Sex differences in interpersonal conflict*

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An experiment is described that compares and contrasts male and female behavior in response to various forms of threats that previous research had indicated elicited different perceptual and behavioral reactions. A fairly complex decision-making interaction simulation game was employed in a computer-controlled laboratory. The results indicate that deterrent threats are somewhat more likely to result in compliance than are compellent threats. Further, there were no gross differences between male and female response patterns. It was found, however, that males are somewhat more likely to comply to a threat. But, of the noncompliers males are more likely to behave aggressively and attack the other. Evidence is presented that indicates that females respond to an emotion-evoking hostile situation by passively resisting or withdrawing.

This study is an extension of previous research¹ that dealt with the effects of different kinds of threats on compliance. In Schelling's (1966) theorizing, there are two basic types of threats: deterrent and compellent. The latter is a threat intended to make the adversary do something, while the former is intended to make the adversary either not do something or not start something. "Deterrence involves setting the state, usually in a nonintrusive or nonhostile way, leaving the overt act up to the opponent. Compellence, though, often involves initiating an act that will cease only when the other responds in the appropriate manner; compellence is more like an offensive move. It is usually inducing the adversary's withdrawal by an action that threatens to hurt. In reality the threat that compels rather than deters often requires that a punishment be administered until the other acts instead of if he acts [Schelling, 1966]."

In the Johnson study, three dimensions were extracted that were felt to differentiate deterrent from compellent threats. These were: (1) the semantic mode of the threat, (2) the number of behavioral options closed, and (3) the time of implementation of the threat. The dimensions, separately, did not result in different levels of compliance. When Dimensions 1 and 2 were allowed to vary simultaneously, though, it was found that a threat worded in a deterrent mode that closed off only one behavioral option resulted in significantly more compliance than did

a compellent threat. The results were interpreted as providing some support for Schelling's (1966) theory.

In another study (Johnson & Mihal, 1971), an interaction simulation was used to test the effects of threat type (deterrent vs compellent), situation type (hostile vs friendly set), and opponent type (man vs computer) on compliance. The results indicated that those playing against the computer were most likely to initiate an early preemptive attack. Of those that did not attack, though, those playing against the computer were more likely to comply to a threat than were those playing against another person. Further, compellent threats were less likely to be complied with and were more likely to result in an attack from the person being threatened.

There are several studies that have dealt explicitly with female behavior in a conflict situation. The results of these studies have been unclear. The study most directly related to the present one is by Schlenker et al (1970). These authors looked at both the wording of the threat (compellent or deterrent modes) and sex of the influence target. They found that the semantic mode of the threat had little effect on compliance but that a compellent wording of a threat heightened the perception of the other as hostile and exploitative. They found several interesting sex differences. In general, females were more cooperative than males. The single exception was that females were more competitive than males when the source of the threat was perceived as exploitative and when little hope of accommodation was apparent. They conclude that females do not respond in a similar fashion to all influence attempts; rather, their responses depend on the behavior of the other.

Grant & Sermat (1969) found that in a mixed-motive game, females proved to be more competitive (in their terms, less submissive) than males. Further, submissive behavior was no more likely toward male others than toward female others. Horai & Tedeschi (1969) found no difference in compliance to a demand as a function of sex. They did discover that males lied more often than females when sending messages of intended future behavior.

The results of these various studies show that females are not more influenceable or conforming than males but that, instead, there is some complex relationship involving situational factors.

In these studies, there may have been somewhat of a problem with the experimental paradigm. The Ss had only two possible responses. Johnson¹ and Johnson & Mihal (1971) found that the results regarding threat type (deterrent vs compellent) could not be replicated in an experimental situation that was more complex and that allowed the S a greater variety of responses in reaction to a demand. There are many modes of noncompliance. The Johnson and Mihal study, for example, found a significant number of Ss who at first complied to a demand, but at a later point, when given the opportunity, attacked the source of the threat. Although they at first behaved as the threat demanded, one would not want to label this behavior as compliance.

The purpose of the present study, then, is to investigate threat type (deterrent/compellent) and compliance, particularly as the former interacts with sex to affect the latter in a complex situation.

The experiment used a computer-controlled allocation game that previous research had shown (Johnson & Mihal, 1971) to be an excellent vehicle for studying the escalation and resolution of conflict. The situation employed allowed for varying degrees of cooperative, hostile-aggressive, and noninteractive withdrawal response styles. This flexibility enhanced discrimination among compliant and noncompliant behaviors.

