

# BRIEF COMMUNICATION

## An Objective and Sensitive Method for Quantitative Measurement of Stereotyped Gnawing

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KOLASIEWICZ, W. AND S. WOLFARTH. *An objective and sensitive method for quantitative measurement of stereotyped gnawing*. PHARMAC. BIOCHEM. BEHAV. 4(2) 201–202, 1976. — A simple device for quantitative measurement of apomorphine- or amphetamine-induced gnawing is described. This device enables the investigator to maintain close and objective control over the intensity of stereotyped gnawing, thus giving the possibility to differentiate discrete quantitative changes.

Stereotypy    Gnawing measurement    Apomorphine

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APOMORPHINE- or amphetamine-induced stereotypy in rats, as well as in rabbits, represents a laboratory model for the evaluation of the activity of the dopaminergic system in the brain [2, 3, 5]. With the help of this model a number of substances have been tested. For quantifying of stereotyped behavior many simple scores are commonly used [1,2]. This kind of quantification is not sufficient to reveal discrete changes in the intensity of these phenomena. We have constructed a simple device allowing an objective and quantitative measurement of one of the stereotypy components: gnawing, in rabbits and in rats. This device automatically registers each bite on plastic plates, giving an objective measure of the intensity of stereotyped gnawing.

### DESIGN

Figure 1 shows the device. The animal can freely move in the transparent metaplex cage (50 × 50 × 50 cm) with a wooden floor but without a cover. In one corner in a slit a pair of parallel plastic plates are inserted (for details: see legend of Fig. 2). These plates when compressed close the

electrical circuit connected to a counter. The spring between the plates moves them back to the original position. In Fig. 2 a schematic design of the device with all important dimensions is shown.

When the stereotypy is induced the animal spontaneously approaches the plastic plates to realise its compulsive gnawing. It is of importance that the cage must be composed of surfaces completely smooth thus not giving other possibilities for gnawing.

### APPLICATION

Using this device the influence of intracaudal injections of atropine and methacholine on apomorphine-induced gnawing was investigated (Fig. 3) [4]. A clearcut difference between the effect of atropine (circles, the lowest line) and that of methacholine (triangles, the upper line) was obtained in comparison to the control water injections.

When the results were evaluated accordingly to Janssen's scores [2] no statistically significant difference between atropine and methacholine was found.

