

TASK- AND SETTING-RELATED CUES  
IN IMMUNIZATION AGAINST LEARNED HELPLESSNESS

JOHN DAVID ECKELMAN

A thesis submitted to the Faculty of Graduate Studies  
in partial fulfillment of the requirements  
for the degree of

MASTER OF ARTS

GRADUATE PROGRAMME IN PSYCHOLOGY  
UNIVERSITY OF MANITOBA  
WINNIPEG, MANITOBA

APRIL, 1977

"TASK- AND SETTING-RELATED CUES  
IN IMMUNIZATION AGAINST LEARNED HELPLESSNESS"

by

JOHN DAVID ECKELMAN

A dissertation submitted to the Faculty of Graduate Studies of  
the University of Manitoba in partial fulfillment of the requirements  
of the degree of

MASTER OF ARTS

© 1977

Permission has been granted to the LIBRARY OF THE UNIVER-  
SITY OF MANITOBA to lend or sell copies of this dissertation, to  
the NATIONAL LIBRARY OF CANADA to microfilm this  
dissertation and to lend or sell copies of the film, and UNIVERSITY  
MICROFILMS to publish an abstract of this dissertation.

The author reserves other publication rights, and neither the  
dissertation nor extensive extracts from it may be printed or other-  
wise reproduced without the author's written permission.

## ACKNOWLEDGEMENTS

I would like to express my deep appreciation and thanks to Dr. Dennis Dyck, whose thoughtful criticisms and unfailing support contributed immeasurably to all phases of this research. I am also indebted to Dr. W. Ross Hartsough and Walter Driedger for their critical readings of this manuscript, and for their helpful suggestions.

Special thanks are due to Dr. Roy Gabriel for always making time for another question. His careful teaching and guidance in data analytic procedures have been greatly appreciated.

Finally, I wish to thank my colleagues Kathryn Jensen and Alan Borden for their willing assistance throughout this project. We are all in this together.

## TABLE OF CONTENTS

Introduction .....	1
Method .....	6
Overview .....	6
Subjects .....	7
Apparatus .....	8
Procedure .....	10
Immunization .....	11
Pretreatment .....	13
Testing .....	15
Results .....	16
Immunization .....	17
Pretreatment .....	18
Testing .....	20
Postexperimental Questionnaire .....	24
Discussion .....	25
Reference Notes .....	35
References .....	36
Appendix A: Tables 1-4 .....	43
Appendix B: Literature Review .....	48
Overview .....	49
Predictions of the Helplessness Model .....	53
Factors in the Generalization of Learned Helplessness	60
Contrary expectancies .....	61
Discriminative control .....	62
The relative significance of task outcomes .....	65

## LIST OF TABLES

Table 1: Group Means and Standard Deviations on the Anagrams Test .....	44
Table 2: Triad Contrasts .....	45
Table 3: 2 X 2 Factorial .....	46
Table 4: Immunization Contrasts .....	47

## ABSTRACT

One prediction of learned helplessness theory is that experience with control prior to exposure to uncontrollable aversive events should prevent the performance deficits which otherwise would occur. According to Seligman (1975), such "immunization" results from the generalization of expectancies of control, and should occur regardless of the setting(s) in which control and uncontrollability are experienced. The present study tested this prediction by manipulating task- and setting-related cues so that the immunization and testing situations were similar or different on each dimension. Undergraduate students were randomly assigned to a group in the helplessness triad or to one of four immunization groups. Subjects experienced control on several cognitive tasks, and were exposed to uncontrollability on an instrumental noise task. Measures of performance on a final anagrams test were used to assess group differences. Interference effects were observed as a function of uncontrollability within the helplessness triad, and in three immunization groups. The group immunized in the same setting and on a similar task as testing showed no deficits. These results were interpreted within a stimulus control framework, and the implications of this conceptualization of immunization for learned helplessness theory were discussed.

## Introduction

The term "learned helplessness" has been advanced to account for the interference with instrumental learning which occurs in animals and humans following exposure to uncontrollable aversive events (Overmier & Seligman, 1967; Seligman, 1975). According to the learned helplessness model, organisms learn that it is futile to respond when exposed to contingencies of response independent reinforcement. Such learning generalizes other situations where response contingent reinforcement is available, and results in interference with new learning (Seligman, Maier, & Solomon, 1971). Seligman (1975) has proposed that "helplessness" in humans may be mediated by a similar mechanism. According to this view, individuals exposed to uncontrollable aversive events come to expect their responding to be futile, and this expectation interferes with learning in a different situation. A number of studies with humans have supported this "generalized expectancy" hypothesis by demonstrating changes in mood (Gatchel, Paulus, & Maples, 1975; Miller & Seligman, 1976) and expectancy for success (Klein & Seligman, 1976) concurrently with performance deficits following exposure to uncontrollable outcomes.

One prediction generated by the learned helplessness model is that initial experience with control over aversive

events should interfere with forming an expectation of response-reinforcement independence, just as initial lack of control interferes with learning that responding may be effective (Seligman, 1975, p.57). This "immunization" hypothesis predicts that a prior history of control will cause an organism to be more persistent when confronted with uncontrollability, and to respond more readily when controllability is reestablished. In support of this hypothesis, Seligman and Maier (1967) found that dogs which received controllable shock in a shuttlebox, followed by uncontrollable shock in a Pavlovian hammock, showed no performance deficits when they again received controllable shock in the shuttlebox. A comparable group of dogs which received no prior escape training showed severe deficits in the shuttlebox following uncontrollable shock in the hammock. These findings were extended by Seligman, Marques, and Radford (Note 2), who found that shuttlebox deficits were prevented in dogs which received both immunization and helplessness training in the hammock.<sup>1</sup> Immunization effects have also been demonstrated with laboratory rats (Seligman, Rosellini, & Kozak, 1975), and with wild rats (Richter, 1957). However, Wepman (Note 4) found deficits in mice which had received immunization training, and Thornton and

---

(1) While these immunization effects were significant, they were not as large as those reported by Seligman and Maier (Seligman, personal communication, noted in Thornton & Powell, 1974).

