Center for Family and Demographic Research

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TRAJECTORIES OF OVERWEIGHT AMONG US SCHOOL CHILDREN:
A focus on social and economic characteristics

INTRODUCTION

In the past 25 years, the prevalence of overweight and at-risk for overweight children quadrupled, increasing from roughly four percent to sixteen percent. It is important to document both the prevalence of overweight and the timing of weight gain among children because overweight children are more likely to become obese adults.

CURRENT STUDY

We use the Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K), a nationally representative sample of US kindergartners, to identify weight trajectories using growth mixture models. We use multinomial logistic regression to explore the relationship between weight patterns and key demographic and socioeconomic characteristics. Multiple measures of body mass index (BMI) from K through 8th grade (N~ 14,000) are used.

DATA & MEASURES

Race / Ethnicity / Parental Nativity:
Hispanic (of any race), and non-Hispanic white, Black, Asian, and Other. Children Settled Immigrant parents (arrived in the U.S. ages 0-11), children Newly Arrived parents (arrived in the U.S. age 12 and older), and children of U.S.-born native parents.

Socioeconomic Status:
family income in kindergarten (logged), change in income between kindergarten and eighth grade, and parental educational attainment.

Household, Family & Individual Measures:
Includes children's birth weight, number of children in the household, general health status, television viewing habits, mother's full-time work status, family structure, and place of residence.
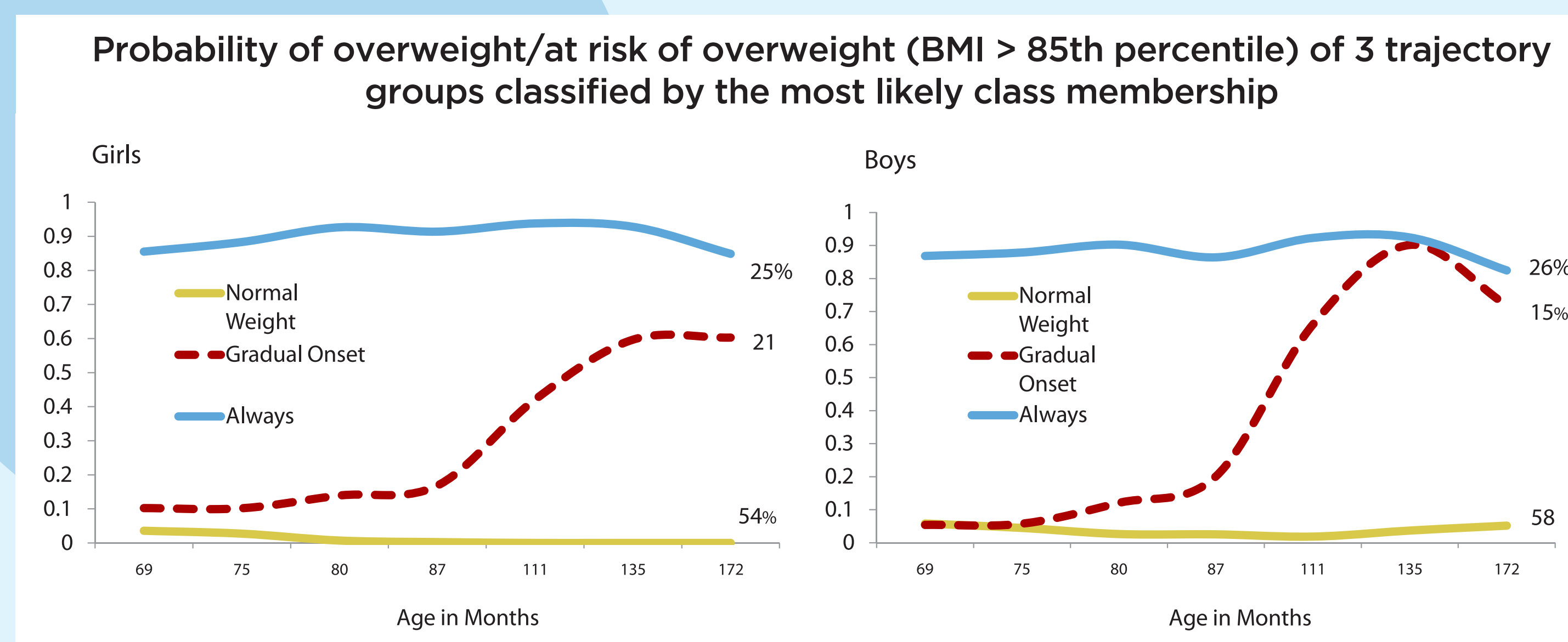

