Individual Social Capital and Physical Activity in Riley County, KS

Presented in partial fulfillment of the requirements for the degree

MASTER OF PUBLIC HEALTH

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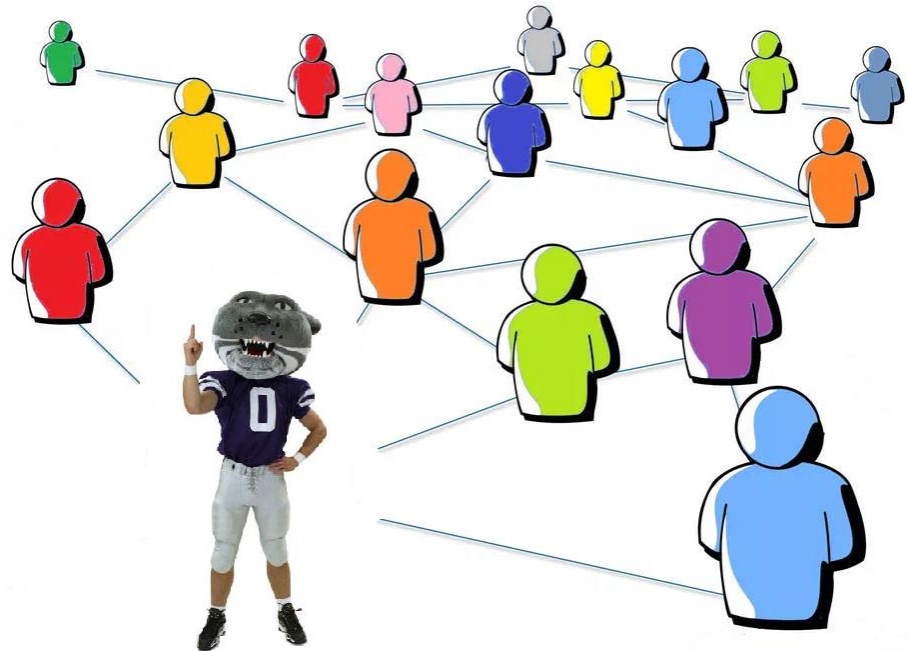
2018

MPH Culminating Experiences

- Integrated Learning Experience
  - Thesis
- Applied Practice Experience
  - Formerly "field experience"

Individual Social Capital and Physical Activity in Riley County, KS

- Background

- Methods

- Results

- Conclusions

What is Social Capital?

Resources within social networks which can influence or be utilized by members of those social networks

- Two views in Public Health (Kawachi, Subramanian, & Kim, 2008)
  - "Social cohesion school" (Putnam, 1995)
  - "Network theory" (Lin, 1999)
- Operationalizations have varied
- Research has favored "social cohesion school"
- "Network theory" allows for multi-level analysis

