

# Effects of Vicarious Consequences on Children's Imitation in the Two-choice or Four-choice Picture Preference Task

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## ABSTRACT

The present study was designed to compare the effects of vicarious consequences on young children's imitation and recall of 12 pictures preferences of an adult in the two-choice task and the four-choice task. As predicted, the vicarious punishment group recalled fewer of the model's responses in the four-choice task than in the two-choice task, while the vicarious reward group and the no vicarious consequence group recalled the responses equally well in both the two-choice task and the four-choice task. In contradictions to the predictions of an informational analysis of vicarious consequences, the type of vicarious consequences did not differentially affect the imitation of the model's responses in both the two-choice task and the four-choice task.

In the past two decades, many investigators have expressed considerable interest in the components of the imitation or modeling process. The main focus of the earlier studies was on the effects of vicarious consequences on the observer's subsequent performance and acquisition of the modeled behavior (Flanders, 1968; Thelen & Rennie, 1972).

Most of the studies that have investigated the effects of the observation of response consequences to a model have been interpreted to suggest that such consequences have little or no influence on the acquisition of imitative responses but merely influence performance of such responses (Bandura, 1965, 1969). In his study, Bandura (1965) found that children who observed a model punished for a series of aggressive responses performed fewer of the model's responses than children who either observed a model rewarded or receive no consequences for those responses. Yet, when the children were asked to reproduce the modeled responses, all three groups reproduced the responses equally well. On the basis of the results, Bandura (1965) concluded that vicarious consequences influenced the observer's performance but not the acquisition of imitative responses.

However, Liebert and Fernandez (1970) reasoned that vicarious consequences should influence both the performance and acquisition of modeled responses. They hypothesized

that vicarious consequences, positive or negative, provide two closely related bits of information: first, enhancement of the observer's attention to the model's performance and, second, inference by the observer of likely outcomes for similar performance. Based on their hypothesis, Liebert and Fernandez (1970) predicted that vicarious reward and vicarious punishment, respectively, would increase and decrease the observer's imitative performance of the model's responses. With respect to the acquisition of the model's responses, it was predicted that recall of the model's responses would be higher for the subjects who observed the model receive either reward or punishment than for those who observed the model perform without consequences. Using a commodity preference task and recall as the measure of the acquisition of the model's responses, Liebert and Fernandez (1970) confirmed their predictions. They proposed a possible explanation of this discrepant findings. When the responses are the simple or interesting responses such as aggressive responses in the Bandura's study (Bandura, 1965), the model's responses themselves attract the observer's attention and recall is high regardless of consequences to the model; but when the tasks are relatively complex or uninteresting tasks such as the ones used in their study, reward and punishment to the model attract the subject's attention to the model's responses and facilitate recall.

It should be noted that the task used by Liebert and Fernandez (1970) involved a two-choice situation in which a model was required to choose the preferred item of each of 12 different pairs. If vicarious consequences provide an observer the information that the response eliciting reward is to be performed and the response eliciting punishment not to be performed, vicarious reward should lead to the observer's choice of items chosen by the model and vicarious punishment to the choice of the other items not chosen by the model. Since the other item of each pair is the only one in a two-choice situation, vicarious punishment would be at least as effective as vicarious reward in terms of the information conveyed. In contrast, it is reasoned that vicarious punishment will be less effective than vicarious reward in a multiple-choice situation in which the other items consist of more than two items because vicarious punishment cannot inform the observer which one of the other items to be chosen. The present study was designed to compare the effects of vicarious consequences on imitative performance and recall in a two-choice and a four-choice preference task.

On the basis of the foregoing reasoning, it may be predicted that the observers exposed to a punished model in a four-choice preference task will recall fewer of the model's responses than the observers in a two-choice preference task because vicarious punishment in a four-choice preference task should enhance the observer's attention to the other items not chosen by the model. On the other hand, vicarious reward and no consequences will not differentially affect the recall of the model's responses by the observers in a two-choice and a four-choice preference task. To actively avoid imitating the model's choices, the observer must recall those choices. Thus, if vicarious punishment decreases the recall of the model's choices by the observers in a four-choice pref-

erence task, then the observers in a four-choice preference task will be more likely to imitate the model's choices than the observers in a two-choice preference task. The effects of vicarious reward and no consequences on the imitative performance will not be affected by the number of items used in a preference task.

## METHOD

### *Design and Participants*

A 3×2 factorial design was employed, involving three levels of vicarious consequences (vicarious reward, vicarious punishment, and no vicarious consequences), and task condition (two-choice or four-choice preference task). The subjects were 36 boys and 36 girls drawn as available from two private day care centers in Naha City. They ranged in age from 3 years 11 months to 5 years 5 months, with a mean of 4 years 7 months. Six boys and six girls were at random assigned to each of six groups. An adult female served as a model, and an adult male as an experimenter.

