Children's Technology Use and Health: A Population Studies Perspective

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Media Exposure and Child Development Workshop

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Overview

- Questions that guide population-level research
- Exemplar findings
- Challenges to measuring new media use in current population data infrastructure
- Harnessing current data infrastructure to meet future research needs

Defining a population studies perspective

Using data from observed samples to make inferences to a population about the distribution of attributes and behaviors within and between subgroups and over time

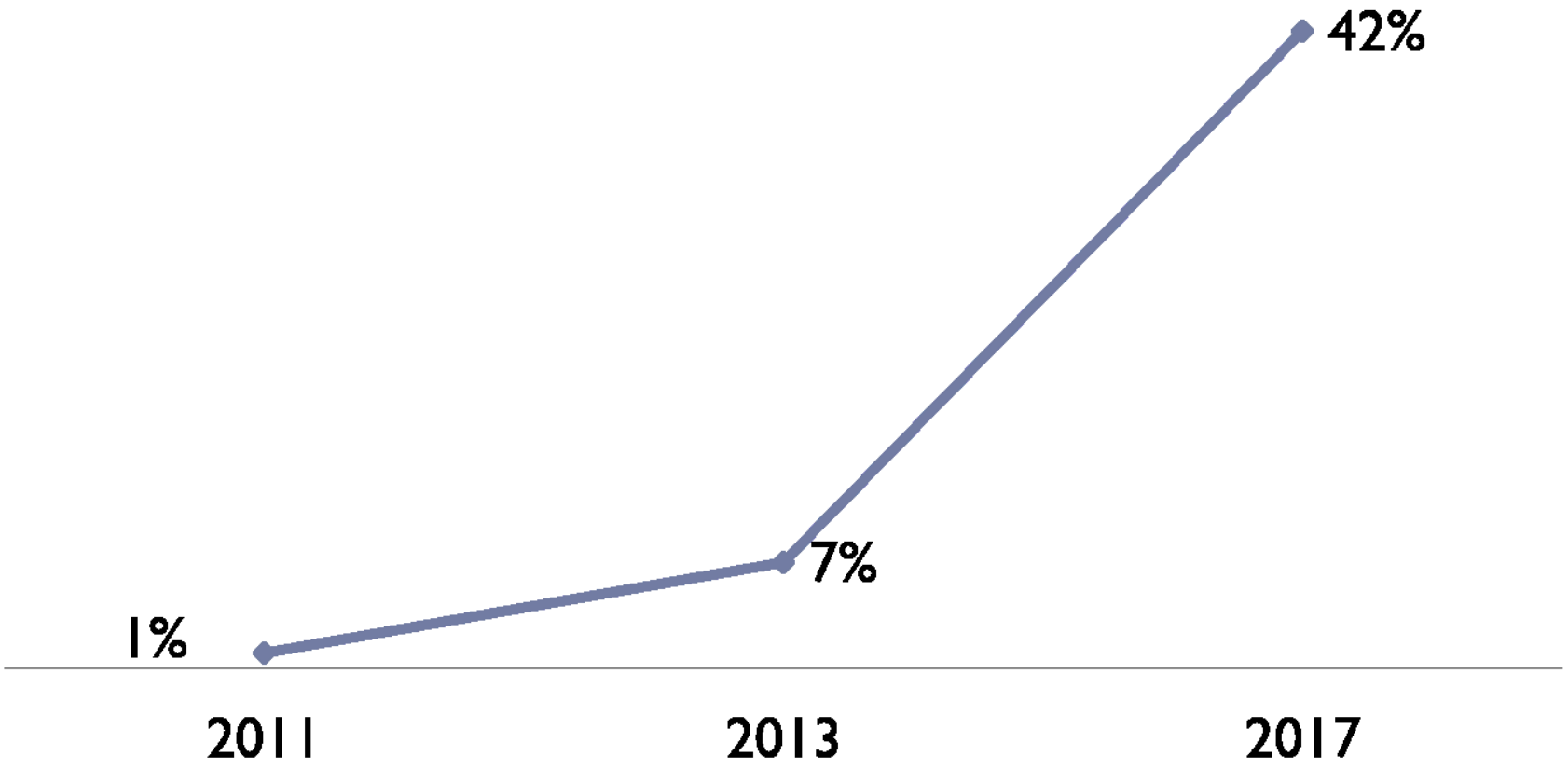
Defining a population studies perspective

