Induced Mood and the Illusion of Control
Lauren B. Alloy  
Northwestern University  
Lyn Y. Abramson  
University of Wisconsin—Madison  
Donald Viscusi  
Temple University Medical School

Alloy and Abramson reported that depressed students give relatively accurate judgments of the degree of contingency between their responses and outcomes while nondepressed students show an "illusion of control" and overestimate their impact on objectively uncontrollable outcomes that are frequent and/or desired. The present experiment examined the directionality of the relationship between realism in judging personal control and depression. Depressed and elated mood states were induced transiently in naturally nondepressed and depressed students, respectively, and the impact of these transient mood states on susceptibility to the illusion of control was assessed. Naturally nondepressed women made temporarily depressed gave accurate judgments of control while naturally depressed women made temporarily elated showed an illusion of control and overestimated their impact on an objectively uncontrollable outcome. In addition, mood induction groups showed predicted changes in self-reported affect and a behavioral measure of depression. These findings cannot be attributed to demand characteristics because nondepressed and depressed women instructed to simulate depression and elation, respectively, behaved differently than their respective mood induction groups. An intriguing implication of these findings may be that therapeutic interventions for depression that successfully remediate depressive symptoms may also increase depressed individuals’ susceptibility to the illusion of control.

An intriguing finding is that depressed people often accurately judge their personal control, whereas nondepressives succumb to a number of illusions and biases in judging their impact on events (Abramson & Alloy, 1980, 1981; Abramson & Martin, in press; Alloy & Abramson, 1979, 1980, in press; Alloy & Seligman, 1979; Tabachnik-Kayne & Alloy, in press). For example, Alloy and Abramson (1979) presented depressed and nondepressed college students with one of a series of problems that varied in the actual degree of control that subjects’ responses exerted over outcomes. In each problem, subjects estimated the degree of contingency between their responses (pressing or not pressing a button) and an environmental outcome (onset of a green light). Depressed students gave relatively accurate judgments of the degree of contingency between their responses and the outcome in all conditions of all experiments. Nondepressed students, on the other hand, overestimated how much control they had over objectively uncontrollable events that occurred with high frequency or were associated with success (e.g., winning money). In addition, nondepressed students underestimated how much control they had over objectively controllable events that were associated with failure (e.g., losing money).

It is worth pointing out an apparent similarity between results obtained from work on attributional style and depression and Alloy and Abramson’s (1979) findings. Many investigators have demonstrated that nondepressives typically exhibit a robust self-serving attributional bias (i.e., making internal attributions for successes and external
attributions for failures). In contrast, depressives typically exhibit an attenuated version of the nondepressive self-serving attributional style or make similar causal attributions for successes and failures (see Abramson & Alloy, 1981; Abramson & Martin, in press; Tabachnick-Kayne & Alloy, in press; for reviews). Nondepressives' tendency to make internal attributions for success and external attributions for failure resembles their tendency to exhibit an illusion of control (Langer, 1975) when they encounter objectively uncontrollable events associated with success and an illusion of no control when they encounter objectively controllable events associated with failure (see Abramson & Alloy, 1981).

Using the experimental paradigm developed by Langer (1975), Golin, Terrell, and Johnson (1977) found that nondepressed college students exhibited an illusion of control in an objectively chance task in which elements typically associated with skill tasks (e.g., active involvement) had been introduced, whereas depressed students did not succumb to this illusion. Golin, Terrell, Weitz, and Drost (1979) extended these findings to a clinical setting and reported that, similar to mildly depressed college students, more severely depressed inpatients did not show this illusion of control. In contrast, nondepressed psychiatric inpatients who were mainly diagnosed as schizophrenics showed a robust illusion of control.

It is worth pointing out that Abramson, Alloy, and Rosoff (1981) reported one experimental condition in which, on the face of it, depressives appeared to misjudge their personal control. Relative to nondepressives and the potential degree of control they could exert, depressives underestimated how much control their responses exerted over the onset of a green light when a complex hypothesis was necessary to arrive at the maximally effective response. However, as Abramson et al. (1981) pointed out, depressives were less likely than nondepressives to perform the correct controlling response. Thus, depressives' judgments that they had little control over the onset of the green light accurately reflected the amount of control they actually exerted. Taken together, the aforementioned studies demonstrated that at least in some laboratory situations, depressives give accurate judgments of control while nondepressives succumb to systematic illusions and biases in making such judgments.

At present, the causal direction of the association between depressive affect and accuracy in judging personal control is not known. Perhaps the state of depression itself causes people to accurately assess their impact on events, and the state of nondepression causes people to succumb to systematic illusions about their personal control. Alternatively, those people who tend to judge accurately how much control they have over outcomes may be more vulnerable to depressive states than people who systematically misjudge the efficacy of their responses. Finally, some third variable such as anhedonia or attributional style may be responsible both for accuracy in judging personal control and vulnerability to depressive states.

