

# Repeated Maternal Separation and Ultrasonic Vocalization in Rat Pups

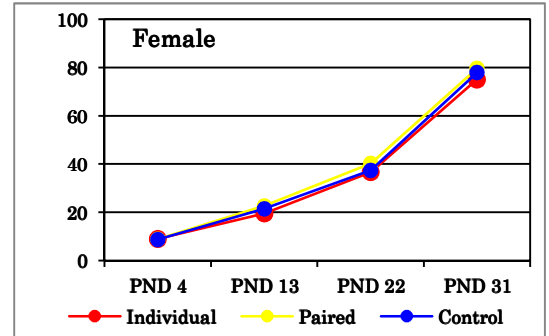
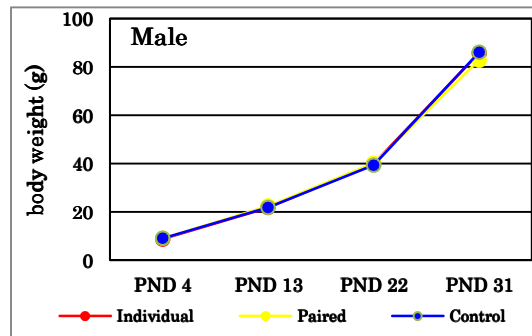
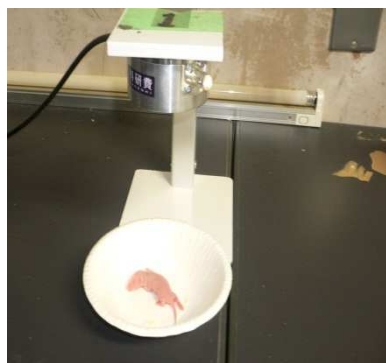
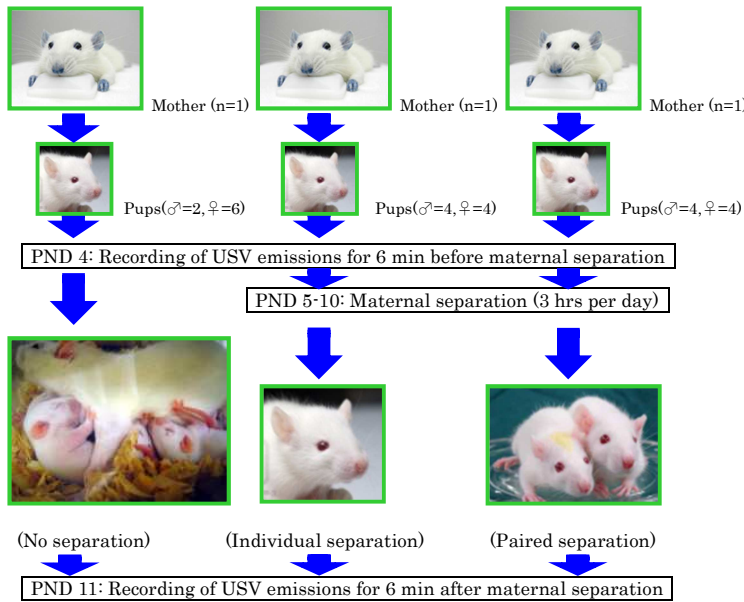
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## BACKGROUND AND AIM

The abandonment of infant care is a big-social problem because it causes harmful effects on mental and physical health of children. The animal study indicates that maternal separation induces delayed effects in hippocampal structure such as the decreases of synaptic formation. Thus, the animal model system using maternal separation has potential to study the abandonment of infant care. This study aims to examine whether maternal separation affects the emission of ultrasonic vocalizations in rat pups.

## MATERIALS AND METHODS

● Control (Cont) ● Individual separation (IS) ● Paired separation (P S)



## RESULTS

- 1, Recording of USVs using the Sonotrack system (Fig. 1).
- 2, The body weight gain was not affected (Fig. 2).
- 3, The USVs were reduced in IS & PS (Fig. 3 & 4).
- 4, The USVs in durations of 0-250ms were reduced in IS & PS (Fig. 5).
- 5, The USVs at frequencies of 40-45 kHz were reduced in IS & PS (Fig. 6).

## DISCUSSION

Rat pups emit USVs when they are separated from the mother rat. The mother rat approaches to them and exhibits retrieval behavior. The IS and PS pups reduced the USVs after maternal separation. These pups emitted USVs when they were separated from the mother. However, maternal care was not given to them because of maternal separation. They might learn helplessness. Our results suggest that the animal model studies using USVs are useful to investigate the infant-care abandonment.

Fig. 1 Recording of USVs

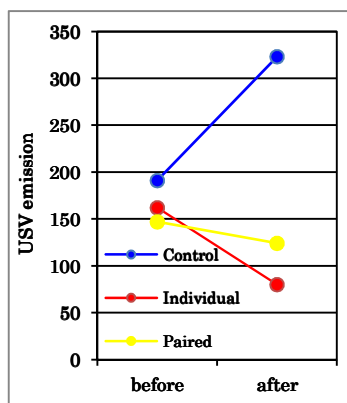


Fig. 3 USV emissions before and after maternal separation

Fig. 2 Effects of maternal separation on body weights

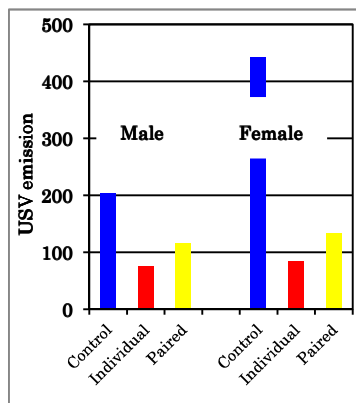


Fig. 4 USV emissions after maternal separation

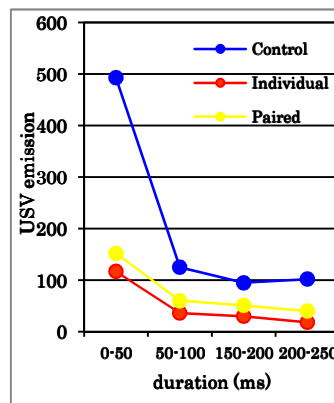


Fig. 5 USV durations after maternal separation

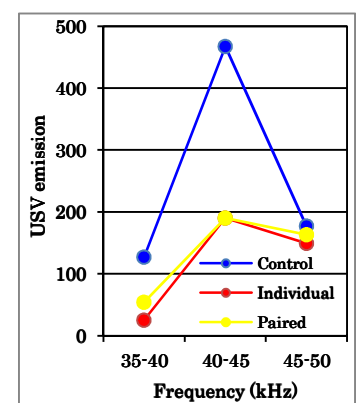


Fig. 6 USV frequencies after maternal separation