Neighborhood Context and Alcohol Use Among Urban, Low-income, Multi-ethnic, Young Adolescents

Amy L. Tobler, MPH, PhD
Research Assistant Professor
University of Florida
Department of Epidemiology and Health Policy Research
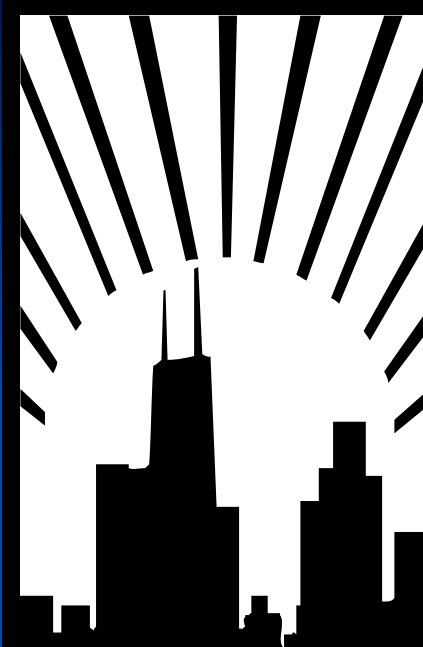College of Medicine

Annual Meeting of the American Public Health Association
November 11, 2009

1

Presenter Disclosure

Amy L. Tobler

The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

No Relationships to Disclose

Project Northland Chicago Research Team

Kelli A. Komro, M.P.H., Ph.D.	Principal Investigator
Cheryl L. Perry, Ph.D.	Co-Principal Investigator
Traci L. Toomey, M.P.H., Ph.D.	Co-Investigator
Melissa H. Stigler, M.P.H., Ph.D.	Co-Investigator
Rhonda Jones-Webb, Dr.P.H.	Co-Investigator
Carolyn L. Williams, Ph.D.	Co-Investigator
Mildred Maldonado-Molina, Ph.D.	*Co-Investigator*
Keith Muller, Ph.D.	*Co-Investigator*
Sara Veblen-Mortenson, M.P.H., M.S.W.	Project Director
Kian Farbakhsh, M.S.	Data Management/Analysis
Karen Munson, M.B.A.	Data Collection
Linda Bosma, M.A./Mirlene Cadichon, M.A.	Community Organizing
Amy Tobler, M.P.H., Ph.D.	*Research Coordinator*
Kari Kugler, M.P.H., Ph.D.	Research Assistant
Keryn Pasch, M.P.H., Ph.D.	Research Assistant
Mary Hearst, M.P.H., Ph.D.	Research Assistant

Project Northland:
An Alcohol Use Preventive Intervention

- **Project Northland: Original Trial in Minnesota**

  - Conducted in northeastern Minnesota (rural, low to middle income, mostly white)

  - High rates of alcohol-related problems

  - Randomized controlled trial—10 intervention & 10 control school districts

  - Reduced monthly & weekly alcohol use, multi-drug use, and risk factors at the end of 8th grade

  - Designated a model program and recommended by the Centers for Substance Abuse Prevention (CSAP) and the U.S. Department of Education.