- Based on analysis of (mostly) secondary data that are:
  - Population-representative
    - Probability-based (i.e., not clinical or convenience) samples
    - Generalizable to a clearly-defined population
    - Reproducible
  - From multiple sources
    - Survey interviews
    - Interviewer observation
    - Time diaries
    - Biomarker collection
    - Administrative data linkages
    - Passive data collection

Using population research to study media exposure

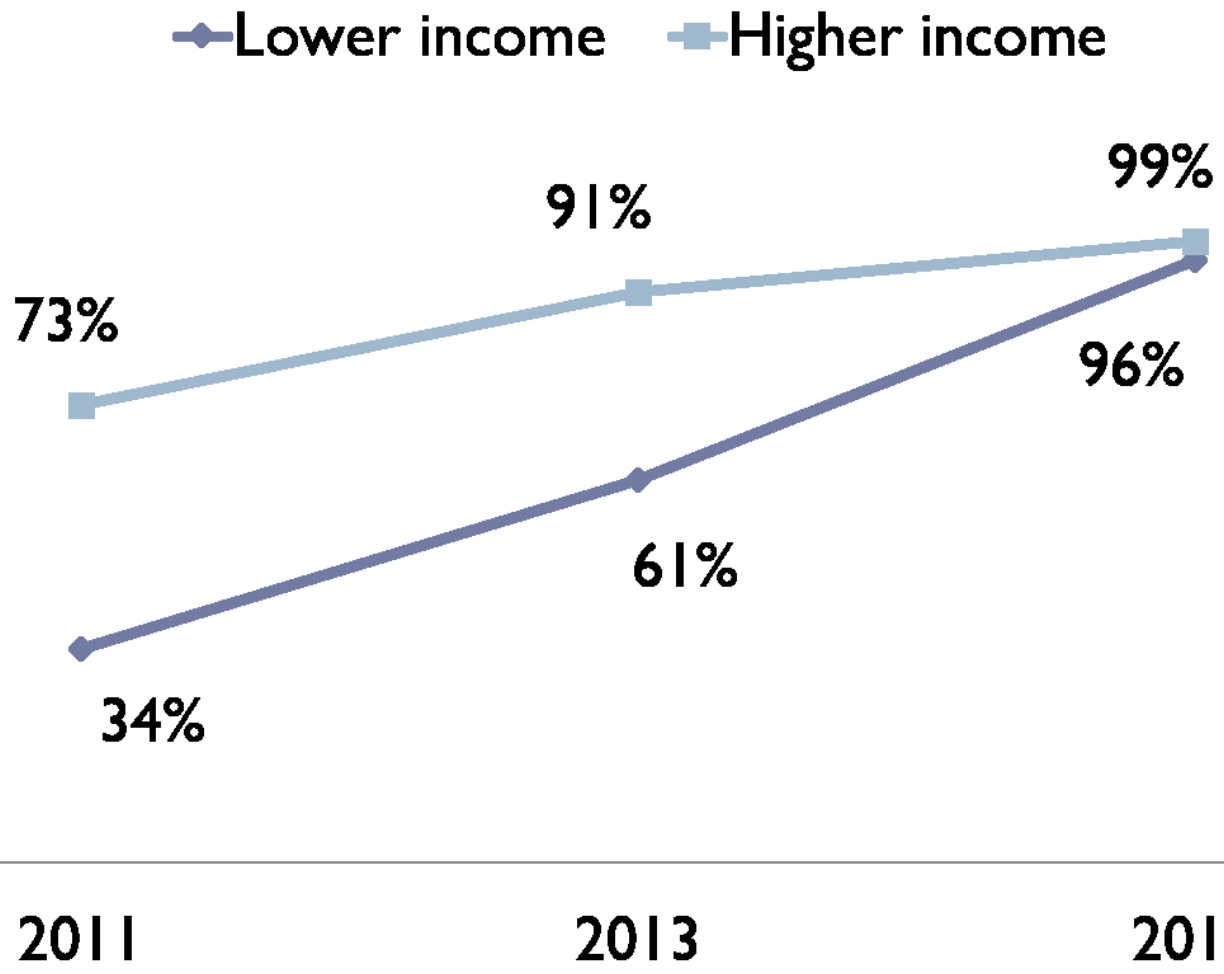
- Prevalence of media exposure
- Population disparities
  - Race/ethnicity
  - Gender
  - Social class
  - Region
- Time trends
- Developmental patterns