The present study is a first step in investigating the directionality of the relationship between realism (Mischel, 1979) in judging personal control and depressed affect. We induced depressed mood in naturally nondepressed college students and elated mood in naturally depressed students and assessed the impact of these transient mood states on students' susceptibility to the illusion of control. To measure susceptibility to the illusion of control, we asked students to judge how much control they had over the onset of a green light in the "Win" noncontingency problem developed by Alloy and Abramson (1979, Experiment 3). In the Win problem there is no objective contingency between subjects' responses and the onset of the green light, but subjects win $5 noncontingently. Alloy and Abramson (1979) reported that depressed students accurately judged their personal control in this problem, whereas nondepressives succumbed to an illusion of control. If current mood states themselves influence accuracy in judging personal control, then naturally depressed students made depressed should exhibit an illusion of control in the Win problem, whereas naturally nondepressed students made depressed should judge personal control accurately.
Mood induction was achieved with Natale's (1977) modification of the Velten technique (Velten, 1968). This modification consists of automating the original Velten procedure. We specifically chose the Velten technique for the induction of transient mood states because this technique is better validated than any other mood induction procedure (Velten, 1968). Furthermore, the Velten technique has been used in a variety of clinical and social psychological experiments to demonstrate the relationship between mood and other behaviors (Aderman, 1972; Hale & Strickland, 1976; Natale, 1977; Raps, Reinhard, & Seligman, 1980; Strickland, Hale, & Anderson, 1975).

In addition to including mood induction, neutral mood, and no mood induction conditions, we included two groups of simulators in the experimental design. One group of simulators consisted of naturally nondepressed students instructed to behave on the experimental tasks and questionnaires as if they were depressed. The second group of simulators consisted of naturally depressed students instructed to behave as if they were elated. While we expected that simulators would be perfectly capable of mimicking their respective mood induction subject counterparts on a self-report measure of depth of transient depressive mood, we were unable to make predictions about the simulators’ performance on the judgment of control task. If the simulators’ judgments of control differed from those of their respective mood induction subject counterparts, we would be confident in ruling out demand characteristics (Orne, 1962) explanations of results obtained in the mood induction conditions.

Method

Subjects

Eighty female undergraduates, 40 depressed and 40 nondepressed, served as paid volunteers. Sign-up sheets posted in university classroom buildings were used to recruit subjects for participation in a problem-solving and mood experiment. When subjects arrived at the laboratory, they were assigned to depressed and nondepressed groups on the basis of both their Beck Depression Inventory (BDI) score (Beck, 1967) and their Multiple Affect Adjective Check List (MAACL) depression score (Today Form, Zuckerman & Lubin, 1965). To qualify for admission to the depressed groups, subjects had to score 9 or above on the BDI and 14 or above on the MAACL depression scale. To qualify for admission to the nondepressed groups, subjects had to score 8 or lower on the BDI and 13 or lower on the MAACL depression scale. Subjects who did not meet both criteria did not qualify for the experiment.

Of the 40 depressed subjects in the experiment, 28 were mildly depressed, 10 were moderately depressed, and 2 were severely depressed according to BDI cutoff points for severity of depression established by Kovacs and Beck (1977). The fact that almost one third of our depressed subjects scored in the moderate to severe range on the BDI is consistent with Hammen’s (1980) findings. It is important to emphasize that we assigned subjects to depressed and nondepressed groups on the basis of the severity of their depressive symptoms rather than on the basis of the presence or absence of the clinical syndrome of depression. Table 1 presents the mean BDI and MAACL depression scores for all experimental groups.

The 40 depressed subjects were assigned randomly either to an experimental elation-induction group or to one of three control groups (10 per group). The 40 nondepressed subjects were assigned randomly to an experimental depression-induction group or to one of three control groups (10 per group).

Experimental Design

The experimental design consisted of eight treatment groups. Depressed subjects were assigned to one of four groups: elation-induction (E-Ind); elation-simulation (E-Sim); neutral mood induction (D-Neu); or no induction (D-No). Nondepressed subjects were also assigned to one of four groups: depression-induction (D-Ind); depression-simulation (D-Sim); neutral mood induction (ND-Neu); or no induction (ND-No). All statistical analyses employed a set of seven orthogonal, a priori contrasts (Hayes, 1973) among the eight groups.

1 Females only were employed as subjects because Velten (1968) reported that women are more susceptible to mood induction effects than are men. Pilot work supported this notion.

2 The BDI is a well-validated measure of relatively enduring mood (Beck, 1967; Bumbery, Oliver & McClure, 1978; Hammen, 1980), whereas the MAACL is a measure of more transient mood (Zuckerman & Lubin, 1965).