LABORATORY

The equipment was located in a room 12 x 12 ft. The computer terminals were situated such that the Ss were facing opposite walls and, hence, would be unable to observe each other directly.²

THE COMPUTER PROGRAM

The program consisted of a main-line and four subfunctions. The main-line initialized the arrays, accepted the codes for the experimental conditions, and supervised the running of the

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experiment. Involved in the latter was "interacting" with the S, printing out summary intermediate data for the Ss, and storing all the responses made by the S. In the interests of experimental control, the computer's pattern of allocations was not responsive to the S's behavior across trials and was the same in all conditions. This pattern was pretested to appear neutral, i.e., neither hostile nor peaceful, neither cooperative nor competitive, etc. The main-line also determined whether or not the S complied with the threat and, on the basis of this, decided whether or not to declare war.

The subfunctions printed the background information and instructions, administered the threat treatment, presented the questionnaire, and determined the legitimacy of responses.

At the conclusion of each experimental session, the program printed out the condition codes and all behavioral data.

The program is described at length elsewhere (Johnson & Mihal, 1971).

SUBJECTS

The Ss were 41 undergraduate students at the University of Rochester who were fulfilling a course requirement in introductory psychology.

PROCEDURE

Two Ss participated in each run of the experiment. On arrival, one S was seated at each terminal. There was no E in the traditional sense. The computer controlled all phases of the experiment from the initial instructions to the postexperimental interview. For this reason, it was not necessary to vary the sex of the E systematically. The Ss were then told to push the return key; this caused the instructions to print out. These instructions informed the Ss that each would be a representative of a country—either Kolomon or Seigland. The countries were explained to be relatively poor and in need of generating large sources of income to raise the standard of living of the people. In an attempt to accomplish this, each nation had been given a loan by the World Bank. A certain percentage of the loan was to be allocated on each trial of the game, with the objective of obtaining as large a return as possible. They were told to allocate exactly 100 units on each trial. They could invest these 100 units into four different areas: Trade A, Trade B, investments, and arms. Trade A: Each unit invested in Trade A that was matched by a unit invested in Trade A by the other nation earned 8 points for Kolomon and 4 points for Seigland. Units that were not matched earned nothing. Trade B: Each unit invested in Trade B

that was matched by the other nation earned 8 points for Seigland and 4 points for Kolomon. Again, units that were not matched earned nothing. Investments: Each unit put into investments earned 2 points for that nation regardless of what the other nation did. Arms: Each unit invested in arms resulted in no profit for that nation. Their utility lay in the event that one or the other nation declared war. In that circumstance, the nation that had the fewer units in arms lost 6 points for every unit in the difference between the number of units each country had. For example, should war be declared with one nation having 100 units in arms and the other nation having 150 units in arms, the first nation would lose 300 points from his overall total. Further, they were told that should war be declared by either side, the game would be terminated.

The Ss were told that they would make allocations over a series of trials and, hence, did not know exactly how long the experiment would run.

The background set for the game indicated that the relations between the countries were quite strained, with several border incidents and military skirmishes having occurred in the past. Further, although the nations were dependent upon each other for trade, previous agreements had seldom been mutually beneficial.

Each S was told that his overall goal in the experiment should be to make as many points for his nation as possible. Further, all Ss were told that, at the end of the experiment, they would be evaluated and told how well they had done in comparison to the other nation and in comparison to the average of the people who had played the game.

When all questions were answered in regard to the game, the Ss were again told to hit the return key. From this point, the computer "conducted" the rest of the experiment.

Implementation of Independent Variables and Experimental Design

Although the Ss were led to believe that they were playing the other S, in reality everyone represented "Kolomon," while the computer played the part of "Seigland."

The first independent variable was threat type—deterrent (D) or compellent (C). After the fifth trial, the Ss were told that they could send a message to the other side. The message they received from the other was either: *Deterrent*: Do not put any more units into Trade A. If you do put your units into Trade A, I will attack you. *Compellent*: I want you to put your units into Trade B. If you don't put your units into Trade B, I will attack you.

The Ss were told that messages could only be exchanged after the fifth trial.

The second independent variable was the sex of the S. In all cases, both Ss in a pair were the same sex.

The independent variables were combined to form a 2 by 2 factorial design. The 23 males and 18 females were assigned randomly to the threat-type condition.

RESULTS

Behavioral Data

Declaring war made it possible for Ss to complete a varying number of trials. Therefore, the analysis for the allocations was divided into two parts: Trials 1-5 and Trials 5-7. In the latter case, all Ss that declared war prior to Trial 7 were deleted. A two-between and one-within 2 by 2 by 5 unequal Ns analysis of variance was performed on the first segment of the data, with trend comparisons across the five time segments.³

Looking first at the trends across Trials 1-5, ignoring the effects of the independent variables, one finds a highly significant linear trend indicating a decrease in allocations to Trade A and Trade B across trials. The linear trend for arms is also highly significant, but, in this case, it is because of an increase in allocations across trials. The allocations to investments are fairly stable and show no trends across Trials 1-5. There were no meaningful interactions involving the between-Ss effects and trend components.