Child has own digital tablet, age 0 to 8 years



Source: Rideout, V. (2017). The Common Sense Census: Media Use by Kids Age Zero to Eight (Figure A)

Household has any mobile device, by Family Income, 2011 to 2017

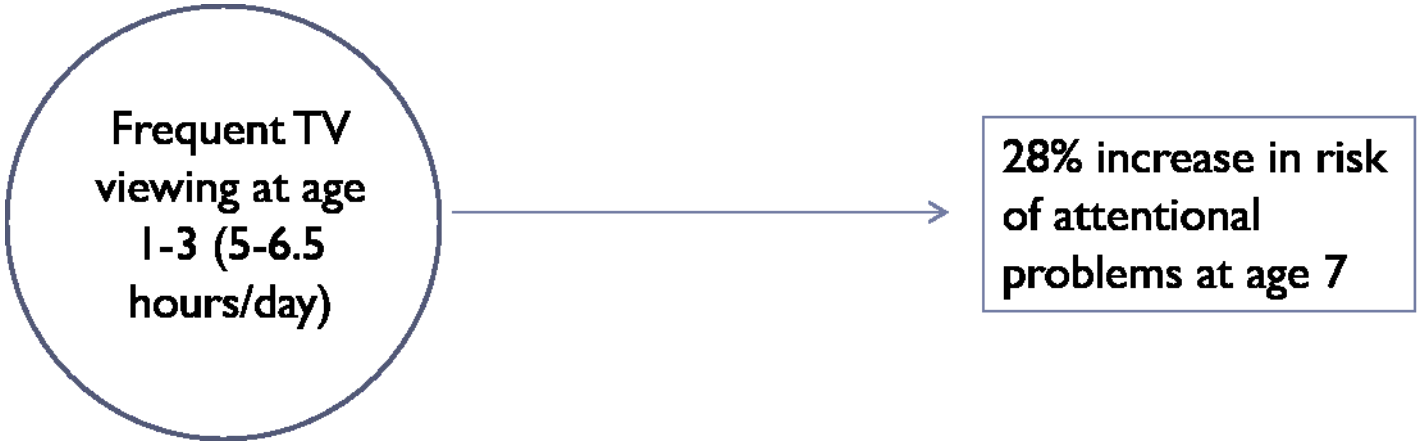


Source: Rideout, V. (2017). The Common Sense Census: Media Use by Kids Age Zero to Eight (Figure E)

