Generalized Imitation: Review and New Perspectives

Lilia Irene Duran Gonzalez
Western Michigan University

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Lilia I. Duran
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To My Parents, Grand-Parents,
Sisters and Brother

To
Jose A. Becerra A.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEDICATION</td>
<td></td>
</tr>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>ii</td>
</tr>
<tr>
<td>TABLE OF CONTENTS</td>
<td>iii</td>
</tr>
<tr>
<td>I INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>II EXPLANATORY HYPOTHESIS</td>
<td>6</td>
</tr>
<tr>
<td>III SKINNER'S POSITION WITH RESPECT TO IMITATION</td>
<td>10</td>
</tr>
<tr>
<td>IV STUDIED VARIABLES: SIMILARITY</td>
<td>12</td>
</tr>
<tr>
<td>V DISCRIMINATION OF REINFORCEMENT</td>
<td>19</td>
</tr>
<tr>
<td>VI INSTRUCTIONS</td>
<td>25</td>
</tr>
<tr>
<td>VII SOCIAL CONTROL AND CONCLUSIONS</td>
<td>29</td>
</tr>
<tr>
<td>VIII NEW PERSPECTIVES</td>
<td>33</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>36</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

Imitation is a behavioral process event that has attracted the attention of the experimental psychologists in the last few years. This is due to the theoretical importance of imitation for the behavioral development of children. One major reason for such an emphasis is to provide a learning mechanism for the rapid acquisition of novel behavior by children.

How and why imitative repertoires develop is still under discussion and experimentation but it is obvious that the results of present research efforts should provide data which will aid them to increase the speed in instructing this type of repertoire in children who require special methods of instruction and whose lack of an imitative repertoire severely restricts their learning.

The adequacy of the research on imitation depends upon a number of issues. Sherman (1971) indicates the following: a) the amount of laboratory evidence supporting the assumptions of the theoretical accounts of imitative development, b) the number and quality of studies demonstrating the development of imitative behavior in children lacking such repertoires and c) the degree to which variables or conditions demonstrated to be functional in experimentally-producing imitative behavior are present in the normal environment of children.
Any behavior can be considered imitative if it follows immediately the behavior of another subject (called the model) and if the topography of that behavior is functionally controlled by the topography of the model's behavior and not by any other variable, then we can assert that there is a functional relation between both responses.

There are other criteria that have been established in order to consider a response like imitation. For example, Metz (1965) says that a response can be defined as imitative on the basis of the following: 1) the behavior must be similar and appear just after the presentation of the model's behavior; 2) the subject must respond differentially using the model's behavior as discriminative stimulus and 3) the subject's behavior must be under stimulus control.

For Parton and Fouts (1969) the imitation is explained in terms of a matching to sample procedure where the sample stimulus is the model's behavior and the comparison stimulus is the subject's behavior.

For Miller and Dollard (1941) the imitation is a process in which similar or matching actions are evoked in two persons in relation to adequate environmental signs. They make a distinction between two types of action that can be differentiated in the imitative responses. One is matching dependent behavior in which the leader is able to observe the signs provided by the environment but the follower is not able to observe them, and then will
depend on the leader to emit a response. The other type of imitation is called copy, in which the subject that copies should gradually approximate his response to one provided by a model and should also know that his act is an adequate reproduction of the model's act.

Following the analysis of the imitative behavior, there is another phenomenon where explanation is even more controverted and this phenomenon is the generalized imitation. This term is used to define situations in which a number of different responses of the model are matched under different conditions, very often in the absence of extrinsic reinforcement. Baer and Sherman (1964) note that this term can refer to 1) the performance of a response the first time that it is presented by the experimenter and in which the subject doesn't have previous training or 2) the continuous performance of a response for which the subject has never received reinforcement.