### *Task*

The preference task consisted of 12 monochromatic slides, and each of them presented two or four line drawings of things that seemed to be familiar to the younger children. As is shown in Table 1, items within each slide were selected for conceptual similarity although these characteristics varied between slides. After the subjects observed the model indicating which of the items on each slide she preferred, they were asked to indicate which of the items in each of 12 slides they preferred (imitative performance test) or the model had preferred (recall test) as each slide was projected on

TABLE 1

Items used for the two-choice or four-choice preference task

Two-choice task		Four-choice task	
1. Goldfish	Crab	Turtle	Octopus
2. Dog	Rabbit	Elephant	Giraffe
3. Scissors	Knife	Saw	Hammer
4. Butterfly	Dragonfly	Ladybug	Cicada
5. Spoon	Glass	Plate	Teacup
6. Clock	Television	Camera	Telephone
7. Morning-glory	Sunflower	Dandelion	Lily
8. Car	Truck	Ship	Airplane
9. Apple	Grape	Banana	Strawberry
10. Shoes	Slippers	Boots	Sandals
11. Clarinet	Drum	Tambourine	Guitar
12. Chair	Desk	Cabinet	Dresser

a 62×82 centimeter translucent screen. In this experiment the position of items in each slide and the order of presentation of the slides were at random determined for all the subjects with the restriction that for the subjects in the two-choice preference task the model chose the left item for half the slides and the right item for the other half, and that for the subjects in the four-choice preference task the model chose equally the item in each position across the slides three times. The particular items the model chose were counterbalanced within items used for the two-choice preference task regardless of whether the subject was assigned to the two-choice or four-choice preference task condition.

### *Procedure*

Each subject was individually escorted to the experimental room by the experimenter. On the way to the experimental room, the experimenter explained to the subject that he or she was going to see some pictures. The model was waiting in the room when the experimenter and the subject arrived. After the subject was simply introduced to the model, the model was seated at the table on which the screen was put and the subject was seated about sixty centimeters behind and to the left of the model so that he or she had a clear view of the model, the experimenter, and all the items on the screen. The experimenter then suggested that the model would go first and he in turn gave the model the following instructions: "I am going to show you some pictures on the screen. In each picture there will be two (or four) things. When the picture comes on I want you to point with this pointer to the thing in the picture that you like best." After these instructions given to the model, the experimenter turned to the subject and said, "This time you just watch what the model is doing." Each of 12 slides was then projected for 10 seconds. As each slide appeared, the experimenter asked the model, "Which of the things do you like best?" Approximately 2 seconds after the slide appeared, the model made her choice, without any verbalization, by pointing to the predesignated item and holding the pointer in position until the slide changed.

In the vicarious reward condition, following each of the model's choices, the experimenter remarked, "Yes, that's a good choice. I like that one, too." In the vicarious punishment condition, each of the model's choices produced parallel disapproval, that is, "No, that is not a good choice. I don't like that one." For the subjects in the no vicarious consequences condition, the experimenter merely responded to each of the model's choices with the statements, "Now we'll go on to the next one."

After the model had completed all 12 choices, she took a seat toward the back of the room. Subsequently, the subject was seated at the table and tested for both the performance and the recall of the modeled responses. In the imitative performance test, the experimenter said to the subject, "Now I am going to show you the same pictures again. I want you to point with this pointer to the thing in the picture that you like best." Then the subjects were shown each of 12 slides in the order different from the

one shown for the model. As each slide was projected in sequence according to the subject's pace of responding, the experimenter asked the subject: "Which of the things do you like best?" No verbal comments were administered to the subject's responses. For the recall test, the experimenter showed the 12 slides again but in the order different from the one shown for the imitative performance test with the statements: "Now I am going to show you the pictures one more time. This time I want you to point to the thing that the lady (model) liked best." Then, as each slide was projected in sequence, the experimenter asked the subject: "Which of the things did the lady like best?" Regardless of the correctness of the subject's responses, the subject always received from the experimenter the verbal comment: "That's right." When the tests were completed, the subjects were thanked for their participation and they returned to their playroom. The entire procedure required approximately 12 minutes.