Using population research to study media exposure and early child health

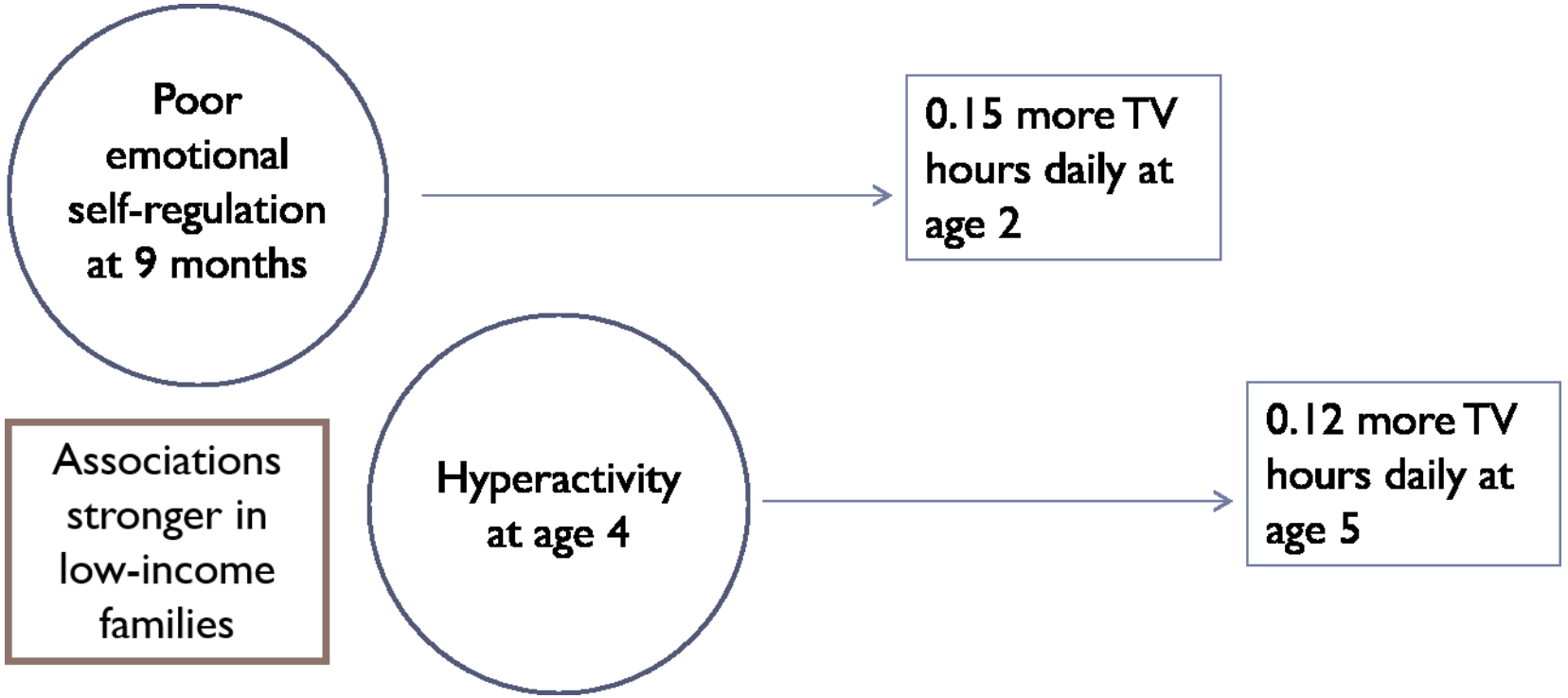
- Document magnitude of associations (Adjusted and unadjusted population estimates)
- Describe population variation in impact of exposure on health
- Describe changes within individuals and in populations over time
- Use study designs, statistical methods, and quasi-experimental conditions to estimate causal effects
- Research community use of public data builds a knowledge base that supports the public interest

Early television viewing and later child behavior



Christakis et al. (2004), *Pediatrics*.
Data source: Children of NLSY, mother report of usual TV hours and selected items from Behavior Problems Index