Peterson (1967) says there can exist four types of generalized imitation, and those are:

1) Imitative responses that are generalized toward different models that can vary in some characteristic such as age, sex, and physical appearance;

2) Imitative responses that are generalized to different settings;

3) Imitative responses which are maintained by various kinds of reinforcement;

4) Imitative responses which the subject emits without previous training.
The last type mentioned above is the one that has been studied more extensively as an example of generalized imitation. In order to explain why such a phenomenon occurs different theories have been postulated. Mowrer (1960) explained the generalized imitation in terms of the properties of conditioned reinforcers of the imitative responses that are emitted despite the fact that they do not have as consequence the presentation of an evident extrinsic reinforcement. For example, the secondary reinforcement that has been conditioned to the model's produced stimuli is generalized to the stimuli produced by the subject. Mowrer refers to the autistic kind of reinforcement as the basic procedure that maintain and generalize the imitative response. Then the generalization of the imitative behavior depends upon the transference of the imitative training to different situations and the performance of the imitative behavior becomes relatively independent of any kind of external reinforcement.

Another of the possible explanations that has been given is the one that assumes that if accurate reproduction of modeling stimuli is consistently reinforced, behavioral similarity *per se* acquires secondary reinforcing properties. This explanation is given by Baer and Sherman (1964) following the early theory of Mowrer.

Another alternative explanation is offered in terms of discrimination difficulty and schedule of reinforcement used. These explanations argue that the generalized imitation is due to the
fact that the few non-reinforced responses are mixed randomly with
the large number that are consistently reinforced, making it diffi-
cult for the subject to discriminate between the responses that are
reinforced and those that are not.

The last hypotheses that have appeared are basically based upon
the social control that is present in the acquisition of imitation,
and this social control is studied taking into account presence or
absence of the experimenter, visual contact and specific instructions
(Steinman, 1970; Martin, 1972).

In the next chapter an analysis will be made of each of the
different hypotheses.
CHAPTER II

EXPLANATORY HYPOTHESES

All interpretations so far proposed to explain the maintenance of generalized imitation can be classified under four hypotheses:

a) Conditioned Reinforcement
b) Discrimination Of Reinforcement
c) Response Class
d) Social Control

Conditioned reinforcement hypothesis. - Under this hypothesis can be included the explanation first given by Mowrer and followed by Sherman and Baer. They consider as mentioned before, that the similarity between the model's behavior and the imitative responses of the subjects is an important variable in the maintenance of generalized imitation. Thus a non-reinforced imitative response is probably emitted because the similarity between the model's behavior and the imitative response has acquired properties of conditioned reinforcement.

Discrimination of reinforcement. - This hypothesis was first proposed by Dollard and Miller (1941). It contends that imitation is produced under conditions in which matching other's behavior is reinforced. The imitation is nothing else but the performance of a discriminated operant where the stimulus generalization and differential reinforcement play an important role in the emission of
imitative behavior in the presence of other models and/or settings. Recently Bandura (1969) has said that the occurrence of generalized imitation is due to the fact that it is impossible to discriminate the reinforced responses from the non-reinforced ones. He says that "when a few non-rewarded responses are randomly mixed with a large number that are consistently reinforced, the two sets of modeling responses cannot be easily distinguished and consequently it is probable that they would be performed with similar frequency." (p. 236) This explanation is based upon the fact that the presentation of a non-reinforced imitative response is dependent upon how discriminable is the intermittency of reinforcement that is made contingent upon the imitative responses.

Response class hypothesis. - The authors who suggested this hypothesis were mainly Peterson (1968) and Gewirtz and Stingle (1968). They referred to the creation of a functional response class to explain why the responses that do not receive reinforcement, are performed and maintained. The definition of response class was given by Skinner (1966) and according to him a response class is determined by the discriminative and reinforcing stimuli that control the production of a specific behavior. If the imitative response, discriminated by stimuli that resemble the response requirement, has been initially reinforced in a continuous manner the posterior omission of reinforcement does not affect the members of that response class given that the discriminative control is still the same. In this context the schedule and proportion of
reinforcement during the training can determine the boundaries of
the response class and the generalized presentation of imitative
responses during the probe sessions. Consequently they do not con­sider that the similarity between responses is a fundamental
dimension in the maintenance of generalized imitation.

Social control hypothesis. - Steinman (1970) has mentioned the
importance that special reinforcement and instructions have in the
maintenance of this phenomenon. His experiments have shown that if
the subject had the opportunity to choose between imitation of a
reinforced response and imitation of a non-reinforced one, they
consistently chose the model that presents the reinforced sample and
didn't choose the model that presents the non-reinforced sample.
The same effect was obtained when the subjects were verbally in­
structed that they should not imitate the non-reinforced samples.
And from these findings Steinman concluded that the causes of the
generalized imitation had to be searched for in the social control
provided by the model through instruction and social reinforcement.
Bandura (1969) and Dollard and Miller (1941) also support the
relevance of sources of social control in the maintenance of
imitative behavior.

