

Contextual Effects of Children's Time Use on Health

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Does the rhythm of children's everyday lives vary in different community contexts and is this variation associated with children's physical well-being? The social organization of neighborhoods is strongly linked with negative health outcomes among children, such as greater risk of obesity and asthma and higher engagement in risky behaviors (Robert 1999; Leventhal and Brooks-Gunn 2000; Earls and Carlson 2001; Cagney and Browning 2004; Browning et al 2004). How children spend their time is also associated with negative health outcomes, with lower time in active leisure linked with higher risks of being overweight and reduced physical functioning (Curtin, Randolph, and Scott 2006; Hofferth and Sandberg 2001; National Center for Health Statistics 2005). Understanding how neighborhood characteristics, children's time use, and children's health outcomes are connected is a vital social issue, urgently needed to inform public health policy initiatives. Although neighborhood effects and time use have each been shown to significantly affect children's health separately, there has been almost no research connecting the two. Yet neighborhood effects on children's time use are often proposed to be a key mechanism in producing the observed variability in health outcomes between places.

The major theoretical perspectives on neighborhood effects suggest that social disorder, the local ecology, and a lack of social connections, or "collective efficacy" among neighbors result in different activity patterns for children in poor compared to affluent neighborhoods. Social disorder may lead both children and parents to prefer different activities in disadvantaged versus advantaged settings, and these preferences may be reinforced by the physical and social ecology of neighborhoods. Most importantly, children in disadvantaged neighborhoods are typically expected to have fewer opportunities for active play and to spend more time inside engaged in sedentary activities such as watching TV. Lower activity levels encourage obesity and related health problems, and because of the low quality housing prevalent in disadvantaged neighborhoods, more time indoors for poor kids increases exposure to allergens and toxins. Additionally, lower exposure to public environments may stifle children's interests and abilities and restrict the pool of non-familial mentors (Crosnoe and Trinitapoli 2007).

Theoretical perspectives on child development posit that children's exposure to parenting practices and access to economic and social resources influence both time use and developmental outcomes. Positive parenting practices include establishing regular meals, bedtimes, and family routines and regular schedules increase positive outcomes (Leventhal and Brooks-Gunn 2003). Economically well-off parents "cultivate" children by ensuring involvement in activities that promote cognitive and physical functioning (Arendell 2001; Lareau 2000). In contrast, fears about children's safety, which may be more common among poor families, cause parents to limit children's exposure to non-family environments and activities (Best 1990; Warr and Ellison 2000). Children whose parents exhibit more controlling parenting behaviors, such as harsh discipline and low levels of nurturing, experience home environments that are less enriching and face higher risks of stress and depression. Hence, family processes and resources are associated with health-promoting or health-retarding time use patterns among children. Additionally, parental practices designed to mitigate harmful influences on children may moderate or mediate contextual effects on children's outcomes (Browning, Leventhal, and Brooks-Gunn 2005; Furstenberg et al. 1999; Kurz 2002).

Consequently, time use may be an important mechanism which links neighborhood effects, family processes, and children's outcomes. Time expenditures are quantifiable measures of children's exposure to different environments and experiences (Hofferth and Sandberg 2001;

Larson and Verma 1999). Because of the constraints of the 24-hour day, time is a limited resource, with investments in certain activities displacing investments in other, perhaps more beneficial, activities. Children's time use thus reflects varied opportunities to develop physical, mental, and social competencies. On average, children spend about 51 hours per week in leisure activities, with about half of this time devoted to unstructured play and watching television and one-fifth of the time devoted to sports, visiting with friends and family, and church activities (Hofferth and Sandberg 2001: 300, Table 1). Participating in active leisure, such as organized sports, calls forth more engagement, initiative, and self regulation than time spent in passive leisure, such as watching television (Larson and Verma 1999).

How children spend their time varies by age, gender, race-ethnicity, socioeconomic status and family characteristics (Bianchi and Robinson 1997; Hofferth and Sandberg 2001; Lareau 2000; Larson and Verma 1999). Black children, those of lower socioeconomic status (SES), and children living with a lone parent spend less time participating in sports and club activities and more time watching television. Variation in health outcomes among children is associated with the same characteristics that affect time use: Poor health outcomes are more common among minority children and lower SES children than white and higher SES children (NCHS 2005). Race-ethnicity and social class are also strongly correlated with greater risk of living in disadvantaged neighborhood contexts. The consistent differences by race-ethnicity and social class in children's time use beg the question of whether disparate health outcomes are due to children's characteristics, the selection of children into unhealthy neighborhood contexts, or the association of both with time use patterns.

