"LYING" AND "TELLING THE TRUTH" AS A FUNCTION OF
COOPERATIVE AND COMPETITIVE ORIENTATIONS
AND BEHAVIORAL OUTCOME
Morton Deutsch, Harvey A. Hornstein, Lois Biener, and Ella Lasky
Teachers College, Columbia University

This study is an initial inquiry into some of the conditions determining "lying" and "truth-telling" in interpersonal relations. The interpersonal situation being investigated is one that is "instrumental" in character. In such situations, the participants are primarily concerned with their individual outcomes, their "gains" or "losses," rather than with self-expression or the impressions and reactions of other participants. However, if O can choose between a cooperative course of action which is mutually beneficial and a competitive one that is disadvantageous to S and advantageous to O, it seems reasonable to assume that, even in instrumental situations, a subject will try to influence the other (O) to have favorable impressions of him. This should be the case whether S's own orientation to O is cooperative or competitive since S is always benefited more when O behaves cooperatively.

Yet, it is evident that if S's orientation to O is competitive (i.e., he benefits most by successfully competing with O), there is a dilemma: a competitive action toward O, may elicit a competitive response. Of course, if O is unaware of
Abstract

In the experiment which is described below, we studied the effects of two variables upon "lying" and "truth-telling." The first variable involved a comparison of Ss with cooperative and competitive orientations toward O. The second one entailed a comparison of three equally-occurring, types of actions by S: actions whose effects were as intended; actions whose effects were opposite to those intended; and actions which were ineffectual. The first was created by different bonus systems and the second by controlling the feedback Ss received about the outcomes of their behavior. The results indicate that the Ss with a competitive orientation did considerably more lying than those with a cooperative orientation. Both groups of Ss were more likely to tell the truth about actions whose effects were as intended rather than counter to what they intended.
$S$'s action except as he is informed of its nature by $S$, the dilemma is resolvable by $S$'s lying about his action. Pursuing this line of reasoning leads one to expect more "truth-telling" from a $S$ with a cooperative orientation and more "lying" from one with a competitive orientation (Deutsch, 1949, 1962). This conclusion presupposes that in each instance the $S$ is acting effectively in behalf of his own orientation, that his behavior achieves the effects he intends.

But suppose $S$'s actions have effects opposite to those he seeks. For example, a competitive $S$ unintentionally acts in a way that is mutually beneficial or a cooperative $S$ acts so as to harm the other and benefit self. How will this affect "truth-telling" and "lying"? A purely instrumental view of truth-telling and lying would lead the cooperator to conceal his unintended competitive actions and the competitor to reveal his unintended cooperative ones. Thus, for actions whose effects are opposite to what was intended, one would expect a competitive $S$ to be more truthful than a cooperative $S$. If, however, $S$'s credibility to $Q$ would be stretched too far by claims of completely successful cooperative action then one would anticipate that $S$ may be willing to reveal some of his harmful acts.

If we consider a third type of outcome, an ineffectual action (one which is of little value or harm to either $S$ or $Q$), a purely instrumental orientation is likely to lead both
cooperative and competitive Ss to conceal it from O.
However, the pressure to conceal such actions would be less
than for the actions which were harmful to O and beneficial
to S.

Our theoretical analysis so far has led us to conclude
that if a S has purely an instrumental view of his relation
to O, he will be: (1) more truthful in reporting actions
whose effects he intended, if he is cooperatively rather
than competitively oriented toward O; (2) less truthful
in reporting actions whose effects are opposite to those
he intended, if he is cooperatively rather than competitively
oriented toward O; and (3) equally untruthful in reporting
ineffectual actions whether his orientation is cooperative
or competitive. The absolute levels and relative amounts
of truth-telling and lying would be a function of the
amounts and proportions of the different kinds of actions.
Thus, if actions were predominantly successful in achieving
their intents, truth-telling would predominate for cooperators
and lying for competitors. If actions predominantly achieved
effects which were counter to their intentions, the opposite
results would be expected. Normally, one would anticipate
that people are reasonably successful in directing their
actions to achieve the effects they intend. Hence, usually,
one would predict cooperators to be more truthful than com-
petitors. In the laboratory experiment described below,
it was possible to vary systematically S's effectiveness in achieving his intent and, thus, to create an unusual amount of lying in cooperative Ss.