## RESULTS

### *Test of imitative performance*

For each group the mean and standard deviation of the number of choices made by the subject that matched the model's choices are presented in Table 2. A 3 (vicarious consequences)  $\times$  2 (task condition)  $\times$  2 (sex of subject) analysis of variance was performed on the subject's matching responses. The analysis yielded a highly significant main effect for task condition ( $F=20.75$ ,  $df=1/60$ ,  $p<.001$ ), with the subjects in the four-choice task condition matching less of the model's choices ( $M=2.39$ ) than those in the two-choice task condition ( $M=5.11$ ). Although the subjects who observed a rewarded model tended to match the model's choices ( $M=4.71$ ) to a somewhat greater extent than did those

TABLE 2

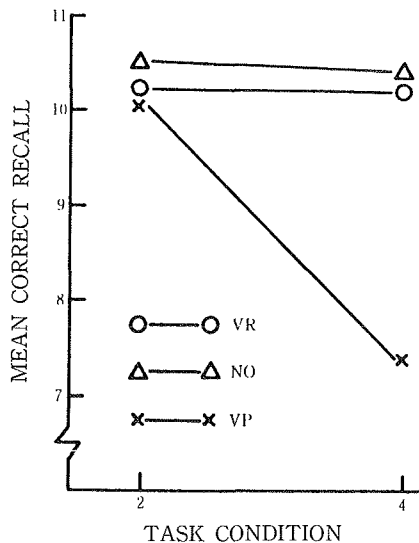
Means and standard deviations of matching responses for all groups

Vicarious consequences	Two-choice task			Four-choice task		
	Boys	Girls	Combined	Boys	Girls	Combined
Vicarious reward	5.67 (3.08)	7.00 (3.16)	6.33 (3.06)	3.67 (3.08)	2.50 (2.88)	3.08 (2.91)
No Consequences	4.17 (2.32)	5.33 (3.45)	4.75 (2.86)	1.50 (1.38)	1.50 (1.76)	1.50 (1.51)
Vicarious punishment	4.50 (2.81)	4.00 (2.61)	4.25 (2.60)	2.50 (1.38)	2.67 (1.03)	2.58 (1.17)

whose model received punishment ( $M=3.42$ ) or no consequences ( $M=3.13$ ), suggesting an increase in imitation as a result of vicarious reward, the main effect for vicarious consequences fell short of significance ( $F=2.65$ ,  $df=2/60$ ,  $.10 > p > .05$ ). Any other main effect and interaction effects were not significant.

### *Test of recall*

The model's choices correctly recalled by the observer were also subjected to a three-way analysis of variance. Although the large differences of matching responses between the subjects in the two-choice and four-choice task condition was substantially reduced in recall, the subjects in the four-choice task condition still were less likely to recall the model's choices correctly ( $M=9.36$ ) than were the subjects ( $M=10.28$ ) in the two-choice task condition ( $F=3.81$ ,  $df=1/60$ ,  $.10 > p > .05$ ). The main effect for vicarious consequences was significant ( $F=5.25$ ,  $df=2/60$ ,  $p < .01$ ). In order to determine more specifically the effects of vicarious consequences, a series of Tukey follow-up comparisons were conducted. These comparisons revealed that subjects who observed the punished model ( $M=8.75$ ) recalled the model's choices significantly less than did subjects who observed the model receive a reward ( $M=10.25$ ) and perform without consequence ( $M=10.46$ ) from the experimenter ( $p < .05$ , for both comparisons). The latter two groups did not differ from each other. There was also a significant interaction between vicarious consequences and task condition ( $F=3.48$ ,  $df=2/60$ ,  $p < .05$ ). An examination of the interaction, which is presented graphically in Fig. 1, reveals that the main effect for vicarious consequences is accounted for by this interaction. Specifically, whereas there



**Fig. 1.** Mean number of correct recall of the model's choices for each of vicarious consequence groups in the two-choice or four-choice preference task condition. VR, NO, and VP refer to the vicarious reward group, the no vicarious consequence group, and the vicarious punishment group, respectively.

was no difference in the recall of the model's choices among all of the vicarious consequence groups in the two-choice task condition, the vicarious punishment group recalled the model's choices less than the vicarious reward group and the no vicarious consequence group in the four-choice task condition ( $p < .05$ , for both comparisons). Furthermore, there was no difference in the recall of the model's choices as a function of the two-choice or four-choice task for both the vicarious reward group and the no vicarious consequence group, while the subjects in the four-choice task condition recalled the model's choices significantly less than the subjects in the two-choice task condition for the vicarious punishment group ( $p < .05$ ).

