# THE EFFECTS OF PREMATURE BIRTH ON INTELLIGENCE

Gina Custodio, Maryfel Llanillo
and Pamela Nacionales
Department of Psychology
University of the Philippines

This study took off from the findings of past researches that premature birth exposes infants to higher risks of (a) brain damage, either due to fetal pressure during delivery, or early separation from the placenta which interrupts oxygen supply to the brain; and (b) having reduced gross brain size due to incomplete gestation, resulting to decreased neural materials essential for information processing. These were observed to happen regardless of the cause of prematurity

Maternal Malnutrition

Glandular Imbalance —

Non-obstetric conditions: uterine crowding, multiple births, toxemias

Obstetric Conditions: uterine crowding, multiple births, toxemias

PREMATURITY

fetal head varies directly with length of gestation)

high risk of brain damage

soft skull

premature separation of the placenta

smaller brain size at birth (which is already 28% of the adult brain size)

fetal pressure

oxygen deprivation

mental deficiency especially in reading

less amount of neural materials needed for processing information

Following from these, the present study hypothesized that prematurity affects intelligence and that children born normally will most probably perform better in intelligence tests than those born prematurely.

To test this hypothesis, the researchers administered the Philippine Non-verbal Intelligence Test to sixty-four Grade One pupils of Ladislao Diwa Elementary School in Cavite City. The children were asked to submit their birth certificates, based on which were established whether they were prematurely or normally born. Since authorities themselves do not quite agree about the specific criterion for prematurity, this study adopted one general category of prematurity as its own criterion i.e., prematurity in terms of weight and gestation period. Thus were chosen children born with a weight of 5 lbs. and 8oz. or less and had a gestation period of 36 weeks or less. The researchers decided to peg the start of prematurity at 36 weeks since births two weeks earlier than the normal gestation period of 38 weeks are still considered normal by most pediatricians. Only 32 of the Grade One pupils in Ladislao Diwa were "prematurely born" in this respect, so correspondingly, only 32 normal pupils were chosen to comprise the control group.
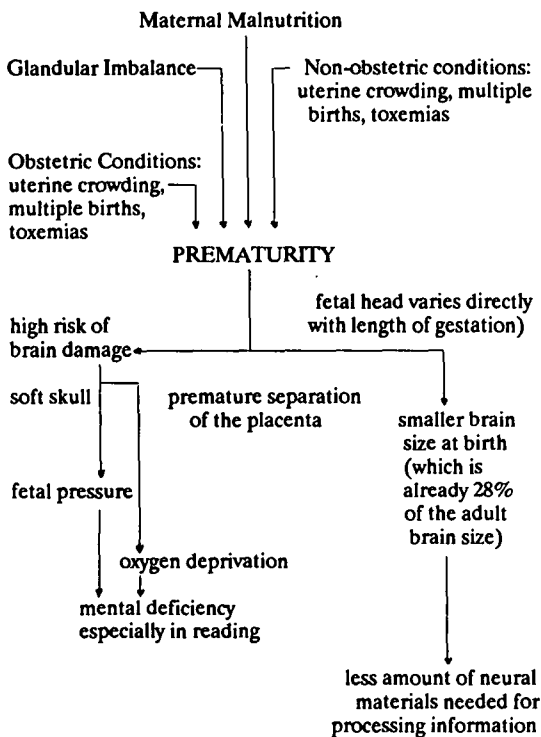
Results of the test seem to support the hypothesis: the control group garnered higher raw scores than the premature group and the statistical tests used to compare their averages confirmed the significant difference.

Summary of Score Distribution

Premature Group			Control Group		
Equivalent	Boys	Girls	Equivalent	Boys	Girls
Satisfactory	0	0	S	1	1
Above Average	3	4	AA	10	9
Average	11	8	A	2	4
Below Average	2	2	BA	2	1
Poor	1	1	P	2	0

Significant at the 1% level (t-comp = 3.00; Z-table = 2.98), the Z-test indicated that the mean scores of the normal group are significantly higher than that of the premature group. Measuring the statistical significance of the difference between the means, the t-test yielded supportive findings, also significant at the 1% level (t-comp = 3.14; t-table = 2.74). All other things being equal, therefore, the children born of normal weight in this particular sample were more intelligent than those born earlier than the complete 38 weeks and of lower birth weight.

However, though this association was clearly shown, the results did not establish direct causality between prematurity and lower level of intelligence. The researchers, themselves, were quick to point this out.

The most probable intermediary causes as found by previous studies — damage and reduced brain size — were not definitively established among the subjects of this study. The researchers list this among their limitations. Doing so would have entailed sophisticated tests using EEG's and PET scan's which were not within the scope of this initial study.

Other dimensions which could have shed light to the observed association were also left undiscussed: the differrent possible causes of the subjects' prematurity; current malnutrition among the children; and other sicknesses in the intervening years since birth which, among others, might have been the main reason for lowered intelligence level. For a more general conclusion to have been obtained, the same test could have been administered to other like samples, or to samples comprised of older children, or other tests could have been administered to the same sample. Significant differences might have been observed therein.

In any case, this study was not really intending to go beyond the bounds of its immediate interest — to put into clear focus the relationship hypothesized to exist between prematurity and intelligence. Therefore, keeping everything else constant, and, assuming, as the researchers qualified, that the PNIT was an accurate gauge of the concept "intelligence," the premature children tested in the study indeed had lower intelligence than the normally born ones. Within these boundaries, the association was clearly established.