So far, we have assumed that S's view of his relationship with O will be purely instrumental. But Ss do not enter experimental situations as blank slates. They have culturally-developed expectations about what is appropriate and permissible in cooperative and competitive relations. Social convention demands truth in cooperative relations but tolerates mendacity in competitive ones. Hence, the cooperative S is less likely to lie than the competitive S, even when it is equally instrumental for both to do so. Also, although the unique and peculiar characteristics of the social laboratory may weaken the general societal norm in favor of truthfulness, it probably does not eliminate the effects of this norm completely. Thus, even for competitive Ss one may expect that there will be some influence toward "truth-telling."

In the experiment which is described below, we studied the effects of two variables upon "lying" and "truth-telling." The first variable involved a comparison of Ss with cooperative and competitive orientations toward O. The second one entailed a comparison of three equally-occurring, types of actions by S: actions whose effects were as intended; actions whose effects were opposite to those intended; and actions which
were ineffectual. Each of the variables were independently varied. The first was created by different bonus systems and the second by controlling the feedback that Ss received about the outcomes of their actions.

Procedure

Subjects

Male Ss were recruited by means of an advertisement in a local newspaper. The advertisement afforded volunteers an opportunity to earn money by participating in small group experiments.

In the main, Ss were undergraduates, 18-23 years of age. We can assume that their primary motive for participating in this experiment was to earn money.

Method

As each S arrived, he was greeted by a male experimenter and taken to a small cubicle where he was to wait until another person arrived. After a few minutes, E returned, told S that the other person (who was in reality non-existent) had arrived, and showed S to his own experimental cubicle which contained an electrical panel.

A tape-recorded set of instructions explained that the two people were going to take part in a decision-making task. They were to try to determine the rule controlling a complex sequence of light patterns which would appear on their electrical panels. The pattern always consisted of one light
from each of three rows (A, B, or C) and appearing in one of the three columns (1, 2, or 3). Ss were led to believe that by learning the rule it would be possible to predict the light patterns with 95% accuracy. They were told that in order to make the task easier for them, they only had to make one prediction on each trial. They could predict in which column the light in row A would appear, in which column the light in row B would appear, or in which column the light in row C would appear. Each subject was informed that the rule governing his pattern was unique and independent of the rule governing the other person's pattern. Their earnings, in this task, however, would be affected by the other person's decisions as well as their own. There were two ways to earn money:

1. The Prediction Task. S earned the monetary value of the light which actually appeared in the column he selected. If a light appeared in row A of the column S selected, S earned 15¢ for himself and 15¢ for O (Cooperative alternative). If the light appeared in row B, S earned 20¢ for himself and lost 10¢ of O's money (Competitive alternative). If the light appeared in row C, S lost 2¢ of his own money and earned 2¢ for O (Ineffectual alternative).
Thus, the prediction task worked in the following way: If S wanted to obtain a mutually beneficial outcome he would attempt to predict the column in which he believed light A would appear. If he was correct, and light A appeared in the column he selected, he earned 15¢ for himself and 15¢ for the other. If he was incorrect, and, for example, light B appeared in the column he selected, he earned 20¢ for himself and lost 10¢ of O's money even though he had not intended to diminish O's outcomes. Therefore Ss were led to believe that it was important for them to discover the sequence in which the lights would appear in order for them to control their own and the other's outcomes.