Defining Social Capital

Encouragement

A ride to the store

Financial Assistance

Information

Cigarettes
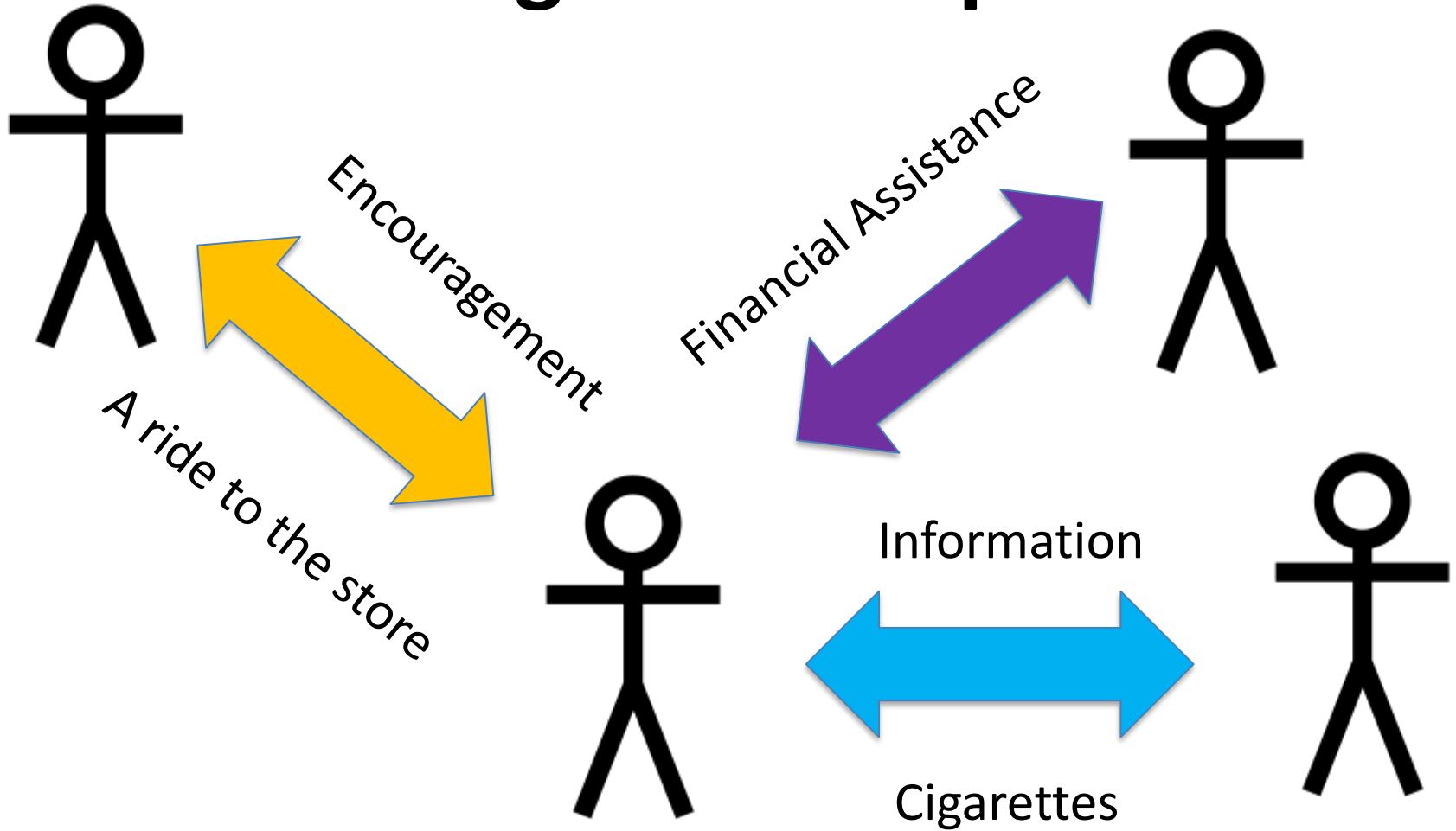
Why Examine Social Capital and Physical Activity?

- Social mechanisms influence behavior (Bandura, 1998; Israel & Rounds, 1984)

- Social capital may shape health disparities (Berkman, Kawachi, & Glymour, 2014)

- Physical activity provides a wide range of health promoting effects (Physical Activity Guidelines Advisory Committee [PAGAC], 2018)