Others recognize the importance of the social reinforcement,
but they do not support the emphasis upon instructions. Martin
(1972) showed in his experiment that regardless of the instructions
given to the subjects they always imitate the samples that were
reinforced. Duran (1971) also sustained this point and showed the
relevance of the visual contact as a source of social control. Finally Ribes and Galvan (1973) concluded that the generalized imitation is nothing else, but a discriminated operant under control of social stimuli.
CHAPTER III

SKINNER'S POSITION WITH RESPECT TO IMITATION

Most of the authors that have studied the generalized imitation have put aside Skinner's position on the imitative behavior. Duran and Ribes (in press) discuss the analysis of Skinner of the "echoic repertoires", that include all the response classes that were treated until now under the title of imitation.

Skinner (1957) considers that the echoic behavior is a verbal repertoire under the control of antecedent verbal stimuli and generalized reinforcers, though echoic behavior can simultaneously produce specific consequences. His definition of verbal behavior and consequently of verbal stimuli, should not be restricted to the vocal dimension but include all the behaviors reinforced through the mediation of others, when the "listener's" behavior has been conditioned "...precisely in order to reinforce the behavior of the speaker" (p. 225). Skinner's definition of an echoic behavior is that of a "...verbal behavior...under the control of verbal stimuli" where "...the response generates a sound pattern" or any other stimulus dimension "...similar to that of the stimulus" presented (p. 55).

It is important not to confuse echoic behavior with some other response classes that share some common properties with it. These non-echoic response classes are those that being similar to the
stimulus, lack a precedent verbal stimulus of corresponding form; they are separated from the corresponding stimulus by a gap of time or are produced by explicit instructions (under mand control).

When Skinner did the analysis of echoic behavior there were not available data on generalized imitation but he advanced that "...echoic behavior is...exceptional in the extent to which novel occasions may give rise to accurate responses" (p. 64). The fact that a subject can emit a new echoic response without specific reinforcement, has been taken into account for two reasons: First, the formal correspondence between the stimulus and the response permits the reinforcement of minimal repertoires. Second, this formal correspondence between stimulus and response makes it easy to respond in the same way to a previously presented stimulus: "When some echoic behavior has been acquired, the acquisition of a new unit is simplified. Exploratory behavior may be narrowed. In acquiring an echoic repertoire the skillful speaker increases the chances that he will correctly echo new material be learning not to respond as he has already responded ineffectively" (p. 60).

In the next chapter an analysis will be made of the different experiments that have been done on the variables that can affect the maintenance of the generalized imitation. Those experiments will be grouped with respect to the different experimental variables.
CHAPTER IV

STUDIED VARIABLES; SIMILARITY

The variables that have been studied until now and are supposed to affect in one way or other the generalized imitation can be grouped as follows:

a) Similarity
b) Discrimination Of Reinforcement
c) Instructions
d) Social Control
e) Schedule Of Reinforcement

Similarity. - Many studies have as their main aim to indicate that the similarity between the model's behavior and the subject's behavior is the responsible variable in the maintenance of generalized imitation.

As examples of these we will cite:

Baer, Peterson and Sherman (1967) used three severely retarded children as subjects with a range of age between 9 to 12 years old. The definition of imitative behavior is all the responses that were topographically similar and that followed immediately in time the responses presented by the model. Generalized imitation was defined as every imitative response that was performed without previous training or consequent reinforcement.
The initial training in this study involved the use of reinforcement procedures to establish simple matching responses. They used a prompt and fading out procedure to establish imitative repertoires. Prompt was a procedure in which the experimenter manually guided or assisted the children through the desired behavior. As training on a particular response progressed the experimenter's assistance was gradually removed or faded out.

Once they established an imitative repertoire on the subjects, the next phase was presented and consisted of the presentation of new responses without reinforcement. In the first phase of the experiment the subjects increased their imitative repertoires from 0% to 100% of performance; with the criteria of just one presentation by the model and without any kind of help. In the second phase, the new non-reinforced responses were maintained on the same performance level as the reinforced ones.