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Insert Table 1 about here
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2. The Bonus Systems. Ss were randomly assigned to one of two bonus systems at the beginning of the game. On the basis of total earnings for S and O at the end of the first 50 trials, Bonus System I awarded S an additional 4¢ for every 5¢ that O made, and penalized him 4¢ for every 5¢ that O lost. Bonus System II awarded S an additional 4¢ for each 5¢ that he made more than O, and penalized him 4¢ for every 5¢ that O made more than he. Thus, S understood that
if he was assigned to BS-I the more O earned, the more he would earn and the more O lost, the more he would lose. If he was assigned to BS-II, the more O earned, the more he would lose, and the more O lost, the more he would earn. For convenience of exposition, we shall label the first system as "cooperative" and the second as "competitive."

In communicating with the Ss, we did not label them nor at any time refer to them as cooperative or competitive.

The taped instructions also explained another aspect of the S's task, the message system. After a S made his prediction, the pattern for that trial would light enabling him to see which row the light had appeared in and, thus whether or not he had been correct. Then he was to select and send a message to O telling him something about what had happened on that trial. There were five messages to choose from, these included all the outcomes that were possible. They communicated to O that a subject's outcome on that trial had been either an A, B, or C, or that he had received no information about his outcome, or that the trial had been a practice trial, and therefore did not affect earnings. These messages would be the only information O would have about S; that is, O did not know the nature of S's bonus system, the light S was trying to predict, or S's actual outcomes. S could use the messages any way he liked and it was indicated that he could use them


to try to influence O's choices. After O received his message (a light appeared next to the appropriate message in O's message area), O would make his own prediction. Ss were told that they would have control of the message system to the first 50 trials during which time O would receive messages but would be unable to send messages back. Control of the message system was to be switched after the first 50 trials. Supposedly, the order of control was randomly assigned.

In summary, Ss were to perform the following actions on each trial:

1. Push a button indicating which of the three types of lights they would try to predict -- a light in row A, B, or C;

2. Push a button indicating in which column they believed the light would appear;

3. Observe the actual pattern when the lights went on, thereby learning whether or not the prediction was correct;

4. Select and send a message to O, telling him something about what happened on that trial.

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Insert Figure 2 about here
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When the instructions were finished E spoke to S over the intercom system and told him to which bonus system he had been assigned. He was told that O would not be assigned to a bonus system but would be able to choose one at the end of the 50
trials. 0's outcomes for the 50 trials would then be calculated according to the bonus system he chose. S was reminded that 0 would not be informed about the nature of S's bonus system. Thus it was possible for S to influence 0's behavior by sending him messages about the outcomes that he and 0 were receiving.

Ss watched the pattern appear for several demonstration trials and then were given as many practice trials as they needed until they felt confident that they knew the rule governing the light pattern well enough to proceed to the actual task. Feedback to Ss concerning the accuracy of their predictions was controlled by the experimenter so that during the preliminary practice trials about 70% of their predictions were correct. Once the actual trials began, however, each S received the same sequence of 10 A's, 10 B's, and 10 C's. Since earnings were determined by actual outcomes and not by predictions, all Ss in the cooperative and competitive bonus conditions earned the same amount of money from the prediction task. Nineteen practice trials were interspersed with the 30 actual trials in order to conceal the regular order with which the outcomes were being presented. During these practice trials feedback was controlled so that Ss believed that they had predicted correctly on about 70% of the 19 trials. One trial on which Ss received no feedback as to the correctness of their prediction also occurred during the game. This was designed to legitimize the use of the "No Information" message.
Results

Pre-task questionnaire. Ss completed a questionnaire after they heard the instructions, were assigned to a bonus system, and had concluded their preliminary practice trials. Several items served as checks on the success of our motivational induction. Data from these items indicate that several Ss failed to adopt the appropriate orientation. Criteria were established to identify groups which could be considered to have purely cooperative and purely competitive motivations.