3 Approximately 120 subjects were tested to find 80 who met both criteria. In addition, the data of 4 subjects from the ND-Neu group were discarded because the postMAACL depression scores for these subjects were greater than 13 and therefore disqualified them for assignment to the nondepressed group. They were replaced by 4 additional subjects.

4 Kovacs and Beck’s (1977) depth of depression cutoff points for the BDI are: 0–9: no depression; 10–15: mild depression; 16–23: moderate depression; 24+: severe depression.
Table 1
Means and Standard Deviations for the Beck Depression Inventory (BDI) and the Multiple Affect Adjective Check List (MAACL) Depression Scale

<table>
<thead>
<tr>
<th>Condition</th>
<th>BDI</th>
<th>MAACL-Pre*</th>
<th>MAACL-Post*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Nondepressed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-Ind</td>
<td>2.1</td>
<td>2.21</td>
<td>10.4</td>
</tr>
<tr>
<td>D-Sim</td>
<td>4.3</td>
<td>2.37</td>
<td>8.1</td>
</tr>
<tr>
<td>ND-Neu</td>
<td>2.4</td>
<td>2.24</td>
<td>7.5</td>
</tr>
<tr>
<td>ND-No</td>
<td>2.1</td>
<td>1.97</td>
<td>8.5</td>
</tr>
<tr>
<td>Depressed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-Ind</td>
<td>13.0</td>
<td>3.69</td>
<td>18.7</td>
</tr>
<tr>
<td>E-Sim</td>
<td>13.5</td>
<td>3.32</td>
<td>19.4</td>
</tr>
<tr>
<td>D-Neu</td>
<td>13.3</td>
<td>4.27</td>
<td>18.1</td>
</tr>
<tr>
<td>D-No</td>
<td>11.2</td>
<td>1.89</td>
<td>18.7</td>
</tr>
</tbody>
</table>

*Pre- and post- refer to before and after the mood induction procedure, respectively.

Note. D = depressed; ND = nondepressed; E = elated; Ind = induction; Sim = simulation; Neu = neutral; No = no induction.

Apparatus

The experiment was conducted in a two-room suite. Standard switching-relay circuitry equipment for controlling stimulus presentation and for recording subjects' responses was housed in the observation room of the suite. Subjects were seated in the experimental room next to a one-way mirror so that they could be observed by the experimenter in the observation room.

Judgment of noncontingency task. Following the mood induction procedures, all experimental groups participated in the noncontingent, "Win" judgment-of-control problem developed by Alloy and Abramson (1979, Experiment 3). In this task, subjects are given 40 trials. On each trial, subjects perform one of two responses (pressing or not pressing a button) and then receive one of two outcomes (green light onset or no green light onset). The subject is then asked to judge the degree of control her responses exert over green light onset. In the noncontingent Win problem, subjects' responses actually exert zero control over green light onset and the green light occurs on a random 50% of the 40 trials. However, subjects gain a quarter each time the green light comes on. Subjects do not gain any money on trials on which the green light does not come on. Thus, all subjects win $5 noncontingently.

The stimulus apparatus for the judgment of noncontingency task consisted of a black wooden stand-up platform (23 cm × 23 cm) on which a yellow and green light were positioned 5 cm from the top of the platform, facing the subject. The subject's response apparatus consisted of a 15.5 cm × 7.5 cm × 4 cm wooden box, also painted black, on which a spring-loaded button was mounted in the center. A Kodak 650H Carousel slide projector with a remote control panel presented slides depicting the amount of money subjects had at any point in time. The slides were projected onto a 75 cm × 60 cm screen positioned on the wall approximately 90 cm from the subject. The remote control panel was operated from the control room of the two-room suite.

Dependent Measures

Judgments of control. The major dependent measure consisted of subjects' judgments of control. On the judgment of control scale, subjects rated the degree of control their responses (pressing and not pressing) exerted over green light onset. The scale was marked off in units of five with extreme values of 0 and 100. The extreme values were labeled "no control" and "complete control" and the 50% point was labeled "intermediate control." Subjects also rated their confidence in the accuracy of their judgments of control on a 10-point scale (endpoints labeled "completely uncertain" and "completely certain").

