SOME DETERMINANTS OF RESPONSE IN THE ASSESSMENT OF SNAKE FEARS

by

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ABSTRACT

To evaluate a number of procedural factors important in assessing treatment success in animal phobia research, the following variables were studied using live and stuffed harmless garter snakes: mundane reality of the feared object (live versus stuffed), pre-experimental estimates of fear, social context on behavior approach trials, sex of subject, and post-experimental assessment of fear of the phobic object. Forty-eight male and 48 female undergraduates enrolled in various psychology classes, who had indicated "some" "much" "very much" or "terror" of snakes on a Fear Survey Schedule were included. Each subject was individually asked by one male experimenter to approach both a live and a stuffed snake presented separately in a runway approach test. Multiple measures of fear were included.

A reinterpretation of the study done by J. E. Marcia, J. S. Efran, and B. M. Rubin "Systematic desensitization: Expectancy change or counter-conditioning?" which compared the effectiveness of systematic desensitization with a placebo therapy as assessed by subjects approaching specimen animals is given. Other results are discussed.

INTRODUCTION

Over the past 13 years, many investigators have attempted to demonstrate the efficacy of various treatment procedures by comparing subjects' (Ss') pre-treatment and post-treatment fear of harmless snakes. Much research of this kind has evaluated the effectiveness of systematic desensitization (SD), a treatment procedure first described by Wolpe (1958). Reasons given for using snakes as the phobic stimuli in these studies include: 1) the availability of snake phobic Ss, (Lang and Lazovick, 1963, p. 519; DeMoor, 1970); 2) the availability and ease of controlling the feared object; 3) the advantage of testing a phobia which does not constitute a major life problem; 4) the assumption of psychoanalytically oriented writers that such fear represents a fundamental personality conflict (Lang and Lazovick, 1963; Harper, 1959, p. 34); and 5) the facility with which SD can treat such fears.

Two studies using amount of snake and spider fear in assessing the effectiveness of different treatment procedures were performed by Efran and Marcia (1967) and Marcia, Efran and Rubin (1969). The first of these studies demonstrated the effectiveness of a placebo treatment (T-scope therapy) when Ss were given a high expectancy for

post-treatment improvement, relative to a low expectancy condition and to no treatment controls.

In the second study, SD was compared with T-scope therapy. Comparable results were found for SD and the placebo procedure when the latter was administered in a manner producing a high expectation for improvement: the central measure of treatment effectiveness was Ss' ability to approach and handle a stuffed animal specimen (either snake or spider) before and after treatment. Although the results may well have indicated that both procedures were equivalent in successfully treating these animal phobias, it is also possible that the results were biased by procedural artifacts. To date, there have been some published articles criticizing the methodology employed in the Marcia et al. (1969) work (e.g., Rimm, 1970), but one seemingly crucial artifact which may have been responsible for their obtained results has been overlooked.

It seems plausible that had the experimenters (Es) tested fear using behavior approach scores obtained by Ss when approaching a live animal instead of a stuffed animal specimen, the results would be more applicable to the most important test of any such clinical treatment; i.e., an actual encounter with the feared object itself. Although it is highly likely that measures of fear with respect to a specimen phobic stimulus are correlated with similar measures based on approach to the live phobic object, it is not

clear that a relationship between surrogate and actual phobic stimuli is of sufficient magnitude to warrent the conclusion that contact with a stuffed snake constitutes an adequate test of snake fear. One assumes that Ss reporting fear of snakes will demonstrate less arousal with a stuffed snake specimen than they will with a live snake of comparable type and appearance. If this is true, it is possible that the results of the Marcia et al. (1969) work may be influenced by a ceiling effect, (i.e., that maximum fear-elicitation was curtailed by the specimen snake). This hypothesized effect may have masked real differences between the high expectation T-scope group and the SD Ss. The present experiment attempted to investigate the relationship between various behavioral and self-report measures of snake fear emitted in response to encounters (a) with a stuffed specimen snake, versus (b) with a comparable live snake.

Because of the widespread use of behavioral approach tests in evaluating success in the treatment of phobia, it seemed of interest to also examine a number of other variables which might affect outcome results: the first of these was the sex of S. In all experimental conditions, which will be described below, an equal number of males and females were included, thus permitting the analysis of sex effects relative to a male E. The second variable studied was S's initial estimate of snake fear, as taken from a more general fear survey schedule (FSS). Two levels of initially

reported fear (strong versus moderate) were included in this study and will be described in greater detail below. It should be noted that only Ss who indicated at least some snake fear were allowed to participate in the behavioral approach procedure. The third variable studied was the effect of social context. Half of the Ss in each combination of conditions were accompanied by E down the runway during behavior approach testing of fear. The other Ss approached the snake stimuli unaccompanied by E.