Three items on the pre-task questionnaire assessed the orientation and motivation of the Ss:

1. A 61 point scale on which Ss rated how cooperative (1) or competitive (61) they intended to behave.

2. A check list on which Ss indicated which outcome they would prefer to receive - a light in row A (cooperative); a light in row B (competitive); or a light in row C (ineffectual).

3. A check list on which Ss indicated why they preferred any particular outcome. It included the following alternatives:
   1. I want to win as much money as possible.
   2. I want both of us to win as much money as possible.
   3. I want to avoid losing money.
   4. I want to do better than the other person.
Ss who fit any one of the following criteria were eliminated from the main analysis:

1. "Cooperative" Ss who placed themselves in the competitive quartile of the 61 point scale of cooperativeness to competitiveness; "competitive" Ss who placed themselves in the cooperative quartile of the same scale.

2. "Cooperative" Ss who indicated that they would prefer light B. "Competitive" Ss who indicated that they would prefer light A.

3. "Cooperative" Ss who checked alternative #4 ("I want to do better than the other person"). "Competitive" Ss who checked alternative #2 ("I want both of us to win as much as we can").

On this basis 5 Ss were eliminated from the cooperative condition and 6 from the competitive condition. This left 12 in the cooperative and 11 in the competitive condition. Data from the pre-task questionnaire indicate that the resulting groups were quite consistent in their orientation. The mean rating of the cooperative group on the 1 (cooperative) to 61 (competitive) point scale was 13.75. The mean rating of the competitive group was 58.00. Eleven Ss in the cooperative condition indicated that the outcome they would prefer was a light in row A, and 10 Ss in the competitive condition preferred a light in row B. One S in each group did not
respond to this item. Concerning the reasons for their preferred outcomes, 7 cooperative Ss checked alternative #2, and 4 checked #1. One S did not respond. Nine Ss in the competitive condition checked #1, 1 checked #3, and 1 checked #4. Responses to a question assessing Ss expectations about the behavior of the other, indicated that Ss in both conditions appeared to project their own motives onto O. Cooperative Ss believed that he would prefer light A, and competitive Ss believed that O would prefer light B ($\chi^2 = 5.05; p < .05$). The pre-task questionnaire also included several scales of bi-polar adjectives on which the Ss rated themselves and the other person. These scales were repeated on the post-task questionnaire and the results are reported below.

Preference Scores. The preferences of the pure groups indicate the success of the motivational inductions. Cooperative Ss attempted to predict the location of the light in row A on an average of 46 times out of the 50 trials. Competitive Ss preferred to try for the light in row B 48 times out of 50.

Truth Scores. Cooperative Ss were about twice as truthful as competitive Ss. In the 30 actual trials where outcomes affected earnings, cooperative Ss sent messages which truthfully described their outcomes an average of 18.5 (61.7%) of the times. Competitive Ss, on the other hand, were
truthful about the same outcomes only 9.36 (31.2%) of the
times, (t = 2.64; p < .01). As expected, cooperative Ss were
truthful about A outcomes significantly more often than they
were about B or C outcomes (F = 9.65, p < .01; see Table 2).

Ss with a competitive orientation were slightly, but not
significantly more truthful about B's than A's and least
truthful about C's. If the competitive Ss had been fully
opportunistic in their lying and truth-telling they would
have been more truthful about A's than B's.

Deception Scores. An examination of the patterns of
deception scores helps to clarify the dynamics of the response
of the two conditions. Analyzing the 30 actual trials separ-
rately, a deception score was assigned to each of the 5
messages. This score was determined by calculating the number
of times a message was used deceptively, divided by the number
of times it was possible to use it deceptively. For example,
since the 30 actual trials consisted of 10 A outcomes, 10 B
outcomes, and 10 C outcomes, an A (or a B, or C) message could
be used as a deception only 20 times out of the 30. Since a
FT or NI outcome did not occur during the 30 actual trials, it
was possible to use these messages deceptively 30 times.

