

**EMBARGOED UNTIL 3 PM U.S. EASTERN TIME, 24 JANUARY, 2011 BY THE  
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES (PNAS)**

**TITLE:** A gradient of childhood-self control predicts health, wealth, and public safety.

An international research team led by Avshalom Caspi & Terrie Moffitt at Duke University, King's College London, and the University of Otago reports that a young child's self-control skills, such as conscientiousness, self-discipline, and perseverance, predict the child's health, wealth, and criminal history in later life, regardless of the child's IQ or family social class.

**PUBLICATION SOURCE:** PNAS, to appear on 24 January 2011.

**THE FINDINGS:**

1. In 1000 Dunedin, New Zealand, study participants followed from birth to age 32, even after accounting for differences in social status and IQ, children as young as three who scored lower on measures of self-control were more likely than higher-self-control children to have the following outcomes as adults:

physical health problems assessed in medical exams and blood tests (including lung airflow limitation, periodontal disease, sexually transmitted infection, C-reactive protein indicating inflammation, and metabolic abnormalities such as overweight, cholesterol, and high blood pressure)

dependence on substances (including tobacco, alcohol, cannabis, and harder drugs)

difficulty with financial planning (including savings habits, home ownership, investments, retirement plans)

difficulty with credit and money-management (including bankruptcy, missed payments, credit card problems, living from paycheck to paycheck)

rearing a child in a single-parent household,

a criminal conviction record.

2. These adult outcomes were predictable from the entire gradient of self-control in the population, from low to high self-control (**see attached figure**).
3. Children whose self-control improved during the 32-year study fared better as adults in measures of health, wealth, and criminal history than predicted by their initial childhood scores.

4. Children with low self-control tended to make mistakes while they were adolescents, including starting to smoke tobacco, becoming a teen parent of an unplanned baby, and leaving secondary school with no qualification. These mistakes accounted for the low-self-control children's poor adult outcomes in part.
5. But even non-smoking, non-parent, high-school graduates still had poorer outcomes at age 32, if as children they had low self-control.
6. In a second sample of 500 non-identical British twin pairs, the sibling who had scored lowest on self-control at age five was more likely than the sibling with higher self-control to begin smoking, perform poorly in school, and engage in antisocial behaviors at age 12. This shows self-control is important by itself, apart from all other factors that siblings share, such as their parents and home family life.

### **WHY ARE THESE FINDINGS IMPORTANT?**

Although policy-makers in the USA and UK are considering national programs to improve health, wealth, and public safety through early interventions to increase children's self-control skills, until now, researchers had not shown that childhood self-control actually does influence adult outcomes in the general population.

The gradient suggests that even small improvements in self-control for individuals could yield important reductions in costs of healthcare, welfare dependency, and crime control for a nation.

The gradient suggests that there is room to improve adult outcomes even among children whose self-control is above average, indicating that universal interventions for all children could be more desirable than targeting a few children at the extreme bottom of the distribution of self-control for treatment.

The studies single out children's self-control as a clear target for prevention policy, apart from all other influential features of children's backgrounds, such as family life, family social class, or the child's intelligence.

Children in the study whose self-control increased tended to have better adult outcomes, showing that self-control can change and with desirable results.

The comparison of data from childhood versus adolescence suggests that interventions could profitably target adolescents, but also suggests that interventions with preschool children may bring a better cost-benefit ratio.

Our finding that many study members with low self-control had unplanned babies who are now growing up in low-income single-parent households reveals that one

generation's low self-control disadvantages the next generation.

Model programs to enhance self-control have been developed and positively evaluated, but the challenge remains to scale them up for widespread application.

### **SUPPORTING DETAILS:**

Self-control was measured in assessments by teachers, parents, observers of the children, and the participants themselves. It included aspects such as “low frustration tolerance, lacks persistence in reaching goals, difficulty sticking with a task, over-active, acts before thinking, has difficulty waiting turn, restless, not conscientious.”

Outcomes were measured in medical examinations, blood tests, interviews, searches of official records, and by reports from informants who knew the study members well.

### **PARTICIPANTS:**

1037 members of the Dunedin Multidisciplinary Health and Development Study which follows all children born between April 1972 and March 1973 in Dunedin, New Zealand. This birth cohort's families represent the full range of socioeconomic status and health in the general population. Follow-ups have been carried out at ages 3, 5, 7, 9, 11, 13, 15, 18, 21, 26, and most recently at age 32, when 96% of the living cohort members took part.

1018 members of the E-Risk Longitudinal Study, which follows twins born in 1994-1995 in England and Wales. This birth cohort's families represent the full range of socioeconomic status and health in the general population. Follow-ups have been carried out at ages 5, 7, 10 and most recently at age 12 years, when 96% of the living cohort members took part.

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(3) Duke University, Durham, NC, 27708, USA.

The study protocol was approved by the institutional ethics review boards of the

participating universities. Study participants gave informed consent for the research.

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**Self-control gradient: Children with low self-control had poorer health (Panel A), more wealth problems (Panel B), more single-parent child-rearing (Panel C) and more criminal convictions (Panel D) than those with high self-control**