- Research can assist policymakers and public health advocates
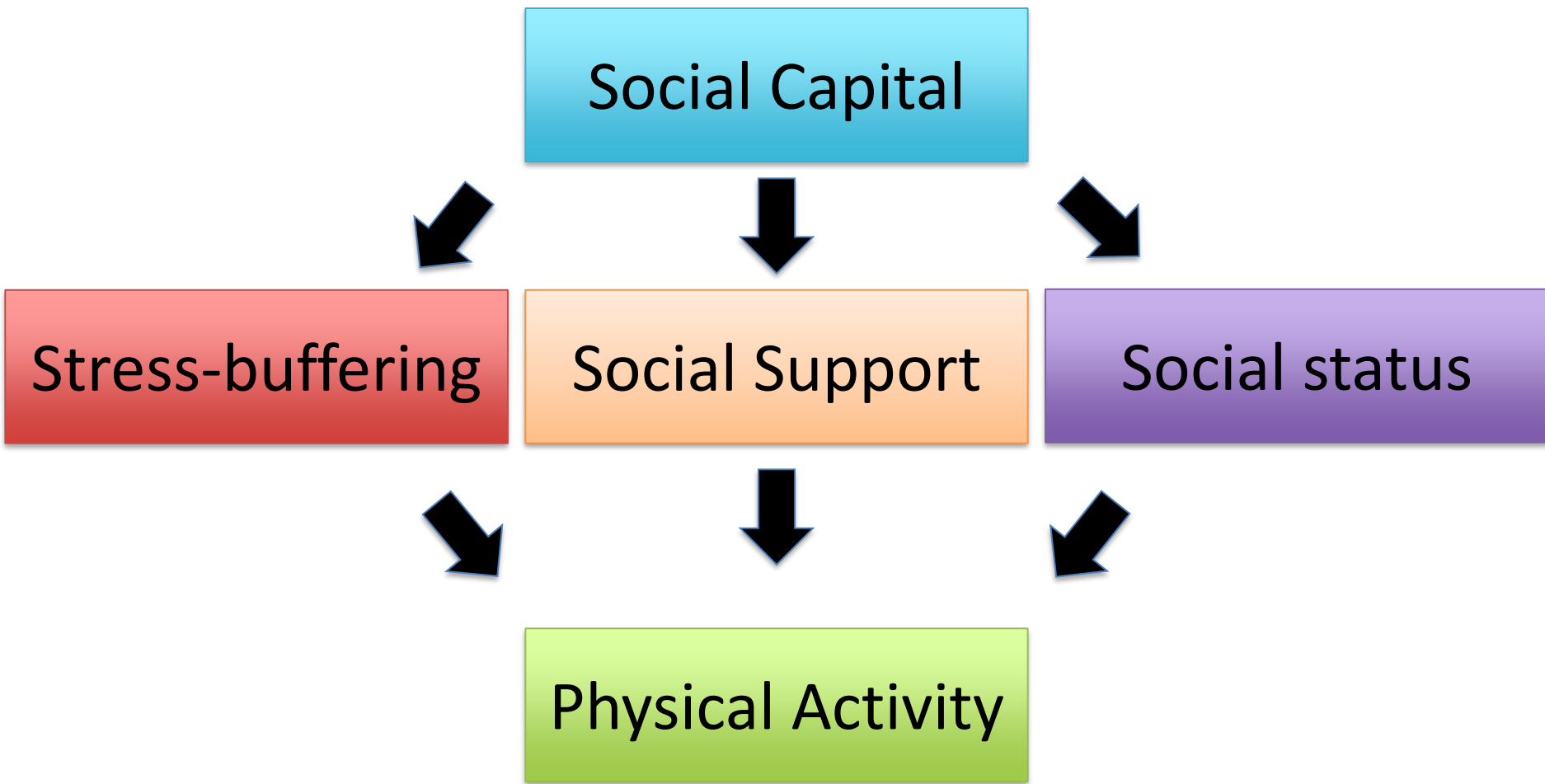
(Kawachi et al., 2008)

Purpose

(1) Develop a detailed description of the relationship between social capital and physical activity

(2) Identify whether the influence of social capital on physical activity extends beyond provisions of physical activity related social support

Hypotheses

- Hypothesis 1- Individuals with lower household income will report lower levels of both social capital and physical activity participation.

- Hypothesis 2- Social capital has a positive relationship with physical activity participation.

Hypotheses (cont.)

- <u>Hypothesis 3</u>- Individuals who typically engage in leisure-time physical activity with a partner or group will report higher levels of social capital than those who do this individually.

Hypotheses (cont.)

- <u>Hypothesis 4</u>- Social support for physical activity mediates the relationship between social capital and physical activity.

Social Capital → Social Support → Physical Activity

Methods

- Survey of Riley County, KS residents
  - March to May 2018
  - Online via Qualtrics (supplemented with paper)
  - Compensation via gift card drawing
  - Marketed primarily online
  - Promotional flyers mailed out to residents outside of Manhattan
  - 828 responses analyzed

Key Variables

- Social Capital (SC)
  - Personal Social Capital Scale (Chen et al., 2009)
  - Both bonding and bridging SC assessed
    - Bonding: Close connections
    - Bridging: Distant connections
  - <u>Variables Analyzed</u>: Bonding SC, Bridging SC, Total SC

Example Question:

Among the people in each of the following six categories, how many will definitely help you upon your request?

	None	Few	Some	Most	All
Immediate Family	○	○	○	○	○
Extended Family	○	○	○	○	○
People in your neighborhood	○	○	○	○	○
Friends	○	○	○	○	○
Coworkers/classmates	○	○	○	○	○
Former coworkers/classmates	○	○	○	○	○

Key Variables (cont.)

- Physical Activity (PA)
  - Short form IPAQ (Craig et al, 2003)
    - Moderate and vigorous PA
  - PA domains (workplace, travel, home, leisure-time)
  - Leisure-time PA: Individually, with partner, with group
  - Meeting PA guidelines (USDHHS, 2008)
  - <u>Variables Analyzed</u>: Moderate PA, Vigorous PA, Total PA, Leisure-Time PA, Meeting/Not meeting PA guidelines

Key Variables (cont.)