The deception scores (Table 3) indicate that when coopera-

Insert Table 3 about here

ative Ss were sending untruthful messages to 2, most often those
messages falsely reported an A outcome. For competitive Ss an
untruthful message was most often NI, an indication that the S had received no feedback on that trial, and therefore had no information about what the actual outcome was. The second most frequent deception used by competitive Ss was to report falsely that they had received an A outcome. As Table 3 shows, cooperative and competitive Ss often indicated falsely that they had received mutually beneficial A outcomes.

Table 4 presents the percentage of true messages sent when the outcomes were the ones intended or not intended by S. The results generally indicate that in comparison to competitive Ss the cooperative ones were more frequently truthful in reporting both the intended and unintended consequences of their actions. The data also reveal that under certain conditions both cooperative and competitive Ss were more frequently truthful about the intended than the unintended effects of their behavior. (Other analyses indicate that when cooperative Ss were deceptive, they sent a message which was the same as the outcome they had intended but failed to receive (primarily A), 66% of the time; when competitive Ss lied, they sent a message which was the same as their intended (primarily B) only 28% of the time while a "No Information" message was sent 29% of the time.) The interesting exceptions occur in 2 kinds of situations: 1) when the S has acted effectively, but in a way opposed to his orientation (i.e., when the cooperative S has achieved a competitive outcome that he sought and when a competitive S achieved an intended cooperative outcome) or
2) when the $S$ has unintentionally achieved an outcome, which

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Insert Table 4 about here
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is consistent with his orientation, but is the opposite of
what he sought (i.e., when a cooperative $S$ sought a competitive
outcome but nevertheless achieved a cooperative one). To be
truthful under circumstances where one has knowingly violated
the "ought" requirements of one's situation is, perhaps, to
put forth a pretense of honesty and good-will which may seem
to brash even for our $S$s.

Post Task questionnaire. Checking a list of 7 alternative
motives for sending messages, the cooperative $S$s reported
their motives as follows:

58% (7 out of 12) "I wanted to tell him what actually
happened."

33% (4 out of 12) "I wanted to influence him to choose A."

8% (1 out of 12) "I had no objective."

The competitive $S$s reported the purpose of their messages as
follows:

45% (5 out of 11) "I wanted to confuse him."

27% (3 out of 11) "I wanted to tell him what actually
happened."

18% (2 out of 11) "I had no objective."

9% (1 out of 11) "I wanted to influence him to choose A."
The Ss's projection of their own motivations onto O is indicated by the results of the pre- and post-task adjective rating scales. As shown in the Table 5, cooperative Ss rate the other as more friendly, cooperative, and sharing than do the competitive Ss.

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Insert Table 5 about here
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Ss in these two conditions also present quite different pictures of themselves. The results, presented in Table 6, demonstrate that cooperative Ss as compared to competitive Ss see themselves as more cooperative, friendly, sharing, and considerate. It is evident that the Ss in each of these conditions see O similar to themselves in orientation.

Comparing the difference between ratings on the pre- and post-questionnaire we find that Ss tend to see themselves as less strong and good after the task than before. Most likely this reflects their inability to make correct predictions during the actual trials. We also find that compared to their ratings on the pre-questionnaire competitive Ss tend to see themselves as more friendly, cooperative and generous after the task has been completed.

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Insert Table 6 about here
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Results of questionnaire items dealing with S's perception of performance on the task, show that cooperative Ss and competitive Ss have essentially the same perceptions on the
pre- and post-questionnaire. Furthermore, on the post-
questionnaire, all Ss see themselves as doing significantly
worse than their partners (p < .05). Once again, this probably
reflects the relatively low proportion of correct predictions.

Discussion

It is evident that our Ss did not "tell the truth" and
"lie" in a manner which would indicate that they had an
exclusively instrumental view of their relation to O. Such
a view would have led the cooperative subjects to lie more
often when their behavior did not have the mutually beneficial
effects they had intended; it would also have led the com-
petitive Ss to be truthful more often when they unwittingly
benefitted O.