The following hypotheses were advanced: (1) approach to a stuffed specimen should be easier (i.e., closer, less fear arousing) than with a live snake, (2) volunteers who reported strong fear on the FSS should manifest greater avoidance and arousal than the group showing moderate fear on the initial FSS reports, and (3) the group accompanied by the experimenter should exhibit less fear and avoidance than the unaccompanied group. Two other results were anticipated but not formally predicted: (a) sex of S should not influence response to the several combinations of conditions (except that females might be expected as a group to endorse FSS fear more strongly initially; see Rosenthal, 1966), and (b) as a kind of "extinction" effect, repeated testings should create some reported fear reduction (see Suinn, 1969).

METHOD

Subjects

College student volunteers enrolled in elementary psychology courses at The University of Arizona served as Ss. Most of the students were freshmen and sophomores. A total of 48 men and 48 women were studied.

Materials and Procedure

A 15 item version of Geer's Fear Survey Schedule (Geer, 1965) was administered in classes. Those students indicating "some" fear, "much" fear, "very much" fear, or "terror" of snakes on the Fear Survey Schedule (FSS) item #9 (see Table 1) were selected for participation. These Ss were then assigned to the eight experimental groups. No students whose initial FSS endorsements indicated little or no snake fear ("none", "very little", "a little") were included in the experiment.

Students were given individual appointments for testing. After a short introductory interview, E asked S, "Will you come with me to a nearby hallway, observe some harmless snakes, and describe your feelings about them?" All students agreed and were then taken by E to the experimental corridor. The corridor was, in fact, a hallway along which a 15 foot runway approach test had been constructed

TABLE 1

FEAR SURVEY SCHEDULE USED*

		None	Very Little		A Little		Some		Much		Very Much		Terror
1.	Worms	1		2		3		4		5		6	7
2.	Hypodermic Needles	1		2		3		4		5		6	7
3.	Death	1		2		3		4		5		6	7
4.	Rats and Mice	1		2		3		4		5		6	7
5.	Being Self-Conscious	1		2		3		4		5		6	7
6.	Spiders	1		2		3		4		5		6	7
7.	Deep Water	1		2		3		4		5		6	7
8.	Being Criticized	1		2		3		4		5		6	7
9.	Snakes	1		2		3		4		5		6	7
10.	Illness or Injury to Loved Ones	1		2		3		4		5		6	7
11.	Heights	1		2		3		4		5		6	7
12.	Stinging Insects	1		2		3		4		5		6	7
13.	Auto Accidents	1		2		3		4		5		6	7
14.	Strange Dogs	1		2		3		4		5		6	7
15.	Blood	1		2		3		4		5		6	7

*Selection of volunteers was based on response to item #9.

(Lang, 1964). The approach test was quite simple in physical layout. White adhesive tabs had been applied to the right edge of the hallway at one foot intervals. The number of feet, from 1 through 15, away from the end of the runway was readable from the numbered tabs. A small table was located at the end of the runway. The phobic stimuli were then placed on the table.

The Ss' task was to approach both the live and the preserved snake (presented in counterbalanced order) as closely and as comfortably as possible. All Ss approached each snake presented on separate approach trials. Half of the Ss approached the stimuli in the order live-stuffed, while the remaining Ss approached the stimuli in the reverse order. The snakes were nearly identical in appearance. Both were harmless garter snakes, one alive and the other stuffed. Both snakes were about two feet in length. The live snake was always presented in a hamster cage, the front of which was glass. The stuffed snake was always presented on the table, in clear view of Ss.

Those Ss who were able to get within a single foot of the stimulus were then asked if they could touch it. If this were accomplished, E requested that S hold the snake. The runway test was concluded with S's success or failure on this task. The behavior approach test (BAT) thus comprised a 17 step ordinal scale. A score of 1 on the BAT indicated that S was able to hold the snake. A score of 2 indicated

that S was able to touch, but not hold the stimulus. Scores of 3-17 were given for terminal approaches to the snake of 1-15 feet respectively. The BAT used in this study was nearly identical to that employed in the Marcia, Efran and Rubin (1969) work.

When S was at his maximum point of approach to the snake, or when he had successfully completed either touching or holding, he was asked for a numerical rating of his fear of snakes at that moment. Experimenter asked, "How much fear of snakes do you feel right now?" After posing this question to S, E held up a 3" x 5" white index card which reproduced the rating scale format of the FSS (see Table 1). Subject verbally selected a number 1-7 which best described his feelings of fear at that point.

