

# Understanding the determinants of active transportation to school among children living in poverty: Evidence of environmental injustice from the Quebec Longitudinal Study of Child Development.



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# Rationale

- Secular declines in physical activity
- Increased prevalence of overweight and obesity among children
- Need opportunities for physical activity
  - Such as active transportation (AT) to/from school
- Need a better understanding of what influences AT

# Background

- Many cross-sectional studies
- One longitudinal study:
  - Hume et al, 2009
  - Among children & adolescents aged 9 & 14
  - Parent reported environmental indicators
  - Children who had many friends were more likely to increase AT over two years
  - Adolescents reported having no traffic lights or crossings were less likely to increase AT
- Need longitudinal studies:
  - among younger children
  - measures of the environment other than self-report

# Background (2)

- Social inequalities have also been implicated in AT to/from school.
- Children from low socio-economic status (SES) backgrounds are more likely to:
  - use AT to/from school.
  - be exposed to danger.
  - be harmed while walking to/from school.
- Environmental injustice:
  - Inequalities in walking to/from school
  - Low income populations are disproportionately exposed to harmful environmental conditions.

# Purposes

- To further explore the association of poverty and use of AT to/from school,
- To determine the extent to which children who live in unsafe neighbourhoods are more likely to use AT to/from school,
- To examine the combined influence of poverty and dangerousness of the neighborhood environment on the likelihood of AT to/from school.

# Data Source

- Quebec Longitudinal Study of Child Development (QLSCD-ELDEQ).
- ELDEQ = birth cohort (1998); annual follow-up since age 5 months.
- Initial sample (n=2120) = representative of singleton births in Quebec in 1997-1998
  - excluding those *born < 24 weeks gestation*
  - women living in northern regions and on Aboriginal reservations
- ELDEQ designed to identify factors affecting social adjustment , academic performance, and health.

# Study Sample

- Data collected
  - Spring of 2003, 2004, and 2005
  - Children in kindergarten (K), grade 1, and grade 2
  - Aged 6, 7, and 8 years old, respectively
- 1 492 (70.5%) provided data in K
- Excluded:
  - 78 attending private school
  - 259 who moved out of the neighborhood
  - 244 with missing data
- 911 (61.1%) provide data in K, G1, G2

# Children Lost to Follow-up

- More likely to be:
  - Immigrants
  - Have insufficient family income at K
  - From urban regions
  - Boys
- No differences on:
  - Maternal perception of child's health
  - Low birth weight



# Outcome:

## “Active Transportation (AT) to School”

■ At each measurement time: “How does your child usually get to school?”

- School bus
  - Public Transit
  - Is driven
  - Walking/bicycling
- } Non-active
- } Active

# Covariates

- Sex
- Household income when child in K
  - Sufficient vs. Insufficient (Low Income Cut Off - LICO)
- Mother's immigrant status
- Neighbourhood decay
  - 4 items tapping into incivilities in physical environment
- Quality of neighbourhood for raising family
  - Excellent/good vs. average/bad/very bad
- Mother's perception of child's health
  - Excellent vs. other than excellent

# Covariates (2)

- For children living on the island of Montreal:
  - Vehicle-Pedestrian Collisions 1999-2003 mapped
  - The density of pedestrian-vehicle collisions was matched by postal code
  - Students who lived in an area
    - with 1 or more pedestrian-vehicle collisions
    - classified as living in an area more dangerous

# Statistical Analysis

- Description of child characteristics
- Growth Curve Analyses
- Estimated proportions of children walking to school at ages 6, 7, 8 years:
  - Overall sample-Urban & Rural: n=911
  - Urban Public School: n=710;
  - Children who live within 2.0 km: n=425
  - Children who live on the Island of Montreal: n=129

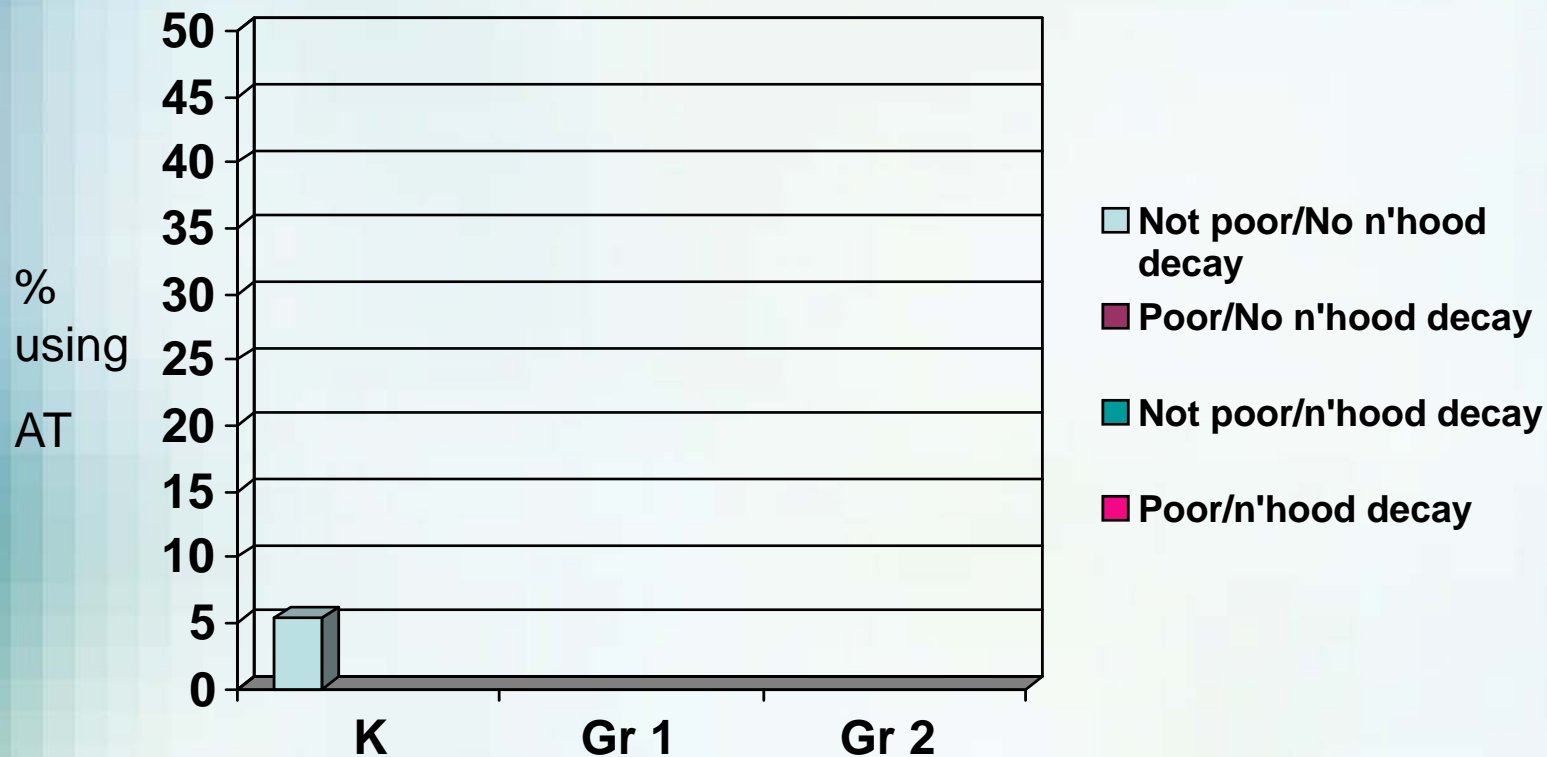
# Participant Characteristics in K (n=911)

Female	51.8%
Rural	22.4%
Insufficient income	15.7%
Neighbourhood Decay-High	29.6%
Perception of child's health Other than excellent	20.6%
Neighbourhood quality Average/bad/very bad	19.5%

# **Results**

**Children from Public  
Schools in Rural and  
Urban Regions**

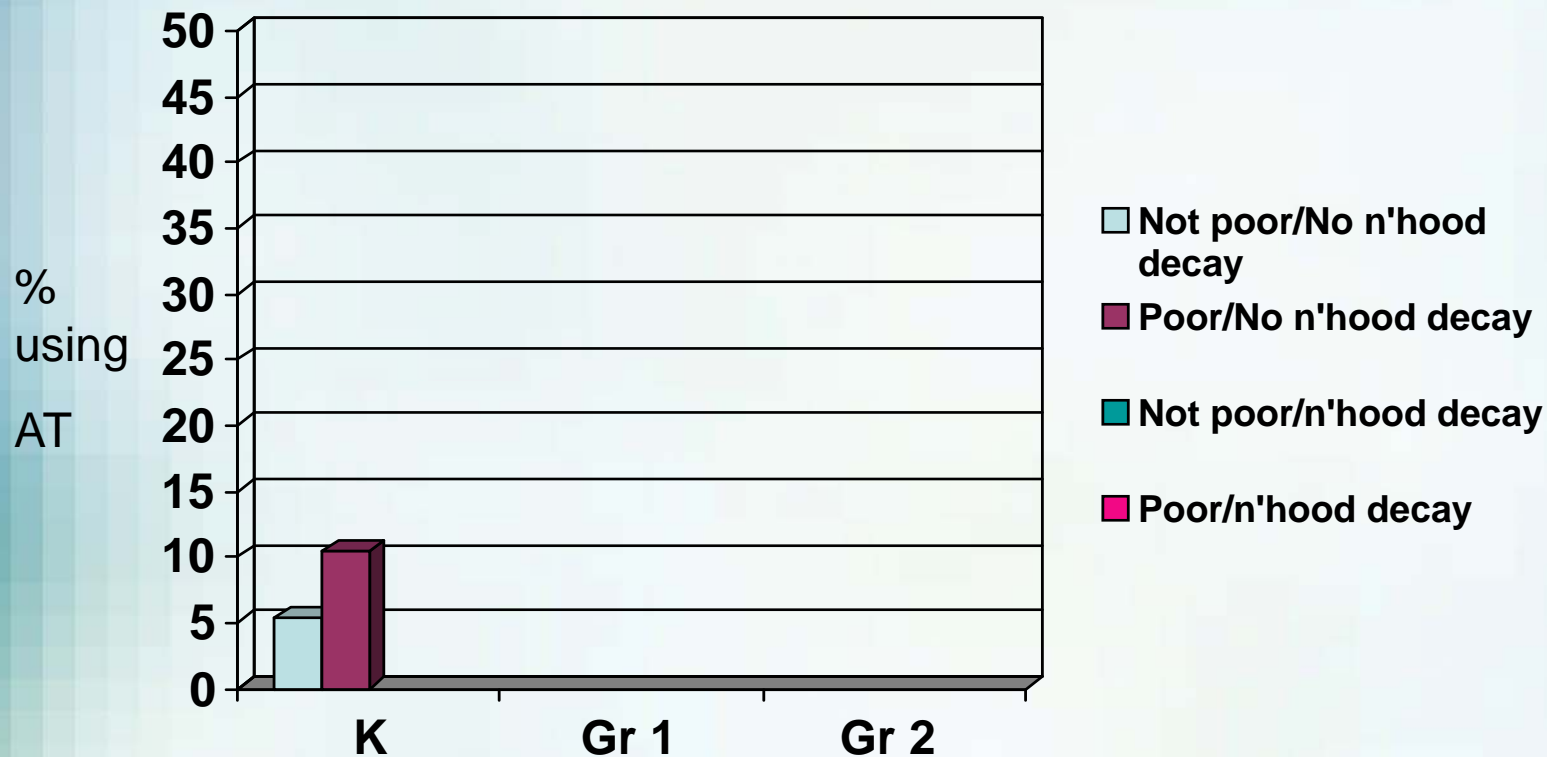
# Multilevel Analysis of AT Among Urban-Rural-Public School Children (n=911)



