Notes and Comment

Comments on Ksir, C. "Scopolamine does not reduce tonic immobility in chickens"

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In a recent paper in this Journal, Ksir (1978) reported that "Scopolamine does not reduce tonic immobility in chickens" (p.21). This result stands in direct opposition to the results obtained by a number of other investigators in several different laboratories (Gagliardi & Thompson, 1977; Hicks, 1976; Thompson, Piroch, Fallen, & Hatton, 1974; Woodruff, Hatton, Frankl, & Meyer, 1976—using ducks). The major point of Ksir's paper was that drug studies should be conducted "blind" because the experimenter might influence the outcome due to preconceived hypotheses, a point with which most would agree.

However, Ksir's primary concern was with the experiments of Thompson et al., and he reported that he "attempted to replicate as nearly as possible" (p. 521) their experiments. Examination of Ksir's experiments reveals a number of differences between his methodology and that of Thompson et al. Some of these points might be rather minor, but others are probably very important in understanding the differences in the results between the two sets of experiments. Some of these points are presented below.

(1) Ksir used "mixed breed and sex" birds, whereas Thompson et al. used White Leghorn cockerels. Gallup, Ledbetter, and Maser (1976) have shown there are significant strain differences in duration of tonic immobility (TI) in chickens.

(2) In his first experiment, Ksir gave his subjects a single TI test trial with a maximum duration of 180 sec, and based his results (no effect) on those data. In the Thompson et al. study, birds were given *three* trials with a maximum duration of 180 sec/trial and analyses were based on the average of those three trials. Analysis of data from the first trial only of the Thompson et al. study revealed no effect of scopolamine (a result similar to Ksir's), $F(3,36) < 1$. However, analysis of average of the three test trials indicated that scopolamine significantly reduced TI durations, $F(3,36) = 5.80$, $p < .005$. Had Ksir actually replicated the Thompson et al. experiments, he might have obtained data consistent with those of their studies.

(3) Ksir used a quite unusual testing procedure in his second experiment: The experimenter was "instructed to restrain the chickens 'until they were ready,' not for a specified amount of time" (p. 522). This procedure may have reduced the incidence and/or duration of TI in his birds, since Gallup, Nash, and Wagner (1971) have found that the restraint duration which produced the most "durable reactions" was 15 sec, the restraint duration used in all the Thompson et al. TI experiments.

In Ksir's second experiment, if a bird failed to stay down at least 10 sec it was restrained again. (No intertrial interval was specified.) This procedure is likely to lead to prolonged TI durations, since massing of TI inductions has been shown to sensitize animals to TI (Nash & Gallup, 1976). The birds in the Thompson et al. experiments had intertrial intervals from 15 to 195 sec. It is readily apparent that the procedures used in Ksir's second experiment were quite different from those of Thompson et al. These differences not only make comparisons difficult, but also unjustified.

(4) Ksir's third experiment was an investigation of the effects of scopolamine on activity in a simple activity chamber, an experiment almost identical to the third experiment of Thompson et al. and with comparable results. However, Ksir somehow interpreted the Thompson et al. experiment to show "significant changes in open-field activity with scopolamine" (p. 522). This conclusion is simply wrong; they did not use an open field, but an activity box which was slightly larger than that used by Ksir. The only new information provided by Ksir's third experiment was an extension of the activity measure from 10 min, reported in Thompson et al., to 60 min.

In sum, Ksir failed to replicate the procedures of the experiments he claimed he was trying to replicate. Thus, his failure to find an effect of scopolamine on TI duration is not persuasive, especially since such effects have been found in a number of different laboratories (Gagliardi & Thompson, 1977; Hicks, 1976; Thompson, Piroch, Fallen, & Hatton, 1974; Woodruff, Hatton, Frankl, & Meyer, 1976).

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