Affect change measures. The Today Form of the MAACL (Zuckerman & Lubin, 1965), which assesses depression, anxiety, and hostility, was administered before and after mood induction. The two administrations of the MAACL yielded a set of three affect-change scores. The assessment of subjects' mood changes served, in part, as a check on the mood induction procedure. It was expected that depressed subjects who received elation induction would show significantly less self-reported depression and nondepressed subjects who received depression induction would report significantly more depression than their respective neutral mood induction and no-induction control groups. Elation or depression simulators were also expected to report significant mood changes since they were instructed to act as if they were elated or depressed, respectively (see Procedure section).
Writing speed measure. As an additional check on the effectiveness of the mood induction procedure, subjects were given a numbers writing task before and after the mood induction. In this task, subjects wrote numbers backwards from 100 on a sheet of paper for a 1-min. period. A common finding is that depressed individuals have slower writing speeds than nondepressed or elated individuals (e.g., Johnson, 1937; Velten, 1968). Thus, it was expected that the elation induction group would show significant increases in writing speed and the depression induction group significant decreases in writing speed as compared to their respective simulation, neutral induction, and no-induction control groups.

Procedure

Subjects were tested individually. When the subject arrived at the experimental room, she was greeted by the experimenter as follows:

Hi, I'm Don and I'm the experimenter for this study. As you know, this is a mood and problem-solving study. In general, I am interested in studying people's ability to induce moods in themselves and the relationship between mood and performance on problem-solving tasks. Before we actually begin, I want to give you a consent form.

After filling out the consent form, the subject was administered the BDI and MAACL. Today Form. The experimenter was not present while the subject filled out the mood inventories. After completing the mood inventories, subjects were administered the numbers writing task to obtain a baseline measure of writing speed. In this task, subjects were asked to write numbers down on a sheet of paper, in descending order from 100, for a 1-min. period. Following the writing speed task, the subject was assigned to one of the eight experimental groups and participated in the mood induction task.

Mood induction conditions. Subjects in the elation induction (E-Ind) group, depression induction (D-Ind) group and both neutral mood induction (D-Neu and ND-Neu) groups were given a deck of 69 cards. Following Natalie's (1977) modification of Velten's (1968) procedure, the first nine cards contained instructions that were preparatory to reading the actual mood induction cards that followed. These statements emphasized that the subject should try to feel the mood suggested by the cards that would follow and provided several suggestions of strategies for accomplishing this goal. Subjects were told that they could do this and that there was nothing worrisome or embarrassing about feeling such a mood. The 60 cards that followed were composed of 60 self-referent statements adapted from Velten (1968). For the E-Ind group, the statements progressed from a neutral statement, "Today is neither better nor worse than any other day," to elated statements like, "Things will be better and better today" or "God, I feel great." For the D-Ind group, the statements progressed from the same neutral statement to depressive statements like, "I have too many bad things happen in my life" or "I want to go to sleep and never wake up." For the D-Neu and ND-Neu groups, the statements were affectively neutral and not self-referent. An example of a neutral statement card is "Utah is the Beehive State."

The subjects read each card first silently and then aloud, and turned it face down after reading it. The first nine preparatory cards were read at the subject's own pace, and the mood statement cards were paced by auditory signals of 1-sec duration that were spaced 20 sec apart.

The preparatory instructions and mood statements were typed on unlined index cards and were all in the first person. The mood statements were all capitalized and each statement was printed on a separate index card.

The instructions for the mood induction task were tape recorded and were as follows:

This is a study involving mood induction. Essentially we will be determining if people can talk themselves into a specific mood or feeling. Your success in talking yourself into the mood will depend to a great extent on your cooperation and willingness to participate in the experiment. This is not intended to be harmful or frightening but is only an effort to find out if people can induce moods in themselves.

The materials for this study are arranged on the table. Please move the stack of cards directly in front of you. Do not look at the cards until I tell you to do so. There are 69 cards in the stack. On the first 9 cards you will find the instructions for the mood induction task, while the remaining 60 cards contain mood statements, which, when read, will suggest a specific feeling, and help you to induce that feeling in yourself. Please read both the instructions and the mood statements first to yourself and then aloud. Once you have completed reading the nine instruction cards I will sound a tone. This tone will be your signal to pick up and read the first mood statement card. After reading this card to yourself, and then aloud, continue to look at and concentrate on the statement until you again hear the tone which will be your signal to pick up and read the next card. Continue in this manner until you have viewed and read each mood statement card. Remember, do not go on to the next card until you hear the tone. Now, please read the nine instruction cards.

When you hear the tone please read the first mood statement card. Remember, do not go on to the next card until you again hear the tone.

Sixty tones of 1-sec duration, spaced 20 sec apart, followed the above statement and served to pace the subject through the mood induction cards.

Mood simulation conditions. Subjects in the elation simulation (E-Sim) and depression simulation (D-Sim) groups were given a deck of 11 cards. The first five cards contained instructions for simulating elation or depression, whereas the next five cards contained mood statements that were samples of the statements that subjects in the corresponding mood induction groups had received. The five instruction-cards described the procedure that mood induction subjects would be following and instructed the simulator to behave the way she estimated other subjects behave after they have been administered all 60 statements representing this mood. The last card in the deck reminded the subject to always act as if she were elated or depressed, respectively, for the remainder of the experiment.