The results suggest that subjects tended to conceive
of the relation with the other as symmetrical: the cooperative
Ss perceived themselves and the other, to be rather cooperative,
friendly, and sharing, while the competitive Ss saw themselves
and the other both as not very cooperative, friendly, nor
sharing (see Tables 5 and 6). In our introductory remarks,
we suggested that culturally-derived expectations would lead
cooperative subjects to the view that "truthfulness" was the
appropriate behavior in a mutually cooperative relationship
and would lead competitive subjects to believe that "lying"
was a permissible behavior in a competitive context. The
consistently greater truthfulness of the cooperative subjects
is in accord with this suggestion.
However, it remains necessary to explain the considerable amount of lying by the cooperative subjects when their behavior had unintended consequences. In this connection, a basic fact of the experiment to keep in mind is that all subjects experienced an inability to accomplish what they set out to do in twenty of the 30 task trials. In other words, during the task the Ss were led to believe that they were performing rather poorly, at a level much below their own and the other's expectations. Under such circumstances, a subject might wish to conceal some of his errors and thus, to present himself as less of a failure than his obtained outcomes would suggest. Partially, this was motivated to preserve his self-esteem and partially, to maintain the other's desire to cooperate with him. Presumably, the other's willingness to cooperate might diminish if the other perceived a subject to be incompetent or uncooperative. Not only did the unusual circumstances of the subject's unexpectedly poor performance create a motivation for concealment, but in addition, concealment of "B" and "C" outcomes could be readily rationalized as "white lies." In falsely reporting an "A" outcome, the cooperative subjects were truthfully reporting their intention. Thus, the barrier to lying may have been lowered somewhat because the lies were "white" ones.

The behavior of the competitive subjects, superficially presents a puzzle. They lied more frequently when they received an "A" outcome and they sent fewer false "A" messages
than we expected initially. Apparently, they were not committed to portraying themselves as an effective cooperator to the other. However, this makes sense in light of their view that the other resembled themselves in regard to competitiveness: a competitive other might exploit with delight a subject's seeming cooperation. Yet, faced with a potentially competitive other, a subject had no reason to hope that any communication strategy would get the other to behave the way he wanted him to behave. In such a situation, communicating "no information" seemed a natural way out of the impasse. There were essentially two ways of transmitting "no information." The most direct means was to use the "No Information Received" message; the other way was to use "A," "B" and "C" messages in a random like-pattern. Both methods were employed by the competitive subjects. They used the "NI" messages untruthfully considerably more than the cooperative subjects did; they also sent "A," "B," and "C" messages in an almost random equally distributed pattern, except for a tendency to send each message proportionately more when it coincided with the actual outcome than when it did not ("truth" in message use occurred more often than one would expect by chance).

The major points of our discussion can be summed up as follows: The views that the subjects developed of the other and their conception of what was appropriate to communicate to the other were much influenced by whether he had been
induced to have a cooperative or competitive orientation. Subjects did not view the other as equally accessible to influence in the cooperative and competitive conditions and held different views about the rules for "truth-telling" and "lying" in the two conditions. As a consequence, the communication objectives and strategies of subjects in the two contexts differed. The cooperative subjects were systematic about establishing a mutually cooperative relation and sought to present themselves to the other as a reasonably effective cooperator. To do so, they had to lie about their poor performance. However, the cooperative context placed restraints on the amount and types of permissible lying. It should also be noted that the communication device provided in this experiment was limited. For example, the message system did not allow subjects to unambiguously communicate their intent as well as their outcome. Had this been possible there might have been less lying in the cooperative condition.

The competitive subjects were not hopeful that they might induce the other to act beneficially toward them, so they had little reason to communicate any particular kind of information to him; "no information" provided a useful screen for their intentions and outcomes. In addition, the competitive context placed only minimal restraints on the amount and types of permissible lying.
References


Footnotes

(1) We acknowledge gratefully the help of
Jack Kytle in conducting the experiment. This research
was supported by an ONR Contract, Monr-4294(00) whose
principal investigator is Morton Deutsch.