They attributed this high performance level of imitative responses to that

"...topographical similarity between child and experimenter was there to be attended to by the child, and this similarity was potentially discriminative with the only reinforcement delivered in the experimental situation..." (and then)

"...similarity could be expected to take a positive reinforcing function as well as a discriminative function. As a positive reinforcer, it should strengthen any new behavior that produced or achieved it. Behaviors that achieve similarity between one's self and a model are, of course imitative behaviors; furthermore, they are imitative by function and not by coincidence."
Brigham and Sherman (1968) used three normal children of three years of age. The definition of imitative behavior is the same as given in the Baer, Peterson and Sherman (1967) study. The responses modeled were of verbal-vocal type. In this study, an experimenter demonstrated both English and Russian words to subjects. Accurate imitation of the English words was reinforced, while imitation of Russian words produced no consequences from the experimenter. In a later condition, reinforcement was no longer presented contingent upon accurate imitation of English words, but instead was presented after a minimum time period following an English-word imitation and finally there was a pairing of English words and reinforcement. In the first phase the English words as well as the Russian words were imitated correctly 100% of the times that they were presented. In the two subsequent phases the correct performance of both types of words (English and Russian) decreased considerably. The explanation that is given to these results, i.e., to the fact that the Russian words also were correctly imitated, is similar to the explanation given in the preceding study. The authors concluded that

"...during reinforcement of English imitation vocal productions which matched those of the experimenter were reinforced. Since vocal matching (similar auditory stimulus) preceded and was discriminative for reinforcement, it may have become a conditioned reinforcement" consequently "...improvement on the Russian words could have been a function of the increased amount of conditioned reinforcement involved in closer approximations to a good pronunciation..."
Lovaas, Berberich and Perloff (1966) used as subjects two six-year-old children diagnosed as mute schizophrenic. The definition of imitation and generalized imitation are also the same as mentioned in the above studies. The responses modeled were verbal-vocal. They used the same procedure of prompting and fading out in order to create an imitative repertoire in the subjects. Once that this repertoire was well established they introduce Norwegian words, that didn't receive any specific consequence. When these words were introduced their pronunciation improved during the sessions. Lovaas et al. interpreted these results as follows:

"Since the child was rewarded whenever he responded like the adult, similarity was consistently associated with food. Because of such association, similarity should become symbolic of reward. In other words, imitative behavior, being symbolic of reward, should eventually provide its own reward."

In another study, Hingtgen, Coulter and Churchill (1967) used two children six years old, considered schizophrenic of the autistic type.

They defined an imitative response as any response that was performed "...during the next 10" after the model's presentation and that the topography of the subject's responses would be similar to that presented by the model." They used three different types of responses to be modeled: a) use of the body; b) use of objects; c) verbalizations.

When the imitation of the subjects reached 100% of performance without any kind of help, the experimenters introduced new responses
in each one of the groups, and the subjects imitated 25% of them without any kind of help from the experimenter.

The authors concluded that by reinforcing the imitative responding of autistic children to simple samples presented by an adult, the imitation becomes rewarding in itself (generalized imitation) and in this way the children can learn new complex behaviors faster.

In another study by Parton and Fouts (1969) it was attempted to isolate similarity as an event that can be a reinforcement for the precedent behavior. In this case they used a matching to sample procedure in which the consequence that could be obtained after pressing the key by a subject, was a similar or a dissimilar color to that of the sample stimulus. They measured the number of matching responses under both conditions. When similarity was presented contingent to a different key, the formal pattern of responding was weakened and responding in the similarity programmed key increased.

Then they concluded that:

"...similarity served as a positive reinforcer (and/or dissimilarity served as a punishing stimulus) because differential responding to the comparison key was maintained by the consequence of similarity."