Further, most research on the association between children's time use and developmental and health outcomes has used only measures of time in specific activities. This is problematic because children's engagement in activities changes with age and considering only measures of time in activities overlooks the clustering of activities in distinct aggregations. Crosnoe and Trinitapoli (2007), the only study we are aware of that uses profiles of time use instead of activity based measures, find that children's time in specific activities changes with age but patterns of shared time with parents established earlier had long-term effects on academic achievement. Likewise, we anticipate that profiles of time use that are present in children's early years may lay the groundwork for a preponderance of healthy or unhealthy behaviors in adolescence.

Hence, the first goal of our study is to identify profiles of health-relevant time use. Our hypothesis is that we will be able to sort children into four distinct groups that will reflect the nexus of type of activity, involvement with others, and location. Theoretically, the context of activities condition how they are experienced by individuals and how they affect outcomes. Time use profiles that combine information on the type of activity, whether the activity is supervised or done with other individuals, and the location of the activity can be classified as health-promoting or health-retarding based on the extent to which the multiple dimensions of time use develop children's self-efficacy, physical and mental functioning, and social capital. Engagement in household chores, sports and other active leisure, and community and cultural organizations expose children to environments that develop and instill self-regulation, higher-order cognitive abilities, interpersonal skills, and long-term goal orientations (Brooks-Gunn et al. 2000; Furstenberg et al. 1999; Lareau 2002). In contrast, spending time watching television or playing electronic media games may have a soporific effect on children's cognitive and interpersonal development, and their curiosity about the world. The nature of these experiences depends, though, on the extent to which they involve others and their location. Relaxing with peers may be qualitatively different in terms of experience and effect when it is done at home under the watchful eye of parents compared with when it takes place in a neighborhood playground deserted by adults. We anticipate that four time use profiles will be identified based on the

combined levels of health-promoting or retarding activities, parental monitoring and engagement, and activity location.

The second goal of our project is to determine whether and how children's time profiles vary across neighborhoods and evaluate whether neighborhood mediated variation in time profiles is associated with cross-sectional and longitudinal measures of children's Body Mass Index (BMI). We will also consider how the neighborhood mediated effect of context differs across children of different ages, genders, and racial-ethnic groups, because of their influences on time use, developmental trajectories, and family processes.

Data and Method

We use two waves of the Panel Study of Income Dynamics' Child Development Supplement linked to Census tract data (PSID-CDS). The CDS was collected in 1997 on a sample of 3,563 children ages 12 and under. Follow-up interviews with 2,907 children were completed in 2002, when the children were ages 5 to 19 (CDS-II User Guide 2006). The PSID-CDS includes both a weekday and a weekend time diary of children's activities, data on children's characteristics and family setting, and measures of child health, as well as data on subjective perceptions of neighborhood context that we will use to supplement the objective Census measures. The time diary component of the survey provides a unique opportunity to map the contours of neighborhood variability in children's time and its effect on health and well-being. The PSID-CDS also contains approximately 300 sibling pairs. This provides an excellent opportunity to disentangle the effect of individual-level, family-level, and neighborhood level effects on children's outcomes. The core PSID includes much more data on family characteristics, useful for isolating family level impacts from neighborhood effects.

Measures

Child BMI will be determined from weight and height information collected by interviewers during the home interview of the CDS. BMI was calculated according to the National Center for Chronic Disease Prevention and Health Promotion formula, then converted to a z-score using the Centers for Disease Controls' age-and sex-specific standards for children ages 2 to 20 (Ogden et al. 2002). Children who are at or above the 95th percentile of the CDC's growth reference for children of their same age are defined as obese; children who are at or above the 85th percentile are defined as "at risk of overweight."

Children's time use data from the 24-hour weekday and weekend diaries will be used to construct the time profiles. The diaries collected information on children's activities, including their duration, location, who was present during the activity, and who was participating in the activity with the child. In our preliminary analyses shown below, we use detailed activity data from the time diaries to create 25 measures that reflect children's time use across a representative weekday and a representative weekend. Separate measures were created for weekdays and weekends because children spend time differently on weekdays compared with Saturdays and Sundays (Timmer, Eccles, and O'Brien 1985). We nest the 25 activities into 6 broad categories: paid work; household work; personal care of self and others; education, religious, and organizational activities; leisure activities, including active and passive leisure; and "missing" time that includes activities not elsewhere classified as well as time periods with missing activity information.