The subjects read each card first silently and then aloud, and turned it face down after reading it. The first nine preparatory cards were read at the subject's own pace, and the mood statement cards were paced by auditory signals of 1-sec duration that were spaced 20 sec apart.

The preparatory instructions and mood statements were typed on unlined index cards and were all in the first person. The mood statements were all capitalized and each statement was printed on a separate index card.

The instructions for the mood induction task were tape recorded and were as follows:

This is a study involving mood induction. Essentially we will be determining if people can talk themselves into a specific mood or feeling. Your success in talking yourself into the mood will depend to a great extent on your cooperation and willingness to participate in the experiment. This is not intended to be harmful or frightening but is only an effort to find out if people can induce moods in themselves.

The materials for this study are arranged on the table. Please move the stack of cards directly in front of you. Do not look at the cards until I tell you to do so. There are 69 cards in the stack. On the first 9 cards you will find the instructions for the mood induction task, while the remaining 60 cards contain mood statements, which, when read, will suggest a specific feeling, and help you to induce that feeling in yourself. Please read both the instructions and the mood statements first to yourself and then aloud. Once you have completed reading the nine instruction cards I will sound a tone. This tone will be your signal to pick up and read the first mood statement card. After reading this card to yourself, and then aloud, continue to look at and concentrate on the statement until you again hear the tone which will be your signal to pick up and read the next card. Continue in this manner until you have viewed and read each mood statement card. Remember, do not go on to the next card until you hear the tone. Now, please read the nine instruction cards.

When you hear the tone please read the first mood statement card. Remember, do not go on to the next card until you again hear the tone.

Sixty tones of 1-sec duration, spaced 20 sec apart, followed the above statement and served to pace the subject through the mood induction cards.
The instructions for the mood simulation groups were also tape recorded and were as follows:

This is a study involving mood induction. Essentially we will be determining if people can talk themselves into a specific mood or feeling. You have been assigned to a group, however, in which I want you to simulate a specific mood or feeling.

The materials for this study are arranged on the table. Please move the stack of cards directly in front of you. Do not look at the cards until I tell you to do so. There are 11 cards in this stack. On the first 5 cards you will find the instructions for the mood simulation task, while the next 5 cards contain mood statements which are samples of the kinds of statements subjects in the mood induction task have received. Please read both the instructions and the mood statements first to yourself and then aloud. Once you have completed reading the 5 instruction cards I will sound a tone. This tone will be your signal to pick up and read the first mood statement card. After reading this card to yourself, and then aloud, continue to look at and concentrate on the statement until you again hear the tone which will be your signal to pick up and read the next card. Continue in this manner until you have viewed and read each mood statement card. Remember, do not go on to the next card until you hear the tone. Now, please read the 5 instruction cards.

When you hear the tone please read the first mood statement card. Remember, do not go on to the next card until you again hear the tone.

Six tones of 1-sec duration spaced 20 sec apart followed the above statement and served to pace the subject through the mood simulation cards.

No-induction conditions. Depressed and nondepressed subjects in the no mood-induction groups (D-No and ND-No) were assigned to read magazines for the amount of time the other subjects spent in the mood induction task. Instructions to the no-induction groups were as follows:

You have been randomly assigned to a group which receives no mood induction. So I would like you to sit here quietly for approximately 20 minutes. You may occupy yourself by reading these magazines, or if you have brought books with you, you may work on your course work. The important thing is for you to remain quietly seated for the first part of the experiment. I will return in about 20 minutes and we will then proceed to the next part of the experiment. If you need me for any reason, I will be sitting right outside the door.

Second administration of MAACL and writing speed task. Following the mood induction phase, all subjects again wrote numbers backwards from 100 for a 1-min. period and then completed the MAACL. The instructions for the MAACL stressed that they should fill it out according to the way they felt at that time, and not the way they felt at the beginning of the experiment. The experimenter was not present while the subject completed the MAACL.

Judgment of noncontingency task. After completing the MAACL, the apparatus for the judgment of noncontingency task was uncovered. The judgment-of-control problem consisted of 40 3-sec trials on which the subject had the option of either pressing a button or not pressing a button. Onset of a yellow light signaled the start of each trial. At the end of the 3-sec trial, a green light was either presented or not presented, dependent on a 50% random schedule. A new slide depicting the subject's current earnings was presented on each trial after the green light had either appeared or not appeared. The intertrial interval ranged from 10 to 25 sec with a mean of 14 sec. Further details of the procedure may be found in Alloy and Abramson (1979, Experiment 3). All subjects were given the following instructions:

Now, in this problem-solving experiment, it is your task to learn how to turn on this green light. Each time the yellow light comes on indicates the start of a new trial, the occasion to do something. For each trial, after the yellow light comes on, you have the option of either making a button press response or not making a button press response. A button press response consists of pressing this button once and only once immediately after the yellow light comes on. Not making a button press response consists, of course, of doing nothing when the yellow light comes on. If you do intend to press the button on a given trial, you must press within three seconds after the yellow light comes on; otherwise the trial will be counted as a not press trial. So, in this experiment there are only two possibilities as to what you can do on each of the trials: either press the button within three seconds after the yellow light comes on, or else, just sit back and do nothing. Any questions so far?