And they add that:

"...this research found that similarity as a stimulus consequence was a reinforcing event...consistent with the general thesis that for young children the reproduction of observed events is reinforced by the relational stimulus of similarity..."
In another study by Parton (1970) a replication was made of the study of Baer and Sherman (1964) where a puppet was used as a model. But Parton proposed that the results obtained by these authors are probably due to the verbal requirements given by the puppet to the children. So under this postulation he manipulates presence or absence of a modeling response, instructions and response reward, all controlled through the puppet. The children imitated almost 100% of the modeled responses under the three experimental manipulations. But it was found that the instructions did not affect significantly the imitative behavior. They say that this study gives additional demonstration that the children can reproduce the observed events. Now, with respect to the last manipulated variable, i.e., reward of the similarity and its transformation in a conditioned reinforcement, they conclude that:

"...one implication of the similarity hypothesis stems from a consideration of the effects produced by conditioned reinforcers. It is typically the case that the stimulus used to provide a neutral stimulus with a reinforcing function serves as a more effective reinforcer than does the previously neutral stimulus. It follows that the probability of subject matching responses maintained by praise should exceed the probability of subject matching responses assumed to be maintained by similarity of responding. Furthermore, when reinforcement (praise) is withdrawn the probability of generalized imitation should decline faster than imitation of the responses previously reinforced with praise..."

Consequently, the studies that try to find out the role of the similarity in the maintenance of the imitative responses should
require use of subjects that lack a reinforcement history for reproduction of behavior.

Finally, an important study by Peterson (1968) will be cited. In this study the author tried to find out whether or not the similarity between the model's responses and the subject's behavior is the responsible dimension for the maintenance of the non-reinforced imitation.

The way that he tested this question was to teach to a retarded child a series of non-imitative responses, and introducing between them another series of imitative responses. He just gave reinforcement for the imitative behaviors.

The results show that despite the fact that the non-imitative responses did not receive reinforcement, they were performed at the same level that the imitative ones were. From these results, the author concluded that the similarity is not a necessary condition for the performance of non-reinforced behaviors.

Some of the studies of the role of the similarity in the maintenance of the generalized imitation do show the influence of this variable; but always is suggested a possible interference of other variables that can be responsible for the mentioned findings. And as can be concluded from the last study, it is probably that the role of the similarity is not one of the more importants in the maintenance of generalized imitation.
CHAPTER V

DISCRIMINATION OF REINFORCEMENT

The next variable to be analyzed through different studies is the Discrimination of Reinforcement. As it was mentioned before, this problem refers to the fact that perhaps the maintenance of generalized imitation is due to a lack of reinforcement discrimination, i.e., that the subjects fail to discriminate between the responses that are reinforced and the responses that are not.

Thus the results from the study mentioned before by Parton (1970) are interpreted in the sense that:

"...generalized imitation occurs when the subject cannot discriminate between the reinforced and non-reinforced responses..."

Another study that is included under this point is the one by Metz (1965), who used as subjects two schizophrenic children (boy and girl). The definition of imitation and generalized imitation is the same. They exposed the subjects to six different experimental conditions; and these are: a) Pretest, b) Preliminary training, c) Early test, d) Intensive training, e) Later test, and f) Post-test.

They measured the number of imitative responses that were emitted by the subjects during the four different test periods mentioned above. The imitative responses were verbal-vocal. The reinforcements used were social reward, tokens and food. The
subjects were presented with a series of responses to be imitated, and which if imitated could have as consequences either one of the reinforcers or all three of them. Together with this series of responses another series of non-reinforced ones was mixed, which was presented during each testing session in order to determine if the non-reward could produce extinction of the generalized imitation.

The results show an increase in the responses of generalized imitation for both subjects. The authors concluded that a) the autistic children can learn to imitate; b) the learning can be generalized to new behaviors that had not received any kind of training and c) the generalized imitation can persist inside a reinforcement context for other imitative behaviors, without specific reinforcement.

The authors did not interpret the finding of the experiment in terms of a failure in the reinforcement discrimination, but taking into account the procedure characteristics it is possible that this was the case. Any way, there is a criticism that can be made to the procedure used, and it is that during one of the testing sessions social reinforcement was made contingent after each imitative behavior, and for this reason it is possible to object that the fact that imitative behavior did not decrease to 0% was due to the social approval developing some properties of reinforcement. Baer, Peterson and Sherman (1967) considered that due to the lack of a real extinction and some other experimental manipulations, it is very difficult to argue that the high
percentage of imitation (of new responses and non-reinforced responses) is due to the reinforcement of imitative responses during training.

Steinman (1970) reported a study where he attempted to determine when and why the children imitated the S-delta as a consequence of a failure to discriminate the contingencies associated with different modeled responses.