$OR_{\text{poor}} = 1.7; 95\%CI = 1.0, 2.8$

$OR_{\text{n'hood decay}} = 2.6; 95\%CI = 1.0, 2.4$

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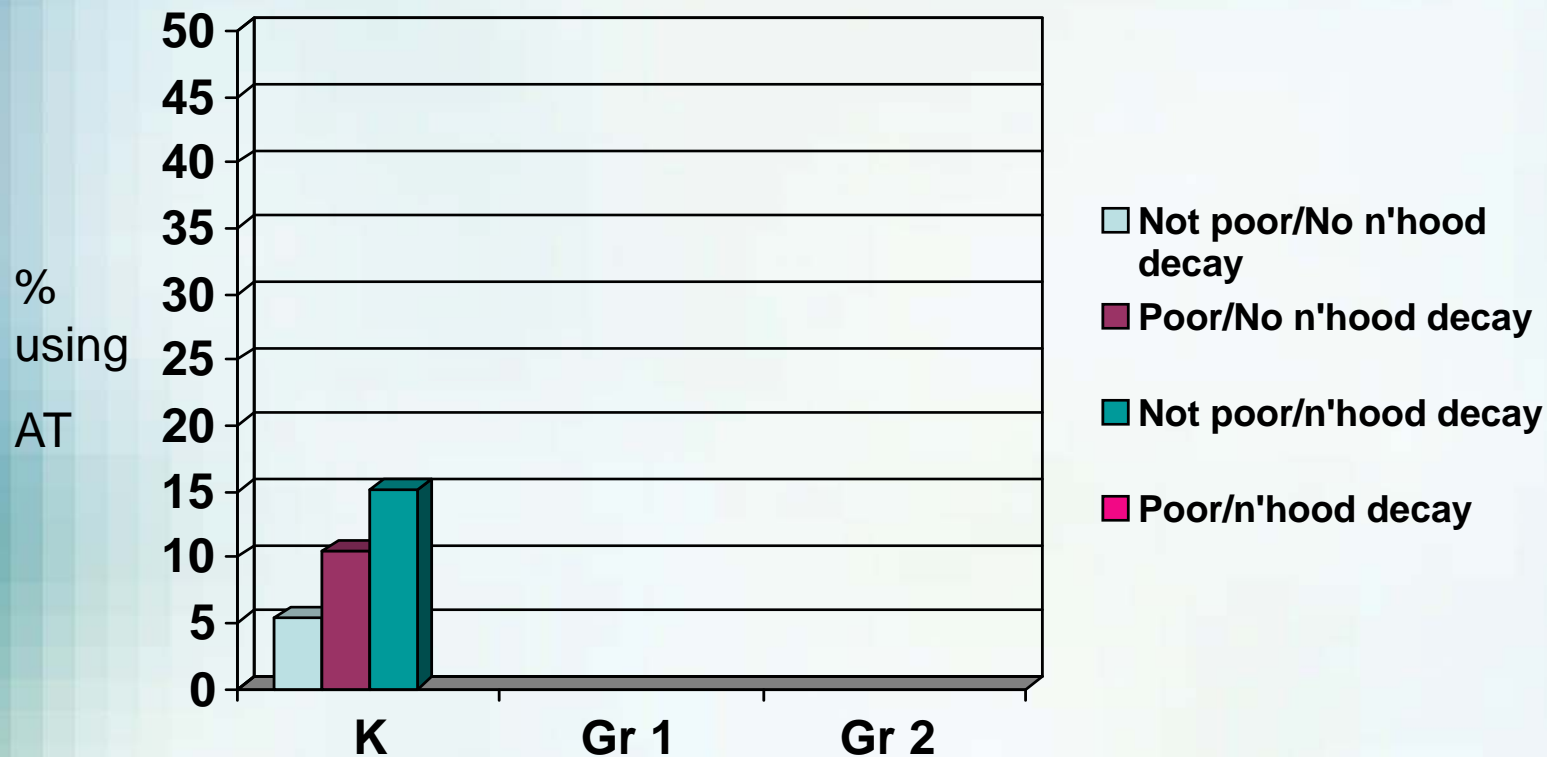