(2) The sequence of outcomes for the 50 trials was as follows:

1. B  
2. C  
3. A  
4. B  
5. C  
6. Practice Trial (PT)  
7. PT  
8. A  
9. B  
10. C  
11. No information  
12. PT  
13. PT  
14. A  
15. B  
16. C  
17. PT  
18. PT  
19. PT  
20. A  
21. B  
22. C  
23. A  
24. B  
25. C  
26. PT  
27. PT  
28. PT  
29. A  
30. B  
31. C  
32. PT  
33. PT  
34. PT  
35. A  
36. B  
37. C  
38. PT  
39. PT  
40. PT  
41. PT  
42. A  
43. B  
44. C  
45. PT  
46. PT  
47. A  
48. B  
49. C  
50. A
TABLE 1
Payoffs Received When Light Appeared in a Given Row

<table>
<thead>
<tr>
<th>If a light appeared in</th>
<th>The S earned for himself</th>
<th>The S earned for the other</th>
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</thead>
<tbody>
<tr>
<td>Row A</td>
<td>15¢</td>
<td>15¢</td>
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<tr>
<td>Row B</td>
<td>20¢</td>
<td>-10¢</td>
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<tr>
<td>Row C</td>
<td>-2¢</td>
<td>2¢</td>
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TABLE 2

Mean Percent of Trials on Which Ss Told the Truth to Q as a Function of Outcome Received and Ss' Orientation

<table>
<thead>
<tr>
<th>Orientation</th>
<th>A (n=10)</th>
<th>B (n=10)</th>
<th>C (n=10)</th>
<th>A + B + C (n=30)</th>
<th>PT &amp; NI (n=20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperative</td>
<td>88.3</td>
<td>55.0</td>
<td>41.6</td>
<td>61.7</td>
<td>49.2</td>
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<tr>
<td>Competitive</td>
<td>30.0</td>
<td>37.3</td>
<td>26.4</td>
<td>31.2</td>
<td>27.3</td>
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</table>
TABLE 3
Percent of Possible Times in 30 Trials that
a Given Message was Used Deceptively

<table>
<thead>
<tr>
<th>Orientation</th>
<th>A (n = 10)</th>
<th>B (n = 10)</th>
<th>C (n = 10)</th>
<th>PT</th>
<th>NI</th>
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<tbody>
<tr>
<td>Cooperative</td>
<td>32.9</td>
<td>9.2</td>
<td>2.9</td>
<td>1.4</td>
<td>6.7</td>
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<tr>
<td>Competitive</td>
<td>23.2</td>
<td>13.2</td>
<td>16.4</td>
<td>6.0</td>
<td>27.1</td>
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</table>
### TABLE 4

Mean Percent of True Messages as a Function of Type of Outcome Received, Whether Outcome was Intended or Not, and Ss' Orientation

<table>
<thead>
<tr>
<th>Outcome obtained</th>
<th>Outcome Intended</th>
<th>Outcome Unintended</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cooperative</td>
<td>Competitive</td>
</tr>
<tr>
<td>A (n = 10)*</td>
<td>92.5 (9.42)</td>
<td>12.1 (0.37)</td>
</tr>
<tr>
<td>B (n = 10)</td>
<td>8.3 (0.67)</td>
<td>37.8 (9.64)</td>
</tr>
<tr>
<td>C (n = 10)</td>
<td>--- (0)</td>
<td>--- (0)</td>
</tr>
</tbody>
</table>