Goal: To adapt, implement and evaluate an intervention for urban young adolescents
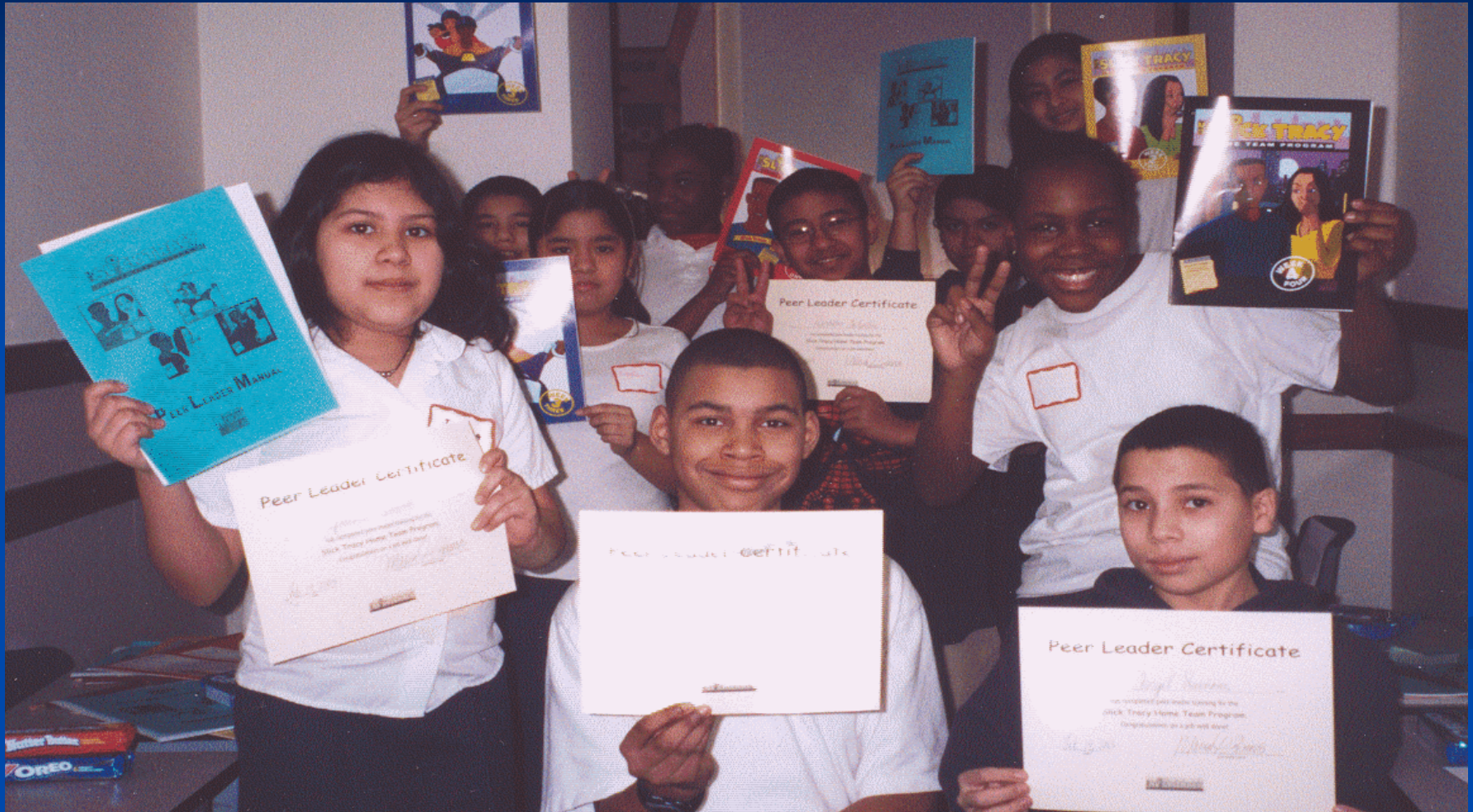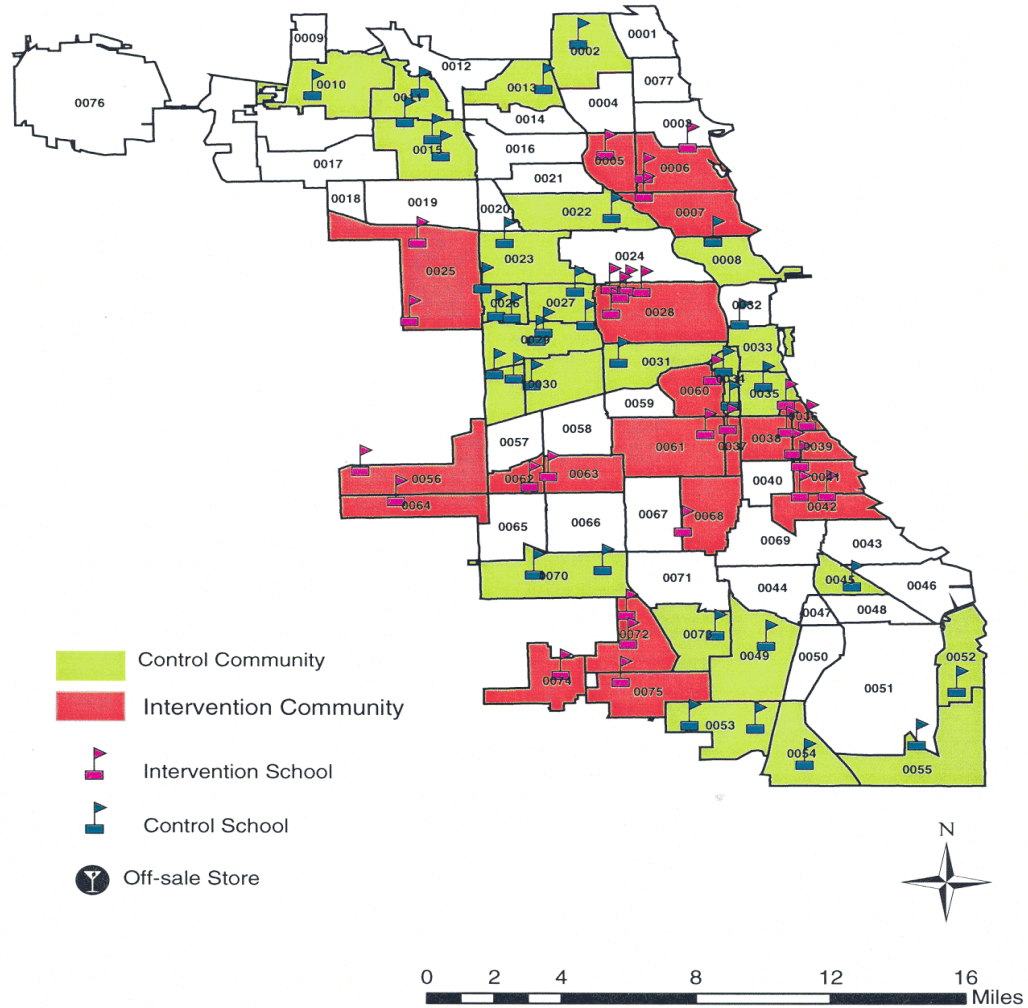
School Recruitment Selection Criteria