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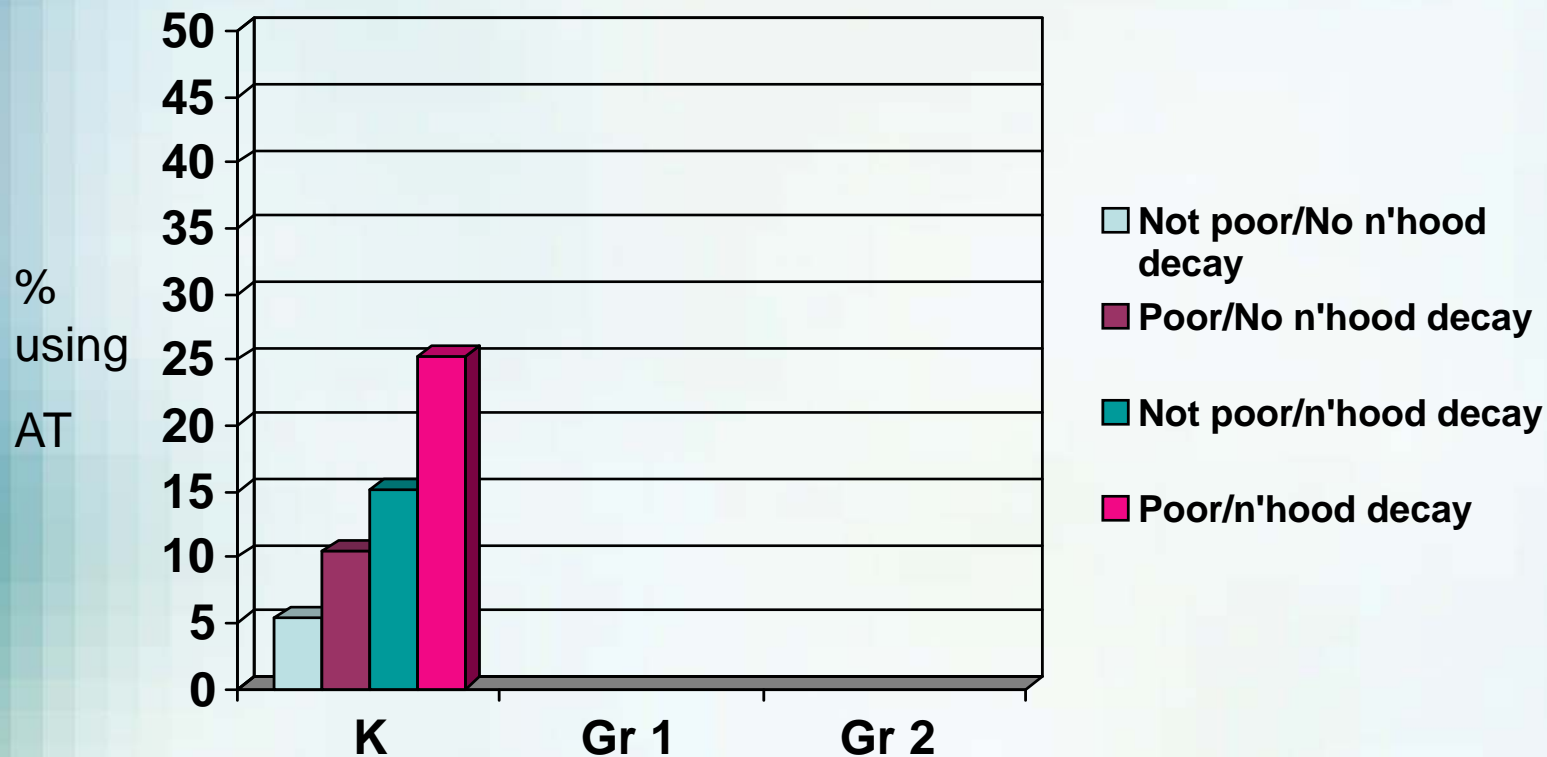
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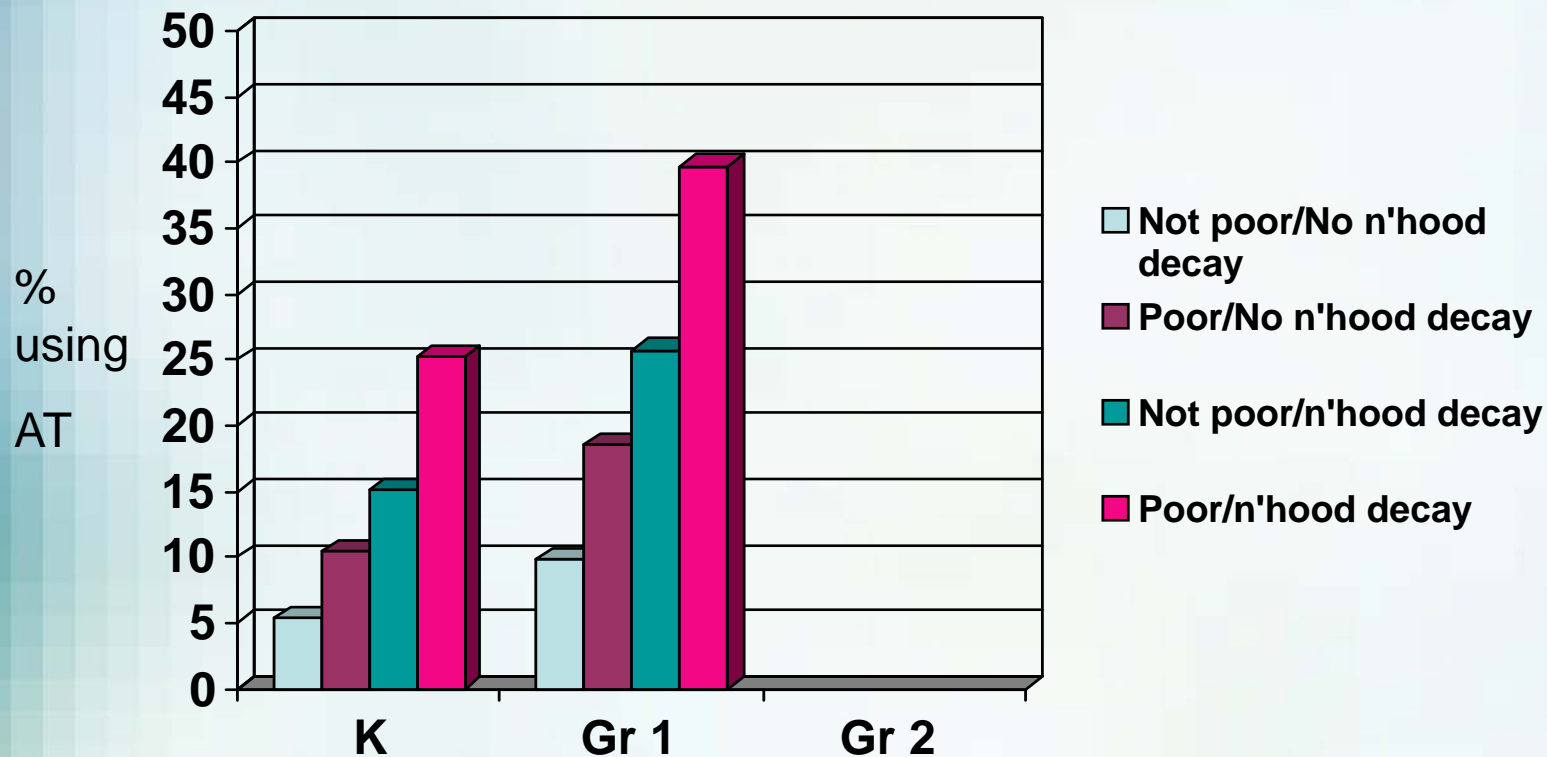
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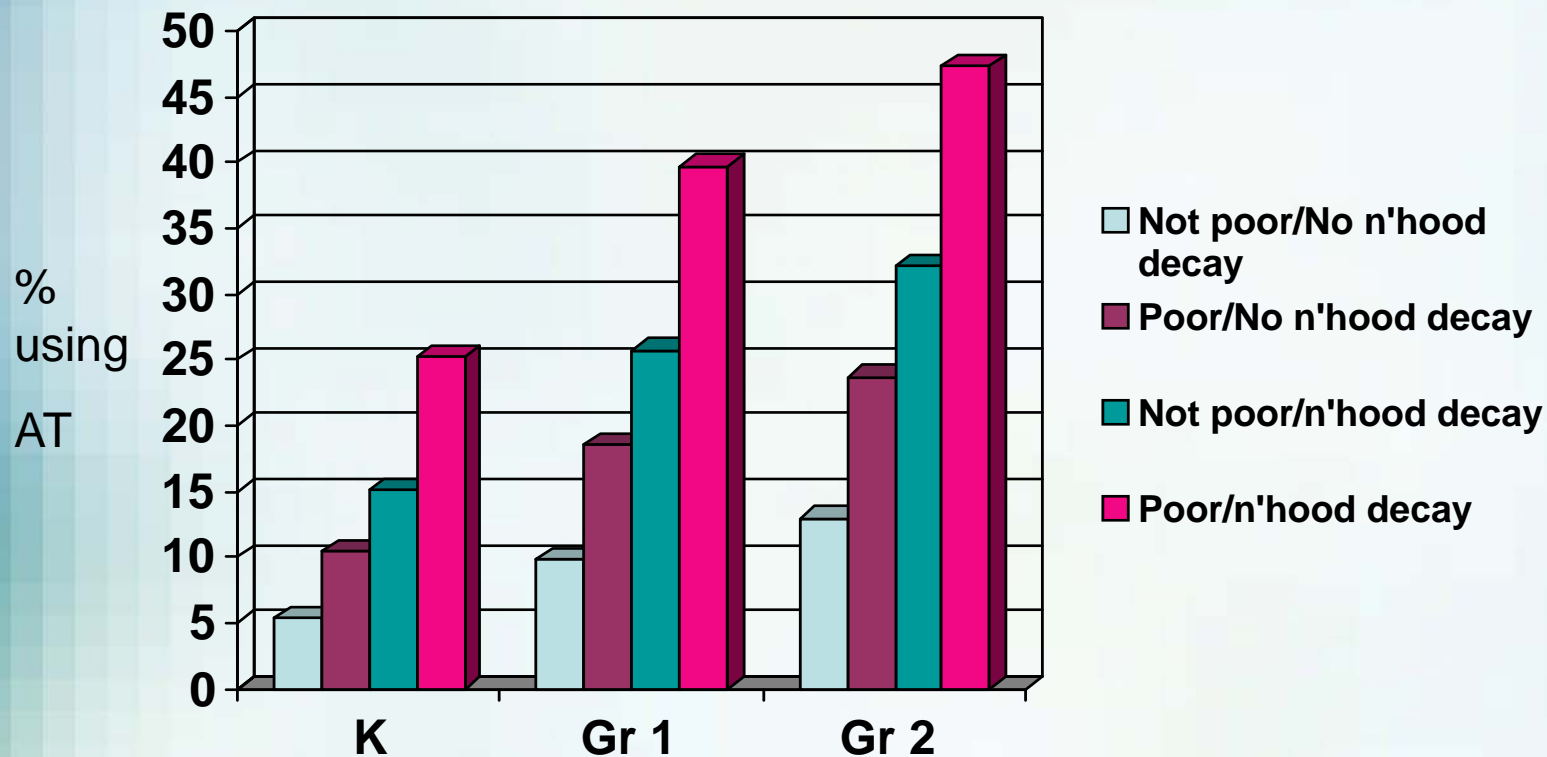
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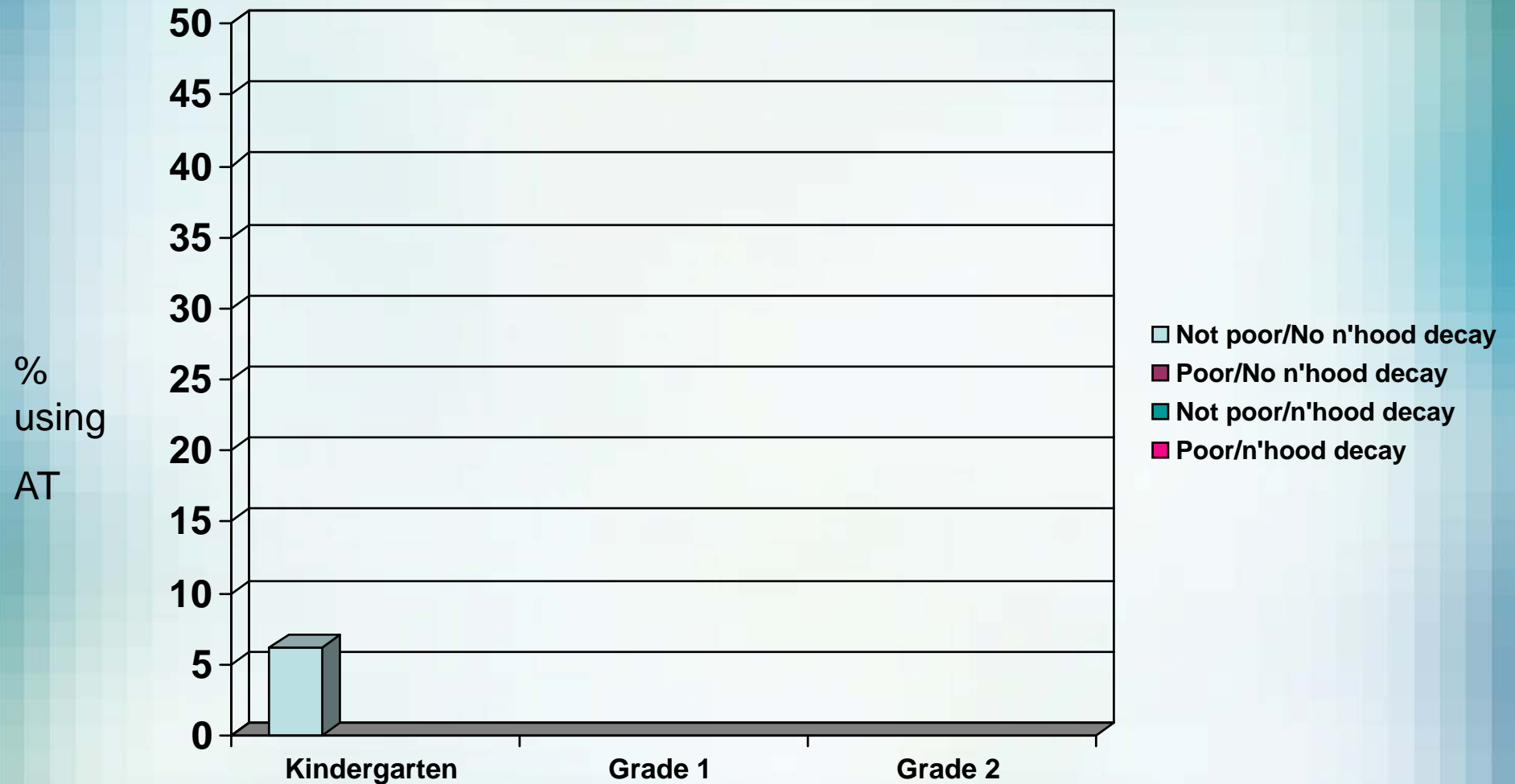
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# **Results**