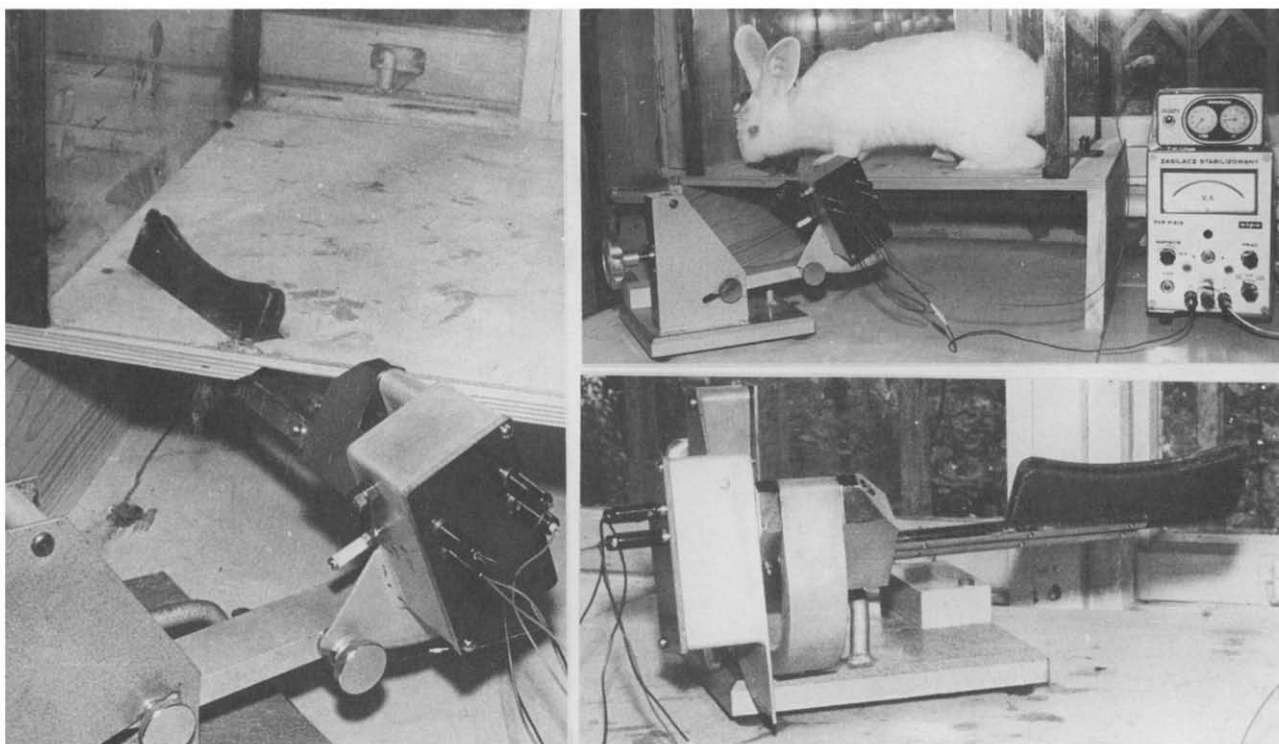


FIG. 1. Device for measuring gnawing. Left: Gnawing plates in corner of the cage, with angle adaptor and control circuitry. Upper right: Overall view showing rabbit gnawing at plates and measurement instruments. Lower right: Gnawing plates and angle adaptor mount.

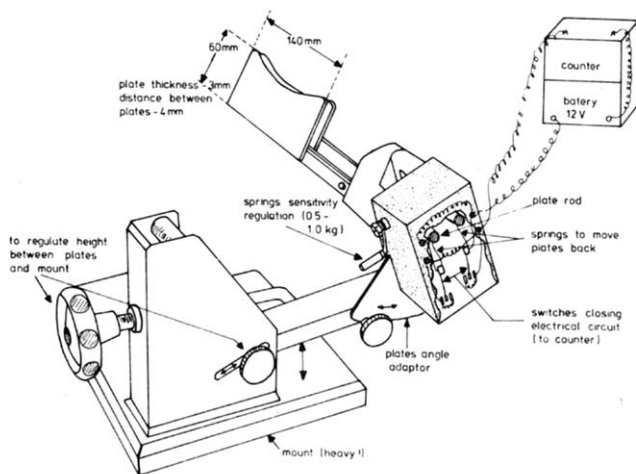


FIG. 2. Schematic design of gnawing counting device.

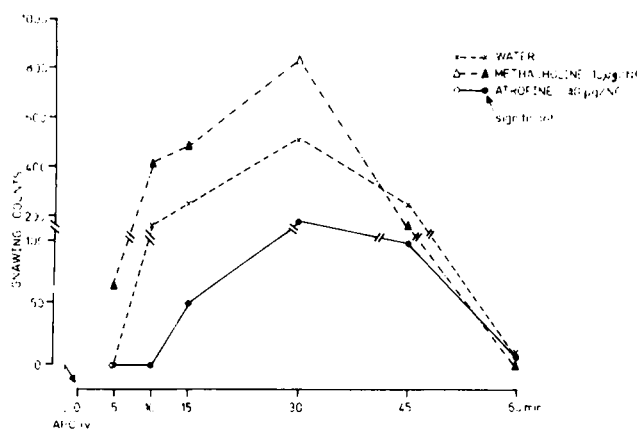


FIG. 3. Effects of intracaudal injections of atropine and methacholine on apomorphine-induced stereotypy.

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