You may find that the green light will go on, on some percentage of the trials on which you do make a button press response. You may also find that the green light will go on, on some percentage of the trials when you do not make a button press response. Alternatively, you may find that the green light will not go on, on some percentage of the trials on which you do make a button press response. And, you may find that the green light will not go on, on some percentage of the trials when you do not make a button press response. So, there are four possibilities as to what may happen on any given trial: 1) you press and the green light does come on; 2) you press and the green light does not come on; 3) you don't press and the green light does come on; 4) you don't press and the green light does not come on. Since it is your job to learn how to turn on the green light, it is to your advantage to press on some trials and not on others, so you know what happens when you don't press as well as when you do press.

Moreover, how often the green light comes on in this problem will determine how much money you earn in the experiment. On each trial on which the green light does go on, you will earn a quarter. Alternatively, on each trial on which the green light does not go on, you will not earn any money. At the end of the problem, you will get to keep all of the money you have earned up to a maximum of $5. So, in general, the more successful you are in producing the green light, the more money you will take away with you at the end of the experiment. During the problem, you will be able to see how much money you currently
own by watching the green screen. The slide projector to your left will keep track of your accumulation, if any, of quarters.

When it was clear that the subject understood the outline of the task, she was then shown the judgment of control scale and the concept of control was discussed briefly. The instructions continued for all subjects as follows:

Forty trials will constitute the problem. After the problem, you will be asked to indicate your judgment of control by putting an "X" someplace on this scale: at 100 if you have complete control over the onset of the green light, at 0 if you have no control over the onset of the green light, and somewhere between these extremes if you have some but not complete control over the onset of the green light. Complete control means that the onset of the green light on any given trial is determined by your choice of responses, either pressing or not pressing. In other words, whether or not the green light goes on is totally determined by whether you choose to press or to just sit back and not press. No control means that you have found no way to make response choices so as to influence in any way the onset of the green light. In other words, the onset of the green light has nothing to do with what you do or don't do. Another way to look at having no control is that whether or not the green light comes on, on any given trial, is totally determined by factors such as chance or luck, rather than by your choice of pressing or not pressing. Intermediate degrees of control means that your choice of responses, either pressing or not pressing, influences the onset of the green light even though it does not completely determine whether the green light goes on or not. In other words, what you do or don't do matters to some extent but not totally. Another way to look at having intermediate control is that one response, either pressing or not pressing, produces the green light onset more often than does the other response. Any questions before we begin?

After the judgment of control instructions were read, the experimenter left the room and the subject proceeded with the contingency learning problem. At the end of the 40 trials, the experimenter returned and paid the subject $5. The control instructions were then re-read, and the subject completed the judgment-of-control scales.

Subjects were then completely debriefed and it was emphasized to subjects in the mood induction groups that the statements on the cards were not directed at them personally, but that they were part of the experimental procedure. No subject was permitted to leave the laboratory until the experimenter was convinced that the subject was no longer in the induced mood state.

Results

Mood Changes

Changes in subjects' self-reported levels of depression served, in part, as a check on the effectiveness of the mood induction procedures. It was expected that subjects in the D-Ind group would report significant increases in their levels of depression while subjects in the E-Ind group would report significant decreases in their levels of depression. Depression and elation simulators were also expected to report increases and decreases, respectively, in self-reported depression because they had been instructed to act as if they were in the appropriate mood state.

These predictions were supported by a set of orthogonal, a priori contrasts conducted on subjects' MAACL depression change (pre-to postinduction) scores. Nondepressed subjects in groups D-Ind and D-Sim became more depressed, $F(1, 72) = 101.54, p < .0001$, than nondepressed subjects in groups ND-Neu and ND-No, which did not differ from one another. It is of interest that depression simulators reported greater increases in depression than subjects in the depression induction group, $F(1, 72) = 22.20, p < .0001$. Similarly, depressed subjects in groups E-Ind and E-Sim became less depressed, $F(1, 72) = 57.33, p < .0001$, than depressed subjects in groups D-Neu and D-No, which were not different from one another. Again, there was a tendency for simulators to report greater shifts in depression (in this case in the elated direction) than subjects in the elation induction group, $F(1, 72) = 2.31, p < .10$. Figure 1 portrays the depression change scores for all experimental groups. An identical pattern of results was obtained for the MAACL anxiety and hostility change scores and thus, these data will not be reported in detail. It is noteworthy that the mean postinduction MAACL depression scores of the depression induction and elation induction groups (see Table 1) are virtually identical to MAACL depression scores typically reported for populations of naturally depressed and nondepressed college females, respectively (see Alloy & Abramson, 1979, Experiments 3 and 4). Depression simulators, on the other hand, showed highly exaggerated MAACL depression scores, scoring more than one and one-half times as high as typical scores for naturally depressed college females.

