

Environment Important

The importance of environment on the intelligence and the adult life of orphans was revealed in a follow-up study made after 30 years

➤ THIRTY YEARS ago a psychologist made what was then a radical and rather daring change in the lives of 13 Iowa orphanage children. Within five years his study was completed, the results were obvious and the children disappeared into the mainstream of American life.

Last year Dr. Harold M. Skeels, now with the National Institute of Mental Health, began the onerous task of tracking down the orphans to discover what, if any, impact his controversial experiment had had in their adult lives.

The results of his follow-up testify to the strong relationship between intelligence and environment.

All 13 children were less than three years old and mentally retarded when Dr. Skeels began his experiment. Three of them were "imbeciles" with IQ ratings around 40.

At the time, normal orphanage procedure was simply to keep those unadoptable children whose development was delayed, and if they did not become normal, eventually transfer them to a nearby institution for the mentally retarded.

But by chance, two little girls, emaciated, undersized, colorless and obviously retarded, got transferred to the institution at very young ages. Within a year they were alert and mentally normal.

Viewing this inexplicable change, Dr. Skeels discovered a major distinction between the orphanage and the institution: the degree of tender loving care. Each girl had been "adopted" by an older institution inmate while others in the ward "served as adoring aunts." The children were pampered, played with and taken on excursions.

By contrast, the orphanage, though standard and designed for mentally normal children, was so overcrowded with youngsters that they had no chance to form intense relationships with an adult.

As Dr. Skeels described it: "Human interactions were limited to busy nurses who, with the speed born of practice and necessity, changed diapers or bedding, bathed and medicated the infants, and fed them efficiently with propped bottles." Few toys were available.

Dr. Skeels decided to try something new. Throughout the wards of the state institution he placed the 13 orphans, using a classification of "house guest" to avoid later stigmatization as "retarded."

As with the two little girls, 11 of the 13 children attained normal intelligence,

including the three imbeciles, who more than doubled their IQ scores. Once normal, the 11 were put up for adoption.

Meanwhile, Dr. Skeels found a similar group in the orphanage to use for comparison. Though this group had originally been fairly well off intellectually (nine were of average intelligence), their IQs dropped as dramatically and as quickly as those of the first group rose.

In two years, the groups literally switched positions intellectually, the first gaining an average of 28 IQ points, the second losing 26. One 10-month-old boy in the orphanage, starting with good average intelligence (IQ 109), became an imbecile in five years. By the time he was 19 he had an IQ score of 19 and a speech defect so severe he could not make himself understood.

Dr. Skeels was successful in locating all the children in the original study, and reports that they have continued these same patterns into adulthood. All 13 "houseguests" are self-supporting. None is a ward of any institution, pub-

lic or private. By contrast, four of the orphanage group are in institutions or hospitals of some kind. In education and level of occupation the same difference exists. Those in the contrast group who do support themselves have only menial jobs, while the "houseguests" entered middle-class occupations.

"In no instance," Dr. Skeels said, "was there any indication of mental retardation" in the 28 children born to these "houseguests" who were themselves so markedly retarded as young children.

Lest the study should be misinterpreted, it should be noted that the orphanage was no snakepit, nor was the home for the mentally retarded a palace. Simply, the quality of orphanage life would be described today as "deprived."

It was a depersonalized, affectionless existence—by necessity, regimented. Like dormitory living, the children were mass handled in groups of 30 or so, headed by one adult.

At the institution, each child became the recipient of much attention. The wards competed, said Dr. Skeels, to "see which one would have its 'baby' walking or talking first."

Although the study describes conditions of thirty years ago, it seems obvious, said Dr. Skeels, that "there are still countless infants born" with full normal capacity who will become retarded (and expensive) wards of society unless intervention occurs.

His findings have been published as a 65-page monograph by the Society for Research in Child Development.

PSYCHOBIOLOGY

Memory Three Processes

➤ MEMORY may actually be three processes instead of one. If so, the current search for a single physical memory structure will not be successful, a California biologist said.

Dr. James L. McGaugh, chairman of the department of psychobiology at the University of California at Irvine, suggested that memory involves three separate but cooperating systems: an "immediate" memory for remembering numbers, the ends of sentences and so forth; a "temporary" memory that takes a few seconds to develop and lasts for several hours; and a "permanent" memory that consolidates slowly over time and is relatively stable.

Because of the time required to fix permanent memory traces, they are susceptible to both destructive and helpful influences for hours. Some drugs help to establish the trace, others destroy it altogether. Electric shock will destroy a recent memory, but if administered after a certain number of hours it seems to have no effect.

Dr. McGaugh demonstrated this phenomenon with mice. When he

shocked them five minutes after an unpleasant experience, they seemed to retain no memory of the experience. But when he waited 24 hours before giving the shock, their retention was complete.

"If permanent memory traces consolidate slowly over time, then other processes must provide a temporary basis for memory," he reported in *Science*, 153:1351, 1966.

Dr. McGaugh could find no evidence in mice of an immediate memory such as humans have for remembering digits. When tested immediately after the unpleasant experience, the animals typically showed no memory of it, he said. Therefore, the second type of memory, called temporary or short-term, must take a few seconds to develop.

The same seems to be true in human memory, Dr. McGaugh said.

Speculating on the relationship between these three traces, the biologist said each experience may trigger activity in each memory system. Thereafter, every time an experience is repeated, it simultaneously builds both the temporary and permanent systems.