A two-between and one-within 2 by 2 by 3 unequal Ns analysis of variance was performed on the data from Trials 5-7.

As before, there were several significant general trends. The linear and quadratic trends for Trade A resulted from a moderate amount of allocations on Trial 5, a severe drop in allocations on Trial 6, and a small increase again by Trial 7. The linear trend in arms resulted from a continued sharp escalation in this category across trials. The quadratic trend in investments resulted from a moderate amount of allocations on Trials 5 and 6, with a sharp increase on Trial 7. Again, there were no interactions involving the between-Ss effects and the trend components.

Because the threat was not delivered until after Trial 5, it was decided to look at the data for Trials 6 and 7 separately, as this was the first opportunity the Ss would have to respond to the threat. A 2 by 2 factorial ANOVA was carried out on the data. The means can be seen in Table 1.

Although only trends were present on Trial 6, several clear differences were apparent by Trial 7. Looking at

the threat condition, one can see that more was allocated to arms in response to a deterrent threat than to a compellent threat [$F(1,29) = 3.4$, $p = .07$]. The findings for the sex variable were somewhat more interesting. Males allocated more to arms in response to a threat than did females [$F(1,29) = 5.3$, $p = .03$]. At the same time, females allocated more to investments than did males [$F(1,29) = 4.4$, $p = .04$]. There were no interactions.

In order to compare the results in the present study with those in the two earlier Johnson studies, it was decided to carry out one further analysis of the behavioral data. This involved categorizing people as either compliers or noncompliers. As a result of earlier pilot testing, compliers were defined as those who did not attack the other side, who, in the D condition, allocated 50 or fewer units to Trade A, and who, in the C condition, allocated 125 or more units to Trade B. Z tests for the difference between proportions were then performed on these data.

In the D condition, the ratio of compliers to noncompliers was 8/13. In the C condition, it was 3/17. This results in a $Z = 2.3$ ($p < .05$). This supports the earlier findings that deterrent threats elicit more compliance than do compellent threats.

The sex variable resulted in a compliance/noncompliance ratio of 8/15 for males and 3/15 for females. The Z of 2.3 ($p < .05$) shows that there was a tendency for males to comply more readily than females.

Questionnaire Data

At the end of the experiment, each S answered a questionnaire concerning his views of his own behavior, his perceptions of the other, and his reactions to the experiment. These data were analyzed in a 2 by 2 factorial ANOVA. The results are shown in Table 2.

Those in the D condition saw themselves as more competitive than did those in the C condition. Males saw themselves as somewhat stronger than did females.

Table 2
Summary of Mean Squares and Means for Questionnaire Data

Question	Error	A (D - C)	B (M - F)	A × B
1. Self: cooperative-competitive	3.2	12.3†	0.1	1.9
2. Self: weak-strong	2.2	0.0	6.5*	9.2†
3. Other made me feel hostile	4.4	0.0	4.0	22.4†
4. Other selfish	3.0	4.9	3.7	16.1†
5. Satisfied with others outcome	5.2	0.2	0.0	25.3†

Cell	Questions				
	1	2	3	4	5
1 (D - M)	4.6	4.2	3.0	2.4	5.5
2 (D - F)	5.1	4.2	3.7	4.1	4.1
3 (C - M)	3.9	5.0	4.3	4.2	4.0
4 (C - F)	3.5	3.1	2.0	3.4	5.6

* $p < .10$

† $p < .05$

df effects = 1

df error = 37

Note—The first two questions were based on 7-point semantic differentials, while Questions 3-5 were 7-point scales running from 1 = great deal.

There was a significant interaction on the degree to which the S viewed his behavior as weak or strong; in the D condition, there was no difference between males and females, while, in the C condition, males saw themselves as considerably stronger than did the females.

The other items reflecting significant differences are best considered together. In the D condition, males reported that the other made them feel more hostile and aggressive, that they felt the other was more selfish, and that they were less satisfied with the other's outcome than were the females. In the C condition, the females felt more hostile, saw the other as more selfish, and were less satisfied with the other's outcome than were the males.

DISCUSSION

The immediate purpose of the experiment was to compare and contrast male and female behavior in response to various types of threats that previous research had indicated elicited different perceptual and behavioral reactions. To this end, a fairly complex decision-making game was employed in a computer-controlled laboratory. The reason for this type of experimental situation was to look for sex differences in an environment that was as complicated, quick-paced, and life-like as possible.

