

## A RESTRAINING DEVICE FOR PSYCHOPHYSIOLOGICAL EXPERIMENTATION WITH DOGS<sup>1</sup>

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The purebred male beagle dog was chosen as the subject for a program of psychophysiological experiments because of its adaptability to laboratory living, its size, and the ease with which it can be handled. Other reasons include health considerations and the possible reduction of and eventual manipulation of genetic variability. Test procedures require that the dog, debarked and isolated for 1 or more hours in an environmentally controlled enclosure, be sufficiently restrained in a Pavlov frame to prevent it from removing recording electrodes and pickup devices. Yet, it should be free enough to move its head into food and water troughs, and to move its front legs to depress a pedal.

With the experimenter out of the animal's sight, we found that Pavlovian leg loops and other applicable techniques were ineffective against the vocalizations and extremely vigorous and topographically varied muscular actions of 2-year-old beagles (*cf.* Pavlov, 1928).<sup>5,6</sup>

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<sup>5</sup>It is not clear whether the behavior is related to the daily regimen, under which each dog (a) is transferred to a clean cage with fresh water and (b) has additional contact with a handler both when it is weighed and during an exercise period. Automatic controls dispense the food ration in the storage cage and extinguish vivarium lights for a 9-hr period beginning at 8:30 P.M.

<sup>6</sup>The following investigators generously shared relevant experiences and ideas with us to help us out of our difficulty: A. H. Black, McMaster University; S. Brutkowski and E. Fonberg, Nencki Institute of Experimental Biology, Warsaw; L. Cook, R. Kelleher, and A. Davidson, Smith Kline & French Laboratories; J. L. Fuller, Roscoe B. Jackson Memorial Laboratory; W. H. Gantt, Perry Point VA Hospital; W. T. James, University of Georgia; L. Karmin, Bellerose Animal

Success was achieved, however, with the device described below. It remains intact and escape-proof, and vocalizations and restlessness decrease to acceptable levels.<sup>7</sup>

Figure 1 shows the device and its main features. The apparatus is symmetrical about the plane rising from the center line that bisects the collection trench, T, in the floor of our Pavlov frame. Four iron corner posts, CP, and a superstructure of similar 1-in. cross-pipes, adjustable with Speed-Rail connectors, provide a means of suspending and positioning a rigid harness support.

An inverted U-structure of hard aluminum stock, the support consists of two side blocks, SB, each 12 by 3 by 3 in.; a top plate, TP, 18 by 0.5 by 3 in.; and a head shield assembly, HS. The assembly is composed of a stationary front cross-plate that arches over the back of the dog's neck. Attached to this cross-plate are two vertical sliding panels, 0.1875 in. thick, whose positions may be fixed with set screws. When the panels are adjusted to the thickness of the dog's neck, the dog cannot pull its head under the harness support where, otherwise, it could chew on limb leads.

The dog is fitted as snugly as possible with (a) a leather belt, RB, strapped about the rear of its body, and (b) as Fig. 2 shows in detail, a modified leather chest harness, CH, each shaped and adjusted to the individual's body size. Once placed on the animal, they are buckled to each other with leather side straps, SS. Metal hasps, MH, buckles, and straps, wherever attached to the leather fittings, are

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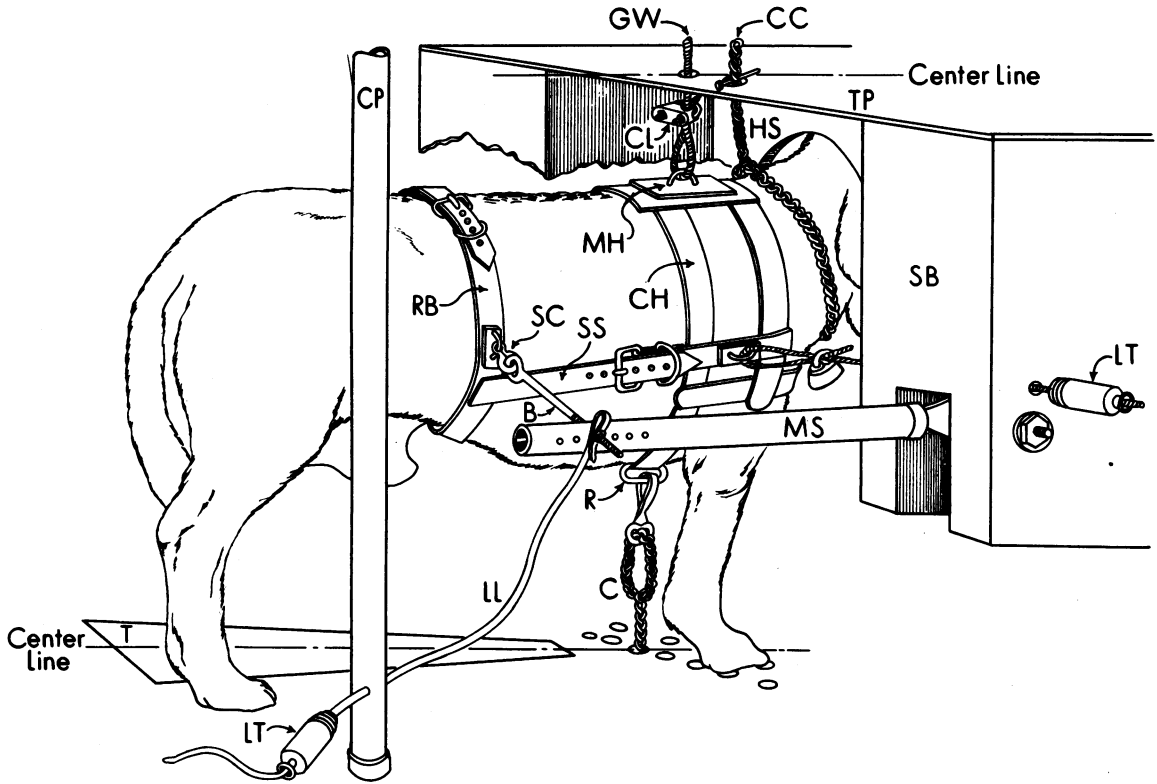