- **Chicago Public Schools**

  - District approval/cooperation prior to grant submission

- Grades 5-8

- Mobility rates < 25%

- Larger schools

- Excluded magnet schools

Project Northland Community Areas

Legend:
- Control Community
- Intervention Community
- Intervention School
- Control School
- Off-sale Store

Evaluation Components

- Annual classroom-based surveys (6th-8th grades)

- Parent surveys through classroom

- Community leader survey

- Alcohol purchase attempts

Additional Data Collected

- # alcohol outlets per study community area

- # alcohol advertisements within 1500 feet of each study school

- Census 2000 indicators of poverty & deprivation

Sample

- 5,655 youth in the 42 PNC study communities who completed at least one study survey.
    - 43% African American
    - 29% Hispanic
    - 50% Boys
    - 47% from two-parent households
    - 72% low income

Research Questions

- How does neighborhood context influence family management practices?

- Do family management practices mediate the effects of neighborhood risk on alcohol use among young adolescents?

Hypotheses
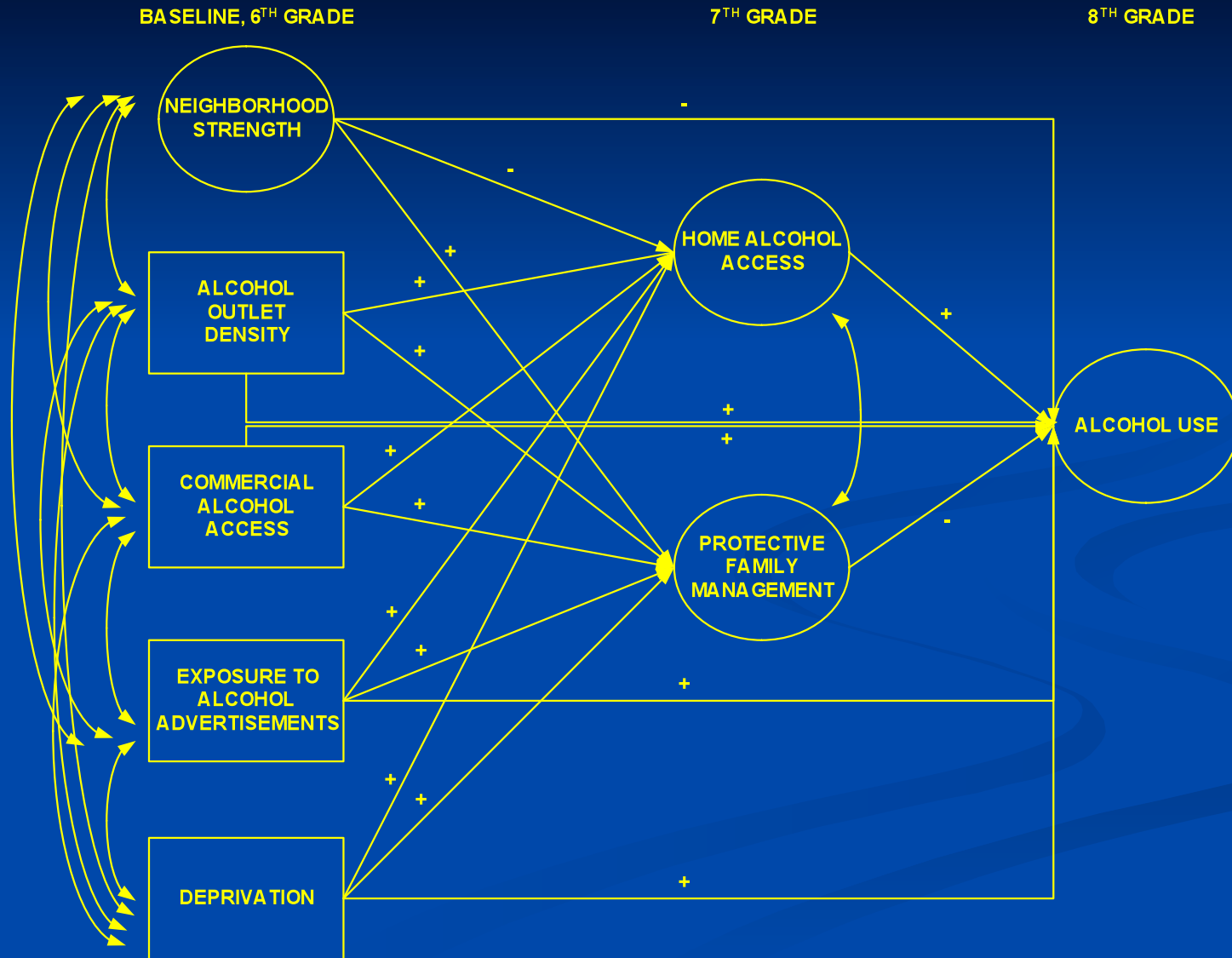
Measures

- **Alcohol-related Neighborhood Context** (6th Grade, 2002)

  - **Protective Factors**

    - **Neighborhood Strength** (Cronbach's α = 0.70, Range: 5-25)
    - **Neighborhood & Police Preventive Action** (α = 0.89, Range: 9-45)

  - **Risk Factors**

    - **Perceived Neighborhood Problems** (α = 0.93, Range: 7-35)
    - **Alcohol Advertisements** (Range: 0-74)
    - **Off-sale Alcohol Outlet Density** (Range: 0.11-3.99)
    - **Commercial Accessibility of Alcohol** (Range: 0.0-0.72)
    - **Area Deprivation** (α = 0.87, Range: 45.6-152.6)

14

Measures

- **Home & Family Management Practices** (7th Grade, 2004)
  - Home Alcohol Access
  - Parental Monitoring/Communication
  - Alcohol-specific Communication

15

Measures

- Alcohol Use (8th Grade, 2005)
  - Past year
  - Past month
  - Past week
  - Heavy episodic use (5+ drinks previous 2 weeks)
  - Ever drunk