After approaching both the live and stuffed snakes, each S was again administered the FSS. When this was completed, S was thoroughly debriefed. The session ended with S's pledge to keep all details of the experiment confidential until after all Ss had been run.

Design and Experimental Groups

The overall design involved a 2 (live snake versus specimen) x 2 (order of presenting the snake stimuli) x 2 (strong versus moderate initial FSS fear report) x 2 (sex of S) x 2 (accompanied versus unaccompanied social context of approach) factorial. The groups resulting from these

combinations of treatments, and the specific dependent measures analyzed are more fully described below.

A total of eight different experimental groups were constituted. Each group was identified by a combination of the levels of three dichotomous variables. These were 1) order of presentation of the snake stimuli, 2) social context, and 3) pre-experimental estimate of snake fear obtained on the FSS. As has already been described, the order of presentation of the stimuli was either live-stuffed (L/S) or stuffed-live (S/L). Social context refers to the accompanied (A), unaccompanied (U) distinction made above. On the BAT S was either accompanied by E down the runway, or was unaccompanied. Finally, initial fear report on the FSS was operationalized trichotomously in the present study (i.e., high, moderate or low fear, with the latter group excluded). Subjects indicating either "terror" or "very much" fear of snakes were considered to be more highly anxious (H) than those Ss reporting either "much" or "some" fear. This second group was designated moderately anxious (M). Treatment designation was simply a combination of levels of the variables just described. The full array of treatment combinations were as follows: Live/Stuffed, Accompanied, Highly anxious (L/SAH); Stuffed/Live, Accompanied, Highly anxious (S/LAH); Live/Stuffed, Unaccompanied, Highly anxious (L/SUH); Stuffed/Live, Unaccompanied, Highly anxious (S/LUH) Live/Stuffed, Accompanied, Moderately anxious

(L/SAM); Stuffed/Live, Accompanied, Moderately anxious (S/LAM); Live/Stuffed, Unaccompanied, Moderately anxious (L/SUM); and Stuffed/Live, Unaccompanied, Moderately anxious (S/LUM). There were 12 Ss in each treatment group, six men and six women.

All Ss in the accompanied social context, A, (L/SAH, S/LAH, L/SAM, S/LAM), entered the test corridor with E. Subject was asked to stand behind a mark on the floor which was 15 feet away from the stimulus snake. Experimenter, while standing next to S, asked, "Can you come closer with me to observe a (harmless live snake, preserved snake)?" If S consented, both E and S proceeded down the runway. If S refused or expressed a question about what he was to do, E said, "I'd like you to come as far down here with me as you are comfortably willing to go. In other words, without forcing yourself." Any S refusing this request was given a score of 17 on the BAT for that trial and the next trial was initiated. If S agreed to proceed after hearing this second instruction, the BAT trial commenced with E and S walking together toward the snake.

Subjects within the Unaccompanied social context, U, (L/SUH, S/LUH, L/SUM, S/LUM), also entered the experimental corridor with E. They, too, were asked to stand behind the 15 foot mark on the floor. Experimenter then asked S to remain at that point and E moved to a position about eight

feet behind and to S's left of the snake table. Experimenter then gave S the above instructions but omitted the words "with me."

For all Ss, irrespective of group assignment, certain procedural features were constant during the BAT. Before asking S to approach the live snake, E went down the runway and removed the wire top of the cage. Experimenter then moved either to a position next to S (Accompanied context) or behind the table (Unaccompanied context). After the first approach trial was completed, E asked S to return to the 15 foot line. When S reached the line E requested that S turn around with his back toward the snake table. Experimenter explained that he had to move some things and then proceeded to switch the stimuli. The second trial was then conducted similarly to the first.

The social context variable required slight differences in administering the BAT. Accompanied Ss, if able to get within a single foot of the snake, observed E nonchalantly touch the snake. Experimenter then asked, "Can you touch it?" If S could touch the snake, E picked it up and asked, "Can you hold it?" The BAT trial ended with S's subsequent success or failure on this task. Subjects in the Unaccompanied context who got within a foot of the snake were similarly asked to touch it, but, because E was behind the snake table, S did not first observe E touching the stimulus. After giving the touching request, E moved forward

to a position where he could observe whether or not S was able to do this. If S succeeded, E moved next to S, picked up the snake and asked S to hold it in the exact manner employed with the Accompanied condition Ss.

