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Unrealistic Optimism About Future Life Events

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Two studies investigated the tendency of people to be unrealistically optimistic about future life events. In Study 1, 258 college students estimated how much their own chances of experiencing 42 events differed from the chances of their classmates. Overall, they rated their own chances to be above average for positive events and below average for negative events, $ps < .001$. Cognitive and motivational considerations led to predictions that degree of desirability, perceived probability, personal experience, perceived controllability, and stereotype salience would influence the amount of optimistic bias evoked by different events. All predictions were supported, although the pattern of effects differed for positive and negative events. Study 2 tested the idea that people are unrealistically optimistic because they focus on factors that improve their own chances of achieving desirable outcomes and fail to realize that others may have just as many factors in their favor. Students listed the factors that they thought influenced their own chances of experiencing eight future events. When such lists were read by a second group of students, the amount of unrealistic optimism shown by this second group for the same eight events decreased significantly, although it was not eliminated.

According to popular belief, people tend to think they are invulnerable. They expect others to be victims of misfortune, not themselves. Such ideas imply not merely a hopeful outlook on life, but an error in judgment that can be labeled *unrealistic optimism.*

It is usually impossible to demonstrate that an individual's optimistic expectations about the future are unrealistic. An individual might be quite correct in asserting that his or her chances of experiencing a negative event are less than average. On a group basis, however, it is relatively easy to test for an optimistic bias. If all people claim their changes of experiencing a negative event are less than average, they are clearly making a systematic error, thus demonstrating unrealistic optimism.

Various data suggest that people do tend to be unrealistically optimistic about the future. Surveys concerning automobile accidents (Robertson, 1977), crime (Weinstein, Note 1), and disease (Harris & Guten, 1979; Kirscht, Haefner, Kegeles, & Rosenstock, 1966; American Cancer Society, Note 2) find many people who say their risk is less than average but few who say their risk is greater than average. When people are asked to predict the outcomes of social and political issues, their predictions tend to coincide with their preferences (Cantril, 1938; Lund, 1925; McGregor, 1938; McGuire, 1960). Even for purely chance events (picking a card out of a deck, for example), people sometimes show optimistic biases (Irwin, 1953; Langer & Roth, 1975; Marks, 1951). None of these studies, however, has examined a range of positive and negative events to determine the extent of optimistic biases and the conditions under which they occur.

The principal goal of the present research

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was to test the following hypothesis:

1. *People believe that negative events are less likely to happen to them than to others, and they believe that positive events are more likely to happen to them than to others.*

In addition, the two studies described here tested several specific hypotheses about the factors that influence the amount of optimistic bias evoked by different events and about the mechanisms that produce this bias.

Event Characteristics Affecting Unrealistic Optimism

In past research, optimistic biases were generally regarded as evidence of defensiveness or wishful thinking. People were said to exaggerate the likelihood of events the anticipation of which produces positive affect and underestimate the likelihood of events the anticipation of which produces negative affect. Presumably, the stronger the affect, the stronger the distortion of reality. This motivational analysis of expectations about future life events suggests the second hypothesis:

2. *Among negative events, the more undesirable the event, the stronger the tendency to believe that one's own chances are less than average; among positive events, the more desirable the event, the stronger the tendency to believe that one's own chances are greater than average.*

Supporting this degree of desirability/undesirability prediction, Kirscht et al. (1966) reported that judgments of disease susceptibility were correlated with perceptions of disease severity. The people who regarded a disease as very serious were the ones most likely to believe that their own chances were less than average. No data or significance levels were given, however.

In recent years, explanations that emphasize flaws in the information handling capabilities of human beings have been advanced for phenomena once explained in motivational terms (e.g., Miller & Ross, 1975; Ross, Greene, & House, 1977; Slovic, Kunreuther, & White, 1974). According to this perspective, people may be unrealistically optimistic because they lack certain information needed to make accurate risk assessments or use procedures to judge future probabilities that introduce systematic errors.

In making comparative risk assessments, errors may arise because people have difficulty in adopting the perspective of others (cf. Jones & Nisbett, 1971; Ross et al., 1977; Ross & Sicoly, 1979). Many of the factors that make us feel that an event is likely or unlikely to happen to us may also make other people feel that it is likely or unlikely to happen to them. If people focus only on their own circumstances, they may conclude incorrectly that their chances differ from those of other people. Through this mechanism, any factor that influences people's beliefs about their own chances could influence comparative judgments. One factor that will affect these beliefs is the perceived probability of the event for the general population. The preceding reasoning then suggests the hypothesis:

3. *The greater the perceived probability of an event, the stronger the tendency for people to believe that their own chances are greater than average.*