Trajectory membership by race/ethnicity/parental nativity
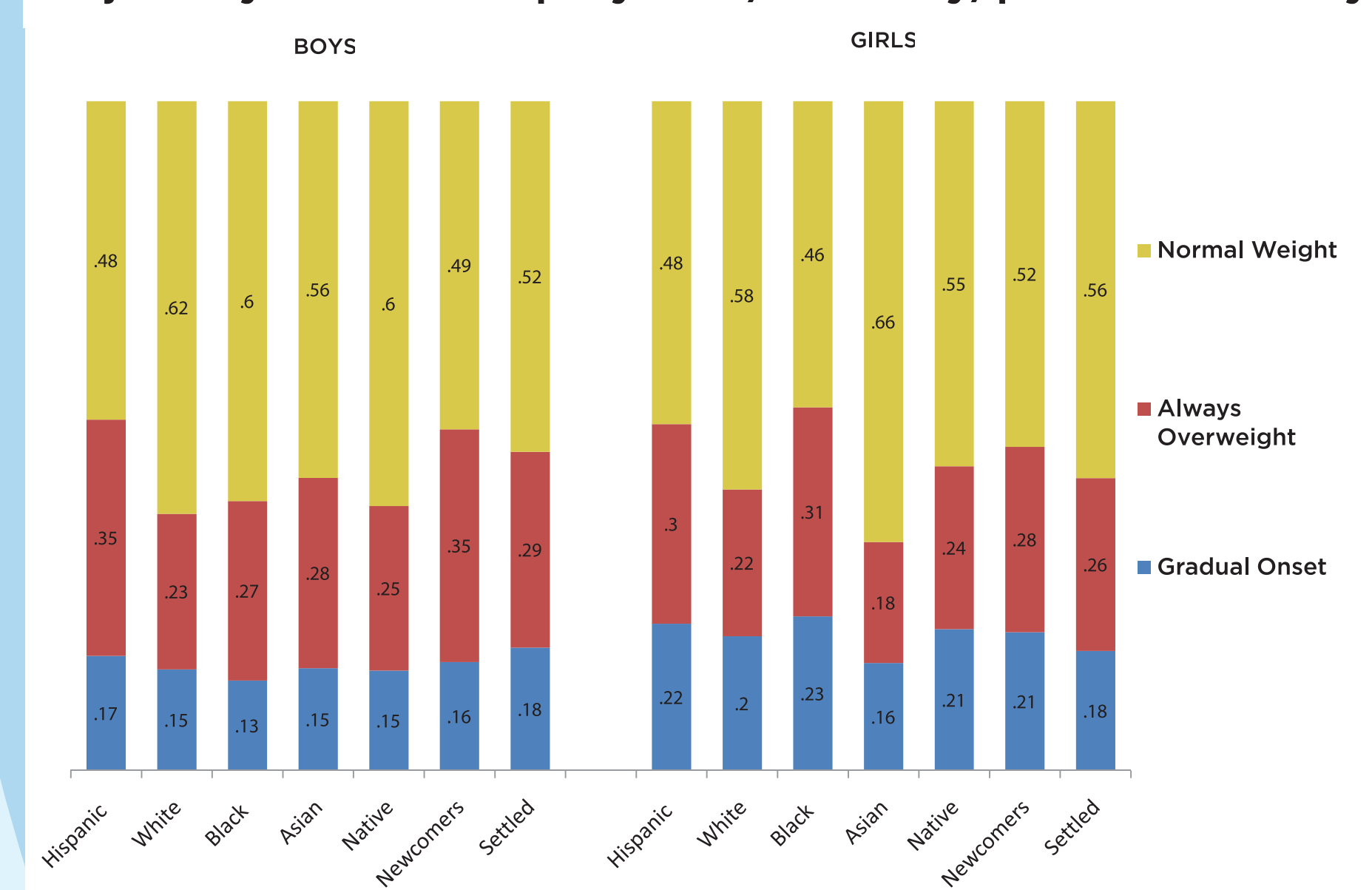
While a majority of children are in the "Normal" weight class, clear differences exist across race, ethnic and parental nativity categories for boys and girls.

RESULTS

Three distinct patterns of weight gain from kindergarten through eighth grade were identified: Consistently Normal (below the 85th percentile for height and weight), Always Overweight, and Gradual Onset of overweight.

Probability of overweight/at risk of overweight (BMI > 85th percentile) of 3 trajectory groups classified by the most likely class membership

Of those classified as always overweight/at-risk or gradually becoming overweight or at-risk, the majority is in the "always" category and therefore appears to have been at risk as early as kindergarten (boys: 66%, girls: 56%).

ALWAYS OVERWEIGHT

- Hispanics are more likely than non-Hispanic whites to experience continuous overweight.
- Parental education is a weaker predictor of sustained overweight among boys than among girls.
- Sons of recently arrived immigrant parents have higher odds of membership in the "Always Overweight" class compared to non-Hispanic whites
- Among girls, higher levels of income in Kindergarten and upward shifts in income over time reduce the risk of transitioning into overweight.