In future analyses, we will use data on activities, location, and who else was present or

involved in the activity, to construct theoretically relevant time profiles. Following Crosnoe and Trinitapoli (2007), we will sort children into groups based on multiple dimensions of time. Specifically, we will use the clustering of health promoting or retarding activities, extent of parental monitoring, and location for the classification. We will then use STATA's kmeans clustering, a nonhierarchical iterative process that uses z-scores to assign observations to different clusters.

For contextual measures in the preliminary analyses, we categorized neighborhoods as poor and nonpoor. Poor neighborhoods consist of those in which 20 percent or more of residents have incomes at or below the poverty level. In future analyses, we will examine children's exposure to a broader range of current and long term neighborhood characteristics that reflect variation across structural factors and social processes. These include measures of concentrated disadvantage, concentrated affluence, residential stability, ethnic heterogeneity; collective efficacy, physical and social disorder, and neighborhood social capital.

To assess family-level associations with child outcomes, we will use measures of parenting practices, direct and indirect social control, parental and child assessment of parent-child relationships, and measures of the home environment. We will also have controls for family and child sociodemographic characteristics, such as family structure, parental education and employment, as well as time in school and child care.

Preliminary Results and Next Steps:

Table 1 shows children's minutes per day in paid work, household work, personal care, educational/organizational activities, leisure, and "missing" activities. Estimates are shown for children in poor and nonpoor neighborhoods, for weekdays (Columns 2 and 3) and weekends (Columns 4 and 5). The results indicate that children's time use does vary across poor and nonpoor neighborhoods. For example, looking at weekends when there is more discretion over time use, children in poor neighborhoods spend less time on health-promoting activities such as household chores, educational activities, and sports and more time sleeping, eating (e.g. personal care of self) and watching television (television comprises the majority of passive leisure), compared with children in nonpoor neighborhoods. In results not shown, we found similar patterns in Wave 2, excepting household chores in which poor children were now spending more time than children in nonpoor neighborhoods.

Hence, our initial results suggest intriguing differences in time use associated with neighborhood variation that appear to correspond to theoretical expectations. We will extend this analysis by exploring the association of time use profiles with health outcomes and whether and how time profiles mediate and/or moderate the effects of neighborhoods and families on health outcomes. Our project promises to substantially advance understanding of the dynamic effects of spatial inequality on children's health development.

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Table 1. Children's Weekday and Weekend Time Use in 25 Activities by Neighborhood Type

	Weekday		Weekend	
	Poor	Nonpoor	Poor	Nonpoor
Work/Income Producing Activities	0.52	0.75	0.06	2.06

Household Work	9.94	15.44	21.96	29.44
Child Care of Household Children or Others	0.53	1.61	1.21	0.79
Obtaining Goods	7.55	9.60	35.98	27.19
Obtaining Services	11.57	11.21	18.37	18.19
Personal Care of Self	744.13	735.09	821.51	786.41
Attending to Personal Care of Others	0.36	0.41	0.28	1.55
Other Personal Care	65.93	50.94	44.13	40.95
Home Computer Related Activities	1.50	5.25	3.14	9.08
Educational and Professional Training	294.27	301.87	3.89	8.83
Religious Practice or Groups	1.68	2.69	25.75	27.43
Child, Youth, Family Organizations	0.18	1.85	0.00	2.18
Other Organizations	0.33	1.55	5.45	7.07
Attending Events	1.42	2.59	5.91	12.83
Socializing	13.89	13.67	27.87	35.89
Classes for Leisure Activity	0.12	2.54	0.19	0.89
Games or Practices for Team Sports	2.92	5.42	1.79	5.74
Games or Practices for Individual Sports	0.00	0.34	0.00	0.95
Active Leisure	15.35	16.40	32.57	33.54
Other Outdoor Leisure Activities	6.56	7.78	13.76	17.67
Hobbies and Domestic Crafts	0.07	1.01	0.52	1.92
Art, Literature, Music, Theater, and Dance	5.41	7.17	5.53	6.23
Playing Games	109.18	118.02	181.62	182.49
Passive Leisure	131.62	118.40	168.39	163.05
Missing Time	14.95	8.37	20.11	17.64
n	757	1858		

Author Calculations from 1997 PSID-CDS

* Poor neighborhoods have poverty rates $\geq 20\%$

** Nonpoor neighborhoods have poverty rates $< 20\%$