- Received social support for PA
  - Three-item instrument developed for this study (emotional, instrumental, and informational support)
  - <u>Variable Analyzed</u>: PA Social Support

Social Support Instrument

Over the past three months, the people I know:

	Never	Rarely	A few times	Often	Very often
Gave me encouragement to be physically active	○	○	○	○	○
Went out of their way to help me do physical activity (ex. exercise/offer to exercise with me, give me reminders, provide rewards, etc.)	○	○	○	○	○
Discussed or shared information about physical activity	○	○	○	○	○

Analysis

- SAS 9.4

- One-way analyses of variance (ANOVA)
  - Demographic differences
  - Leisure-time PA (alone, with partner, or with group): SC

- Pearson product-moment correlations
  - SC and PA variables

- Two-sample T-tests
  - SC among those meeting/not meeting PA guidelines

Analysis (cont.)

- Sobel Test
  - Mediation of relationships between SC and PA variables
    - PA social support

Results

H1: Individuals with lower household income will report lower levels of both social capital and physical activity participation.

- Supported
  - Income had a significant effect on all measures of SC
    - Bonding SC: $F(4,763)= 14.02$, $p<.001$
    - Bridging SC: $F(4,790)= 7.90$, $p<.001$
    - Total SC: $F(4,752)= 13.01$, $p<.001$
  - Tukey post-hoc test indicated higher mean SC among higher income groups ($p<.05$)

Results (cont.)

- Income had significant effect on leisure-time PA: $F(4,801)= 2.46$, $p=0.04$

- One significant difference between groups according to Tukey's test ($p<.05$)
  - *"$10,000-$24,999" > "Less than $10,000"*

Results (cont.)

H2: Social capital has a positive relationship with physical activity participation.

- Partially supported
  - Weak linear relationships
    - Bonding SC and leisure-time PA: $r(786) = 0.09$, $p = 0.009$
    - Total SC and leisure-time PA: $r(775) = 0.08$, $p = 0.020$
  - Those meeting PA guidelines reported significantly higher levels of SC (Bonding: $p = 0.003$; Others: $p < 0.001$)

Results (cont.)

H3: Individuals who typically engage in leisure-time physical activity with a partner or group will report higher levels of social capital than those who do this individually.

- Not supported
  - Bonding SC: $F(2,655)= 1.31$, $p=0.270$
  - Bridging SC: $F(2,678)= 1.89$, $p=0.152$
  - Total SC: $F(2,645)= 2.19$, $p=0.113$

Results (cont.)

H4: Social support for physical activity mediates the relationship between social capital and physical activity

- Supported

- Only two significant linear relationships between SC and PA
    - Bonding SC and leisure-time PA: $r(786)=0.09$, $p=0.009$
    - Total SC and leisure-time PA: $r(775)=0.08$, $p=0.020$

- Mediation analyses (Sobel test) examined PA social support in both these relationships

