



Academic Achievement of Preterm Infants at Age 17



Suzy B. Winchester, MA & Mary C. Sullivan, PhD, RN

University of Rhode Island, College of Nursing, Kingston, Rhode Island

Brown Center for the Study of Children at Risk, Women & Infants Hospital, Providence, RI

Research Supported by National Institute of Child Health & Development 19195; National Institute of Nursing Research 02263, 003695, 003695-05, 003695-09



BACKGROUND

Children born preterm lag behind full-term peers in academic achievement and have increased rates of learning and behavior problems.

Little is known about ...

→ effects of prematurity and perinatal morbidity on academic achievement in late adolescence.

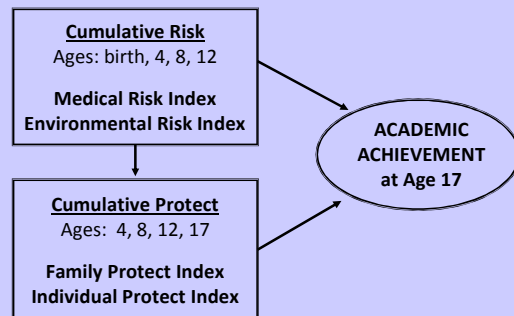
→ role that risk and protect factors play in limiting or enhancing academic achievement.

PURPOSE

Examine effects of RISK and PROTECTION from birth to age 12 on ACADEMIC ACHIEVEMENT at age 17 in preterm children.

THEORETICAL MODEL

Based on General Systems Theory and developmental models, academic achievement is influenced by cumulative risk and protection.¹



HYPOTHESES

1. Preterm children with more perinatal morbidity (NPT, MPT, SGA) will have ↓ academic achievement & ↑ services at age 17.
2. Cumulative medical risk will explain academic achievement at age 17 for NPT, MPT, SGA perinatal groups.
3. Cumulative environmental risk will explain academic achievement at age 17 for all perinatal groups.
4. Cumulative protection will mediate effects of cumulative risk on academic achievement for NPT, MPT, SGA perinatal groups.

STUDY DESIGN AND SAMPLE

Prospective, longitudinal design.
N = 213 infants recruited at birth between 1985-1989, classified by perinatal morbidity into 5 groups, and followed at 18m, 30m, 4y, 8y, 12y, & 17y.

SAMPLE DEMOGRAPHICS at AGE 17 N = 180		PERINATAL GROUP CLASSIFICATION	
Children	Mothers	Perinatal Group	Neonatal Criteria
135 PT infants	M 45 years old	Full Term Infants > 37 weeks gestation	medically & neurologically healthy
45 FT infants	92% HS education +	Preterm Infants < 37 weeks gestation	
81% - Grades 11 & 12	80% - Employed	HPT	no medical/neurological complications
55% - Female	67% - Married/Cohab	MPT	medical illness, BPD, RDS, NEC, sepsis
85% - White		NPT	neurological illness, Grade III & IV IVH, meningitis, shunted hydrocephalus
		SGA	Birth weight for gestational age <10 th percentile
	Retention Rates:		
	Birth to age 17 = 85%		
	Age 12 to Age 17 = 94%		

MEASURES

CUMULATIVE RISK birth, 4y, 8y, 12y

MEDICAL RISK INDEX $\alpha = .87$
Neonatal Risk, IVH, NEC, Meningitis, BPD, Hydrocephalus, Duration of Oxygen, Medical Status, Neurological Status

ENVIRONMENTAL RISK INDEX $\alpha = .89$
SES, Mom/Dad Education, Occupation, Marital Status, Minority Status, Mom Depression, Life Stress, Psychological Distress, Family Resources

CUMULATIVE PROTECT 4y, 8y, 12y, 17y

FAMILY PROTECT INDEX $\alpha = .83$
Maternal Interaction Styles, Responsivity, Family Support, Cohesion, Parent-Child Relationship

INDIVIDUAL PROTECT INDEX $\alpha = .64$
Mood, Persistence, Approach, Adaptability, Self-Confidence, Religiosity, Positive Life Events

OUTCOME MEASURE

at AGE 17 Kaufman Test of Educational Achievement - KTEA

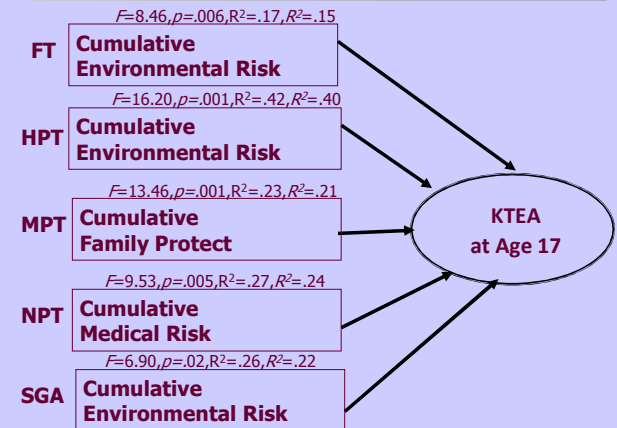
RESULTS Ha 1. Between-Group Analysis

Hypothesis 1

- There were no differences between groups in KTEA scores at age 17.
- 28%-48% of HPT, NPT, MPT, and SGA perinatal groups had an IEP/504 plan.
- NPT had most services, followed by HPT, MPT, and SGA groups.
- NPT received occupational therapy and adaptive physical education, math resource, and reading resource.

¹ Sameroff, AJ, Seifer, R.(Eds.) (1990). Early contributors to developmental risk. New York: Cambridge University Press.

RESULTS Ha 2 & 3. Within-Group Analysis



Hypothesis 1

- Preterm children did not have lower academic achievement at age 17 compared to FT children.
- NPT, MPT, SGA had more school services at age 17.

Hypotheses 2 and 3

- Regression models explained 17%-42% variance in academic achievement at age 17.
- Cumulative Environmental Risk best predictor for FT, HPT, SGA.
- Cumulative Medical Risk best predictor for NPT.
- Cumulative Family Protect best predictor for MPT.

Hypothesis 4

- No mediation of protection for risk effects on academic achievement at age 17.

CONCLUSIONS & IMPLICATIONS

- Preterm infants are not a homogenous group.
- Preterm infants continue to need school services through high school.
- Monitoring of environmental variables during childhood and adolescence for preterm infants classified as HPT or SGA may improve academic success.
- Neonatal and childhood medical conditions have long term impact on academics for preterm infants classified as NPT.
- Variables in the Family Protect Index suggest specific modes for intervention strategies.
- Indexes serve as useful tools for early identification and intervention for PT children to succeed academically.