
Penny Wise and Effect Size Foolish

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“Penny Wise and Effect Size Foolish”

Greg Duncan and Katherine Magnuson

Child Development Perspectives,
forthcoming

Consider the Tennessee Star class size experiment

- Assigned children to classes that averaged 15 vs. 22 students for a mean of 2.3 years
- Schanzenbach (forthcoming) estimated a **.15** standard deviation achievement impact on ACT test scores at the end of high school.
- According to Cohen, .15 is a decidedly small effect size
- Are small classes bad policy?

Costs and benefits of Tennessee Star

- The smaller class translated into additional per pupil expenditures of **\$11,500**
 - The economics literature suggests that a one standard deviation increase in test scores produces a ~20 percent increase in lifetime earnings
 - .15 standard deviation achievement impacts translate into lifetime earnings gains of **\$17,000**, some 1.5 times the intervention's cost
 - Other possible benefits (e.g., crime reduction) might add to benefit total
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In general, there is no “in general”

- Inexpensive programs with small effects may generate more benefits than costs and thus be worthwhile public investments
 - Expensive programs with big effects may cost more than they are “worth”
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Tricks of the trade

- Consider **total** rather than just **taxpayer** costs and benefits
 - Total social cost and benefits = participant + taxpayer costs and benefits
 - Consider a wide array of potential benefits
 - => measure more than intended program targets
 - E.g., an early behavioral intervention might reduce grade failure or placement in special education, and boost test scores
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Tricks of the trade - II

- Measure outcomes that can be linked to important social costs
 - E.g., grade failure, reduced crime, higher productivity (earnings)
 - Try to measure “spillover” benefits and costs
 - E.g., Does improving one child’s behavior enable classmates to learn more?
 - Do immunizations prevent epidemics?
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Tricks of the trade - III

- Measure outcomes that cannot be monetized
 - E.g., tolerance, citizenship
 - After monetary benefits and costs have been tallied up, ask whether these other benefits or cost might change conclusions
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Tricks of the trade - III

- Measure outcomes that cannot be monetized
 - E.g., tolerance, citizenship
 - After monetary benefits and costs have been tallied up, ask whether these other benefits or cost might change conclusions
 - Succumb to the cruel truth of discounting
 - Distant benefit dollars are worth much less than today's cost dollars
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The utility of order of magnitude estimates

- On cost side, staff costs usually dominate
 - Hours of profession time per subject – 10, 100, 1000?
 - Order of magnitude per subject costs?
 - On benefit side, can any conceivable valuation of benefits exceed costs?
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Example: Perry Preschool

- 1-2 year center-based learning-focused curriculum for 3-4 year olds
 - 2.5 hours per day
 - Four teachers for 20-25 students
 - Weekly visits to parents
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Perry Preschool at age 27

Major benefits	For Participant	For Public	Total
K-12 education, e.g, grade retention	0	8,434	8,434
Earnings	40,001	11,063	51,634
Decrease in crime	0	154,762	154,762
...
Total Benefits	38,924	176,276	215,200
Cost of Program	0	-15,166	-15,166

Cautions

- Avoid the “Perry Preschool Shuffle”:
 - Few if any early childhood investments are this profitable and many fail to generate benefits that exceed costs (Aos et al., 2004)
 - Quality matters – less intensive programs do not appear to be as profitable
 - Model programs may not scale up (TN Star and the CA class size initiative)
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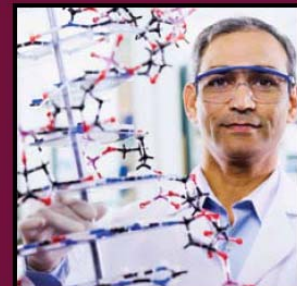
Some best bet programs based on evaluation evidence

- VERY speculative
 - Many guesses about long-run benefits
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A Science-Based Framework for Early Childhood Policy

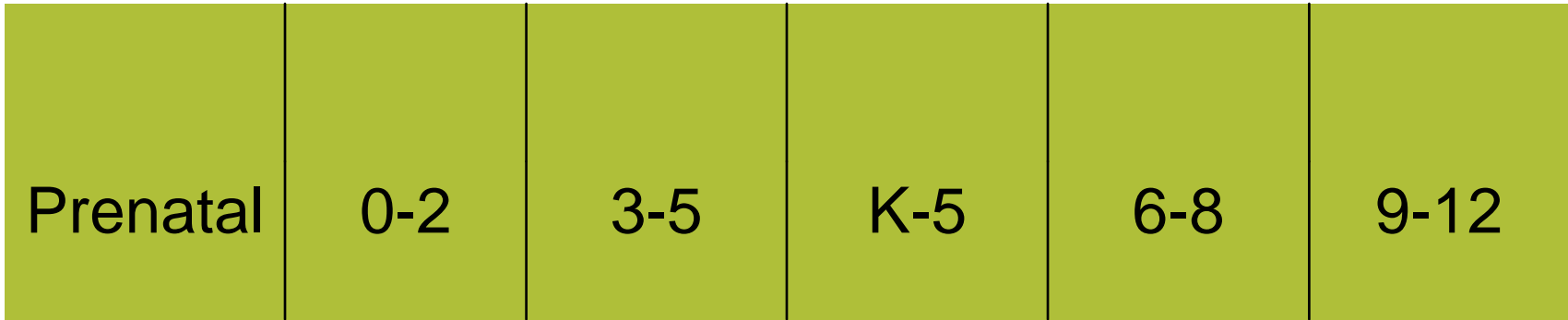
Using Evidence to Improve Outcomes
in Learning, Behavior, and Health for
Vulnerable Children