GRADUAL ONSET OF OVERWEIGHT

- Higher parental education reduces the risk of boys and girls experiencing the onset of overweight after they enter kindergarten.
- Among boys, increased number of daily television viewing hours and black ethnicity are associated with gradual onset of overweight.
- Among girls, significant predictors include parent's annual income and changes in parental income between kindergarten and eighth grade.

NORMAL WEIGHT

- Possessing better health, having a lower birth weight, more siblings, watching less television, and having higher levels of parental income and education appeared to increase the chance of maintaining a normal weight throughout the course of the study.

CONCLUSIONS

EARLY AND SUSTAINED OVERWEIGHT DISPROPORTIONATELY AFFECTS HISPANIC BOYS, GIRLS AND CHILDREN WITH LOW LEVELS OF FAMILY INCOME AND PARENTAL EDUCATION.

Given that race and ethnic differences are evident as early as Kindergarten and that racial and ethnic gaps in the incidence of obesity widen as children move through high school and beyond, it will be important to identify and target family or community based interventions even before children enter elementary school.

THE RELATIONSHIP BETWEEN SOCIOECONOMIC STATUS AND CHILDREN'S HEALTH MAY OPERATE DIFFERENTLY ACROSS GENDER.

Parental education may reduce the risk of overweight if education is related to health knowledge and better child feeding practices. However, the effects of income may be more complex because income can be used to purchase healthier food, but can also increase consumption of obesity-promoting goods and activities (e.g., video games and fast food).

THE CHILDREN OF IMMIGRANTS HAVE BEEN DISPROPORTIONATELY AFFECTED BY THE OBESITY EPIDEMIC.

Children of immigrants whose parents had less exposure to the U.S. may be unaware of the health risks of American junk food. They may be coming from environments characterized by food scarcity and under nutrition and may not consider over indulgence in food among their children a problem. In environments in which food sources are less secure (such as in some less-developed countries), overweight may be a marker of status, or at least is not perceived as unhealthy. Immigrants may bring such inclinations with them to the United States, and their effects may become manifested early in children's lives.

	BOYS				GIRLS			
	Gradual Onset of Overweight/At Risk for Overweight		Always Overweight or at Risk of Overweight		Gradual Onset of Overweight/At Risk for Overweight		Always Overweight or at Risk of Overweight	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Individual Characteristics								
Hispanic	1.176	(.89, 1.6)	1.708	(1.4, 2.1)	1.182	(.90, 1.5)	1.491	(1.2, 1.9)
Non Hispanic								
Black	0.690	(.50, .95)	1.069	(.87, 1.3)	1.254	(.99, 1.6)	1.694	(1.3, 2.3)
Asian	1.030	(.69, 1.5)	1.212	(.89, 1.6)	0.811	(.55, 1.2)	0.825	(.56, 2.3)
Other	1.042	(.74, 1.5)	1.283	(.90, 1.8)	1.197	(.84, 1.7)	1.432	(.97, 2.1)
(White)								
Children of Newly Arrived Immigrants	1.219	(.92, 1.6)	1.440	(1.1, 1.8)	0.971	(.73, 1.3)	1.071	(.84, 1.4)
Children of Settled Immigrants	1.354	(.93, 2.0)	1.239	(.91, 1.7)	0.815	(.57, 1.2)	0.971	(.72, 1.3)
(Children of Natives)								
Family and Household Characteristics								
Base year income (logged)	0.974	(.88, 1.1)	0.918	(.85, 1.0)	0.906	(.82, 1.0)	0.898	(.81, 1.0)
Income change (K-8)	0.923	(.84, 1.0)	0.939	(.88, 1.0)	0.914	(.84, .99)	0.916	(.83, 1.0)
Parents educational attainment								
No high school degree	0.792	(.60, 1.1)	1.022	(.83, 1.3)	1.272	(.96, 1.7)	1.358	(1.0, 1.8)
(High School Degree)								
Some College	0.683	(.56, .84)	0.908	(.77, 1.1)	0.831	(.70, .99)	1.033	(.85, 1.3)
College	0.514	(.42, .64)	0.813	(.66, 1.0)	0.591	(.47, .74)	0.725	(.60, .88)
Mother works full time	1.175	(.99, 1.4)	1.382	(1.2, 1.6)	1.012	(.85, 1.2)	1.194	(1.0, 1.4)
Two parents in household	1.019	(.82, 1.3)	0.964	(.82, 1.1)	1.127	(.91, 1.4)	1.068	(.88, 1.3)
Number of siblings in household	0.972	(.90, 1.1)	0.896	(.84, .96)	0.962	(.90, 1.0)	0.890	(.83, .95)

Early Child Longitudinal Study-Kindergarten Cohort 1999, K-8th grades. OR, odds ratio; CI, confidence interval. Normal weight trajectory class is the referent group. Controls include region of US, level of urbanicity, birthweight, television habits, general health. Highlighted ratios are significant at the .05 level.

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