Informal observation through the one-way

---

5 All statistical tests in the Results section are two-tailed.
mirrors and later interactions with the subjects provided further evidence that the mood induction manipulations had been effective. A majority of the subjects in the depression induction group exhibited a noticeable decline in speech rate and postural changes such as slumping and holding their heads in their hands. On the whole, they appeared visibly tense and upset. In contrast, subjects in the elation induction group appeared quite cheerful and talkative. They often commented on how enjoyable the experiment was. These informal observations are consistent with those of other investigators using the Velten procedure (e.g., Adlerman, 1972). Simulators, on the other hand, tended not to show outward signs of mood change such as changes in speech rate or facial expression.

Writing Speed

Pre- to postinduction change scores for numbers written in the writing speed task are displayed for each group in Figure 2. This behavioral measure corroborated the findings of self-reported depression and provided additional evidence that the mood induction manipulations had, in fact, been effective. Nondepressed subjects in the depression induction group showed greater decreases in writing speed (i.e., wrote fewer numbers following the mood induction procedure) than their respective simulation, neutral, and no-induction control group subjects, \( F(1, 72) = 5.43, p < .05 \). In addition, depression simulators wrote fewer numbers following the pretreatment than nondepressed subjects in the neutral and no-induction groups, \( F(1, 72) = 6.29, p < .05 \), which did not differ from one another. Similarly, depressed subjects in the elation induction group showed greater increases in writing speed than subjects in the elation simulation, neutral, and no-induction groups, \( F(1, 72) = 10.36, p < .01 \). The latter three groups did not differ from one another.

Judgments of Control

The major dependent measure in the present study was subjects' judgments of control on the Win noncontingency problem. Figure 3 displays these judgments for each group.
As can be seen in Figure 3, the mood induction manipulations were successful in reversing depressed and nondepressed subjects’ typical judgments of control. That is, depressed subjects made temporarily elated showed illusions of control normally observed in naive nondepressed individuals (cf. Alloy & Abramson, 1979, in press), whereas nondepressed subjects made temporarily depressed gave relatively accurate judgments of little control of the kind normally observed in naive depressed individuals (cf. Alloy & Abramson, 1979, in press).

These observations were confirmed by a set of orthogonal, a priori contrasts on the judged control scores. Nondepressed subjects made temporarily depressed (D-Ind) judged that they had significantly less control over green light onset than nondepressed subjects in the simulation, neutral, and no-induction control groups, $F(1, 72) = 22.91, p < .001$. The D-Sim group also judged that they exerted less control than the ND-Neu and ND-No groups, $F(1, 72) = 8.41, p < .01$, which were not reliably different from each other. In contrast, depressed subjects made temporarily elated (E-Ind) showed illusions of control and greatly overestimated their impact on green light onset as compared to depressed subjects in the elation simulation, neutral, and no-induction groups, $F(1, 72) = 39.58, p < .001$. The latter three groups were not reliably different from one another.

In addition to judging degree of control for the Win noncontingency problem, subjects also rated how certain they were of the accuracy of these judgments. There were no significant differences in confidence ratings among any of the eight groups. The mean confidence rating for all subjects was 4.7.

Discussion

The major finding of the study is that people’s current mood states do influence their accuracy in judging the degree of control they exert over events. Naturally depressed students temporarily made elated in the laboratory exhibited an illusion of control when judging their impact on an objectively uncontrollable event associated with success, whereas naturally nondepressed students temporarily made depressed accurately judged their personal control over the event. In contrast, and replicating Alloy and Abramson’s (1979) prior findings, naturally depressed students exposed to no mood or neutral mood induction procedures accurately judged that they had little control over the event, whereas naturally nondepressed students in these two experimental conditions exhibited an illusion of control. It is worth highlighting the fact that the mood induction procedures were effective in reversing subjects’ typical judgments of control even though subjects were required to induce in themselves a mood state that was the opposite of their naturally occurring state. It would not be so surprising if naturally nondepressed women made elated showed an illusion of control, but the fact that naturally depressed women did so is more impressive.