## **Children from Public Schools in Urban Regions**

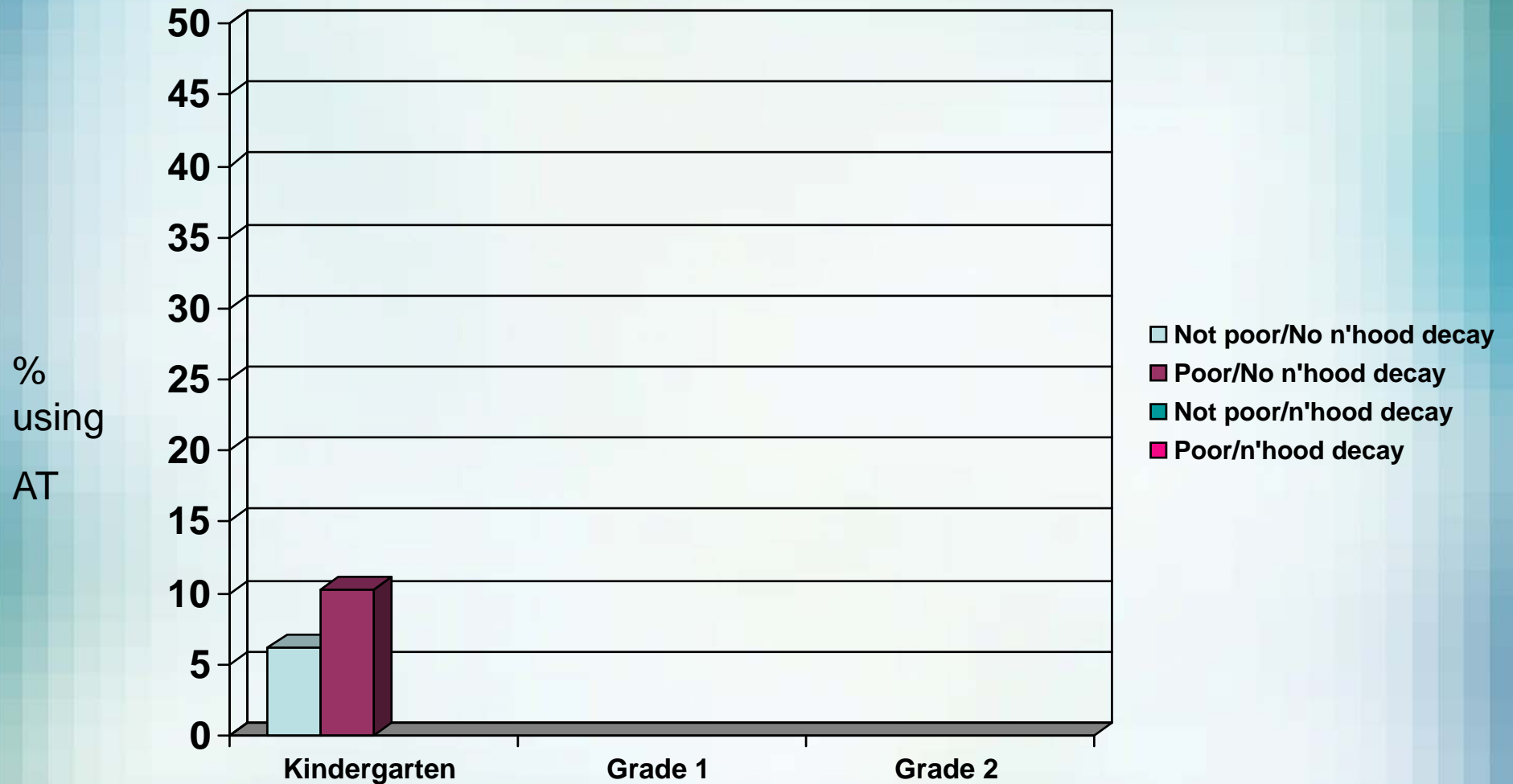
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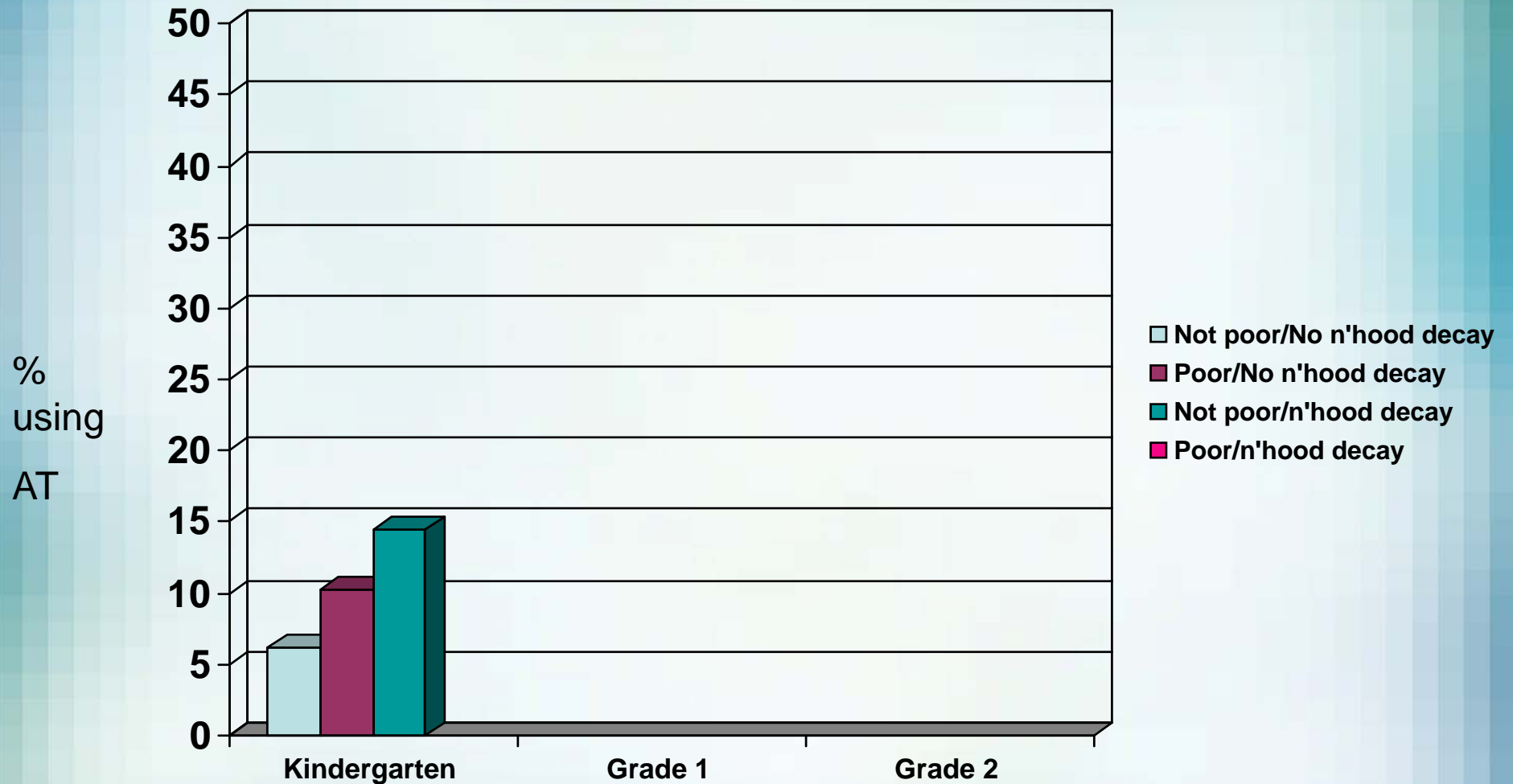
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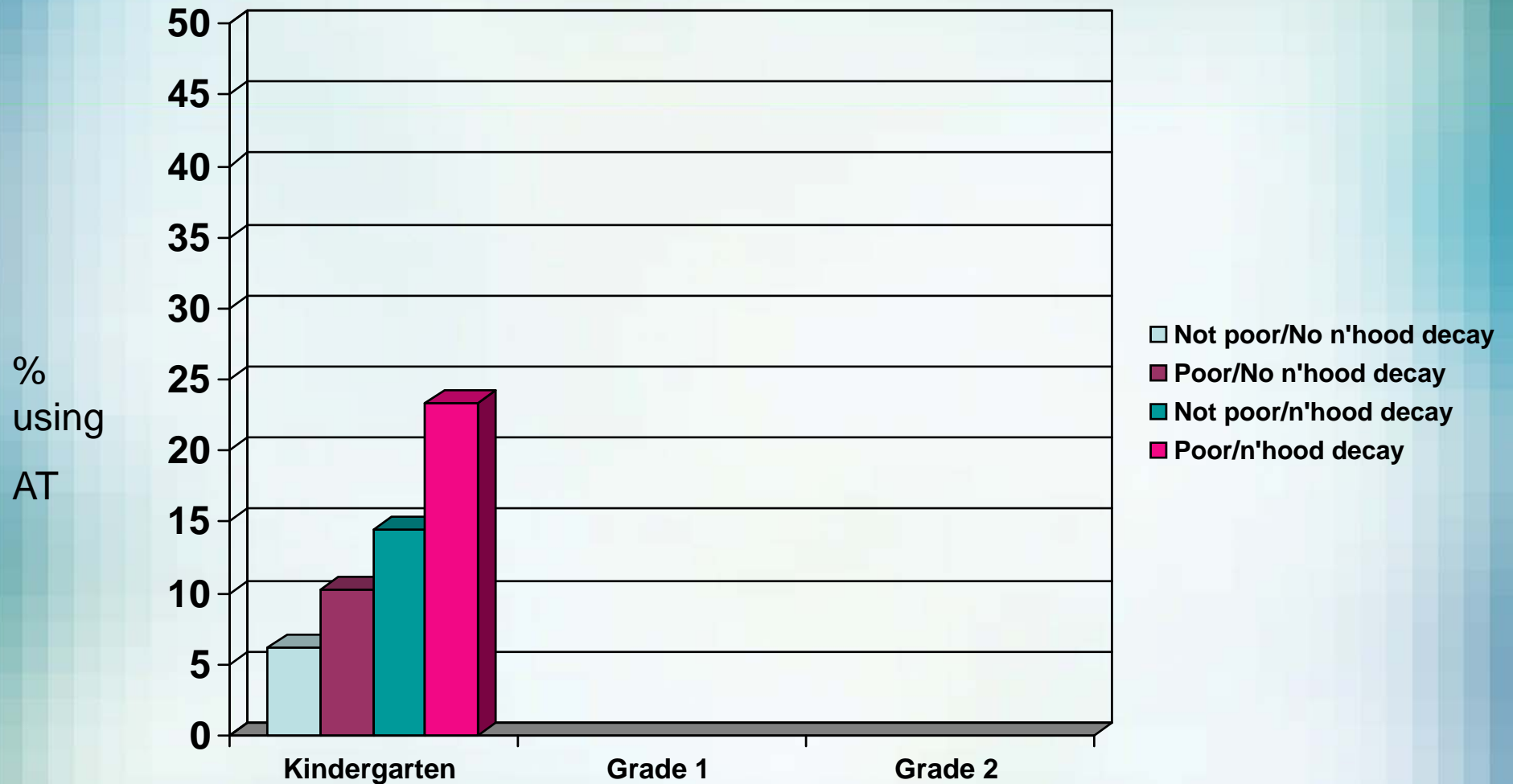