Another factor that should influence people's beliefs about their chances of experiencing an event is past personal experience (Lichtenstein, Slovic, Fischhoff, Layman, & Combs, 1978; Hoffman & Brewer, Note 3). Personal experience should make it easier to recall past occurrences of the event and to imagine situations in which the event could occur, leading to greater perceived probability through the mechanism of "availability" (Tversky & Kahneman, 1973, 1974). Furthermore, for many events causal sequences can be constructed which imply that past experience increases the probability of future experience. Someone who has had a heart attack or has close relatives with heart disease is more likely to have a heart attack in the future than someone who has had no contact with heart ailments. Consequently, we predict:

4. *Previous personal experience with an event increases the likelihood that people will believe their own chances are greater than average.*

Hypotheses 3 and 4 concern two event characteristics that may lead people to make

systematic errors when comparing their own chances with those of other people, but they do not explain the phenomenon of unrealistic optimism. The direction of the errors produced by these characteristics depends on the probability of the event and the frequency of personal experience, not on the type of event. To explain why people would say that their chances are greater than average for positive events but less than average for negative events by using these hypotheses would require that positive events always be associated with high probability or high personal experience and that negative events always be associated with low probability or low personal experience.

There is a way, however, in which egocentric tendencies can produce an optimistic bias for both positive and negative events. If an event is perceived to be controllable, it signifies that people believe there are steps one can take to increase the likelihood of a desirable outcome. Because they can more easily bring to mind their own actions than the actions of others, people are likely to conclude that desired outcomes are more likely to happen to them than to other people. Even for events that are far in the future and have not yet been associated with any overt behavior, people may still be aware of their intentions to act in ways that will help them achieve the desired outcomes.

The preceding argument assumes that people generally bring to mind actions that facilitate rather than impede goal achievement. They might do this because facilitating actions really are more plentiful, because they find reassurance in selectively recalling facilitating actions or in exaggerating their importance (a motivational explanation), or because actions taken to produce desired outcomes are, for various reasons, actually easier to remember (a cognitive viewpoint).

Since the process just outlined would not apply to uncontrollable events, we are led to the prediction:

5. *The greater the perceived controllability of a negative event, the greater the tendency for people to believe that their own chances are less than average; the greater the perceived controllability of a positive event, the greater the tendency for people to believe that their own chances are greater than average.*

The final event characteristic to be examined was suggested by the "representativeness" heuristic (Kahneman & Tversky, 1972; Tversky & Kahneman, 1977). Representativeness denotes the process of judging the probability that an individual fits into a particular category by examining the degree to which the individual displays a few salient features of category members but ignoring base rates for the categories. For many events—contracting lung cancer and becoming an alcoholic, for example—people may have a stereotyped conception of the kind of person to whom this event happens. If they do not see themselves as fitting the stereotype, the representativeness heuristic suggests that people will conclude that the event will not happen to them, overlooking the possibility that few of the people who experience the event may actually fit the stereotype.

If stereotypes of the victim tend to serve an ego-defensive function, people would seldom see themselves as representing the type of person who falls prey to misfortune. Furthermore, if stereotypes are defensive, an individual's image of the people who experience positive events would overemphasize his or her own characteristics. These tendencies would exaggerate optimistic biases for any event associated with a stereotype.

A different line of reasoning does not assume any motivational bias in the construction or use of stereotypes. It suggests that people may be struck by the superficial differences between themselves and the stereotype (differences such as sex, age, or appearance) and fail to see more fundamental similarities between themselves and the people to whom the event occurs. This would lead people to conclude that the event will not happen to them, producing optimism for negative events but pessimism for positive events.

The final hypothesis states:

6. *When a stereotype exists of a particular type of person to whom a negative event is likely to happen, people will tend to believe that their own chances are less than average.* (No clear prediction can be made from the preceding discussion about the effects of stereotype salience on expectations for positive events.)

The preceding hypotheses can each be reached by several lines of reasoning, often involving both motivational and cognitive

considerations. Personal experience, for example, might decrease optimism about negative events by making images of the events more available or by undercutting defensive denial. Consequently, these hypotheses are not offered as a test of motivational versus cognitive points of view or as an examination of the importance of availability and representativeness in generating unrealistic optimism.

Study 1 was designed to test the hypotheses themselves. Its goal was to determine the amount of unrealistic optimism associated with different events and to relate this optimism to the characteristics of the events.