The finding that naturally depressed students instructed to simulate elation failed to exhibit the illusion of control and that naturally nondepressed students instructed to simulate depression judged that they had more control than naturally nondepressed students temporarily made depressed suggests that a demand characteristics (Orne,
1962) explanation cannot be invoked to explain the effect of the mood induction manipulation on subjects’ judgments of control. Likewise, the finding that simulators tended to show greater changes in self-reported mood than students exposed to the mood induction procedures also is inconsistent with a demand characteristics explanation. If students in the mood induction groups simply were pretending to be in the relevant mood states, they should have shown the exaggerated changes in mood reported by the simulators.

A future task is the specification of the mechanism by which current mood states influence people’s judgments of control. Although investigators (e.g., Abramson, Seligman, & Teasdale, 1978; Beck, 1967) have attempted to describe in detail the cognitive processes involved in depression, little work has been done that describes the affective state of depression (or elation) itself. In the absence of a description of these affective states, it is difficult to speculate about how they might influence psychological processes. For example, did the mood induction procedures influence students’ judgments of control by altering their rate of behavior or their likelihood of testing complex hypotheses (see Abramson et al., 1981, for a discussion of the role of the generation of complex hypotheses in the judgment of control)? Alternatively, the mood induction procedures may have altered students’ perceptions of themselves which, in turn, influenced their susceptibility to the illusion of control. Resolution of this mediation issue awaits a more complete description of the properties of the depressed and elated mood states.

It is important to point out that the present study’s demonstration that current mood states influence people’s judgments of control does not rule out the alternative possibility that individual differences exist in the tendency to succumb to the illusion of control and people who do not readily succumb to the illusion are vulnerable to depression. Longitudinal studies that assess people’s cognitive biases and subsequent vulnerability to depressive mood states are necessary to test this hypothesis. An interesting possibility is that a reciprocal relationship exists between failure to succumb to the illusion of control and depression: The tendency to fail to succumb to the illusion may predict vulnerability for developing depressive mood states, but depressive mood states, in turn, may decrease susceptibility to the illusion.

This discussion raises the general question of which cognitive processes predispose depression and which cognitive processes result from being in a depressive mood state. Investigators have shown that depressives differ from nondepressives with regard to a number of cognitive processes including attributional style (e.g., Kuiper, 1978; Rizley, 1978; Seligman, Abramson, Semmel, & von Baeyer, 1979), recall of feedback (e.g., Nelson & Craighead, 1977), expectancy changes following success and failure (e.g., Abramson, Garber, Edwards, & Seligman, 1978; Klein & Seligman, 1976; Miller & Seligman, 1973), self-perception of social competence (Lewinsohn, Mischel, Chaplain, & Barton, 1980), perceptions of social consensus (Tabachnick-Kayne, Crocker, & Alloy, Note 1), and susceptibility to the illusion of control, to name only some. There is no a priori reason to believe that all of these cognitive processes are related to the depressive mood state in the same way. Indeed, in contrast to the present results, Mukherji, Abramson, and Martin (in press) reported that inducing transient depressive mood states in naturally nondepressed people was not sufficient to produce depressive attributional styles in these people. Moreover, Metalsky et al. (Note 2) found that people who typically attribute negative outcomes to internal, global factors (i.e., a depressive attributional style) become more depressed when confronted with a negative life event than people who typically attribute negative outcomes to external, specific factors (i.e., a nondepressive attributional style). Perhaps, as Abramson, Seligman, and Teasdale (1978) hypothesized, attributional styles are generalized beliefs or attitudes that mediate vulnerability to depression and are not easily modified by current mood states. In contrast, accuracy in judging personal control in hedonically charged situations as well as other cognitive processes reported to characterize depressed people may be more influenced by current mood states.

Our finding that inducing elation in nat-
urally depressed people led them to succumb to the same illusion of control to which non-depressives succumb has an interesting implication for the psychotherapy of depression. Whereas cognitive therapists such as Beck and his colleagues (e.g., Beck, Rush, Shaw, & Emery, 1979) have argued that the goal of cognitive therapy for depression is to help depressed clients make more realistic judgments, our work suggests that those therapeutic interventions that successfully remove depressive symptoms may also lead clients to become more prone to certain cognitive distortions such as the illusion of control.

Clinical theorists of depression (e.g., Beck, 1967) often distinguish between depression as an affect and depression as a syndrome. The present study demonstrated that people's susceptibility to the illusion of control varies as a function of whether they currently are in a depressed state. Future research is necessary to determine whether susceptibility to the illusion of control also varies as a function of clinical status. Although ironic, it may be that susceptibility to the illusion of control will be a good indicator that a person has remitted from the clinical syndrome of depression.

Reference Notes


References


Kovacs, M., & Beck, A. T. Empirical-clinical approach...


Received January 29, 1981