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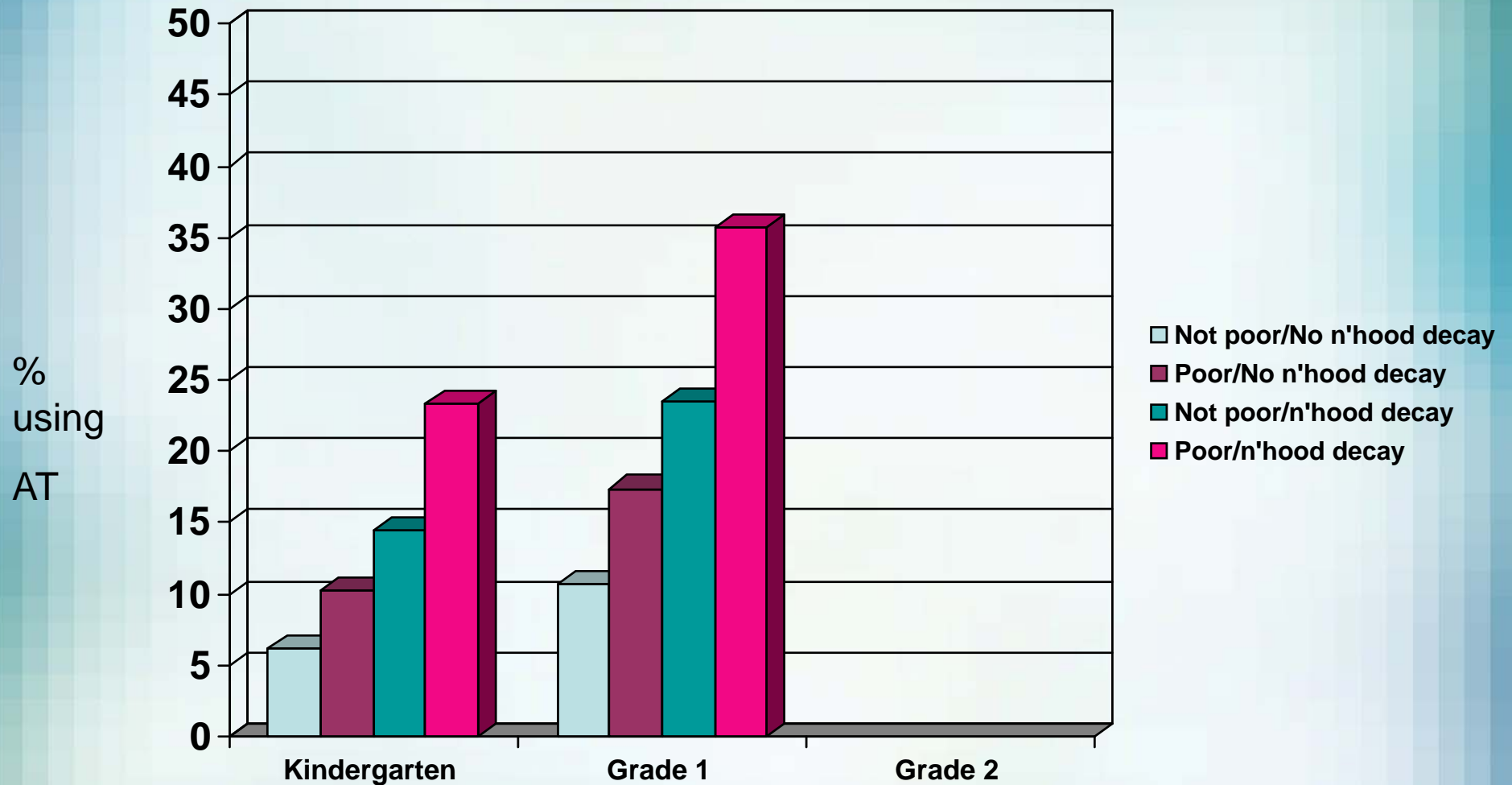
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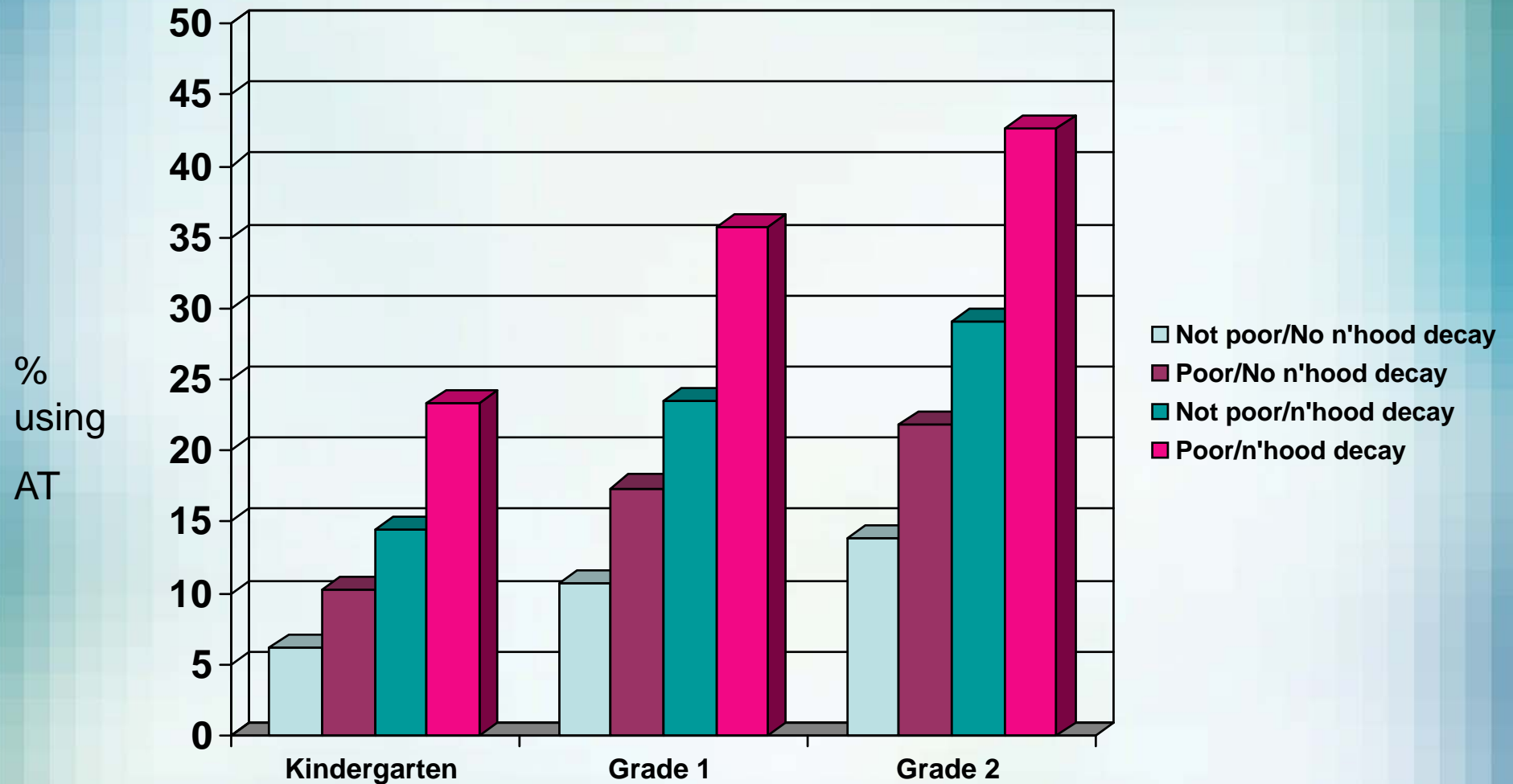
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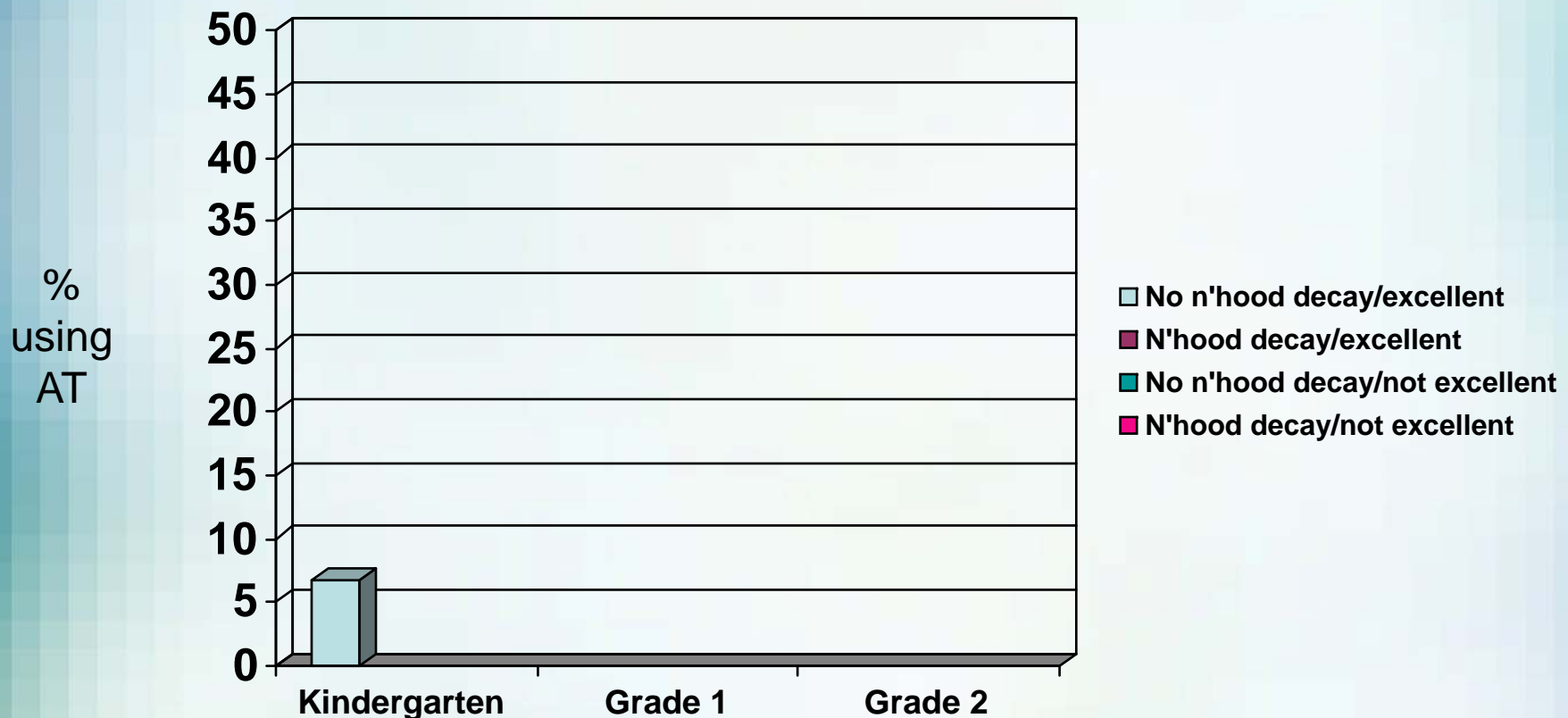
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# **Results**