The finding that deterrent threats

result in more compliance than do compellent threats received support. The proportion of compliers to noncompliers as a function of threat type showed a strong trend in the expected direction.

One of the more striking findings is that there were few differences in the game-playing behavior of males and females. The evidence from the trend analysis for the first five trials indicates that there were no differences in response patterns. The trend analysis for the postthreat data were similar—no differences as a function of sex. The differences that did occur were quite subtle, but, at the same time, appear to be important.

One difference attributable to sex came from the proportion data: compliers vs noncompliers and attack vs no attack. The results indicated that males tend to comply more readily to a threat than do females. Of those that do not comply, though, males are much more likely to attack the threatener. This indicates that male noncompliers tend to be aggressors, while females might be categorized as passive resistors. Although equally or more unwilling to be coerced, the females were especially unlikely to respond with overt hostility. The data from the first two trials after the threat shed further light on this matter. Here one finds minimal differences in allocations to the trade categories. But, of the other two allocation possibilities, one finds the males reacting to a threat by escalating their allocations to arms, while females respond by increasing their allocations to investments. Here again, one can categorize males as becoming more aggressive. The females, though, appear to withdraw from the situation. Investments was the only allocation category whose utility was not dependent on the behavior of the other. In this situation, then, one might say that when faced with hostile actions females do not respond

Table 1
Cell Means for Allocations for Trials 6 and 7

Trial 6	Condition			
	Deterrent-Male	Deterrent-Female	Compellent-Male	Compellent-Female
Trade A	11	15	11	16
Trade B	10	13	28	20
Arms	62	46	46	43
Investments	17	26	14	22
Trial 7				
Trade A	8	8	18	11
Trade B	7	14	13	15
Arms	60	40	46	32
Investments	25	38	23	43

by resisting in the sense of not complying but, in reality, withdraw from the interaction.

Examining the attack vs no-attack data, males appear somewhat more likely to respond to a compellent threat by attack. For females, this is not true. The data become even more interesting when one considers the questionnaire findings. It should be recalled that, in the C condition, females reported that the other made them feel particularly hostile and aggressive and that they felt that the other was quite selfish. It is in this condition that the propensity to attack the other was zero. In the D condition, meanwhile, the emotion-laden perceptions of hostility were lower and the likelihood of attacking the other was at a higher level. One might hypothesize from this that, when females feel a strong emotional response to an upsetting stimulus, they are most likely to

respond by withdrawing. The present data do not allow such an analysis, but further research is certainly called for.

REFERENCES

- GRANT, M. J., & SERMAT, V. Status and sex of other as determinants of behavior in a mixed-motive game. *Journal of Personality & Social Psychology*, 1969, 12, 151-157.
- HORAI, J., & TEDESCHI, J. T. Effects of credibility and magnitude of punishment on compliance to threats. *Journal of Personality & Social Psychology*, 1969, 12, 164-169.
- JOHNSON, D. F., & MIHAL, W. L. The computerized statesman: Further explorations into the escalation of conflict. Paper presented at the Association of Computing Machinery National Convention, Chicago, 1971.
- SCHELLING, T. C. *Arms and influence*. New Haven, Conn: Yale University Press, 1966.
- SCHLENKER, B. R., BONOMA, T., PIRNICK, W. P., & TEDESCHI, J. J. Compliance to threats as a function of the threat and the exploitativeness of the threatener. *Sociometry*, 1970, 33, 394-408.

NOTES

1. Johnson, D. F. The effects of deterrent

vs. compellent threats and the time of implementation of these threats on compliance. Unpublished manuscript, 1970.

2. *Hardware*. Our laboratory used the University of Rochester's IBM 360 Model 65 time-sharing system. Two Datel 30 semiportable terminals are located in the laboratory. These operate in a dial-up mode using normal telephone lines and acoustic couplers. *Software*. The University of Rochester's computing system is controlled and scheduled by the S/360 Operating System (OS MVT) and Houston Automatic Spooling Priority System (HASP). The programs for all experiments thus far have been written in APL, a scientific programming language for on-line remote terminals. It is a mathematically oriented language with considerable power, yet relatively simple notation. Other favorable features for behavioral research are its conversational orientation and its capacity for handling arrays.

3. It should be noted that the kind of analysis employed here does not assume homogeneity of covariance and hence is superior in this respect to ordinary univariate repeated-measures analysis. It was intended that there be an equal number of Ss in each cell. Equipment failures and problems with obtaining Ss prohibited this.