Analysis Strategy

- **Multilevel Structural Equation Modeling**
- **Two Phases:**
    1. **Measurement Models**
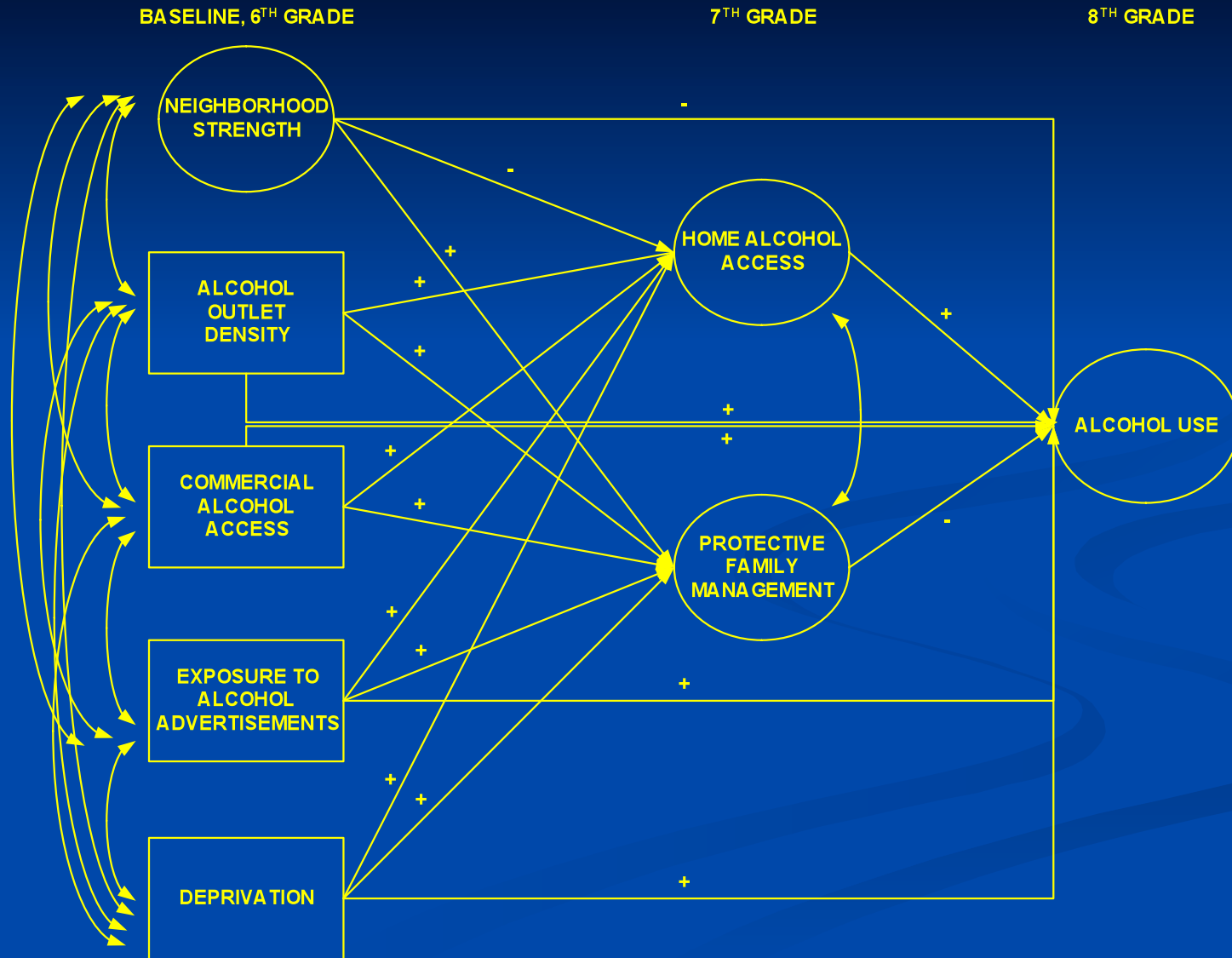   2. **Structural Models**
- **Mplus**

Measurement Models

- **Three Models:**
  - **Alcohol-related Neighborhood Context** (n=4,170)
  - **Home & Family Management Practices** (n=3,778)
  - **Alcohol Use** (n=3,801)
- **Community membership specified as nested random effect**
- **WLSMV Estimation**
- **Geomin factor rotation**

Structural Models

- Model built in stages:
    - Home and family management → Alcohol use
    - Alcohol-related neighborhood context → Home and family management
    - Alcohol-related neighborhood context → Alcohol use
    - Alcohol-related neighborhood context → Home and family management → Alcohol use
- Multilevel specification for first three stages
- Controlled for treatment group assignment & baseline alcohol use

Hypotheses

Structural Models

- Model built in stages:
  - Home and family management → Alcohol use
  - Alcohol-related neighborhood context → Home and family management
  - Alcohol-related neighborhood context → Alcohol use
  - Alcohol-related neighborhood context → Home and family management → Alcohol use
- Multilevel specification for first three stages
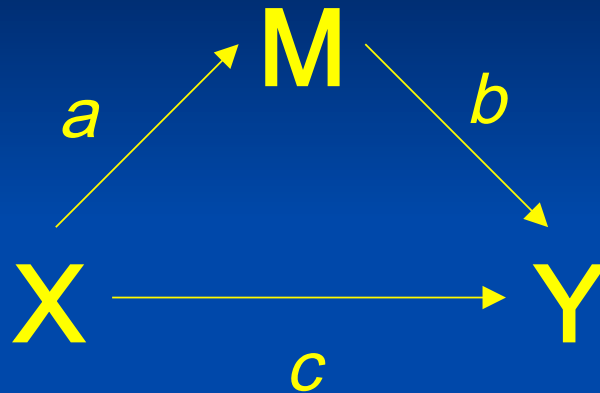- Controlled for treatment group assignment & baseline alcohol use