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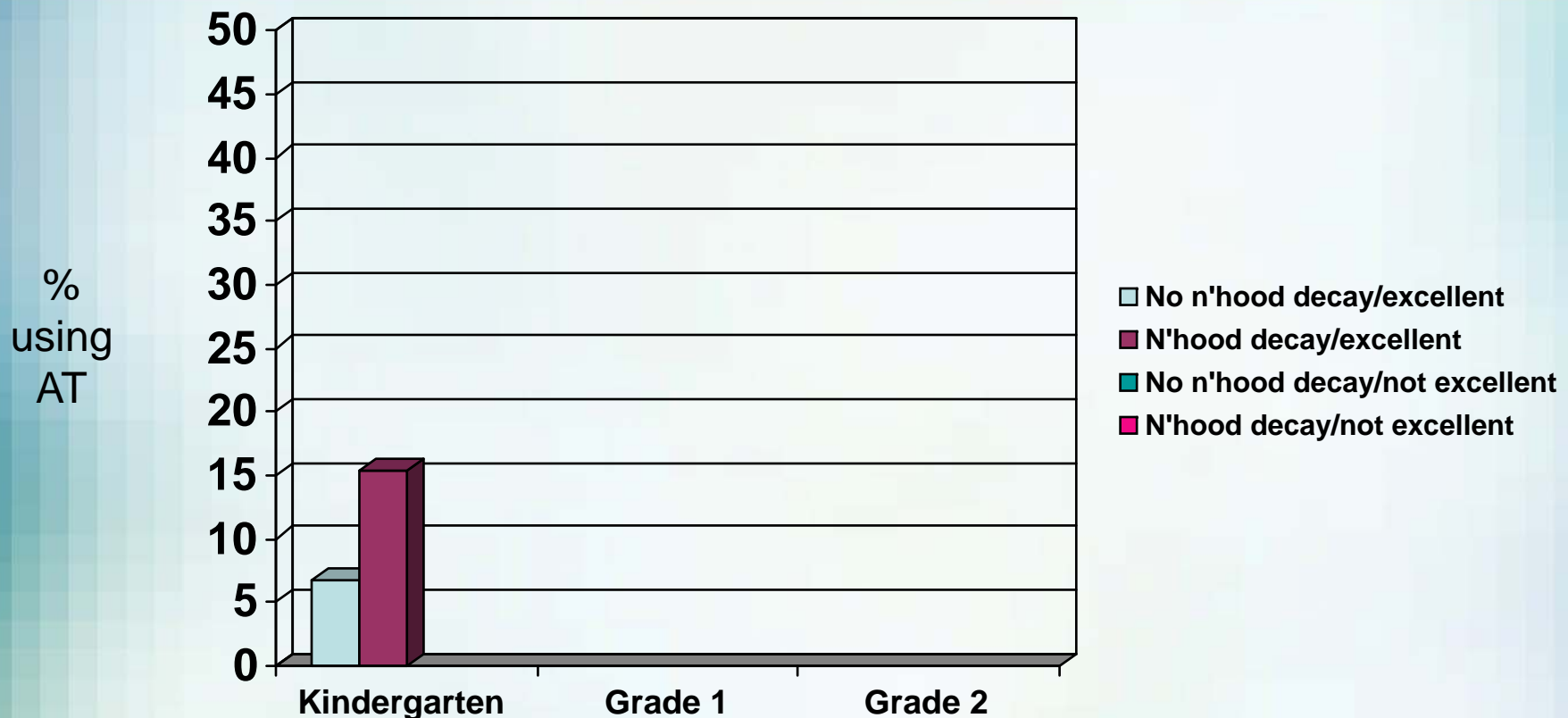
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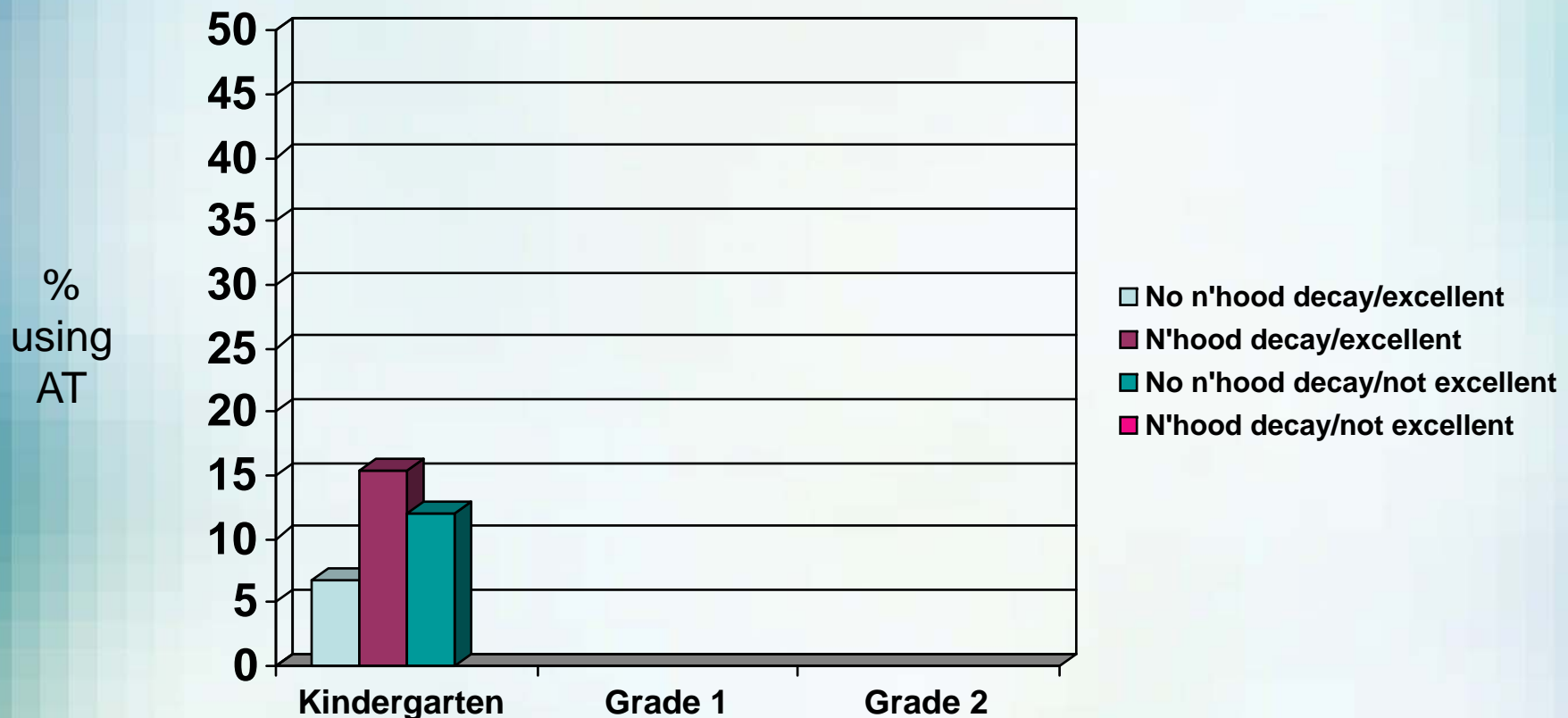
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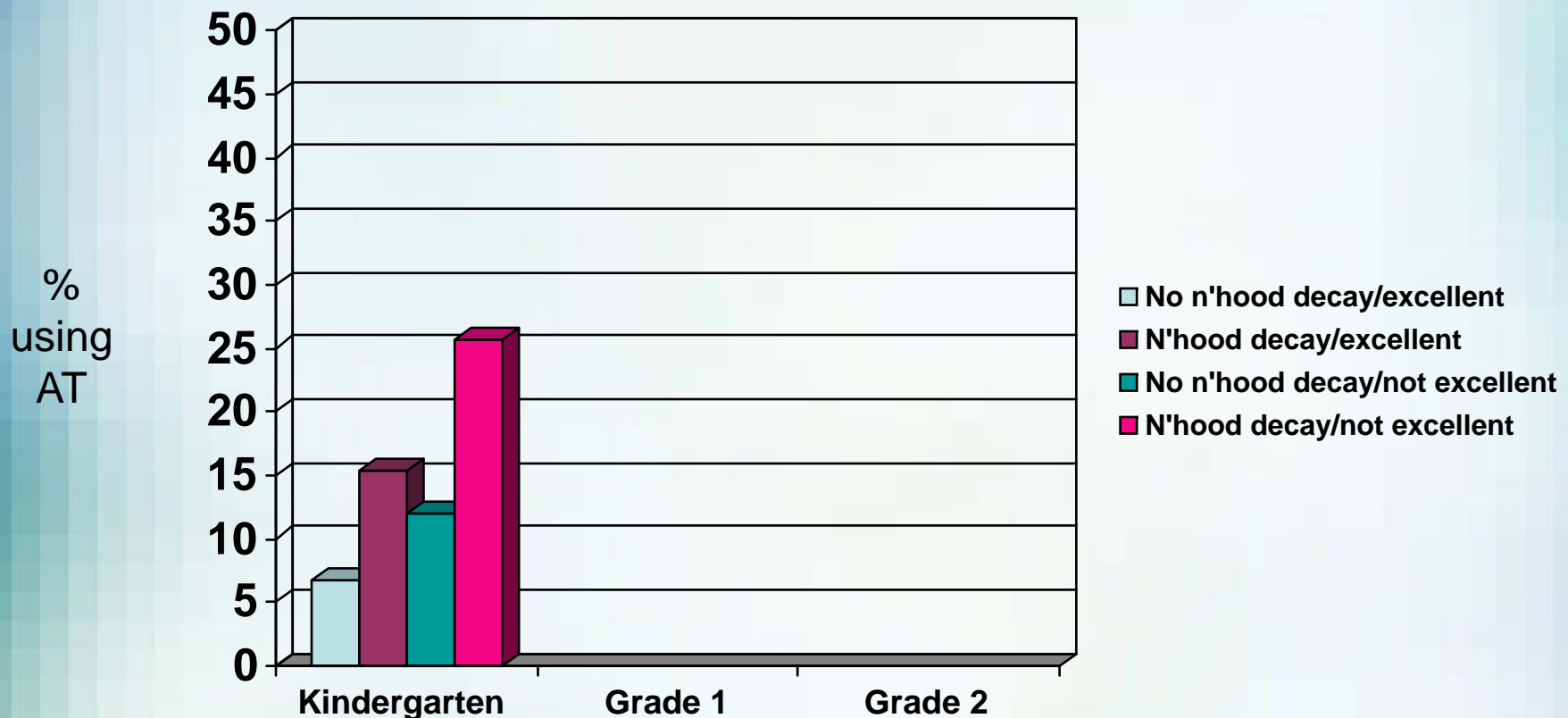
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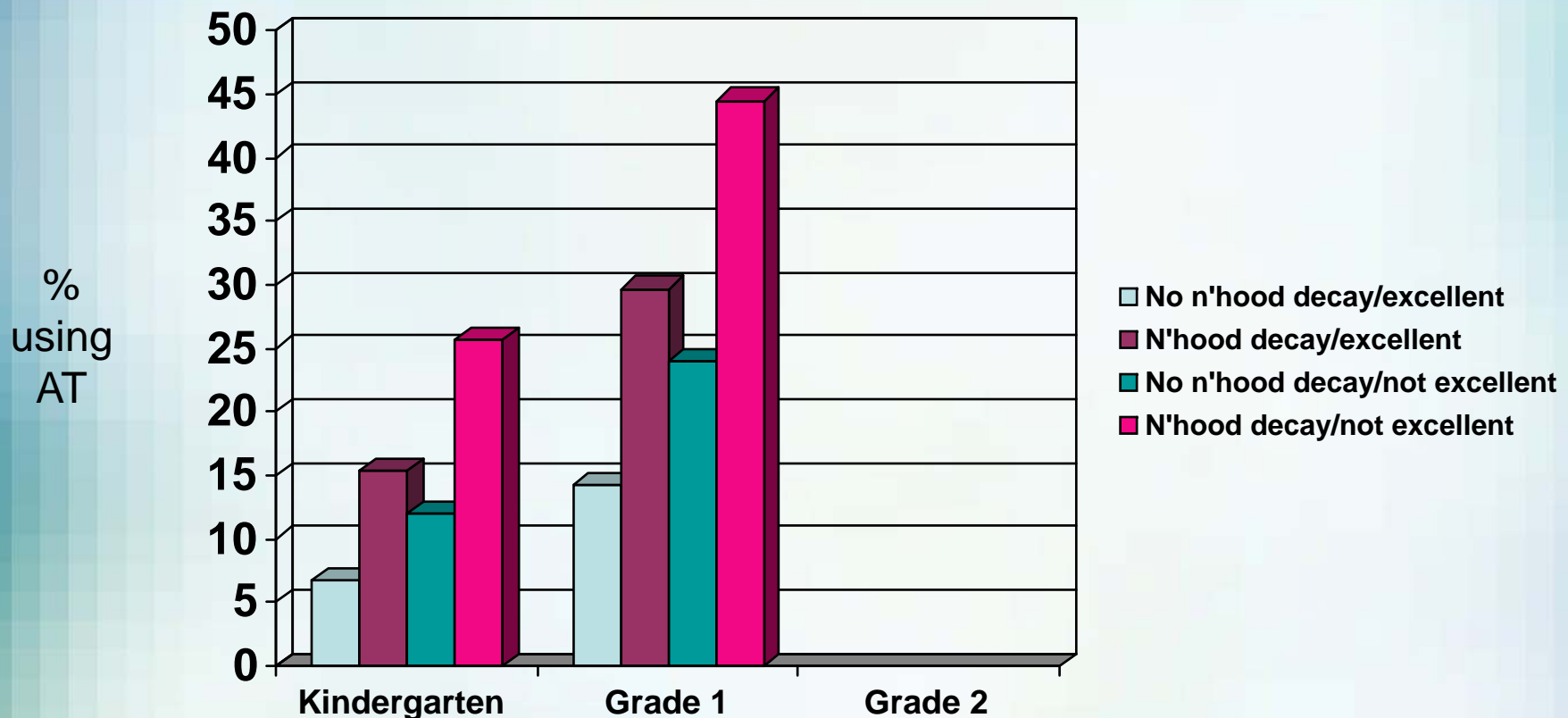