Dependent Measures and Analyses

The main dependent variables in the present study were (a) BAT score, (b) fear ratings, and (c) FSS ratings given to the snake items. For all of these variables two scores were provided by each S. Subject received a BAT score for his approach to the live snake and another for his approach to the stuffed snake. Similarly, maximum approach fear ratings were taken on approach trials to both the live and specimen snakes.

Finally, there were two FSS snake fear ratings. The initial rating provided the basis for selection in the experiment and was partially responsible for S's group assignment. The FSS was re-administered after the BAT, and provided at least one measure of the effect of the experiment on S's fear of snakes. The foregoing measures were analyzed by analysis of variance methods. An additional measure was studied, the number of Ss who were able to physically contact the stimuli spontaneously. This measure was simply a frequency count of the number of Ss able to score 1 or 2 on the BAT before E requested them to try. These

spontaneous responses were analyzed by a chi-square test (McNemar, 1957, pp. 228-231).

RESULTS

Behavior Approach Responses

Table 2 presents the mean approach scores for all main effects and for those interactions which attained significance. All of the expected results were obtained on the analysis of variance for this measure: the variables of type of stimulus snake, FSS fear report, and social context resulting in the anticipated significant differences while the variables sex and order of presentation resulting in non-significant main effects.

As was hypothesized, Ss responded with greater avoidance to the live versus the stuffed snake, the difference clearly achieving significance ($F = 11.42$, $df = 1/80$, $p < .005$). A supplementary measure was taken during the BAT to further directly assess the differences between the live and the stuffed snake stimuli. A record was kept of the number of Ss who spontaneously (before being asked) picked up the stimulus snake. Twelve Ss spontaneously picked up the specimen but not the live snake, and only one S picked up the live but not the stuffed snake before being asked. A chi-square test corrected for continuity (McNemar, 1957) indicated that this difference was significant ($X^2 = 7.61$,

TABLE 2

TABLE OF BAT MEANS FOR ALL MAIN EFFECTS AND THE SIGNIFICANT INTERACTION EFFECTS

Source	Means Obtained			
Snake	Live	Stuffed		
	2.69	2.05		
Sex	Male	Female		
	2.45	2.29		
Initial FSS Fear	High	Moderate		
	3.35	1.38		
Social Context	Accompanied	Unaccompanied		
	1.88	2.85		
Order	L/S	S/L		
	2.25	2.49		
Snake x Initial FSS Fear	Live-High	Stuffed-High	Live-Mod.	Stuffed-Mod.
	3.92	2.79	1.46	1.31

TABLE 2--Continued

Source	Means Obtained			
Sex x Context				
	Male-Acc. 1.65	Female-Acc. 2.12	Male-Un. 3.25	Female-Un. 2.46
FSS Fear x Context				
	High-Acc. 2.56	Mod.-Acc. 1.21	High-Un. 4.15	Mod.-Un. 1.56
Sex x Order x Context				
	Male-L/S-Acc. 2.04	Fem.-L/S-Acc. 2.00	Male-S/L-Acc. 1.25	Fem.-S/L-Acc. 2.25
	Male-L/S-Un. 2.12	Fem.-L/S-Un. 2.83	Male-S/L-Un. 4.38	Fem.-S/L-Un. 2.08
FSS Fear x Order x Context				
	High-L/S-Acc. 3.00	Mod.-L/S-Acc. 1.04	High-S/L-Acc. 2.12	Mod.-S/L-Acc. 1.38
	High-L/S-Un. 3.42	Mod.-L/S-Un. 1.54	High-S/L-Un. 4.88	Mod.-S/L-Un. 1.58

df = 1, $p < .01$), giving further evidence that the live snake elicited stronger fear and avoidance than did the specimen.

In the Marcia, Efram and Rubin (1969) study, only those students who indicated "terror" or "very much" fear of snakes on the FSS used in screening were included. This population corresponds to the high anxious group in the present study. Interestingly, there was a significant interaction between FSS fear and snake ($F = 6.78$, df = 1/80, $p < .05$). Although there was always greater avoidance of the live than the stuffed snake, this difference was larger for the high anxious Ss than for the moderate group. It, therefore, seems plausible that the population from which Marcia et al. (1969) selected Ss was especially likely to have been influenced by the specimen snake. In other terms, the specimen may have curtailed real differences created by SD versus T-scope therapy had fear been measured using a live animal.

As expected, Ss whose initial FSS snake fear ratings placed them in the high anxious group, were more avoidant on the BAT than were those falling within the moderate category ($F = 41.41$, df = 1/80, $p < .001$). Initial snake fear rating was also involved in a number of interactions which will be described below.