Model Fit

- Comparative Fit Index (CFI)
- Tucker-Lewis Fit Index (TLI)
- Root Mean Square Error of Approximation (RMSEA)
- Standardized Root Mean Square Residual (SRMSR)

Indirect Effects

$$M$$

a b

$$X \xrightarrow{\quad c \quad} Y$$

Indirect Effect = *a*b*

$$\text{Standard Error } (ab) = \sqrt{s_a^2 b^2 + s_b^2 a^2}$$

Missing Data

- **Pairwise Deletion**
  - Estimates based on polychoric correlations of all pairwise present data
  - ML optimal but not computational feasible
- 72% of students completed 3-4 surveys
  - More likely to be White and live with both parents
- 28% completed 1-2 surveys
- No significant differences in alcohol use

Results – Alcohol-related Neighborhood Context Measurement Model

Item	Standardized Factor Loading
Perceived Neighborhood Strength	0.737
Neighborhood & Police Preventive Action	0.866
Perceived Neighborhood Problems	-0.373

CFI = 1.000   TLI = 1.000   RMSEA = 0.000   SRMSR = 0.000

Home & Family Management Measurement Model

Item	Standardized Factor Loading	
	Home Alcohol Access	Protective Family Management
Last time drank, received alcohol from parent	0.049	-0.010
Last time drank, took alcohol from home	0.097	0.072
Easy to get alcohol from parent	0.793	0.320
Easy to get alcohol from home	0.783	0.381
Parent ask about school	0.206	0.699
Parent praise when do a good job	0.189	0.658
Eat dinner with parent	0.202	0.485
Parent ask who with	0.249	0.571
Parent/child conversations	0.198	0.671
Parent talk about problems alcohol can cause	0.430	0.790
Parent talk about family rules against drinking	0.443	0.542
Parent talk about consequences of drinking	0.455	0.735
Parent talk about influence of ads and commercials	0.362	0.611

CFI = 0.976   TLI = 0.965   RMSEA = 0.059   SRMSR = 0.063

Alcohol Use Measurement Model

Item	Standardized Factor Loading
Past year alcohol use	0.885
Past month alcohol use	0.972
Past week alcohol use	0.888
Heavy episodic alcohol use	0.857
Ever been drunk	0.777

CFI = 0.984   TLI = 0.9889   RMSEA = 0.102

27

Structural Model

BASELINE, 6TH GRADE   7TH GRADE   8TH GRADE

NEIGHBORHOOD STRENGTH

ALCOHOL OUTLET DENSITY

COMMERCIAL ALCOHOL ACCESS

EXPOSURE TO ALCOHOL ADVERTISEMENTS

ALCOHOL USE

HOME ALCOHOL ACCESS

PROTECTIVE FAMILY MANAGEMENT

ALCOHOL USE

-0.078*
0.050*
-0.061**
-0.436***
-0.040**
0.214***
0.036*
-0.150***
0.083***
-0.080***
0.043*
0.401***
-0.462***
0.446***