## DISCUSSION

The results of the present study indicated that the effects of vicarious consequences on the observer's recall of the model's choices were influenced by the number of items used in the preference task. As predicted, the vicarious punishment group recalled fewer of the model's choices in the four-choice task than in the two-choice task, while the vicarious reward group and the no vicarious consequence group recalled the choices equally well in both the two-choice task and the four-choice task. The difference between the two-choice task and the four-choice task in the amount of the recall for the vicarious punishment group provides support for the reasoning underlying the present study, and suggests that the results of the recall obtained by Liebert and Fernandez (1970) must be limited to a two-choice situation. The poorer recall of the vicarious punishment group in the four-choice task may be explained by the interpretation that the more the number of items are presented to the subjects, the greater attention the subjects are likely to pay to these items because of their initial preference. However, this interpretation cannot explain why the recall of both the vicarious reward group and the no vicarious consequence group were not influenced by the number of items presented in the preference task. Thus, it is reasonable to interpret that the vicarious punishment group in the four-choice task paid the greater attention to the other items not chosen by the model because the information provided by vicarious punishment permitted the subjects to infer the negative outcomes which they would receive for similar performances.

There were no differences in the recall of the model's choices among all three vicarious consequence groups in the two-choice task. These findings support the results of Bandura (1965) and several previous studies that found a similar pattern of results (Peed & Forehand, 1973; Spiegler & Liebert, 1973; Sato & Sato, 1978) rather than Liebert and Fernandez (1970). Since the present study and these previous studies used a procedure similar to that one used by Liebert and Fernandez (1970), several questions are raised as to why their results were not replicated. First, as Peed and Forehand (1973) pointed out, Liebert and Fernandez (1970) combined the results from the vicarious reward group and the vicarious punishment group during the recall and compared

these combined results with the no vicarious consequence group to find a significant difference in the amount of the recall. Consequently, they found the small differences between the means of the groups which received vicarious consequences (reward and punishment combined) and the group which received no vicarious consequences to be on the order of one response out of twelve responses. Nevertheless, these differences were significant because the recall was quite high in all three vicarious consequence groups, and, hence, the variance within each group was extremely small. Thus, the method of analysis used by Liebert and Fernandez (1970) may be responsible for their results. Secondly, the meaning of the disapproval given to the vicarious punishment group of the Liebert and Fernandez study (1970) should be considered. In their study, after each of the model's responses, the experimenter expressed the following disapproval: "No, that is not a good one. I like the other one best." It seems that such disapproval would suggest to the subjects not only the incorrect or undesirable response not to be performed but also the correct or desirable response to be performed in each of pairs. The present study and the previous studies cited above did not use such disapproval as suggesting the other item to be chosen and found any differences in the recall among the vicarious consequence groups. Furthermore, there is evidence that the type of the vicarious right and wrong feedback combinations may be more effective to facilitate learning of the correct responses than the type of the vicarious nothing and wrong feedback combinations (Tamase & Hamamoto, 1978). Therefore, use of the feedback similar to the type of the vicarious right and wrong feedback combinations may be responsible to improve the recall of the vicarious punishment group in the Liebert and Fernandez study (1970).

The fact that the subjects performed fewer of the matching responses in the four-choice task than in the two-choice task regardless of the type of vicarious consequences suggests the likelihood that an occurrence of the imitation may be overestimated in the previous studies using a two-choice situation. Particularly, from the results of the vicarious reward group, it should be noted that there is a greater tendency of the children to choose the item which they mostly preferred according to their initial preference, even when they can infer to receive the positive outcomes by performing the same choices as the model's choices. Although the subjects exposed to the vicarious reward tended to produce more matching responses than those who observed the no vicarious consequences or the vicarious punishment, the differences were not significant in both the two-choice task and the four-choice task. These results are presumably attributable in part to the increased matching responses of the vicarious punishment group. Although the reason for failure to find the differences among all three groups even in the two-choice task is not apparant in the present study, one possible explanation involves developmental changes in the effectiveness of the vicarious consequences. Recently, Sato and Sato (1980) reported the results that suggested a developmental difference in the children's modes of processing the information conveyed by the vicarious consequences. That is, for the older children with a mean age of 6 years 6 months, all of the differences among



the three vicarious consequence groups were significant, while for the younger children with a mean age of 4 years 5 months, there was no difference between the vicarious reward group and the no vicarious consequence group, which were both superior to the vicarious punishment group. Their findings are inconsistent with the results of the Bandura study (1965) and the present study with the children corresponding to the younger children of the Sato and Sato study (1980), but are consistent with the results of the Liebert and Fernandez study (1970) with the children corresponding to the older children of the Sato and Sato study (1980). Considering these discrepant findings, it is more important that further studies be conducted to examine the effectiveness of the vicarious consequences in detail from the developmental point of view.

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