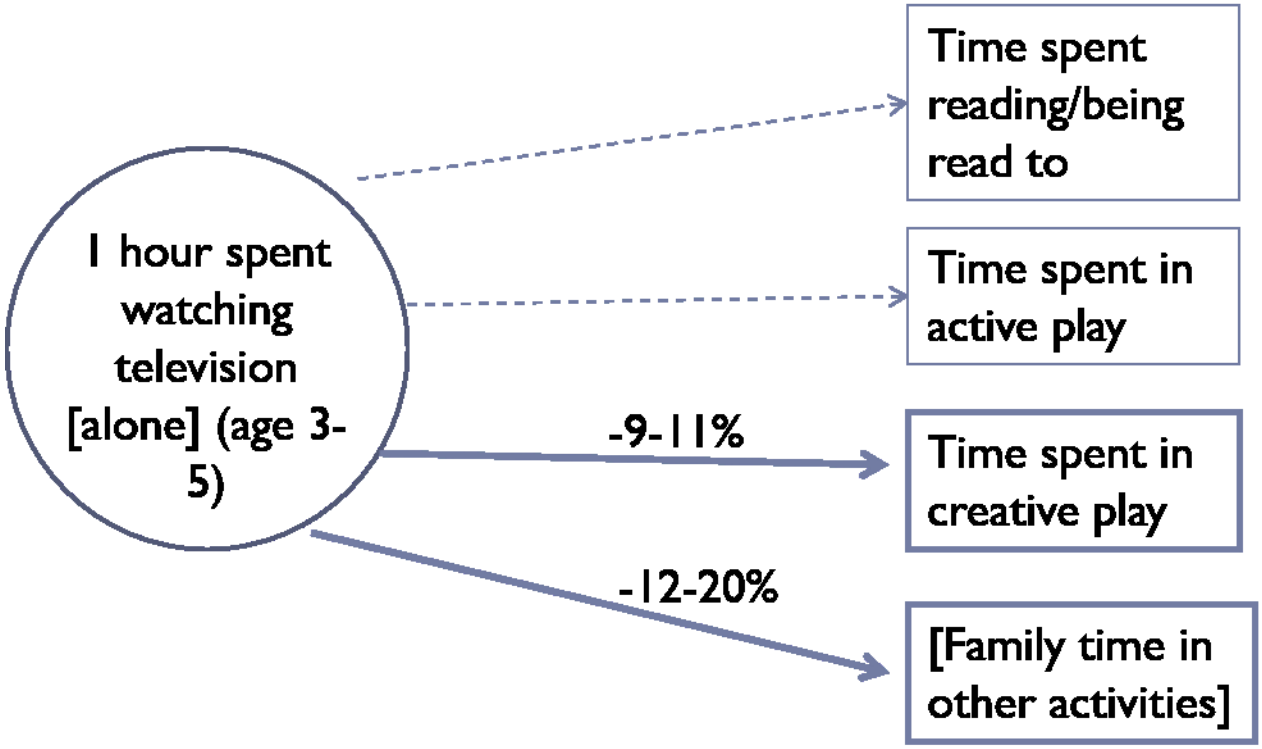
Early television viewing and prior child behavior



Radesky et al. (2014), *Pediatrics;* Ansari and Crosnoe (2016), *Children and Youth Service Review*

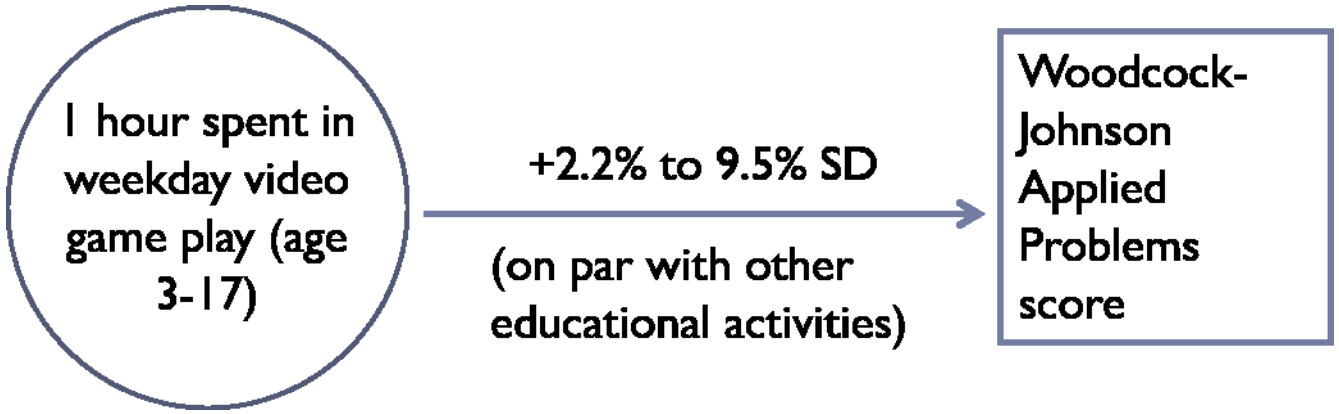
Data source: ECLS-B, caregiver report of usual TV hours and behavior