**0.38
(0.04)**

Social Support for Physical Activity

**13.76
(5.94)**

Bonding Social Capital

Leisure-time Physical Activity
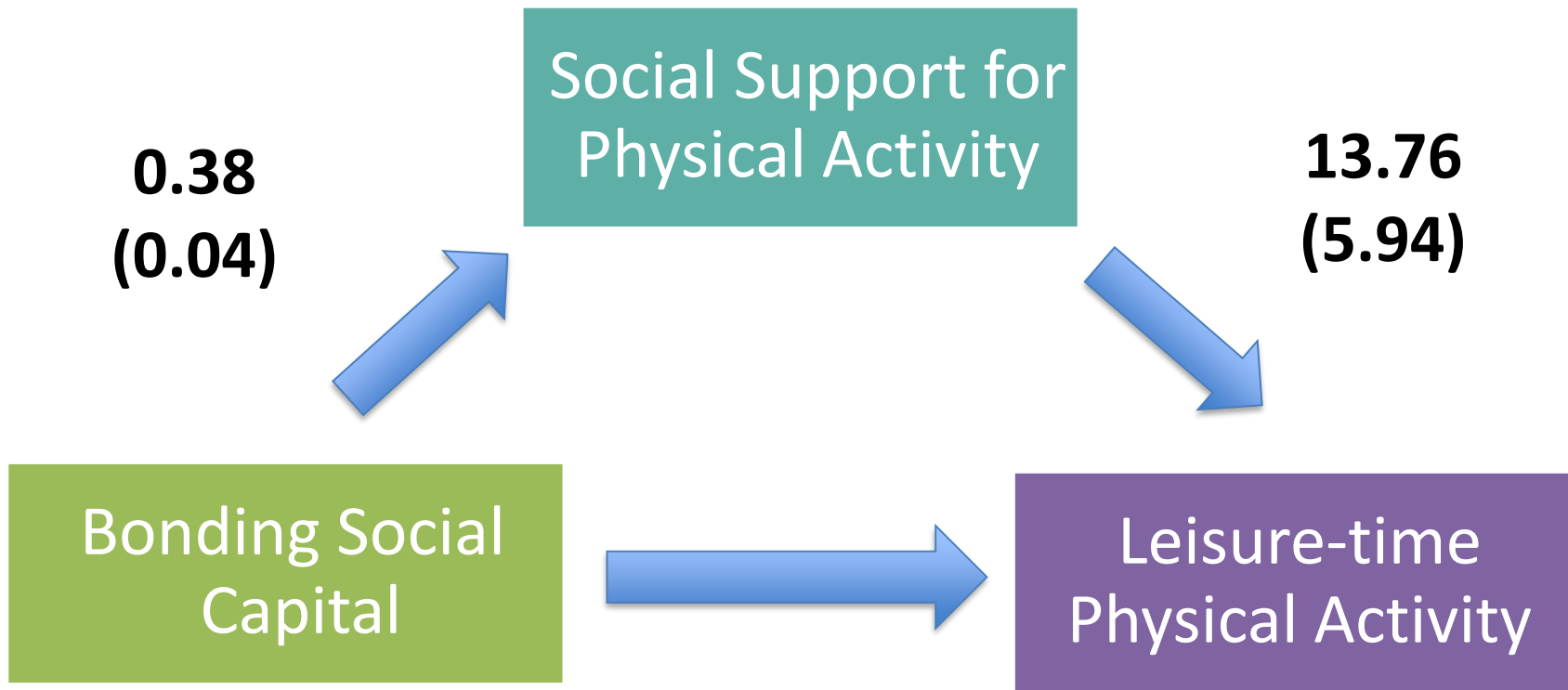
**Direct effect: 7.03 (2.68)
Controlling for mediator: 1.75 (2.75)**

Regression coefficient (standard error)

