INTRODUCTION

- Preschool is a critical period for language and cognitive development, which plays a crucial role in predicting a child's successful transition into formal schooling (Mistry et al., 2010).
- Children who enter school with better cognitive and language abilities benefit more from classroom instruction (Haskins & Rouse, 2005) and have higher reading and math achievement (Duncan et al., 2007).
- Much is known about *what* practices promote early child development and learning, but little attention is given to the effects of *where* children live.
- Ecological systems theory (Bronfenbrenner, 1992) is a useful framework for understanding the effects of context on children.
  - ***Neighborhood*** is an immediate context variable associated with school age children's language, cognition, and achievement (Chase-Lansdale et al., 1997; Dupere et al., 2010). Yet, few studies have explored neighborhood characteristics in relation to preschool children's outcomes.
  - ***Geographic setting*** (i.e., rural, urban) is a more distal context influencing development. However, few studies have compared rural and urban differences in the effects of neighborhood characteristics on children's outcomes.

PURPOSE & RESEARCH QUESTIONS

The <u>purposes of this study</u> are to examine the relationships between neighborhood characteristics and preschool achievement and vocabulary scores, and determine if these relationships vary according to geographic setting.
1. What is the relationship between the characteristics of preschool children's neighborhoods and their vocabulary and achievement?
2. Does geographic setting (urban vs. rural) moderate the relationships between neighborhood variables and preschool children's vocabulary and achievement?