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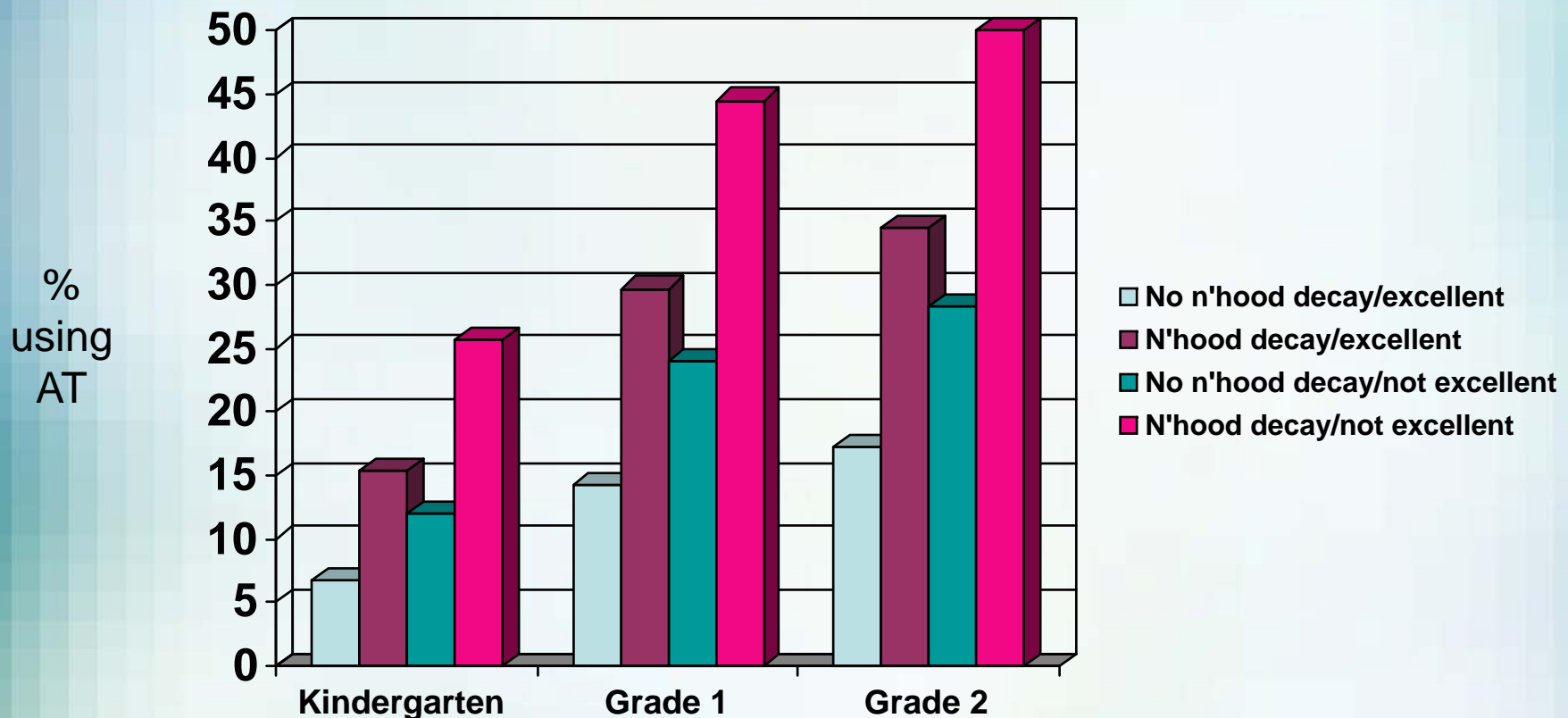
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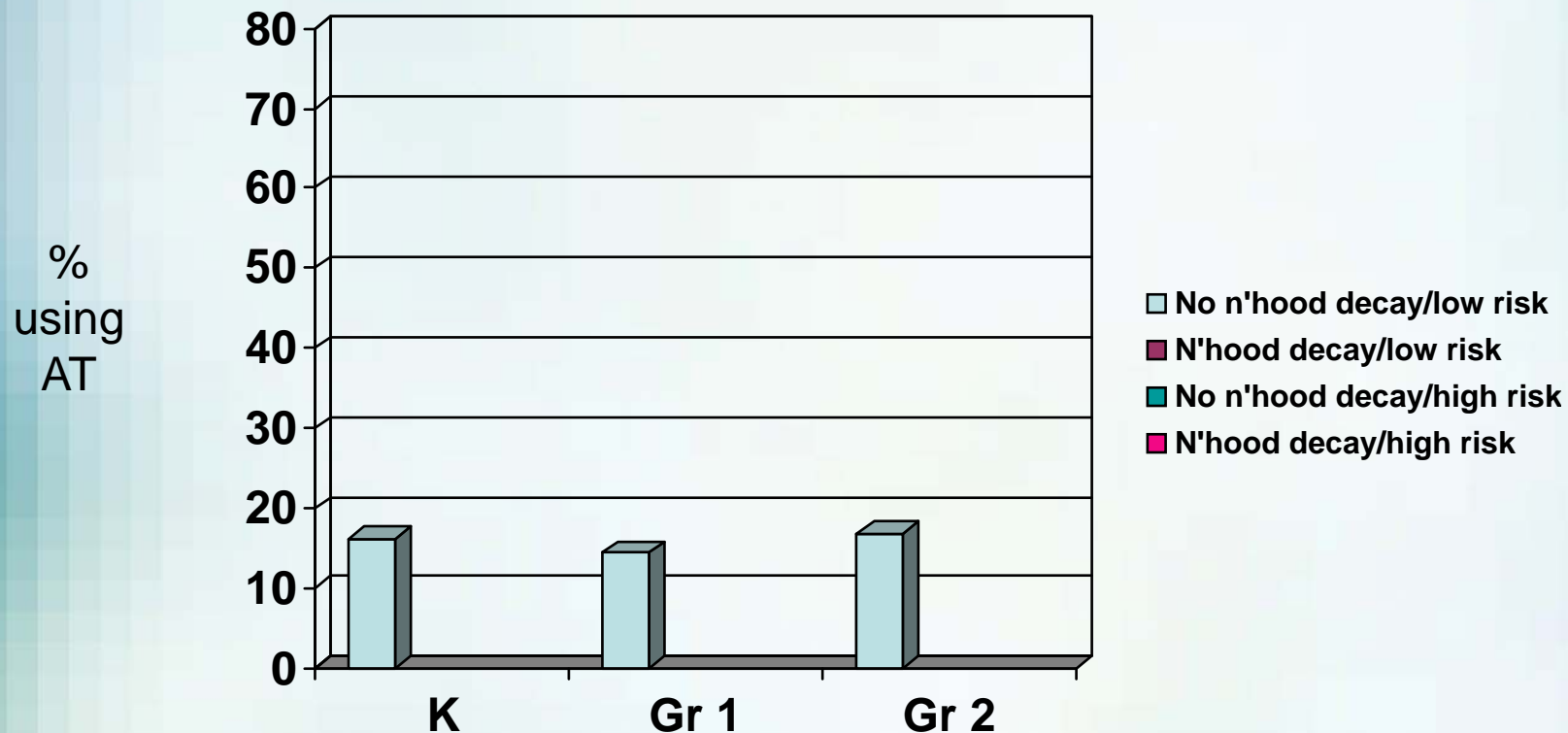
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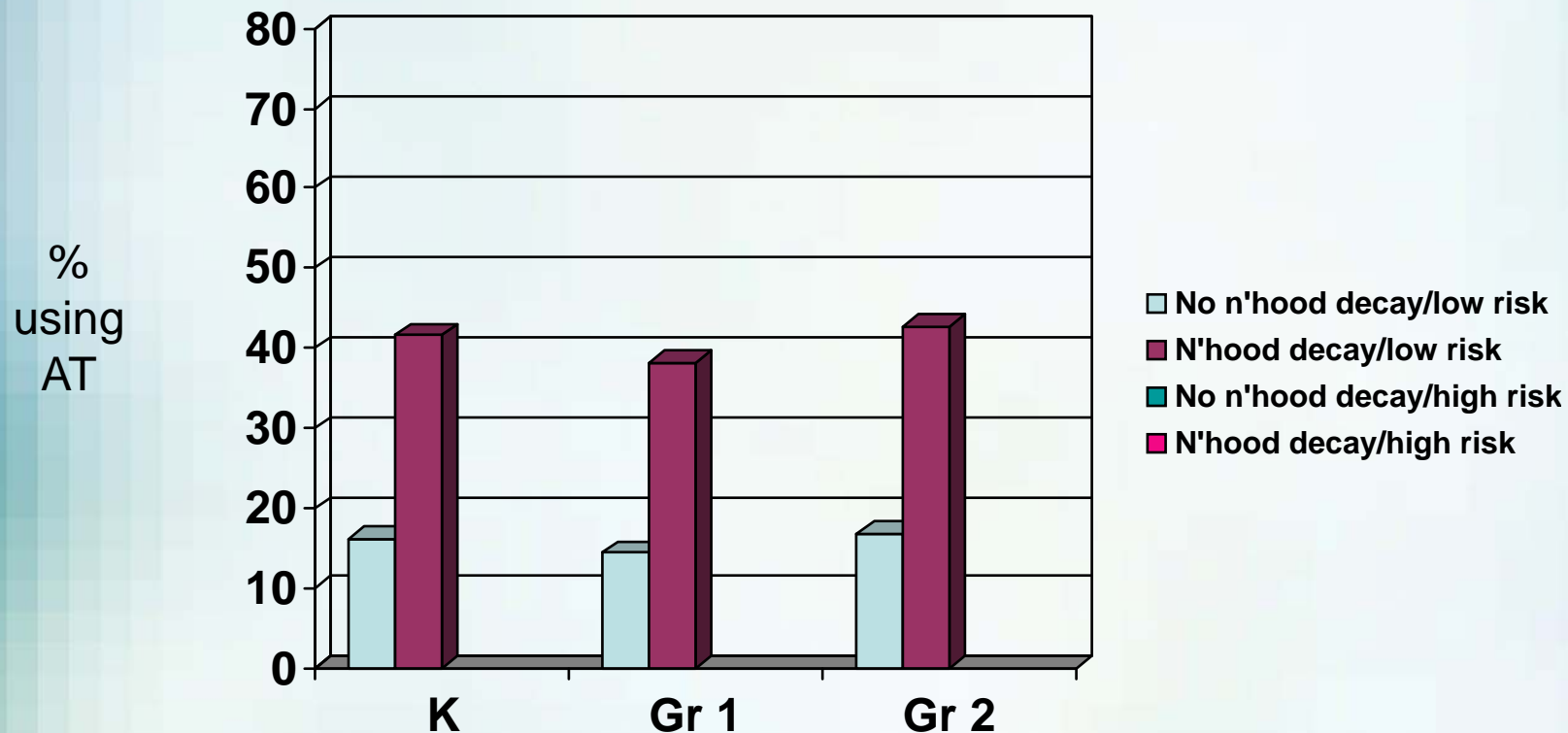
# Multilevel Analysis of Moderating Effect of Neighbourhood Decay on the Association between Vehicle-Pedestrian Collisions and AT Among Children Living on the Island of Montreal (n=129)