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NATIONAL FORUM ON EARLY CHILDHOOD PROGRAM EVALUATION
NATIONAL SCIENTIFIC COUNCIL ON THE DEVELOPING CHILD

Prenatal	0-2	3-5	K-5	6-8	9-12
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Access to health care 

Nurse-Family
Partnership for high-
risk families

High
quality
Pre-K

K-5
aligned
to Pre-K

Proven programs
and curricula

Healthy and safe
child care

Access to health care

- Brain architecture can be damaged by:
 - Alcohol
 - Cocaine
 - Environmental toxins
 - “toxic” stress
 - Pediatric visits can identify:
 - Early hearing, vision and other problems
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Work supports for low-wage work

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Nurse-family partnerships

- Targeted to very high risk pregnancies
 - Weekly visits by a trained nurse beginning in 2nd trimester through neo-natal period; less frequent after that
 - Most effective for low SES first-time mothers
 - Less intensive versions are often ineffective
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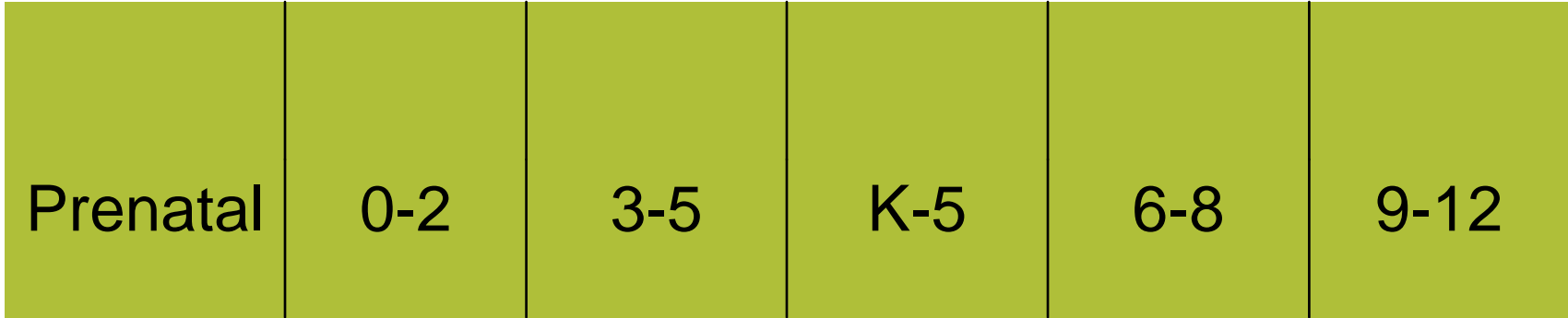
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High quality pre-K

- Perry Preschool evidence is well known, but how relevant today?
 - Study of pre-K programs in five states:
 - .25 sd impacts for receptive vocabulary and math
 - .65 sd impact on print awareness
 - Tulsa pre-K program:
 - .80 sd impacts on pre-reading skills
 - .40 sd impacts for math
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Access to health care

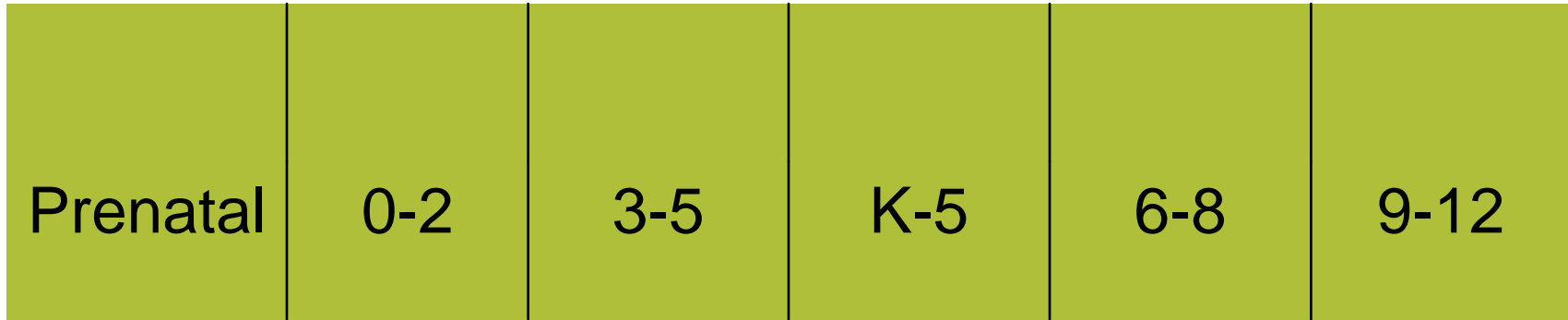
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← **Work supports for low-wage work** →

