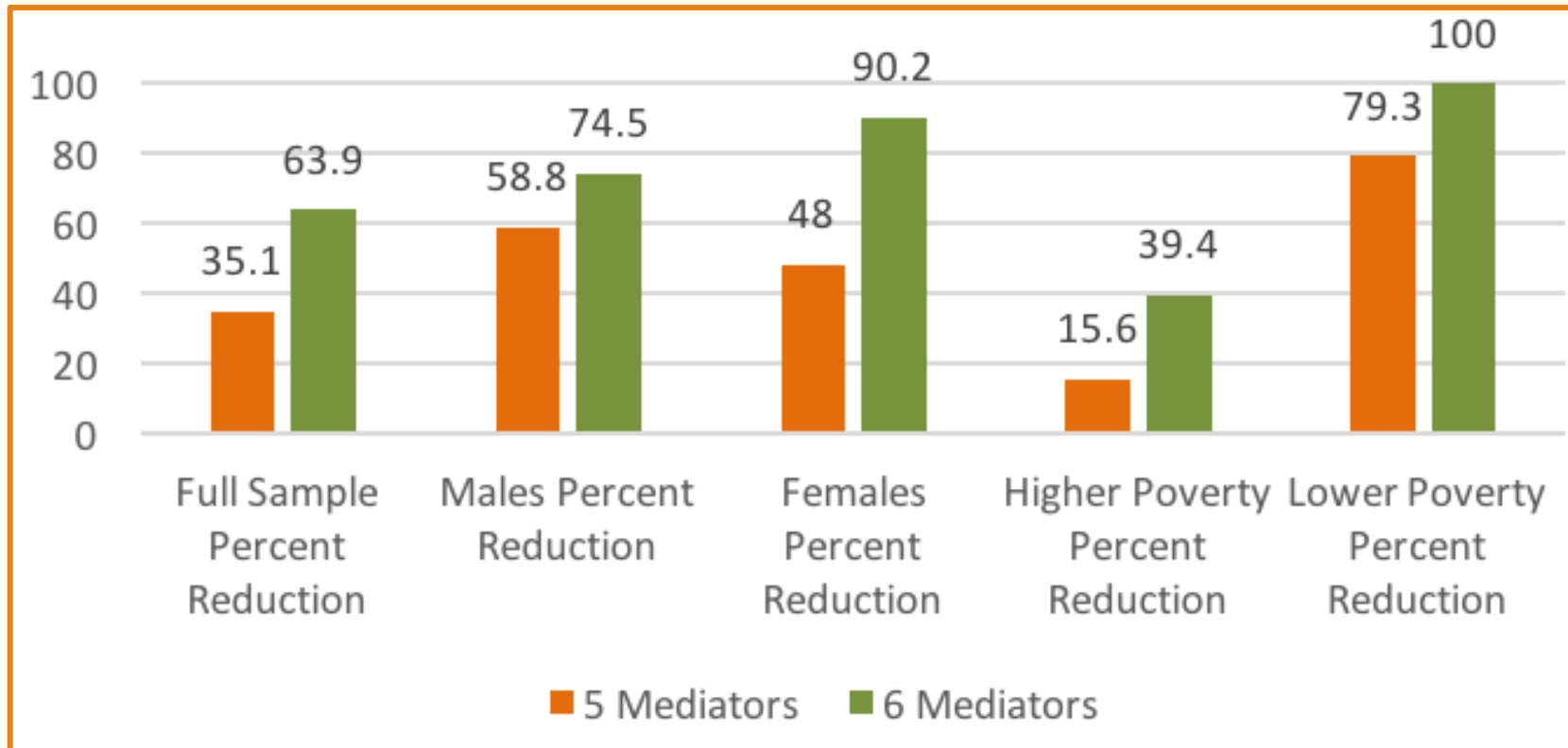
- Mediators partially explained effects of childhood and adolescent ACEs in both higher and lower poverty neighborhoods

# Full Mediation Effects: Smoking



- 5 Mediators: family, school, social, cognitive, and motivation factors
  - 7 Mediators: Juvenile arrest, high school graduation

# Full Mediation Effects: High School Graduation



- 5 Mediators: family, school, social, cognitive, and motivation factors
  - 7 Mediators: Juvenile arrest, high school graduation

# Conclusions

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**Question 1:** Participants with high ACEs were at significantly increased risk for multiple adverse outcomes by emerging adulthood

- Links with occupational prestige were weak

**Question 2:** Generally, males showed stronger relations between ACEs and well-being in adulthood; effects were mixed for neighborhood poverty for ACEs from 0-18

- For **males**, even just 2 or 3 ACEs affected educational attainment, crime, and smoking outcomes
- ACE effects on **smoking** were stronger for the higher neighborhood poverty group

# Conclusions

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- **Question 3:** 5 HM mediators accounted for many of the effects of high ACEs on outcomes
  - Contributions from single mediators ranged from 1.6-64.3%
  - Cognitive advantage was the only mediator that showed very few significant mediation effects
  - When entered together, 5HM mediators partially to fully mediated the effects of ACEs on outcomes
    - High school graduation and juvenile arrest further increased effects

# Conclusions

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## Question 3, continued

- Sex differences in mediation
  - For both sexes, **social adjustment** and **school support** were impactful
  - **Motivation** mediated effects for males, while **family support** tended to mediate effects for females
- Poverty differences in mediation
  - For the higher poverty group, **social adjustment**, **motivation**, and **family support** were most impactful
  - For the lower poverty group, **school support** and **motivation** were most impactful (only on high school graduation)

# Limitations

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1. Retrospective self-report of household dysfunction
2. Underreporting for abuse and neglect
3. Limited ability to replicate given different ACEs
4. Limited assessment of expanded ACEs
  - E.g., involvement in gangs; out of home placement; homelessness

# Implications

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- ACE effects generalize to low income and minority populations
  - Poverty and male sex can confer higher vulnerability to these effects
- Reduced impacts of ACEs on the lower poverty participants, particularly for early childhood ACEs
  - Even a small decrease in neighborhood poverty may have meaningful protective effects
- Critical need for primary prevention and for intervention efforts
  - Programs targeting risk and protective factors at multiple levels of the child's ecological system
  - Universal screening at well-child visits or at preschool entry



# Future Directions

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- Replication with large, diverse, prospective longitudinal samples
- Does early childhood intervention program status moderate the effects of ACEs? Does dosage matter?
- Do different types or timing of ACEs differentially impact outcomes?
- Why and how do specific mediators differentially explain outcomes?
- What are the relations between ACEs and physiological indicators of biological processes and adult health (e.g., cortisol, obesity, telomere length)?

# Acknowledgements

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- Thanks to:
  - The Chicago Longitudinal Study participants
  - My co-authors Arthur Reynolds, Christina Mondi, & Suh-Ruu Ou
  - HCRC students and staff
  - National Institute of Child Health and Human Development
  - The National Science Foundation GRFP #000039202
  - University of Minnesota Doctorial Dissertation Fellowship
  - The Doris Duke Fellowships for the Promotion of Child Well-Being