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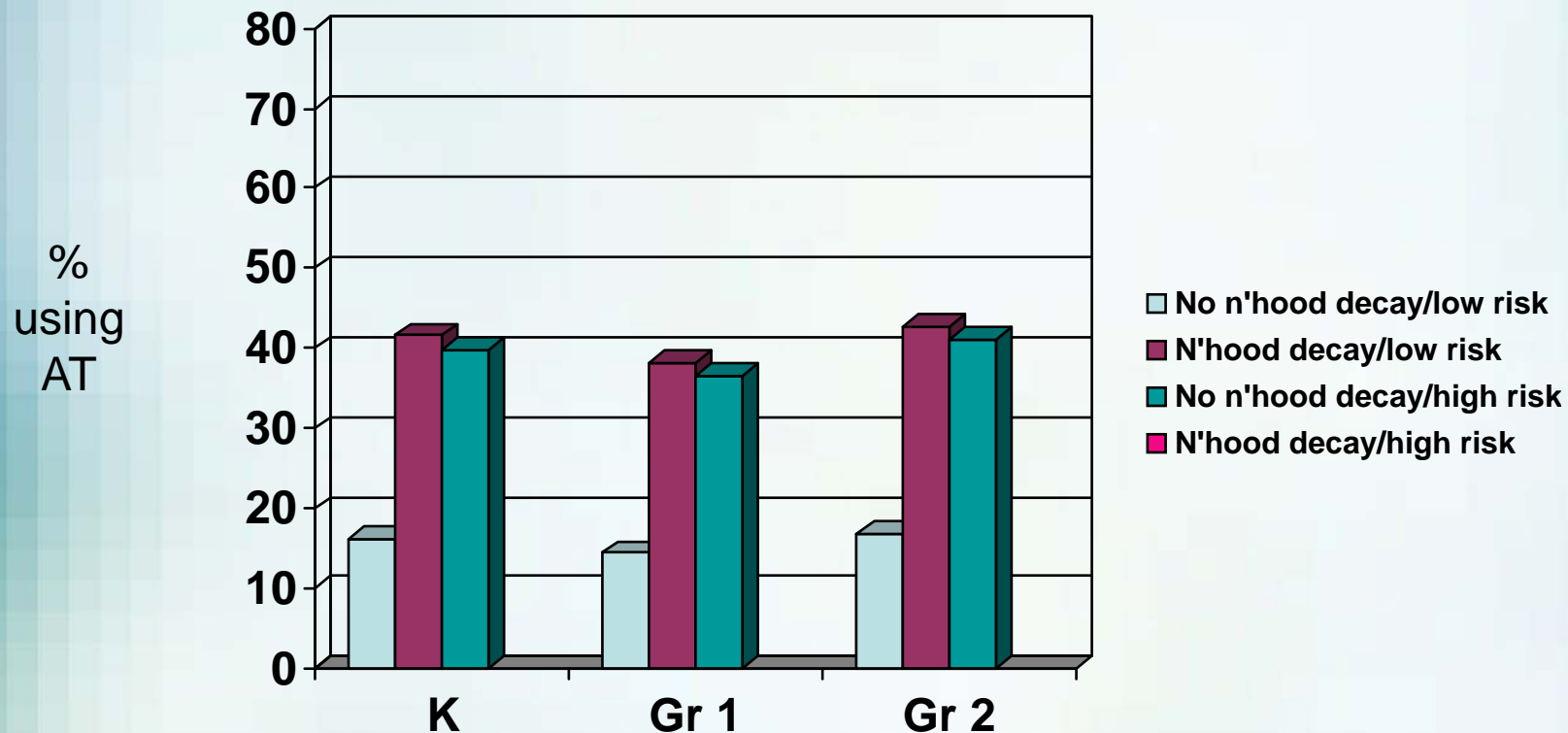
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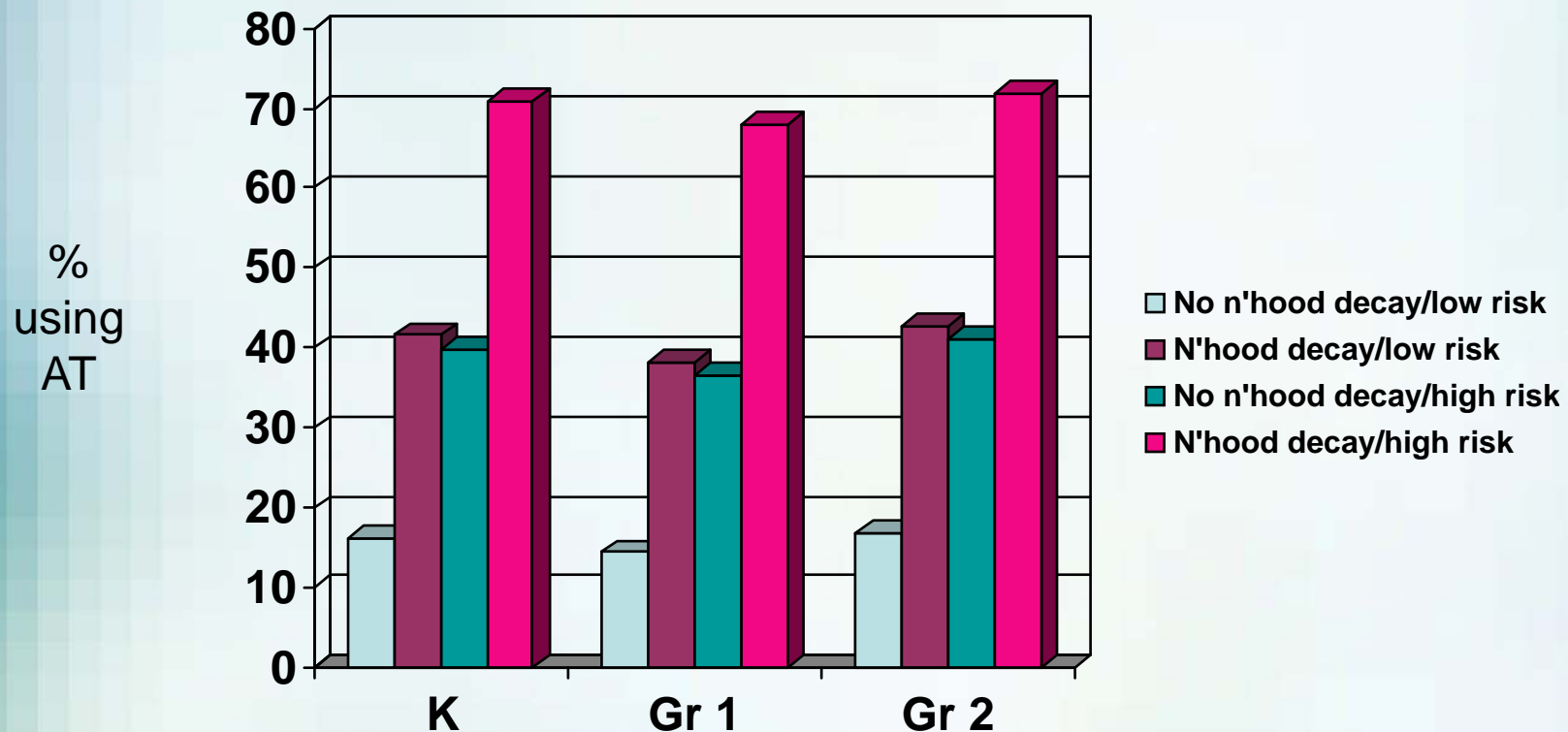
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# Conclusion

- Children who live in poverty and who are exposed to dangerous environments are more likely to use AT— environmental injustice
- Policies and programs aimed at increasing AT must also target neighborhood safety.
  - To protect children already using AT
  - To encourage parents of children who are not using AT to develop this lifestyle habit

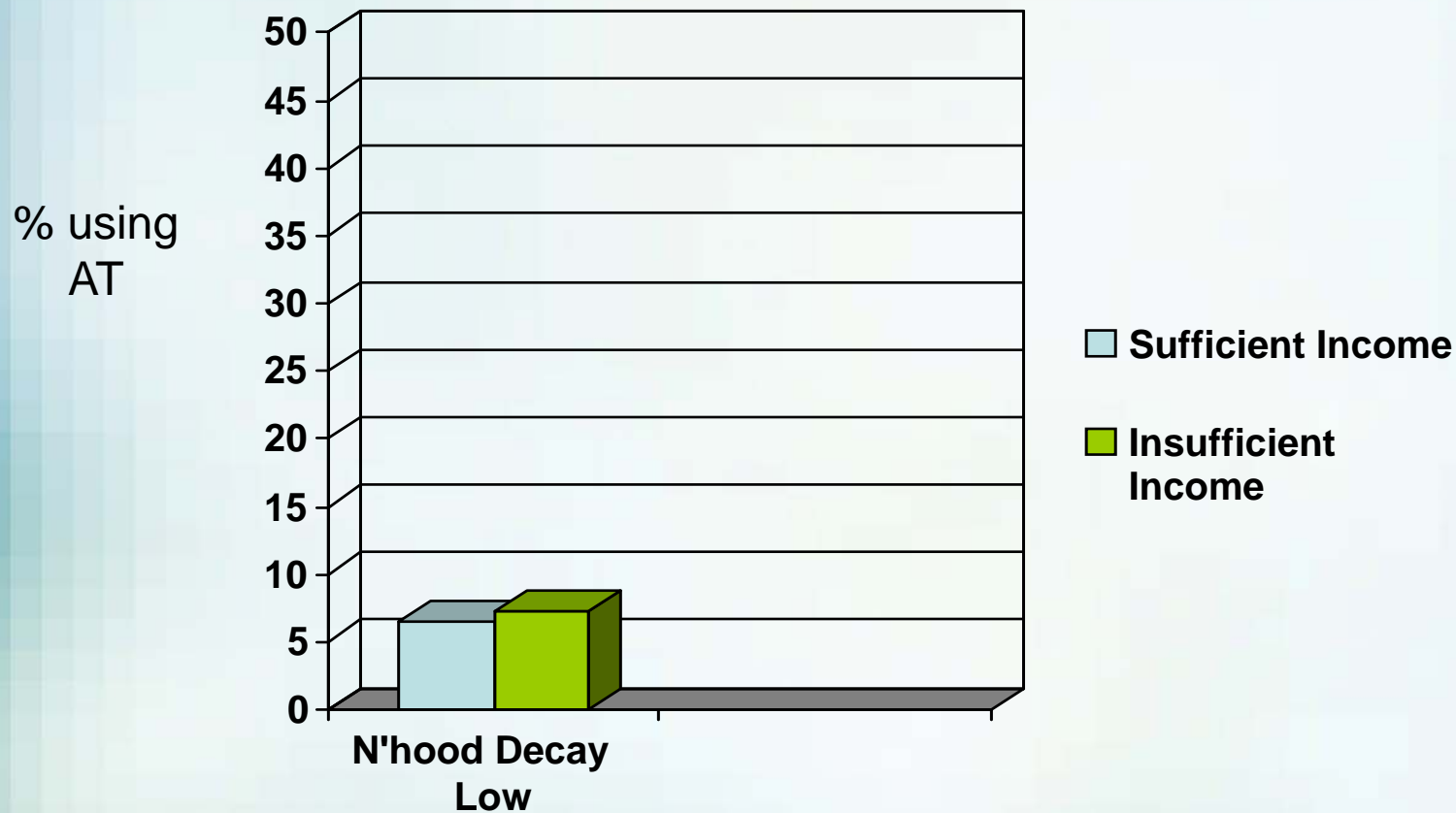


# Acknowledgements

- Data collection and validation for the ELDEQ cohort is performed by the © *Institut de la statistique du Québec, Direction Santé Québec, Gouvernement du Québec.*
- The current set of analyses is supported by CIHR Grant #200309MOP-123079
- **Pabayo** is supported by a CIHR Fellowship from the Canadian Institutes of Health Research (CIHR) Institute for Population and Public Health (#-81009) and is working under the supervision of **Gauvin** and **Barnett**. **Gauvin** holds a CIHR/CRPO Applied Public Health Chair on Neighbourhoods, Lifestyle, and Healthy Body Weight. **Barnett** holds a FRSQ Chercheur Boursier

# Results Interaction

# Interaction between Household Income and Neighborhood Decay (n=710)



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