Social context, a variable which affected the data in a number of rather complex ways, had a significant main effect on the BAT responses. Accompanied Ss were able to

get closer to both snakes than were unaccompanied Ss (F = 10.03, df = 1/80, $p < .005$). In addition, context was involved in four interactions attaining significance on the BAT responses. The first of these included the sex variable. Although sex did not have a significant main effect on the data, it frequently interacted significantly with context. Thus, males were less avoidant than females when accompanied on both trials by E. When unaccompanied, however, this sex difference reversed itself and women responded with less fear than did men (F = 4.31, df = 1/80, $p < .05$).

Context also interacted significantly with pre-experimental estimates of fear on the FSS (F = 4.04, df = 1/80, $p < .05$). Although those Ss in the accompanied social context always were less avoidant than those unaccompanied when the BAT scores were pooled across sex and order, the size of this difference was larger for high anxious students than it was for moderately anxious individuals. Under the accompanied (high demand) context the mean BAT scores of the high and moderate fear groups were more similar than in the unaccompanied condition. Put another way, there was less difference between BAT scores obtained from the high versus moderate fear group when accompanied by E than when unaccompanied, a result consistent with the reported favorable effects of participant modeling (e.g., Bandura, Blanchard, and Ritter, 1969; Ritter, 1969a).

Two triple interactions reached significance. In both cases the variables of sex and initial FSS fear rating were involved. Here, context and sex or context and initial level of FSS fear interacted with an additional variable order of presentation of the snake stimuli. On the BAT measure, order did not have a significant main effect. Apparently, it did not make a simple difference if Ss received the L/S order or the S/L order.

However, an Order x Sex x Context interaction was found such that, under the L/S order and the unaccompanied social context, there were relatively small differences between the sexes, with the males being somewhat less fearful. However, in the S/L stimulus order, under unaccompanied conditions, females made substantially closer approaches to the stimuli than did the males. In contrast, under accompanied conditions, males profited more from the S/L order ($F = 10.91$, $df = 1/80$, $p < .005$). As will be discussed below, this same pattern was also found on the maximum approach fear ratings and on the pre-post snake fear judgments (see Figure 1).

A significant Order X Initial FSS Fear Level X Social Context interaction was also found such that, under the S/L order and accompanied social context there was relatively less difference between the BAT scores of the high versus moderately fearful groups. Although the high fearful students were always more avoidant than the moderate group,