Bonding SC & Leisure-time PA

- <u>Step 1</u>
  - Regression between bonding SC and leisure-time PA was significant
    - $b=7.03$, $t(787)=2.62$, $p=0.009$
- <u>Step 2</u>
  - Regression between bonding SC and PA social support was significant
    - $b=0.38$, $t(784)=8.75$, $p=<.001$
- <u>Step 3</u>
  - Controlling for bonding SC, PA social support was significant predictor of leisure-time PA
    - $b=41.28$, $t(784)=6.45$, $p=<.001$
- <u>Step 4</u>
  - Controlling for PA social support, bonding SC was not a significant predictor of leisure-time PA
    - $b=1.75$, $t(784)=0.64$, $p=0.523$
- **<u>Sobel test</u>**
  - PA social support fully mediates relationship between bonding SC and leisure-time PA
    - $z=5.61$, $p<0.001$
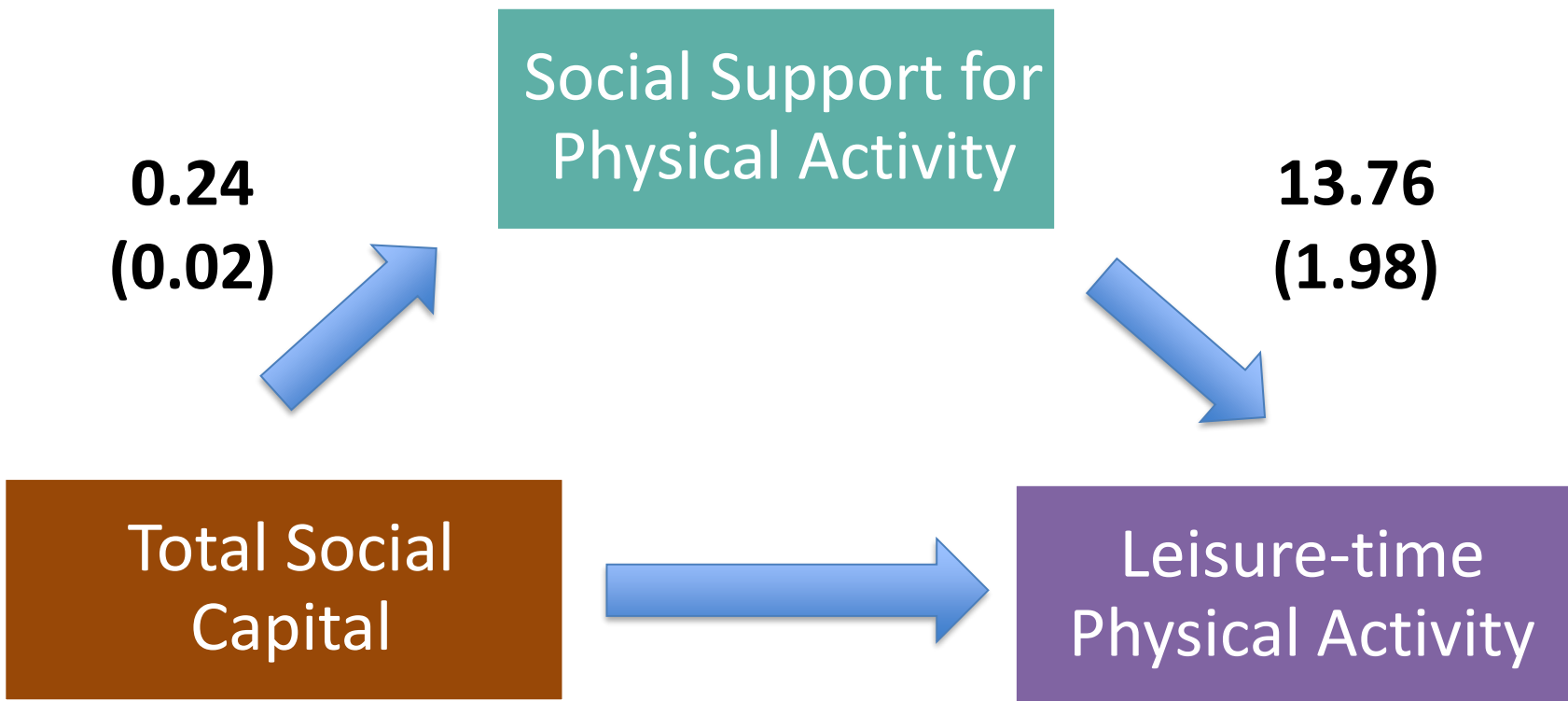
Social Support for Physical Activity

0.24 (0.02)

13.76 (1.98)

Total Social Capital

Leisure-time Physical Activity

Direct effect: 3.29 (1.41)
Controlling for mediator: -0.13 (1.47)

Regression coefficient (standard error)

Total SC and Leisure-time PA

- Step 1
  - Regression between total SC and leisure-time PA was significant
    - b=3.29, t(775)=2.33, p=0.020
- Step 2
  - Regression between total SC and PA social support was significant
    - b=0.24, t(772)=10.49, p=<.001
- Step 3
  - Controlling for total SC, PA social support was significant predictor of leisure-time PA
    - b=14.58, t(771)=6.62, p=<.001
- Step 4
  - Controlling for PA social support, total SC was not a significant predictor of leisure-time PA
    - b=-0.13, t(771)=-0.09, p=0.928
- **Sobel test**
  - PA social support fully mediates relationship between total SC and leisure-time PA
    - z=6.01, p=<.001

Discussion

- Bonding & Total SC have weak positive relationships with leisure-time physical activity
  - Reflects previous research
  - Linear relationship & Meeting PA guidelines
- PA social support explains link between social capital and leisure-time physical activity

Limited Support for Hypotheses

- SC variables too broad?
  - SC encompasses all social support
  - Support from family can have different behavioral impact than support from friends (Mendonça, Cheng, Mélo, & de Farias Júnior, 2014)

Limited Support for Hypotheses (cont.)