Study 1

In this study college students estimated how much their own chances of experiencing future life events differed from the average chances of their classmates. If all students claimed that their chances of experiencing a negative event were less than average (or that their chances of experiencing a positive event were greater than average), this would clearly indicate unrealistic optimism. However, a simple comparison of the numbers of optimistic and pessimistic responses is not sufficient to demonstrate a systematic bias. Unless the median and the mean of the actual probability distribution happen to coincide, there is no reason why the number of people whose chances are below the average (below the mean) should equal the number whose chances are above the average. If the probability distribution is positively skewed, for example, most people's chances will be below the average.

To determine the presence of a systematic bias we have to consider the degree of optimism or pessimism expressed. The comparative judgments students were asked to make in the present studies concern the difference between their own individual chances and the population average. (The population, as defined here, included all the other students at the same college.) Mathematically, this difference is $(P_i - \bar{P})$, where P_i is the probability that the event will happen to a particular individual and $\bar{P}$ is the population mean of P_i.[1] Because $\bar{P}$ is defined as the average of P_i over the population, the mean value of this difference score ought to be zero. In other words, if the judgments students generate are unbiased and the students form a representative sample of the population, the mean value of their comparative judgments should be zero. If the mean of their judgments is significantly different from zero, it indicates that their judgments have a systematic bias. Whenever the mean value of students' comparative judgments departs significantly from zero in an optimistic direction, this will be interpreted as unrealistic optimism, and the size of the mean will be taken as a measure of the magnitude of the optimistic bias.

Method

Subjects

One group of students made comparative judgments about the likelihood that specific events would take place in their lives (comparative rating group). These subjects were enrolled in two interdisciplinary courses at Cook College, Rutgers University, that attract an extremely diverse group of students.

Event characteristics were rated by a group of 120 female students (event rating group) from an introductory psychology course at the same university These students also served as the subjects in Study 2.

Materials

Events. The 18 positive and 24 negative life events used in the study are listed in Table 1. The intention was to assemble a diverse group of events that satisfied two criteria. First, each event had to be clearly positive or negative. Second, there could be no obvious precondition that would make any event relevant to only a limited number of people. For example, the event "being injured while skiing" would be inappropriate because it only applies to people who choose to ski.

Comparative rating forms. The 42 events were divided randomly between two rating forms. Positive and negative events were intermixed. Instructions on the forms stated "*Compared to other Cook students*—same sex as you—what do you think are the chances that the following events will happen to you? The choices range from much less than average, through average, to much more than average" (italics in original). Beneath the description of each event were the following choices: "100% less (no chance), 80% less, 60% less, 40% less, 20% less, 10% less, average, 10% more, 20% more, 40% more, 60% more, 80%

[1] Actually subjects expressed this difference as a percentage of the average chances—$100 \times (P_i - \bar{P})/\bar{P}$. Estimating the percentage difference is easier and more natural for students and does not alter the interpretation of their responses.

Table 1: *Unrealistic Optimism for Future Life Events*

Abbreviated event description	Measures of optimism: Mean comparative judgment of own chances vs. others' chances (%)[a,b]	Measures of optimism: No. of optimistic responses divided by no. of pessimistic responses[b,c]
Positive events		
1. Like postgraduation job	50.2***	5.93***
2. Owning your own home	44.3***	6.22***
3. Starting salary > $10,000	41.5***	4.17***
4. Traveling to Europe	35.3***	2.25***
5. Starting salary > $15,000	21.2**	1.56*
6. Good job offer before graduation	15.3**	1.42
7. Graduating in top third of class	14.2	1.02
8. Home doubles in value in 5 years	13.3*	1.78*
9. Your work recognized with award	12.6*	1.72*
10. Living past 80	12.5**	2.00**
11. Your achievements in newspaper	11.3	1.66*
12. No night in hospital for 5 years	8.5	1.23
13. Having a mentally gifted child	6.2*	2.26**
14. Statewide recognition in your profession	2.1	1.00
15. Weight constant for 10 years	2.0	.82
16. In 10 years, earning > $40,000 a year	− .7	.64*
17. Not ill all winter	− .7	.89
18. Marrying someone wealthy	− 9.1	.36*
Negative events		
19. Having a drinking problem	−58.3***	7.23***
20. Attempting suicide	−55.9***	8.56***
21. Divorced a few years after married	−48.7***	9.50***
22. Heart attack before age 40	−38.4***	5.11***
23. Contracting venereal disease	−37.4***	7.56***
24. Being fired from a job	−31.6***	7.56***
25. Getting lung cancer	−31.5***	4.58***
26. Being sterile	−31.2***	5.94***
27. Dropping out of college	−30.8***	3.49***
28. Having a heart attack	−23.3***	3.18***
29. Not finding a job for 6 months	−14.4***	2.36***
30. Decayed tooth extracted	−12.8	2.22***
31. Having gum problems	−12.4**	1.39
32. Having to take unattractive job	−11.6	1.84**
33. Car turns out to be a lemon	−10.0*	2.12**
34. Deciding you chose wrong career	− 8.8	1.43
35. Tripping and breaking bone	− 8.3*	1.66*
36. Being sued by someone	− 7.9	2.38***
37. Having your car stolen	− 7.3	2.94***
38. Victim of mugging	− 5.8	3.17***
39. Developing cancer	− 4.4	1.28
40. In bed ill two or more days	− 3.2	1.75*
41. Victim of burglary	2.8	1.21
42. Injured in auto accident	12.9*	.80