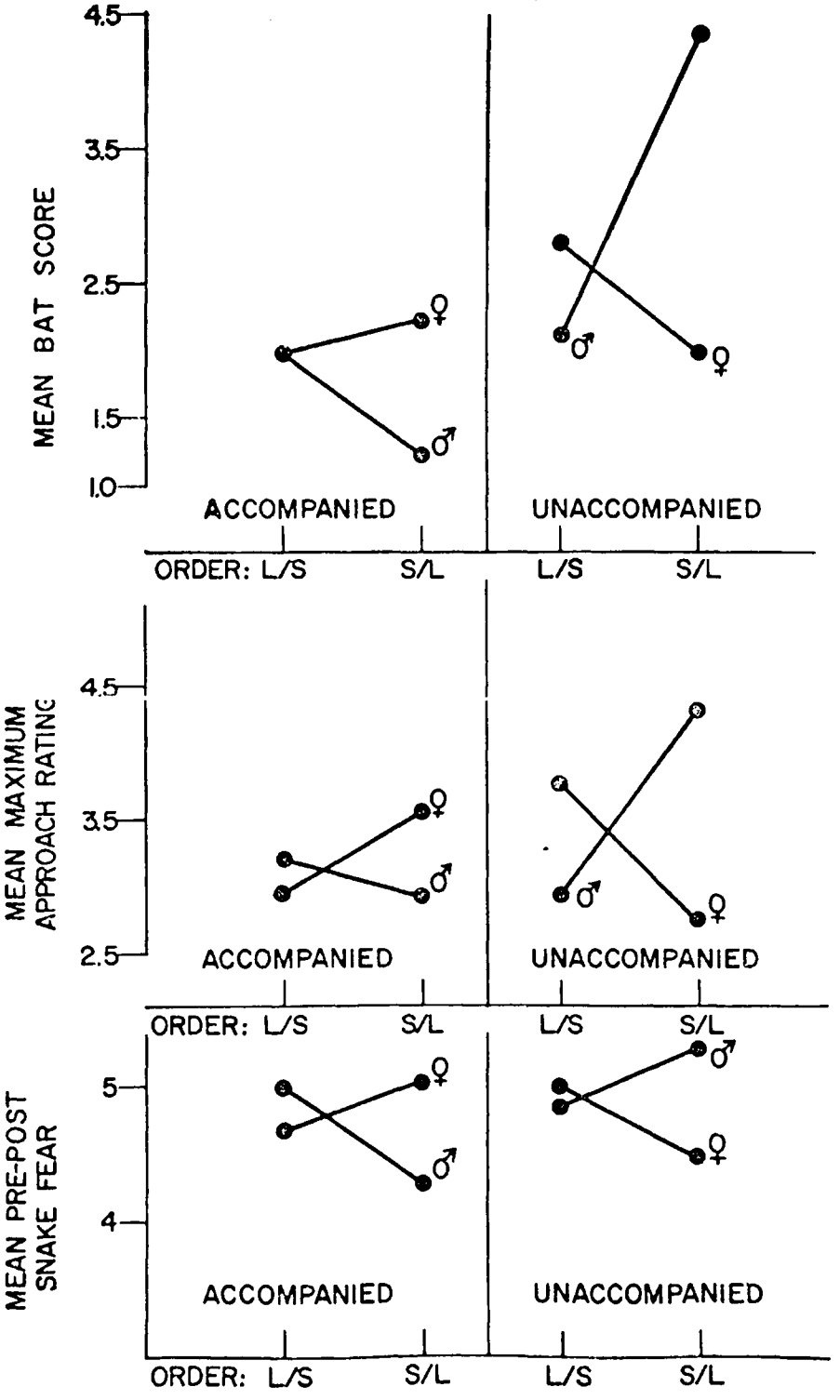

Figure 1. The Sex x Order x Context Interaction.

this difference was much more pronounced when accompanied Ss got the L/S order. When students were unaccompanied, order produced opposite effects. In the unaccompanied context the difference between the fear groups was smaller when given the order L/S ($F = 4.60$, $df = 1/80$, $p < .05$).

Maximum Approach Snake Fear Estimates

Table 3 presents the mean maximum approach ratings of snake fear for all of the main effects and for those interaction effects reaching significance. Results found on this second measure of fear were, in large part, similar to those already described with regard to the BAT.

The live snake produced much more self-reported arousal than did the snake specimen ($F = 23.69$, $df = 1/80$, $p < .001$). Similarly, the high anxiety group reported considerably more fear at the point of maximum approach during BAT trials than did the moderate anxiety group ($F = 33.70$, $df = 1/80$, $p < .001$).

On self-reported fear at maximal approach, social context did not create a significant main effect, although accompanied students showed lower mean fear than unaccompanied students. Sex of S and order of presentation of the stimuli also failed to produce significant main effects on maximum approach ratings of snake fear. As with the behavior approach measure, however, these variables were involved in a number of significant interactions.

TABLE 3

TABLE OF FEAR RATINGS GIVEN AT THE POINT OF MAXIMUM APPROACH

Source	Means Obtained	
Snake	Live	Stuffed
	3.60	3.00
Sex	Male	Female
	3.34	3.26
FSS Fear	High	Moderate
	4.07	2.53
Context	Accompanied	Unaccompanied
	3.16	3.45
Order	L/S	S/L
	3.21	3.40

TABLE 3--Continued

Source	Means Obtained			
Snake x Sex x FSS Fear				
	Live-male-high 3.86	Sfd.-male-high 3.86	Live-fem.-high 4.71	Sfd.-fem.-high 3.83
	Live-male-mod. 3.38	Sfd.-male-mod. 2.25	Live-fem.-mod. 2.46	Sfd.-fem.-mod. 2.04
Snake x Order x Context				
	Live-L/S-acc. 3.21	Sfd.-L/S-acc. 2.92	Live-S/L-acc. 3.54	Sfd.-S/L-acc. 2.96
	Live-L/S-un. 4.04	Sfd.-L/S-un. 2.67	Live-S/L-un. 3.62	Sfd.-S/L-un. 3.46
Sex x Order x Context				
	Male-L/S-Acc. 3.21	Fem.-L/S-acc. 2.92	Male-S/L-acc. 2.92	Fem.-S/L-acc. 3.58
	Male-L/S-Un. 2.92	Fem.-L/S-Un. 3.79	Male-S/L-Un. 4.33	Fem.-S/L-Un. 2.75

Type of snake stimulus interacted with sex and initial FSS fear report ($F = 10.17$, $df = 1/80$, $p < .005$). Both males and females, whether high or moderately fearful, rated the stuffed snake rather similarly. Ratings of the live snake were much more divergent. In the high fear group, females were more fearful than males, but in the moderate fear group, females gave less fearful ratings than did males.