- Differential effects of SC
  - Positive and negative health behaviors can spread via social networks (Powell et al., 2015; Christakis & Fowler, 2007)
  - Low bridging SC, despite high bonding SC can limit exposure to new ideas (Villalonga-Olives & Kawachi, 2017)

Conclusions

- Lowest income groups have lowest social capital and lowest leisure-time PA participation

- Relationship between SC (bonding & total) and leisure-time PA is fully mediated by PA social support

- PA promotion targeting SC alone is unlikely to have a significant impact
  - Small changes may be observed at the population level

Final Considerations

- Study Strengths
  - Validated, multi-item instrument for SC
  - In-depth examination went beyond simply active/inactive
- Limitations
  - Cross-sectional design
  - Generalizability of findings beyond Riley County
  - Participants may have disproportionate levels of online activity

Final Considerations (cont.)

- Future Research
  - Incorporate more specific network characteristics which may promote PA
    - Ex. Prevailing social norms, attitudes, beliefs
  - Consider more specific measures of SC
  - Evaluate interventions

References

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Villalonga-Olives, E., & Kawachi, I. (2017). The dark side of social capital: A systematic review of the negative health effects of social capital. *Social Science & Medicine*, 194, 105-127.

Applied Practice Experience (APE)

- Experience site:
  - Flint Hills Wellness Coalition
    - Active Transportation Workgroup
- Preceptor:
  - Jared Tremblay, MS

February 2018 – October 2018

Green Apple Bikes Text Report Analysis

- Tracked text report locations over 36 days

- Analyzed trends in different areas of Manhattan

- Secondary analysis of SC/PA data from thesis

- Wrote a report discussing findings and offering recommendations
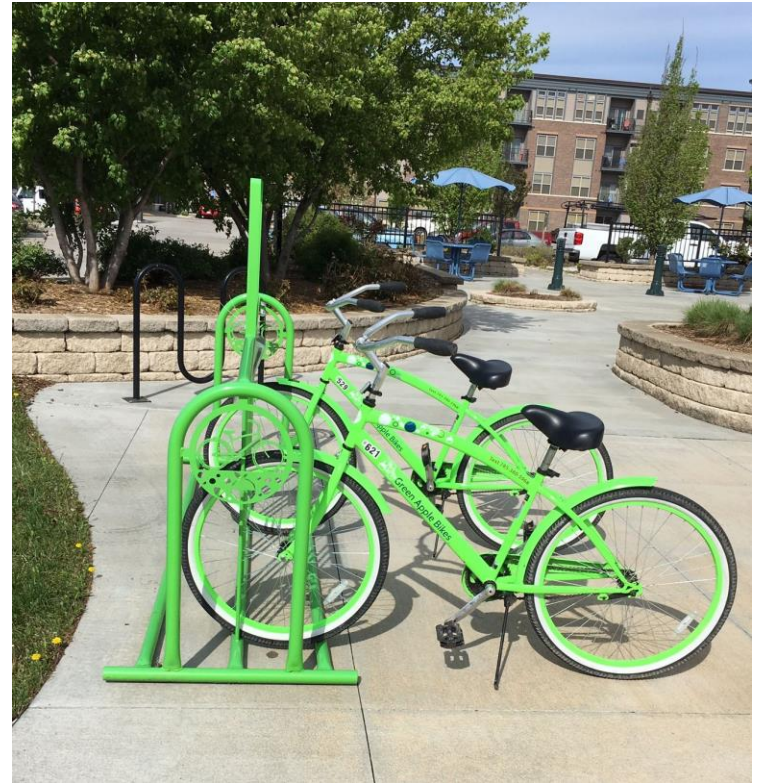
MPH Competencies 3 & 4

- Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate

- Interpret results of data analysis for public health research, policy or practice

Manhattan Trail Markings

- Identified confusing decision points on biking/walking trails
- Worked with FHWC and city planning department to obtain funding and approval
- Painted the markings

MPH Competencies 9 & 21

- Design a population-based policy, program, project or intervention

- Perform effectively on interprofessional teams

Gathering Petition Signatures

- Supported efforts to install new traffic signals and a protected bike lane

- Collected signatures from pedestrians and also K-State students after presenting the proposals in classrooms

Safer Crossings
@ - Vattier
- Thurston
- Petticoat

Northwestern University, Sheridan Rd, Evanston, IL

Flint Hills "Forward" Newsletter

- Started newsletter on active transportation
- Reported local news and encouraged community involvement
- Targeted broad public audience

MPH Competencies 14 & 19

- Advocate for political, social or economic policies and programs that will improve health in diverse populations

- Communicate audience-appropriate public health content, both in writing and through oral presentation

MPH Committee

- Brandon Irwin, PhD

- Katie Heinrich, PhD

- Mary McElroy, PhD

Questions?