He used two four-year-old normal children. There were two kinds of trials in each session: simple presentation and choice. In the choice trials an experimenter presented the samples to be imitated giving the instruction "do this" and another experimenter presented different samples to be imitated giving the instruction "or do this". The choices were of two types: 1) choice of $S^D$ responses paired with another $S^D$ response; 2) choice of an $S^D$ response paired with an S-delta response.

The results showed that during the simple presentation trials the children imitated the non-reinforced responses (they did not have an alternative reinforced response), but they consistently imitated the reinforced response in the choice trials. From this data the author concluded that:

"...certainly discriminative complexity can be a functional variable of the generalized imitation, as it is in any discrimination situation. As a matter of fact the results form the choice procedure...indicate that the discriminative control of an imitative repertoire, is a function of the discrimination requirement...However the hypothesis of reinforcement discrimination does not clearly
explain why the responses that are obviously discriminated as S-delta are still imitated under the trial by trial procedure, typically used in the experiments about generalized imitation."

In another experiment, Steinman (1970) studied the effect of another three variables that are supposed to control the generalized imitation. The second variable studied as the failure to discriminate between reinforced and non-reinforced responses. He used as subjects normal girls with a range of age of 7 to 9 years, that were selected from a public school. One experimenter presented just the reinforced responses and the other one presented just the non-reinforced ones. As in the above mentioned study, they have simple and choice trials. In the choice trials the experimenters were seated in front of the subjects during and between trials. The experiment has six phases: A) single trial presentation; B) simple and choice trials; C) simple trials; D) same as B; E) the subjects are instructed to imitate the trials that they want to; F) no instructions and presence of both experimenters.

The results show that the girls imitated all the modeled responses when there was not any possible alternative of reinforcement, even though the results obtained from the choice trial clearly showed that the subjects could discriminate between reinforced and non-reinforced samples. The data are obviously in disagreement with the discrimination hypothesis and the conclusion given by the author with respect to this result is similar to the one cited in the precedent study.
Finally, another study of the same author (1970) attempted to probe beside the anterior question, that the generalized imitation is a by-product of the discrimination procedures used in the experiment.

The subjects were four normal children, 5 years old. He used again simple and choice trials. The experiment was divided into seven phases: 1) simple trials without S-delta, 2) choice sample trials, with possibilities of election between two $S^D$; 3) same as one with a DRO 0"; 4) extinction; 5) choice trials, between an $S^D$ and an S-delta, 6) simple and choice trials and 7) the same as 6, with the difference that the S-delta samples became $S^D$ and vice versa.

The results showed that the subjects acquired the imitative behavior during phases 1 and 2. The DRO procedure did not produce any disturbance on the imitative behavior while the extinction was more effective, decreasing the imitative behavior. During the choice trials the performance of responses in the presence of a S-delta sample slowly decreased, and the performance of the responses in the last phase is not affected by the contingencies change.

"The results indicated that the generalized imitation effect can be a function of specific discrimination procedures used to study the effect. When the simple trials were used a generalized imitation effect was obtained. However, when in the same sessions the subjects could choose between an S-delta and an $S^D$ the discriminative control was clearly evident..."
And, he concluded that the discrimination hypothesis is totally inadequate to explain the generalized imitation effect.
CHAPTER VI

INSTRUCTIONS

The variable that it is going to be examined now is the use of instructions during the training and acquisition of an imitative repertoire, and how the use of instructions can affect the generalized imitation.

Some authors consider that the use or not of instructions during the acquisition period of the imitative repertoire is not a very important factor and that it does not interfere with the process that is taking place.

But this author considers (as has been pointed out before) that the behavior that is under mand control ("do this") is not behavior under imitative control alone but under instructional control, and as Skinner specifies is important not to confuse echoic behavior with some other response classes that share some common properties with it. These non-echoic behaviors are those that "being similar to the stimulus, lack a precedent verbal stimulus of corresponding form, are separated from the corresponding stimulus by a gap of time or are produced by explicit instructions (under mand control)" Skinner, 1957, (p. 55). Despite this, most of the studies have used instructions in order to establish a repertoire supposed to be imitative. Only a few authors have performed their experiments without the use of instructions (Peterson, 1968; Burges, 1968; Duran, 1971).
There are other authors such as Steinman (1971) who have considered the function of the instructions in the imitative behavior, but having a different role, mainly referred to the discriminative control of reinforced and non-reinforced responses. That is, he is interested in knowing what is the effect of the instructions when the subjects are instructed to stop imitating the responses that are not reinforced.