PARTICIPANTS

TABLE 1. DEMOGRAPHICS

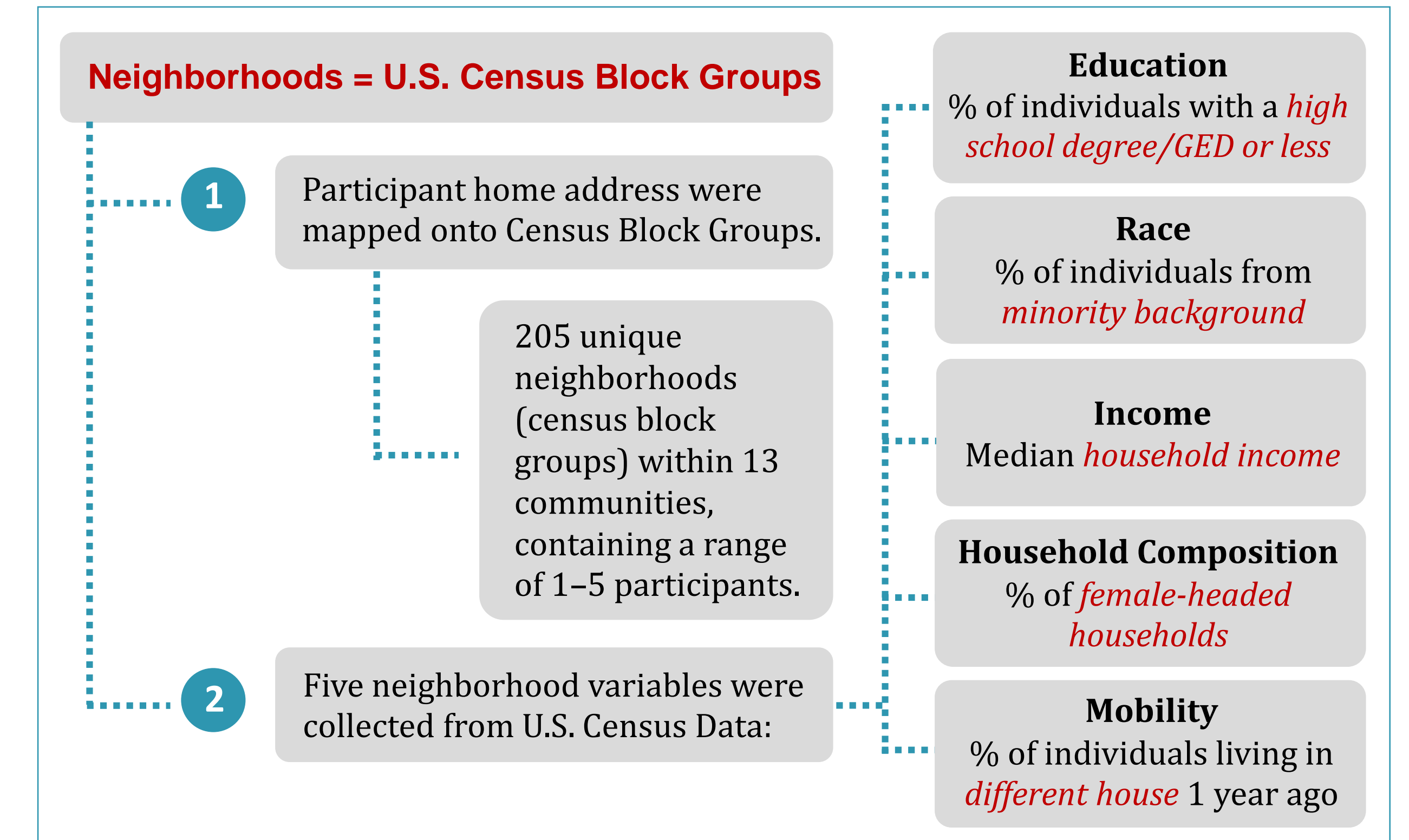|		Urban (n=220)	Rural (n=126)	Total Sample (n=346)
Child Gender	Female	49.30%	49.20%	49.57%
	Male	50.70%	50.80%	50.43%
Child Age	*M* years	5.34	5.30	5.33
Child Race/ Ethnicity	White, non-Hispanic	31.8%	67.2%	43.6%
	Hispanic/Latino	18.8%	24.2%	20.3%
	Black/African American	12.6%	0.0%	7.8%
	Asian	1.8%	0.0%	1.1%
	American Indian	0.0%	0.8%	0.3%
	Multiple Races or Other	10.3%	5.5%	8.4%
Home Language	English	68.9%	84.6%	73.3%
	Spanish	19.3%	9.4%	15.7%
	English & Spanish	2.2%	5.1%	3.7%
	Other	7.4%	0.0%	3.9%
Parent Education	HS Diploma/GED or less	43.5%	35.9%	39.7%
	Some college or more	53.8%	63.3%	55.9%
Parent Marital Status	Married	40.7%	65.0%	50.8%
	Never married	28.9%	7.7%	21.3%
	Living with partner	17.8%	11.1%	14.6%
	Separated or divorced	10.4%	6.8%	8.8%
	Widowed	0.7%	1.7%	1.1%
Income Assistance	Receive some form of income assistance	65.2%	49.6%	61.5%

- 346 preschool-aged children and their parents from 11 rural and 2 urban communities in a Midwestern state
- 220 participants resided in urban communities; 126 resided in rural communities.
  - Rural was defined as any community not considered an "urbanized area" (i.e., areas with a population of 50,000 or more) by the U.S. Census.

TABLE 2. NEIGHBORHOOD DESCRIPTIVES

		Urban (n = 135)	Rural (n = 70)	Total Sample (n = 205)
Median Household Income ($)	Mean (SD)	43,394 (16,628)	53,125 (17,823)	47,096 (17,823)
	Min	13,728	23,036	13,728
	Max	102,083	95,221	102,083
% of Female-Headed Households	Mean (SD)	29.35 (17.70)	17.13 (17.36)	24.70 (17.36)
	Min	0.00	0.00	0.00
	Max	97.37	64.44	97.37
% of Individuals from a Minority Background	Mean (SD)	39.31 (28.55)	19.22 (25.66)	31.66 (25.66)
	Min	0.00	0.00	0.00
	Max	94.83	65.25	94.83
% of Individuals with High School Diploma/ GED or Less	Mean (SD)	44.74 (18.48)	41.83 (16.79)	43.64 (16.79)
	Min	10.03	10.80	10.03
	Max	90.15	72.00	90.15
% of Individuals Living in a Different House 1 Year Ago	Mean (SD)	20.74 (11.38)	14.85 (11.59)	18.50 (11.59)
	Min	1.01	0.74	0.74
	Max	55.24	62.46	62.46