There was also a significant Snake x Order x Social Context interaction ($F = 9.13$, $df = 1/80$, $p < .005$). Fear reports from Ss in the accompanied social context were quite similar for both live and stuffed snakes when presented in the order L/S. Unaccompanied Ss given this same L/S order were much more divergent in their fear reports.

The interaction involving order, sex and social context was significant on the maximum approach rating measure and was strikingly similar in form to the corresponding BAT response interaction (see Figure 1). As before, unaccompanied females benefitted more from the S/L order than did the males, while under the accompanied social context, males benefitted more from this same S/L order. Under both contexts, the difference between males and females was less when given the order L/S than when given S/L. In the L/S order, accompanied females were less fearful than accompanied males, and unaccompanied males were less fearful than unaccompanied females ($F = 10.34$, $df = 1/80$, $p < .005$).

Pre-Post Ratings of Snake Fear

Table 4 presents the relevant means for snake fear ratings given before and after the experimental session. All group means for main effects are presented, regardless of significance. One interaction is excluded from the Table, Pre-Post x Sex x Order x Context ($F = 5.47$, $df = 1/80$, $p < .05$), because this effect was in large measure a function of the Sex x Order x Context interaction which will be discussed below. In this analysis, main effects involved the *average* pooled across both administrations of the Fear Survey Schedule. Significant *changes* from first to final FSS score are represented by interaction terms involving trials (listed as Pre-Post variable) and the independent variables. Table 5 presents the relevant means for a number of variables across trials.

As had been anticipated, the two BAT trials resulted in some reduction of self-reported fear on item #9 of the FSS. Aggregately, *Ss* were significantly less fearful after the session in which they attempted approach responses than before it ($F = 92.07$, $df = 1/80$, $p < .001$).

Another expected result obtained on this FSS measure was that *Ss* in the High anxiety condition reported significantly greater fear of snakes than did the Moderate anxiety group when fear estimates were pooled across trials. Since the initial designation of fear groups was based on initial FSS snake fear ratings alone, it comes as no surprise that

TABLE 4

TABLE OF FSS FEAR RATINGS GIVEN THE SNAKE ITEM BEFORE AND AFTER THE EXPERIMENTAL SESSION*

Source	Means Obtained	
Pre-Post	Before	After
	5.46	4.22
Sex	Male	Female
	4.85	4.82
FSS Fear	High	Moderate
	5.86	3.81
Context	Accompanied	Unaccompanied
	4.75	4.93
Order	L/S	S/L
	4.88	4.79

TABLE 4--Continued

Source	Means Obtained			
Pre-Post x Context				
	Before Acc. 5.52	After-Acc. 3.98	Before-Un. 5.40	After-Un. 4.46
Pre-Post x Sex x FSS Fear				
	Before-male-high 6.38	After-male-high 5.08	Before-fem.-high 6.58	After-fem.-high 5.42
	Before-male-mod. 4.33	After-male-mod. 3.62	Before-fem.-mod. 4.54	After-fem.-mod. 2.75
Sex x Order x Context				
	Male-L/S-Acc. 5.00	Female-L/S-Acc. 4.67	Male-S/L-Acc. 4.29	Female-S/L-Acc. 5.04
	Male-L/S-Un. 4.83	Female-L/S-Un. 5.04	Male-S/L-Un. 5.29	Female-S/L-Un. 4.54

*Averaged across pre-post trials.

TABLE 5

TABLE OF FSS FEAR RATINGS GIVEN THE SNAKE ITEM BEFORE AND AFTER THE EXPERIMENTAL SESSION BY TRIALS

	Before	After	Net Change
All Groups	5.46	4.22	-1.24
Sex			
Males	5.35	4.35	-1.00
Females	5.56	4.08	-1.48
FSS Fear			
High	6.48	5.25	-1.23
Moderate	4.43	3.18	-1.25
Order of Presentation			
L/S	5.52	4.25	-1.27
S/L	5.40	4.19	-1.21
Context			
Accompanied	5.52	3.98	-1.54
Unaccompanied	5.40	4.46	-0.94

the High group would continue to give more fearful ratings than did the Moderate group ($F = 168.88$, $df = 1/80$, $p < .001$).

None of the other independent variables created significant main effects. As before, sex, social context and order of presentation were involved in a number of significant interactions. It should again be noted that although the social context variable did not produce a significant main effect, there was a trend suggesting that accompanied Ss were less afraid than the unaccompanied. This "trend" was confirmed by evidence of a significant interaction between context and change from initial to final FSS snake fear report. Although exposure to the phobic stimuli (or readministration of the FSS) acted to reduce fear reports, the across-trials decrease was greater for Ss in the accompanied context than it was for those within the unaccompanied context ($F = 5.47$, $df = 1/80$, $p < .05$).