Another author (Burges, 1968) suggested that the reinforcement system (or consequences of imitation) and instructional systems may be related to each other in two ways. They may be congruent, i.e., the instructional stimuli are reliable indicators of the consequences associated with imitation or non-imitation. Or they can be incongruent, i.e., the consequences for imitation are not the ones specified by the instructions.

Consequently different experiments support each point of view; we will cite just a couple of them.

Steinman (1970) reported a study where besides presenting one choice trial, the subjects were instructed to stop imitating S-delta samples presented during the simple trial. After these instructions were given, the subjects presented appropriate differential responding in the simple trials as well as in the choice ones.

During the simple presentation procedures, (the procedure used almost exclusively in generalized imitation experiments) instructions and other social variables can be responsible for
the continuing responding in presence of the S-delta samples. The instructions given either explicitly before each trial or just in the initial trials, can function at least in two ways: 1) as discriminative stimuli for specific responses and 2) as setting events, specially when they are combined with the other social factors in the situation such as the continuous presence of the person who provided the instructions. That is, the instructions can provide an additional control system derived from the child's history with respect to following instructions from an adult.

Steinman (1971) used the same experimental design, with the difference that the instructions to stop performing non-reinforced responses were less specific. Thus the children were instructed "...does not matter if you do or don't do the responses that do not have token...", etc. In the first phase the children stopped imitating completely the non-reinforced samples, but in the phase with less specific instructions, they began to imitate the non-reinforced responses. And finally, when the only instruction given before each response was "do this" all the subjects began to respond as usual.

Martin (1972) conducted another type of study under the point sustained by Burges. He used as subjects three children severely retarded of 7 to 12 years old. He did a thirteen-phase experiment. In eight of these phases, the instructions administered by the experimenter before demonstrating a behavior and the consequences for imitative behavior were incongruent.
He found that consequences rather than instructions controlled imitative behavior when a) subjects were instructed not to imitate but received reinforcement if they imitate; b) subjects were instructed to imitate but were differentially reinforced for other behavior; c) subjects were instructed to imitate but were verbally reprimanded for imitation...

"although subjects were highly imitative at the beginning of the study, when there was no reinforcement for imitation subjects gradually stopped imitating when instructed not to imitate." ..."This experiment has shown that it was very difficult to eliminate a well-established behavior that was under instructional control."

These are some of the few studies that work manipulating the instructions in a very specific way, while most of the other studies cited until now use instructional control to establish an imitative repertoire, despite the fact that the effects of that variable are not well determined yet.
CHAPTER VII

SOCIAL CONTROL AND CONCLUSIONS

The effects of the different variables grouped under the title of social control has been first analyzed by Bandura (1965) in a series of studies working mainly with control of the behavior through vicarious reward. The vicarious reward is the name of the "reward" obtained through the observation of another subject that is being extrinsically rewarded.

We will review three of these studies in order to provide an idea about the conceptions that are sustained by them.

Bandura (1965) realized an experiment where he tried to probe the hypothesis that the reinforcement given to a model affects just the performance of the observing subjects but it does not affect the acquisition of the matching responses. He used different groups of children. They were exposed to the exhibition of a film that showed an aggressive model, who received any of these consequences: reinforcement, punishment and non-consequence.

After they observed the film, the children were taken to a similar setting as shown in the film and the amount of responses emitted by the subjects were recorded. The results shows that the amount of responses emitted by the subjects were influenced by the type of consequences that each one observed in the model, i.e., the children that observed the punished model performed significantly
less matching responses than the children of the other group. After this the experimenter offers them attractive reinforcers if they do whatever the model did. Under this condition all of the children presented similar amounts of imitation. Bandura makes the analysis of the data in the sense that:

"...in any social group the models exhibit the cultural repertoires that has had more success, under specific stimuli, consequently, matching other persons, specially superiors in age or status, will increase the positive reinforcement and decrease aversive contingencies for the response."