Fig. 1. The dog-restraining device in use.

fastened with flathead steel machine screws and nuts rather than rivets.

Permanently attached with clamps, CL, to metal hasps on the chest harness are three lengths of 0.1875-in.-thick stranded flexible wire, GW, variously called garage door, airplane, and guy wire. They are slipped through holes in the side blocks and top plate of the harness support—each selected from among several available to accommodate dogs of different sizes. The wires are then secured and their slack adjusted with clothesline tighteners, LT. With an anchored metal chain and spring clamp, C, protruding through the floor of the frame and attached to the metal ring, R, that is slipped over the bottom strap of the chest harness, pulling movements and vertical as well as lateral motion of the thoracic region are restricted. Additional control of this area, sometimes helpful in the early stages of frame-adaptation, is provided by a metal choke collar, CC, whose suspension length from the top plate may be adjusted with a pin.

Extending from axles in the side blocks of the harness support are tubular metal

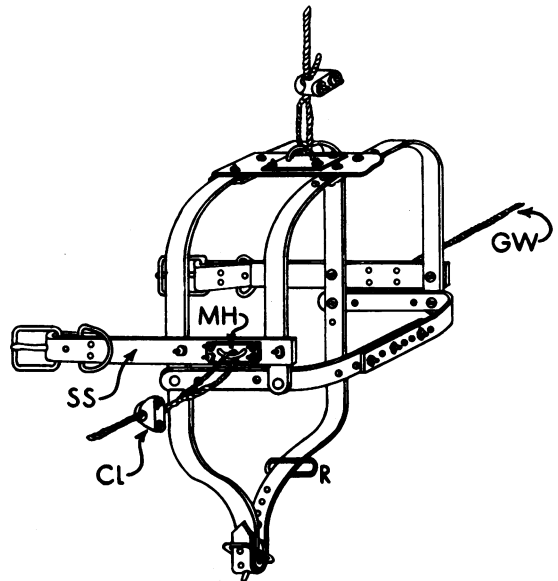


Fig. 2. Detail drawing of the chest harness.

shafts, MS. Eye-bolts, B, are rigidly fixed in positions along the shafts determined by the dog's body length. They are firmly attached

with snap clamps, SC, to metal hasps on both sides of the dog's rear belt. Rolled leather leads, LL, extending from the eye-bolt stems on the shafts, pass through holes in the rear corner posts; and line tighteners are used to secure them and adjust their lengths. Certain types of forward and lateral movements may thus be restricted.

When the leads are adjusted to a length that permits the dog to assume a full standing position, the metal shafts may move in a vertical arc. Although the dog is maintained in a circumscribed area of the frame, it is then free to sit on its hind legs as well as stand on all fours. Therefore, the present arrangement may be more comfortable for the animal than some of the traditional restraining devices.

Under our general adaptation procedure, the dog is gradually introduced to the frame without restraint. Then, at successive restraining sessions, removal of the dog from the apparatus is usually contingent upon increasingly longer periods of quiescence, until desired results are obtained.<sup>8</sup>

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<sup>8</sup>With one difficult subject, restraining sessions were held twice daily. After several weeks of training, this dog remained quiescent only during the second of the two periods.

#### REFERENCE

- Pavlov, I. P. The reflex of freedom. In I. P. Pavlov, *Lectures on conditioned reflexes*. (Transl. by W. H. Gantt.) New York: Liveright Publishing Corp., 1928. Pp. 282-286.