# SYMPOSIUM:

# Classical and Instrumental Conditioning. Presented at the 34th Annual German Experimental Psychology Meeting

# Human Conditioning: Issues and Applications

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THE NINE ARTICLES following this introduction were selected from papers presented at a symposium on human conditioning, as part of the scientific program of the 34th Meeting of Experimental Psychologists (Tagung experimentell arbeitender Psychologen, TeaP). This year's conference was organized by the Department of Psychology at the University of Osnabrueck, F.R.G. (13–16 April, 1992). The annual convention, although primarily a meeting of German experimental psychologists, is also attended by colleagues from the two other German-speaking countries, Austria and Switzerland, as well as by psychologists from Belgium and the Netherlands, implying some presentations in English. The conference program covered nearly all of the traditional areas of experimental psychology.

The symposium on human conditioning as part of the program took two days and included contributions of 17 authors. Nine papers, which illustrate the wide range of theoretical, methodological, and applied innovations characterizing recent studies of human conditioning, were selected in a peer review process. In this process, we tried to avoid any bias against so-called "negative results" (Furedy, 1978). The majority of the papers (seven out of nine) were dealing with Pavlovian conditioning, whereas two focussed on instrumental conditioning, thus reflecting the overall proportions of contributions in the symposium. Investigating conditioning principles in humans has proven to be of significant importance. Although humans are animals, too, the mainstream of conditioning research neglected research with human subjects. This neglect is ill advised. Most issues in conditioning can also be studied with human subjects (unless there is a special interest in looking at very aversive unconditioned stimuli), and with respect to applications there is a greater chance for generalizing laboratory results to field applications.

The selected papers deal with cognition and emotion in normals and patients. In the case of the Pavlovian conditioning studies, a wide range of stimuli were used. Besides well-known unconditioned stimuli (USs) such as shock, noise, and airpuff, a letter reproduction task, "liked" stimuli, and pharmacological drugs were used as USs. On the other hand, the

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*Integrative Physiological and Behavioral Science*, April–June, 1993, Vol. 28, No. 2, 151–153.

measured responses ranged from skin conductance responses and eyeblinks as a component of the startle reflex to evaluative ratings and self-report data.

Kirsch, Boucsein, and Baltissen investigate information processing in human Pavlovian autonomic conditioning. Using a letter reproduction task as a nonaversive US they varied the quantitative information content of the conditioned stimulus (CS). Magnitudes of observed electrodermal responses reflected the manipulation of information content. The authors' conclusion is that the amount of conditioned autonomic responses can be regarded as an indicator of the amount of information processing.

Kleinschmidt and Lachnit reviewed an experimental attempt to show that two differential Pavlovian conditioning designs, namely positive and negative patterning, can best be understood as learning and application of (logical) rules. Keeping constant the total amount of training, they varied the number of stimuli trained. They observed response differentiations for positive and negative patterning, independent of the amount of training per stimulus. Transfer tests suggested that the rules underlying these conditioning designs could be transferred to new stimuli. These findings expand those reported by Kimmel and Lachnit (1991) in the 1990 Budapest symposium (Lachnit & Kimmel, 1991a). Most of the papers presented there have been published in an earlier volume of this journal.

Wolter and Lachnit examined whether or not magnitudes of skin conductance responses observed during the presentation of CSs in a differential Pavlovian conditioning design, where each CS predicted another US, reflect the aversiveness of the US predicted. Magnitudes of two measures of skin conductance responses increased with increasing aversiveness of the according US. The authors concluded that these autonomic responses are not a mere indicator of a cognitive expectancy process, but that they also are affected by emotional factors.

The paper by Hammerl and Grabitz deals with the learning process underlying evaluative conditioning. In spite of the similarities of the evaluative conditioning procedure to classical conditioning experiments, it has been argued that changes in meaning, attitude, or valence do not involve signal learning as proposed for human Pavlovian (autonomic) conditioning preparations. Instead, it is assumed that due to the paired presentation of a neutral (equals CS) and a valued event (equals US), the neutral event itself becomes (dis)liked. Using either a forward or backward conditioning procedure, Hammerl and Grabitz found evaluative conditioning only after forward pairing. This result contradicts the assumption that evaluative conditioning is different from classical conditioning.

The paper by Hamm and Stark contributes to anxiety research. Their study relates animal data to research with human subjects, demonstrating that classical fear conditioning as well as shock sensitization enhances the startle reflex. Replicating results of a study (Hamm et al., 1991) reported as part of the Amsterdam symposium in an earlier volume of this journal (Lachnit & Kimmel, 1991b), they found that the startle reflex magnitude (a) is directly related to the affective valence of the conditioned stimuli used and (b) is potentiated by fear. Furthermore, they observed a strong shock sensitization effect for the startle reflex. These results are in accordance with anecdotical reports that anxiety patients often exhibit exaggerated startle responses. On the other hand, sensitization was absent, and the course of response differentiation during conditioning was different in the skin conductance responses system.

De Jong and Merkelbach also work on anxiety, but in contrast to Hamm and Stark they work with patients. These authors show that phobics dramatically overestimate the covariation of phobia-relevant stimuli and aversive events and that their unrealistic contingency expectations are highly resistant to extinction. The covariation bias of the contin-

gency estimates were accompanied by differentially heightened electrodermal responding on phobia-relevant trials. The findings suggest that phobic subjects process information in a fear-confirming way. This unrealistic perspective, however, may be treated by behavior therapy because the treated subjects did not show a covariation bias.

Stockhorst et al. worked with cancer patients treated with cytotoxic drugs. This kind of treatment is often accompanied by posttreatment side affects (e.g., nausea), and there is evidence that these patients run the risk of developing the side effects in anticipation to chemotherapy, especially anticipatory nausea. The authors conducted a prevalence study to test whether or not anticipatory nausea shows characteristics of a conditioned response. They report results in support of their conditioning model and therefore propose that adequate therapeutic strategies for preventing anticipatory nausea should include classical conditioning techniques such as overshadowing.

The papers focussing on instrumental conditioning both report studies using transfer tests. Krauth and Blaeser examined whether a computer analog of the shuttlebox paradigm can be used for studying human avoidance conditioning. Therefore, they presented the warning stimulus used as a cue for the aversive stimulus during avoidance learning (in a shuttlebox analog) in a subsequent transfer-of-control test phase. The results indicate that the warning signal did not acquire aversive or informative quality. Thus, the authors conclude that a computer analog is not appropriate for studying avoidance conditioning in humans.

Grabitz and Hammerl reviewed studies showing undesirable side effects of contingent reinforcement, namely the development of behavior stereotypy. Their paper provides an analysis of the restrictions occurring when a reinforcement schedule is imposed on unconstrained behavior. Varying sequential and quantitative restrictions, they found that imposing a reinforcement schedule does not necessarily result in negative transfer effects. In contrast, imposing sequential restrictions seems to improve performance in subsequent tasks.

Finally, it is worth pointing out that most of the following studies have explicit or at least implicit implications for applied questions, thus reflecting a current trend in human conditioning literature. This may be viewed as a sign of an increased effort to show the benefits of well-defined procedures, as provided by Pavlovian and instrumental conditioning preparations, for a wide range of practical problems.

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