PROCEDURES

- Family demographic information was collected via a parent self-report survey.
- Measures (assessed in the spring):
  - *Expressive Vocabulary Test–Second Edition (EVT-2)*
  - *Woodcock Johnson–Third Edition (WJ-III)*: Broad Reading and Broad Math

Neighborhoods = U.S. Census Block Groups

1. Participant home address were mapped onto Census Block Groups.

   205 unique neighborhoods (census block groups) within 13 communities, containing a range of 1–5 participants.

2. Five neighborhood variables were collected from U.S. Census Data:

Education % of individuals with a *high school degree/GED or less*

Race % of individuals from *minority background*

Income Median *household income*

Household Composition % of *female-headed households*

Mobility % of individuals living in *different house* 1 year ago

ANALYSIS

- Models for each outcome variable (i.e., Vocabulary, Broad Reading, and Broad Math) were run in SAS, in the following order:
  - An empty model with no predictors
  - A model with only covariates
  - A model with each of the five neighborhood level variables as predictors
  - A model with each of the five neighborhood level variables and the interaction with geographic setting

RESULTS

Neighborhood Education		Est.	F	df	p	Est.	F	df	p
Broad Math	Education	-0.103	4.05*	177	0.046	-0.052	6.56	157	0.011
	Education x Rural					-0.185	2.83	161	0.095
Broad Reading	Education	-0.104	4.66*	169	0.032	-0.144	1.99	143	0.161
	Education x Rural					0.140	1.87	151	0.174
Vocab	Education	-0.094	2.28	129	0.133	-0.034	3.97*	135	0.048
	Education x Rural					-0.199	2.32	144	0.130

Neighborhood Racial Makeup		Est.	F	df	p	Est.	F	df	p
Broad Math	Race	-0.079	5.28*	182	0.023	-0.078	2.53	124	0.115
	Race x Rural					-0.008	0.01	117	0.940
Broad Reading	Race	-0.091	7.83*	179	0.006	-0.090	4.01	110	0.048
	Race x Rural					-0.006	0.00	103	0.948
Vocab	Race	-0.089	4.54*	171	0.035	-0.071	5.54	97	0.021
	Race x Rural					-0.134	1.39	88	0.241

Neighborhood Income		Est.	F	df	p	Est.	F	df	p
Broad Math	Income	0.027	0.35	148	0.557	0.116	0.28	144	0.597
	Income x Rural					-0.185	4.19*	149	0.042
Broad Reading	Income	-0.024	0.32	144	0.574	0.046	0.33	144	0.567
	Income x Rural					-0.139	2.69	152	0.103
Vocab	Income	0.014	0.07	129	0.796	0.196	0.08	126	0.773
	Income x Rural					-0.361	11.71*	136	0.001

Neighborhood Household Composition		Est.	F	df	p	Est.	F	df	p
Broad Math	FemaleHead	0.062	1.80	178	0.181	-0.011	5.25*	157	0.023
	FemaleHead x Rural					0.250	6.27*	159	0.013
Broad Reading	FemaleHead	0.072	2.76	178	0.099	0.045	3.58	151	0.060
	FemaleHead x Rural					0.085	0.83	156	0.364
Vocab	FemaleHead	0.077	1.91	169	0.169	-0.017	5.18*	136	0.024
	FemaleHead x Rural					0.302	6.49*	142	0.012

Neighborhood Mobility		Est.	F	df	p	Est.	F	df	p
Broad Math	Mobility	-0.004	0.01	181	0.943	-0.039	0.00	168	0.955
	Mobility x Rural					0.085	0.45	166	0.504
Broad Reading	Mobility	0.152	7.09*	173	0.009	0.201	5.93	162	0.016
	Mobility x Rural					-0.121	1.08	161	0.300
Vocab	Mobility	-0.118	2.58	160	0.110	-0.264	1.60	149	0.208
	Mobility x Rural					0.343	5.47*	147	0.021

Note. The reference group for the interactions is the urban group. Median income is in $1000's. Covariates in the models included child age, gender, race, home language, parental education, type of residence, number of people in the home, income, and child's preschool attendance.