CFI = 0.974,
TLI = 0.978,
RMSEA = 0.031

*p ≤ 0.05; **p ≤ 0.01; ***p ≤ 0.001

28
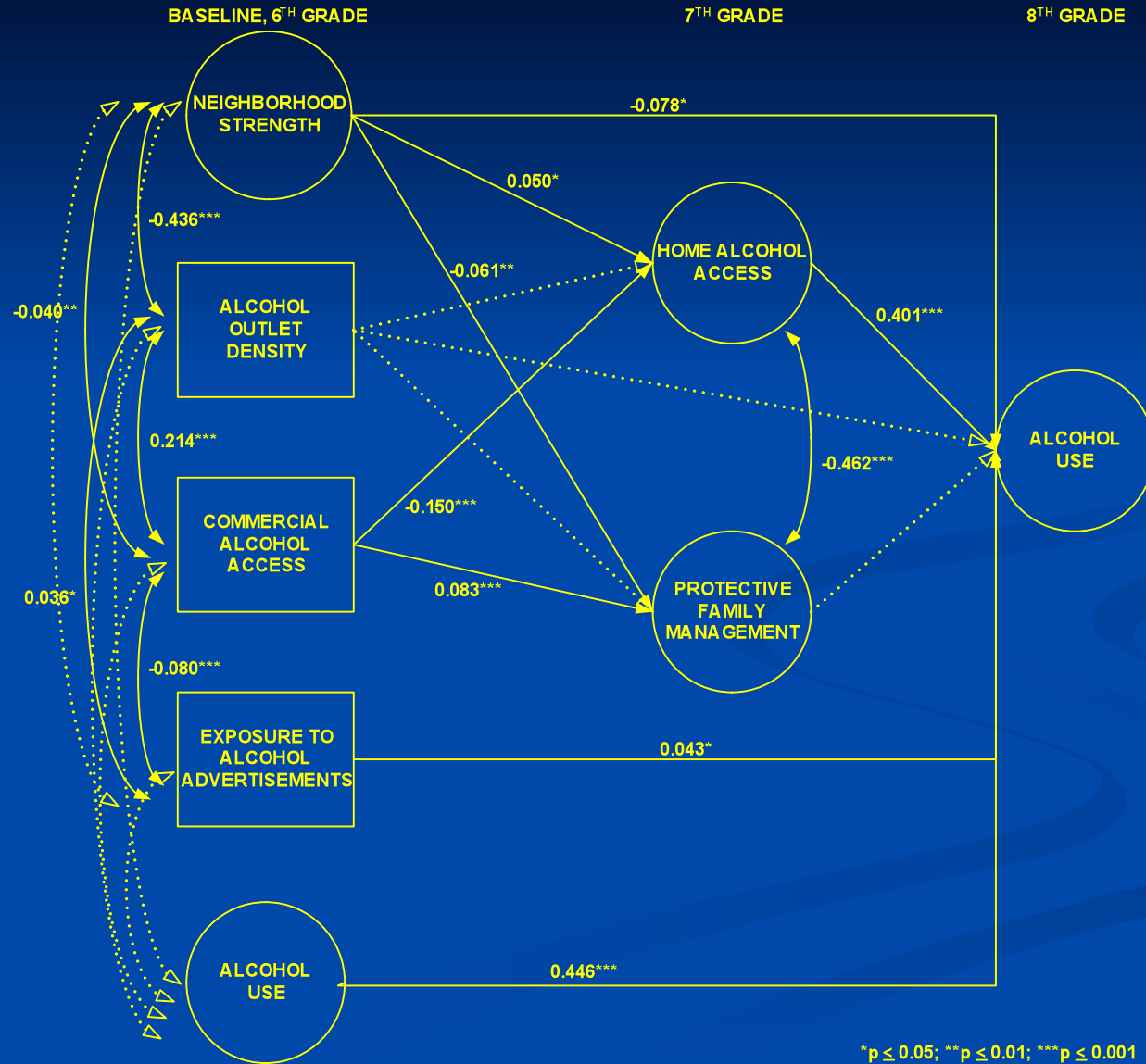
Indirect Effect: Neighborhood Strength → Alcohol Use

	Estimate	SE	*p*-value
Total Direct Effect	-0.078	0.034	0.016
Indirect Effects			
VIA Home Alcohol Access	0.025	0.014	0.062
VIA Protective Family Management	0.002	0.002	0.502

Conclusions

- Exposure and access to alcohol and neighborhood strength may be more prominent predictors of alcohol use than deprivation.

- Inner-city parents may respond to environmental risk. Efforts to engage parents in restricting alcohol access in the home or improving monitoring and communication with children may be fruitful.

30

Conclusions

- Incorporating community-level intervention components that build neighborhood strength and limit exposure to alcohol ads may enhance effects of preventive interventions.

- Efforts to minimize alcohol-related risk and enhance protective factors should be multifaceted.

Limitations

- Community-level data included only static measures
- More studies needed to examine associations among youth residing in other metropolitan cities as well as rural and suburban areas
- Measures of alcohol-related neighborhood context do not represent the universe of neighborhood characteristics which may be influential.

Strengths

- Contributes to a sparse literature
- Multiple dimensions of alcohol-related neighborhood context were considered and from different sources
- Longitudinal study design

Thank You!!

Amy L. Tobler, M.P.H., Ph.D.

alt@ichp.ufl.edu

(352) 265-0111 ext. 86268