The Order x Sex x Social Context interaction which was found on the other two previous measures was again evident ($F = 10.45$, $df = 1/80$, $p < .005$). As can be seen in Figure 1, females were less fearful than males when unaccompanied and given the order S/L, and males were less fearful than females under the same S/L order but the accompanied social context. The S/L order once more resulted in greater differences between the sexes than did the L/S order which produced quite similar fear ratings for both sexes.

Change from initial to final fear report interacted with sex and initial FSS report ($F = 5.47$, $df = 1/80$, $p < .05$). Although by design males and females within fear groups were very similar on their pre-experimental FSS judgments, some interesting differences between the sexes emerged after the experiment. High anxious males became less fearful than did High anxious females. In contrast, after the experimental session, Moderately anxious females were less fearful of snakes than were the corresponding male students.

DISCUSSION

The results of the present study strongly support the notion that fear elicitation with respect to a stuffed animal specimen is significantly different from the arousal produced by the live animal itself. Subjects (a) approached more closely, (b) reported less fear of, and (c) made more spontaneous physical contacts with the specimen than with the live snake. Thus, it seems plausible that the Marcia, Efram, and Rubin (1969) study's failure to find a significant difference between the improvement of Ss treated with SD compared with those receiving high-expectation T-scope therapy, may have been due to a ceiling effect. Perhaps real differences between these two groups were concealed because adequate fear elicitation was not achieved. The significant interaction which was found on the behavior approach variable involving snake and FSS fear indicated that the highly fearful Ss were more influenced by the live-stuffed difference than were the moderately fearful students. As the high fear group was the population from which Marcia et al. (1969) selected Ss for treatment, it seems even more likely that a ceiling effect may have confounded their results.

The second formally predicted result was also supported strongly by the data. Subjects whose initial FSS snake fear estimate placed them in the highly fearful category (a) were more avoidant on the BAT, (b) reported more fear at the maximum approach point, and (c) reported more fear of snakes on the FSS administered after the two BAT trials, than did moderately fearful Ss. As assessed in the present study then, initial self-reported fear estimates were a reasonably good index of subsequent arousal and avoidance in behavioral, as well as rating assessments.

The results also supported the hypothesis that students who approached the snakes under high demand conditions, (accompanied by E), would be less fearful than Ss who approached the snakes under lower demand conditions, (unaccompanied by E). Bernstein and Paul (1971) have argued that "situational context variables may function as invalidating influences on both runway approach tests and on maximum approach fear estimates." The results of the present study indicate that one such social context variable, accompanied by E, can influence BAT scores and maximum approach ratings in a number of complex ways. It is worthy of note that social context was involved in 75 percent of all interactions which attained significance. Apparently, the impact of social context is quite complex.

Sex of S did not affect the data in simple fashion. Like the social context variable, sex was involved in many

interactions, (slightly more than half of all those found significant). It appears that this variable, too, (at least with respect to one male E) has a rather complex effect on the data.

The results indicate that after approaching the stimuli, Ss reported significantly less fear of snakes than they did before the experimental session. This informally anticipated result might appear somewhat mystifying in that the present study was not a treatment study. However, there appear to be two different explanations which may account for the obtained reduction in reported snake fear. First, it seems plausible that encountering the feared object in the presence of a calm E who models non-fear would in and of itself bring about some fear reduction (Bandura, Blanchard, and Ritter, 1969; Ritter, 1969a, 1969b). An alternative to this participant modeling explanation is offered by Suinn (1969). Perhaps the simple fact of readministering the questionnaire at a later point in time was sufficient to bring about a kind of extinction effect. There exists some informal evidence favoring the participant modeling explanation, however. A sample of Fear Survey Schedules was taken and pre-post means were computed for items other than item #9. This examination suggested that there was not a similar reduction in fear reports after the BAT trials on the non-snake items. The Suinn hypothesis would seem to require that sheer readministration of such a self-report instrument

should have produced some general decrease in endorsement of fears. Whichever the case, the results of this study speak to the importance of adequate no-treatment control groups in treatment analogue research.

In conclusion, it would appear to be of utmost importance that future research consider the effects of procedural variables which have here been investigated. Further research is needed to better isolate the effects of these and other such variables. A replication of the Marcia et al. (1969) study with adequate assessment of treatment effects appears warranted. While this study has demonstrated the possibility of a ceiling effect in that work, future research is needed to settle the issue finally.

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