Powell (1974) reported "helplessness" in humans who received prior experience with control. Recently, Jones, Nation, and Massad (1977) used a design similar to Seligman, Marques, and Radford's to demonstrate immunization in humans. In their study, immunization effects were observed following experience with a 50% schedule of control, but not following 0% or 100% control.

The above studies generally support the immunization hypothesis, and provide some information about the necessary and sufficient conditions for immunization to occur (e.g., Jones et al., 1977). However, these studies do not address the basic issue of the generalization of immunization training. As formulated by Seligman (1975), the immunization hypothesis predicts that success training should generalize across tasks and settings just as the effects of uncontrollability generalize. No systematic examination of such generalization and the factors which may contribute to it has yet been conducted.

It is difficult to examine the role of generalization in the immunization studies reported here because several types of experimental tasks were employed in a variety of combinations of experimental settings. For example, Seligman, Rosellini, and Kozak (1975) administered immunization, helplessness training, and testing to rats in a single setting (their cages), but required a different response in testing (lever pressing) than was reinforced in immuniza-

tion training (jumping). Wepman (Note 4) also reinforced different responses in immunization and testing, but in his study immunization, helplessness training, and testing occurred in three different situations (a water maze, a cage, and a shuttlebox). Thornton and Powell (1974) used a design similar to Seligman, Margues, and Radford (Note 2), in which immunization and helplessness training were conducted in the same setting with the same task, while testing involved a different task.

The immunization paradigm has usually been discussed in terms of the transfer of an initially developed expectation of controllability to subsequent testing situations (e.g., Seligman, 1975). This explanation alone is unable to account for the varying success of the different immunization procedures described above. It is suggested that, whereas the inappropriate transfer of passive behavior is the hallmark of learned helplessness (cf. Roth & Bootzin, 1974), the procedures which have been used to prevent "helplessness" may constitute a form of discrimination training. This view of immunization proposes that alternating conditions of controllability and uncontrollability provide an organism with information concerning the stimulus dimension(s) relevant to reinforcement in each condition. The organism is thus able to learn to respond differently in these conditions, and its behavior is brought under stimulus control.

Taken as a group, the studies reported above suggest that the similarity of the immunization and testing situations may be important in establishing discriminative control over "learned helplessness." It appears that when the task- and setting-related cues associated with immunization training and testing were similar, as in the Seligman and Maier (1967) study, immunization was successful. As these situations were made increasingly dissimilar, immunization effects were attenuated (Seligman, Radford, & Marques, Note 2) or absent altogether (Wepman, Note 4). This observation is consistent with a stimulus control interpretation of immunization, since transfer of expectancies of control between immunization and testing would presumably be increased as the similarity between the two was increased.

The experiment reported here tests this stimulus control hypothesis of immunization against Seligman's (1975) generalized expectancy hypothesis by varying the similarity of the immunization and testing situations along several dimensions. The stimulus control hypothesis predicts that performance deficits will be progressively reduced (i.e., immunization will become more powerful) as the similarity of the immunization training and testing situations is increased. The generalized expectancy hypothesis predicts successful immunization in all groups which are provided with a prior experience of control. In order

to demonstrate immunization, of course, it is first necessary to show the potential for interference effects. It is also predicted, therefore, that exposure to uncontrollability will produce performance deficits relative to exposure to controllability and no preexposure.

### Method

#### Overview

The experimental design consisted of the triad of conditions frequently used in learned helplessness research, with the addition of a 2 X 2 factorial arrangement of "immunization" conditions. Thus, the design contained seven cells. The experiment was conducted in three consecutive but distinct phases: immunization, pretreatment, and testing. Subjects in the four immunization conditions of the factorial arrangement proceeded through all three of these phases, whereas subjects in the triad of helplessness conditions were involved only in the latter two.

The triad included three levels of helplessness pretreatment: escapable noise, inescapable noise, and no noise. The factorial combination of immunization conditions used one level of helplessness pretreatment (inescapable noise) for all four cells, and included two levels of

a manipulated setting similarity/dissimilarity factor, and two levels of a task similarity/dissimilarity factor. In immunization, subjects were presented with a soluble cognitive problem either similar to or different from the final test task, in an experimental setting which was either the same as or different from the one in which pretreatment would occur. Following pretreatment, subjects in all seven conditions were tested in the same setting with a series of soluble cognitive problems.

### Subjects

The subjects were 70 undergraduates, 35 males and 35 females, drawn from introductory psychology courses at the University of Manitoba. All subjects had learned English as their first language, and were naive to learned helplessness research. At the time of recruitment, subjects were given the opportunity to sign up for either one or two "learning experiments." Those who chose two experiments were informed that the experiments would occur consecutively for the sake of convenience, but were separate and unrelated studies. The experiments had different names, were to take place in different rooms, and were being conducted by different individuals. Prior to pretreatment, subjects were presented with samples of the aversive tones, and given the option of withdrawing from the experiment. One female chose to withdraw, and another female was subsequently excluded and replaced because she had ruptured