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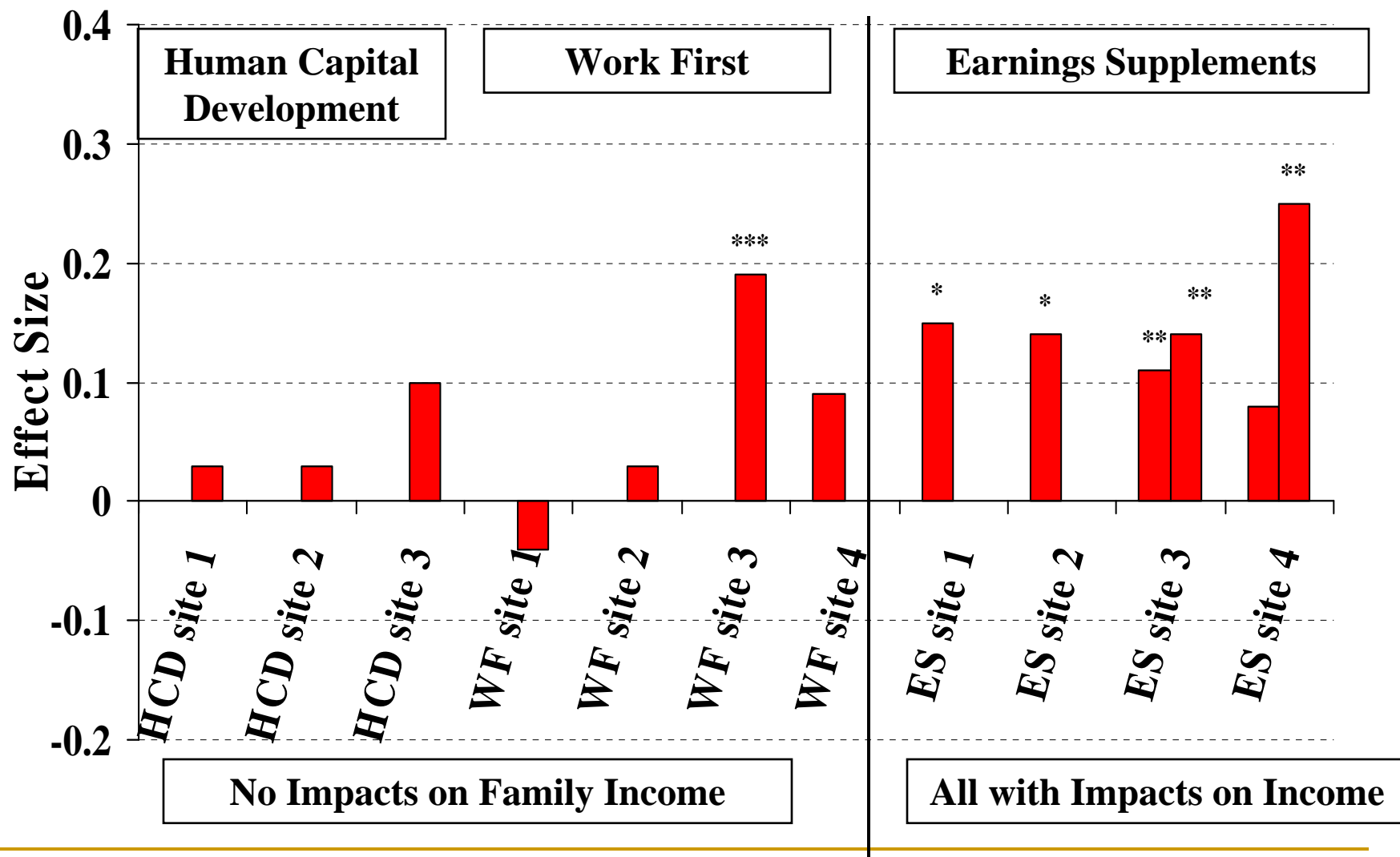
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Impacts of Welfare Programs on Young Children's Achievement



Policy should be guided by:

- Convincing evaluation designs
 - Focus on benefits relative to costs, not just effect sizes
 - Wide-ranging look at policy options
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