1. **What is the relationship between the characteristics of preschool children's neighborhoods and their vocabulary and achievement?**

- ***Neighborhood education:*** An increase in the percentage of individuals in the neighborhood with a *high school degree or less* significantly predicted a decrease in children's math and reading scores regardless of geographic setting.

- ***Neighborhood racial makeup:*** An increase in the percentage of *individuals from a minority background* significantly predicted a decrease in math, reading, and vocabulary scores regardless of geographic setting.

2. **Does geographic setting (urban vs. rural) moderate the relationships between neighborhood characteristics and preschool children's vocabulary and achievement?**

- ***Neighborhood income:*** The effect of *median neighborhood income* was significant for rural only. The effect of increasing median income for rural children was lower than for urban children.

- ***Neighborhood household composition:*** In urban areas, children living in neighborhoods with higher percentages of *female-headed households* had lower math and vocabulary scores. For rural areas, higher percentages of female-headed households was associated with significantly higher math and vocabulary scores than urban areas.

- ***Neighborhood mobility:*** In rural areas only, an increase in the percentage of individuals *living in a different house one year ago* predicted *higher* vocabulary scores. There was no effect of neighborhood mobility on urban children.

DISCUSSION

- Various neighborhood characteristics are related to preschool children's achievement and vocabulary, and ***geographic context matters***.

- The level of ***educational attainment*** and the ***racial makeup*** of a neighborhood have significant effects on children's academic outcomes regardless of geographic context.
  - Lower levels of education within the neighborhood could mean lower levels of overall social capital in the neighborhood, which can impact the social support networks and the quality of services (Witherspoon et al., 2016).
    - Although a child's parents may have high levels of education, the overall level of neighborhood educational attainment may affect children's academic outcomes.
  - Neighborhood context may be one factor contributing to racial achievement gaps.

- ***Differential effects*** of neighborhood characteristics between urban and rural areas were also revealed.
  - The effect of ***median income*** was significantly lower for rural children than for urban children. That is, increases in median income have significantly smaller effects on math and vocabulary scores for rural children than for those in urban areas.
    - Simply increasing income in rural areas may not address other underlying issues in rural areas such as lack of quality resources and services for children and families (Bauch, 2001).
  - For urban areas, higher percentages of ***female-headed households*** predicted lower scores for math and vocabulary. But for rural areas, higher percentages predicted higher scores for math and vocabulary.
    - Strong intra-family relationships and community-family relationships in rural communities may mitigate the effects of residing in female-headed households.
    - The percentage of female-headed households is much higher in urban than rural areas, which may affect interpretations.

- Neighborhood ***mobility*** had a significant effect on rural children's achievement, but in the unexpected direction. This may be due to sampling error, or other unknown explanations.

- The differential effects of neighborhood characteristics on children's academic outcomes between urban and rural areas suggest that the ***effects of neighborhood characteristics may vary by a broader context*** that has not been previously recognized.

LIMITATIONS

- Correlational analyses preclude causal interpretations.
- No two rural areas are the same. Combining different rural communities into one category may mask idiosyncrasies and limit nuanced interpretations of rurality.

FUTURE DIRECTIONS

- Examine the mechanisms through which differential effects of neighborhood characteristics in urban and rural areas occur
- Explore neighborhood variations among rural communities
- Determine the effects of neighborhood longitudinally, as children transition into formal schooling and move through elementary grades
- Explore the effects of neighborhood characteristics on social-emotional and behavioral outcomes in young children

Learning Frontiers PreK to Grade 3