

THE CHARACTERISTICS OF THE CONDITIONED BLINK REFLEX TO SOUND STIMULI IN YOUNG CHILDREN

T. P. Shlyaf'er

From the Department of Comparative Physiology and Pathology of the Institute of Experimental Medicine (Director-Professor D. A. Biryukov, Corresponding Member Acad. Med. Sci. USSR)
Acad. Med. Sci. USSR, Leningrad.

(Received July 5, 1955. Submitted by P. S. Kupalov, Member of Acad. Med. Sci. USSR)

We have studied the dependence of the formation of conditioned reflexes in children 2-10 months old, on the physical characteristics of some sound stimuli. Nine children were used in the research.

The conditioned blink reflex was developed to a clear tone of a frequency of 120 cycles and a loudness of 65 and 73 decibels and for a metronome sound of the rhythm of 120 beats per minute and a loudness of 65 decibels. The unconditioned stimulus was an interrupted jet of air directed into the child's eyes. It was considered that the conditioned reflex appeared only if it was noticed in 40% of combinations during the day. The conditioned reflex was considered consolidated if it appeared in 70-80% of cases and remained at that level for 2-3 days.

The following findings were obtained as a result of the experiments.

In two children.—Tolya (3 months) and Lena (9 months) — the conditioned blink reflex for the clear tone of 120 cycles, 73 decibels, appeared and was consolidated after the 12th combination (2nd day). To the clear tone of 120 cycles and 65 decibels (db) the conditioned blink reflex in Kolya (2 months) was consolidated after 22 combinations, in Lenya (9 months) the conditioned blink reflex to the same stimulus was also consolidated after 22-25 combinations. In two children — Lena and Lyubik — the conditioned reflex was at first developed for the electrometronome sound and then for the clear tone. With this, the conditioned blink reflex to the tone of 120 cycles and 65 decibels developed with equal speed in Lena (3 months) and Lyubik (9 months), after the 12th combination (2nd day).

From the findings shown, it follows that the conditioned reflex to a clear tone of 120 cycles, 65 db, was consolidated with equal speed in children of 2 and 10 months of age. In 4 children the conditioned blink reflex was produced not only for the clear tone of 120 cycles, 65 db, but also for the electrometronome sound with the rhythm of 120 per minute and a loudness of 65 db. It was found that the conditioned blink reflex to the clear tone in Kolya (2 months) and Lenya (2 months) was consolidated after the 12th-22nd combination; in the same children the conditioned blink reflex to the electrometronome sound, was not consolidated in spite of more than 100 combinations. In Lyubik (9 months) the conditioned blink reflex was consolidated with equal rapidity to the electrometronome sound and the clear tone — after 12-14 combinations. In Lenya (9 months) the conditioned reflex was also consolidated with equal rapidity to the clear tone and the electrometronome sound — on the 22-24th combination.

To exclude the influence of training on the speed of formation of the conditioned reflex, in two children the conditioned reflex first to the clear tone and then to the electrometronome sound was developed, and in two children the procedure was reversed.

The Rate of the Formation of the Conditioned Reflex to the Clear Tone and to the Electrometronome Sound in Children of 2-10 Months

| Subject | Age (in months) | The conditioned stimulus | The formation rate of the conditioned reflex | | The conditioned stimulus | The rate of the formation of the conditioned reflex | |
|---------|-----------------|--|---|---|--|---|---|
| | | | the No. of combination at which the conditioned reflex appeared | the No. of combination at which the conditioned reflex was consolidated | | the No. of combination at which the conditioned reflex appeared | the No. of combination at which the conditioned reflex was consolidated |
| Kolya | 2 | Tone of 120 cycles, 65 db | 15 | 22 | Electrometronome 120 beats/minute, 65 db | 12 | Was not consolidated |
| Lena | 2 | Electrometronome 120 beats/minute, 65 db | 27 | Was not consolidated | Tone of 120 cycles, 65 db | 12 | 12 |
| Lyubik | 9 | Electrometronome 120 beats/minute, 65 db | 14 | 14 | Tone of 120 cycles, 65 db | 12 | 12 |
| Lenya | 9 | Tone of 120 cycles, 65 db | 25 | 25 | Electrometronome 120 beats/minute, 65 db | 22 | 22 |

In the Table the findings are cited which show the rate of the formation and consolidation of the conditioned reflexes to the clear tone and to the electrometronome sound. It follows from the table that in children 9 months old, the conditioned blink reflex to the electrometronome sound and the clear tone is produced at the same rate. But in the 2 months old children, the conditioned blink reflex to the metronome sound was developed with great difficulty; the conditioned reflex to the clear tone developed rapidly and easily. Therefore the clear tone of 120 cycles 65 db is physiologically a more powerful stimulus for children between 2 and 3 months of age, than the electrometronome sound of the same loudness. But in the children of 9-10 months of age, the clear tone and the electrometronome sounds were stimuli of equivalent physiological force. Therefore, in spite of the fact that in children of an early age the process of stimulation is weaker than in the older children [1, 2], the conditioned blink reflex to the clear tone develops at an equal speed in children of both age groups.

To exclude the supposition that the electrometronome sound of a frequency of 120 beats per minute and of the loudness of 65 db was too strong a stimulus, its loudness was decreased. However, even in this case the conditioned reflex to the electrometronome sound in the 2-4 months old children was developed with great difficulty.

LITERATURE CITED

- [1] M. P. Denisov and N. L. Figurin, Sov. Ped. 1935, No. 6, 96-108.
- [2] N. I. Kasatkin, [The Early Conditioned Reflexes in the Ontogenesis of Man] (In Russian) (Moscow, 1948).