Liebert and Fernandex (in press) used exactly the same design cited above, with a small variation in the task, their results are similar to those found by Bandura, and when they make the analysis of the data also recall the social aspect of the imitation, saying that:

"...the results show reliable effects of the vicarious consequences, which have different implications for various practices of socialization. Directed toward the educational efforts as an example, the data support the point of view that correctly repeat the demonstrations of others can be facilitated through the vicarious reward..."

In general, that is the point of view sustained by Bandura and followers. However, as it was mentioned before there are some other authors more objective in the analysis of the social control of the generalized imitation.

Steinman (1970), for example, postulated that social control of behavior is powerfully exerted by an adult who frequently reinforces the child for imitative responding whereas that type of
control is not exerted by another adult who is not associated with such a history of reinforcement. Thus, adult models who frequently dispense reinforcement are more likely to be imitated than models who have no such history of reinforcement.

"It is important to note that in many of these experiments the imitations are all S-delta imitations, since no direct reinforcement is given for imitating. Similarly, in the present experiment, the marked effectiveness of the instructions not to perform S-delta imitations demonstrated how readily the children can be controlled by social stimuli."

It can be concluded that if the instructions given to the subjects to stop imitative responding to S-delta stimuli are followed quickly and completely, it could be expected that opposite instructions ("do this") would be enough to maintain imitative responding.

Finally, we will mention the study by Peterson (1971). In one of the phases of this experiment the model left the room after the presentation of the sample to be imitated and gave this instruction: "I am going to do things as before, but then I am going to leave the room, I don't want you to do anything until I leave the room." In the next phase, the model remained in the room without providing any consequences to the behavior of the child; he just modeled the responses. During the absence of the experimenter the imitative behavior decreased rapidly; and in the next phase with the experimenter present, but with presentation of rewards, imitative behavior increased to a very high level. Thus
Peterson concluded that the experimenter's presence can function as a setting event and that it

"...can be possible that these setting events are functioning together with another experimental variable."

Summarizing, from all the studies that have been reviewed, we can say that there are at least three variables that have been shown to be relevant to the maintenance of the generalized imitation:

1. Setting events such as experimenter presence or absence (Peterson, 1971) and instructions (Steinman, 1969).

2. Discriminative stimuli that imply the demonstration of a specific response (Peterson, 1968).

3. Consequences of the behavior (Lovaas et al., 1966).
CHAPTER VIII

NEW PERSPECTIVES

Recently a new explanation has been given to account for the generalized imitation effect (Duran, 1971). It is postulated that the generalized imitation is not an independent phenomenon that exists away from the characteristics that distinguish the operant responses; and basically what is probably happening is that the generalized imitation is nothing else but an effect of resistance to extinction. The class and quantity of the responses imitated during extinction can be determined by the differential reinforcement given to the subject during training; thus a subject who has been reinforced for a wide variety of responses during training will emit more different responses during extinction than a subject that has been trained just in a specific and restricted response class. This point perhaps could be supported with the following proposed experimental designs.

Design:

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Two subjects for each condition, the phases I, III, V and VII should last for 5 days each; II, IV, VI, and VIII should last 15 days each. Each trial should be of 20 seconds, i.e., three trials by minute.

From this experiment it is expected that the subjects will present more resistance to extinction in phase IV than in phase II, as a result of the intermittence in the presentation of reinforcement. It is also expected that the subjects under a VR will present a higher rate of imitation than the subjects being reinforced on a FI schedule, an effect which will consequently be shown in extinction.

Experiment II. - "Generalized imitation" as a function of variability of the response class. Same number of subjects, and the same type of reinforcement as in Experiment I. Independent Variable: Homogeneous Response Class (20) HOM; Heterogeneous Response Class (20) HET. Dependent Variable: Twenty responses (HOM or HET) previously reinforced. The distribution of subjects and time of each phase is the same as in Experiment I.
The result expected in this experiment is that the subjects who are reinforced for HOMHET responses will present a wider variety of responses under extinction than the subjects who have been reinforced only for HOM or HET.

Design:

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If both types of results are obtained as predicted, then it can be concluded that the truly responsible variables for the so called "generalized imitation" are the effect of resistance to extinction in combination with the range of variability of the response classes being reinforced; i.e., a child that is reinforced often for the same class of imitative response will present less imitative responding than another child who is reinforced less often, but for a wider variety of imitative responses.
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