* All Ss received each outcome on 10 trials. Figures in parentheses indicate the mean number of trials on which the type of event specified occurred. Thus, cooperative Ss received an "A" outcome which they intended on an average of 9.42 out of the 10 trials, and a "A" outcome which they did not intend on an average of .58 out of the 10 trials.
TABLE 5
Pre-task and Post-task ratings of 0 by Ss in Cooperative and Competitive Conditions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Orientation</th>
<th>Pre</th>
<th>Post</th>
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</thead>
<tbody>
<tr>
<td>Cooperativeness</td>
<td>Cooperative</td>
<td>38.64</td>
<td>34.09</td>
</tr>
<tr>
<td></td>
<td>Competitive</td>
<td>17.11</td>
<td>10.67</td>
</tr>
<tr>
<td>Friendliness</td>
<td>Cooperative</td>
<td>38.91</td>
<td>39.82</td>
</tr>
<tr>
<td></td>
<td>Competitive</td>
<td>25.64</td>
<td>22.82</td>
</tr>
<tr>
<td>Generosity</td>
<td>Cooperative</td>
<td>33.08</td>
<td>33.82</td>
</tr>
<tr>
<td></td>
<td>Competitive</td>
<td>21.09</td>
<td>18.45</td>
</tr>
</tbody>
</table>

(1) Main effect for orientation was significant for all these dimensions. Main effect for time (pre - post) and orientation x time effects were never statistically significant.
### TABLE 6

Pre-task and Post-task Ratings of Self by Ss in the Cooperative and Competitive Conditions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Orientation</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friendliness $^{1,2,3}$</td>
<td>Cooperative</td>
<td>48.92</td>
<td>47.42</td>
</tr>
<tr>
<td></td>
<td>Competitive</td>
<td>18.09</td>
<td>29.54</td>
</tr>
<tr>
<td>Cooperative $^{1,3}$</td>
<td>Cooperative</td>
<td>47.75</td>
<td>42.58</td>
</tr>
<tr>
<td></td>
<td>Competitive</td>
<td>4.00</td>
<td>15.91</td>
</tr>
<tr>
<td>Generosity $^{1,2,3}$</td>
<td>Cooperative</td>
<td>47.50</td>
<td>46.25</td>
</tr>
<tr>
<td></td>
<td>Competitive</td>
<td>7.45</td>
<td>21.45</td>
</tr>
<tr>
<td>Considerateness $^{1}$</td>
<td>Cooperative</td>
<td>53.17</td>
<td>49.67</td>
</tr>
<tr>
<td></td>
<td>Competitive</td>
<td>30.45</td>
<td>33.00</td>
</tr>
<tr>
<td>Strength $^{2}$</td>
<td>Cooperative</td>
<td>42.09</td>
<td>29.00</td>
</tr>
<tr>
<td></td>
<td>Competitive</td>
<td>51.18</td>
<td>32.27</td>
</tr>
<tr>
<td>Goodness $^{2}$</td>
<td>Cooperative</td>
<td>50.67</td>
<td>31.00</td>
</tr>
<tr>
<td></td>
<td>Competitive</td>
<td>43.00</td>
<td>33.27</td>
</tr>
</tbody>
</table>

(1) Main effect (A) for orientation statistically significant, $p < .05$.

(2) Main effect (B) for time (pre - post) statistically significant, $p < .05$.

(3) A x B interaction statistically significant, $p < .05$. 
FIGURE 1

Examples of Light Patterns
FIGURE 2

Panel Used for Preferences, Prediction and Messages
○ Unlighted

○ Lighted
<table>
<thead>
<tr>
<th>Preference Area</th>
<th>Prediction Area</th>
<th>Message Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>. A</td>
<td>O O O</td>
<td>. A</td>
</tr>
<tr>
<td>. B</td>
<td>O O O</td>
<td>. B</td>
</tr>
<tr>
<td>. C</td>
<td>O O O</td>
<td>. C</td>
</tr>
<tr>
<td></td>
<td>. . .</td>
<td>Practice Trial</td>
</tr>
<tr>
<td></td>
<td>1 2 3</td>
<td>No Information</td>
</tr>
</tbody>
</table>

- Buttons
- Lights