Television use and time tradeoffs



Vandewater et al. (2006), *Pediatrics*
Data source: PSID Child Development Supplement time diaries

Video game play and mathematical reasoning



Suziedelyte (2015), *Economic Inquiry*
Data source: PSID Child Development Supplement time diaries and cognitive achievement tests

Interactive and mobile media use as a new research need

- "New guidance is needed because mobile media differs from television in its multiple modalities…, interactive capabilities, and near ubiquity in children's lives. Recommendations for use by infants, toddlers, and pre-school-aged children are especially crucial[.]" Radesky, Schumacher, and Zuckerman (2015), *Pediatrics*.
- How can the current population data infrastructure inform such guidance?

Challenges posed by new media

- New platforms, new applications
- Time vs. content and context in shaping child outcomes
- Diffusion of media use in households
- Media use as a "background" activity
- Measuring salient "under the skin" pathways and outcomes
- Media/technology developments outpace data collection/release/analysis

Technology-centered data

- Examples
  - Common Sense Census (CSC)
  - Pew Research Center Internet and Technology surveys
- Strengths
  - High periodicity
  - Extensive content on device use and media consumption
- Challenges
  - Little information on health outcomes, child's other activities, other family members
  - Cross-sectional
  - CSC data are not publicly available; to date, Pew studies have not focused on young children

Health-centered data

- Example
  - National Health Interview Survey
- Strengths
  - Large annual survey
  - Detailed content on health status of one randomly-selected child in household
- Challenges
  - To date, no health behavior/activity information collected about children
  - Little information about children's developmental context

Child-centered data: Panel Study of Income Dynamics (PSID) Child Development Supplement

- Multi-cohort study of children aged 0-17 years
  - Began in 1997, most recent data collection in 2014-15
  - Study of child development embedded in long-running multigenerational household panel study
- Strengths
  - Planned steady-state design enables cross-sectional and longitudinal research questions
  - Extensive questionnaire content on contemporary media use
  - Time diary data provide national profile of children's media use activities
- Challenges
  - Sample size/composition determined by who is in larger panel study
  - Relatively small sample sizes (N=200-300) at each age

Child-centered data: Environmental Influences on Child Health Outcomes (ECHO)

- Consortium of 85 existing US child cohort studies
- Strengths
  - Planned harmonized data collection as study moves forward
  - Large sample size (N~50,000)
- Challenges
  - To date, no content developed on children's media use across cohorts
  - Not all cohorts are population-representative

Place-centered data

- Example:
  Pairing administrative data from schools and public agencies to explore place-based variation in academic performance as a function of broadband access (e.g. , Vigdor et al. 2014)
  - Strengths
    - Large samples
    - Improved causal estimation
  - Challenges
    - Difficult to access
    - Research questions and operationalization constrained by data usually collected for other purposes

Conclusions

- A population studies perspective offers critical insight on the implications of media use for early child development (Demonstrated by prior research on conventional media)
- Innovations in the last decade demand new measurement
- No single population data source will be sufficient to address expanding universe of research questions
- How do we enhance the current data infrastructure with content that is robust to the evolving media use landscape?

Thank You!

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