

Why is human capital accumulation prior to school entry important?

- (1) Later interventions with low achievers have proven ineffective.
- (2) Educational structures may propagate pre-school skill difference into later education and labor market outcomes. And, therefore have important implications for:
 - Skill accumulation and distribution of skills
 - Educational attainment
 - Labor market outcomes

A Simple Model of skill Accumulation

Additive Human Capital Accumulation

Innate ability:	$\theta \sim N(\mu, \sigma^2)$
Skills accumulated prior to school entry at time t :	P
School entry:	in period k (kindergarten)
School Human Capital:	H units per school year

Observed skill, X , at age t for individual i is:

$$X_{it} = \theta_i + P_i + (t - k)H$$

If $P_P > P_{NP}$ (P is greater for those who attend pre-school),
the average observable skills are:

$$\bar{X}_{Pt} = \mu_P + P_P + (t - k)H \quad \text{and} \quad \bar{X}_{NPt} = \mu_{NP} + P_{NP} + (t - k)H$$

And, the mean skill difference is:

$$\bar{X}_{Pt} - \bar{X}_{NPt} = (\mu_P - \mu_{NP}) + (P_P - P_{NP})$$

Multiplicative Human Capital

It might seem that HC accumulation is better described by a multiplication function: Student skill augmentation depends on the current skill base

In this case, HC accumulation is faster for those who begin with more skills even though we continue to assume a common HC accumulation factor, $H > 1$

Observed skill at age t for individual i is:

$$X_{it} = (\theta_i + P_i)H^{t-k}$$

In this case the pre-school and non-pre-school functions are:

$$\bar{X}_{Pt} = (\mu_p + P_p)H^{t-k} \quad \text{and} \quad \bar{X}_{NPt} = (\mu_{NP} + P_{NP})H^{t-k}$$

And, the average observable skill differential is:

$$\bar{X}_{Pt} - \bar{X}_{NPt} = (\mu_p - \mu_{NP} + P_p - P_{NP})H^{t-k}$$

What evidence do we have about the ability of early interventions to increase early skill accumulation?

- Experimental results – Lowell
- Head Start – Currie