[a] In making a comparative judgment, students estimated the difference in percent between the chances that an event would happen to them and the average chances for other same-sex students at their college. N = 123 to 130, depending on rating form and missing data. Student's t was used to test whether the mean is significantly different from zero.

[b] For positive events, the response that one's own chances are greater than average is considered optimistic, and the response that one's own chances are less than average is considered pessimistic. For negative events, the definitions of optimistic and pessimistic responses are reversed.

[c] Significance levels refer to a chi-square test of the hypothesis that frequencies of optimistic and pessimistic responses are equal.

* $p < .05$. ** $p < .01$. *** $p < .001$.

more, 100% more, 3 times average, and 5 times average." The lowest choice possible was 100% less than average, since this indicated a probability of zero. At the other extreme, no probability could exceed 100%, but this upper limit could be many times the average probability. The task of comparing one's own chances with the average chances of other students was readily accepted by students and carried out without any apparent confusion.

To calculate the mean comparative judgment, the 15 response choices were given the values −100%, −80%, −60%, −40%, −20%, −10%, 0%, 10%, 20%, 40%, 60%, 80%, 100%, 200%, and 400% to reflect their deviation from a response of "average."

Event ratings. For the rating of event characteristics, events were divided into the same sets as on the comparative rating forms. Written instructions asked subjects to evaluate first the *probability* of each event. Students were required to estimate the percentage of students at the university to whom the event would occur. Several examples were presented to illustrate the relationship between percentage ratings and odds ratios. Next, events were rated for *controllability* (1 = there is nothing one can do that will change the likelihood that the event will take place, 2 = things one can do have a small effect on the chances that the event will occur; 3 = things one can do have a moderate effect; 4 = things one can do have a large effect; 5 = completely controllable) and *desirability* (1 = extremely undesirable; 3 = undesirable; 5 = neutral; 7 = desirable; 9 = extremely desirable). Finally, events were rated for *personal experience* (1 = has not happened to anyone I know; 2 = has happened to acquaintances; 3 = has happened to friends or close relatives; 4 = has happened to me once; 5 = has happened to me more than once) and *salience of a high chance group* (1 = no type of person with a particularly high chance comes to mind; 2 = when I think about the event a type of person comes to mind to whom it is likely to happen, but this image is not very clear; 3 = when I think about the event a clear picture comes to mind of a particular type of person to whom it is likely to happen).

Procedure

The experimenter visited the classes selected for the comparative rating measure and explained that the project concerned college students' expectations about the future. Task instructions emphasized that subjects should compare themselves with other students and not merely rate each event in terms of how likely or unlikely it seemed. The different versions of the comparative rating form, each listing 21 events, were handed to alternate students.

The ratings of the event characteristics were completed separately by members of the event rating group after their participation in Study 2.

Results

The ratings of event characteristics showed that a clear differentiation between positive and negative events was achieved. The least undesirable of all the negative events was still perceived to be relatively undesirable (M = 3.92), and the least desirable of all the positive events was still perceived to be relatively desirable (M = 6.37). Both values are significantly different from the neutral rating of 5 (ps < .001).[2]

Unrealistic Optimism: Hypothesis 1

Both positive and negative events in Table 1 are arranged in order of decreasing optimism as indicated by the mean comparative judgment. A positive value in Column 1 indicates that subjects tend to believe that their own chances are greater than average; a negative value indicates that students believe their chances are less than average. These values strongly support Hypothesis 1; the means in Column 1 are in the predicted direction for 37 of the 42 events (p < .001 by the binomial test). Averaged over all positive events, the comparative judgments of individuals were significantly greater than zero, M = 15.4%, $t(255)$ = 6.8, p < .001; averaged over negative events, individuals' judgments were significantly less than zero, M = −20.4%, $t(255)$ = 13.9, p < .001.

Column 2 shows the ratio of the number of optimistic to pessimistic responses. Although the significance levels derived from the statistics in Columns 1 and 2 differ for a few events, the existence of strong optimistic tendencies is clear in both. The correlation between the ratio in Column 2 and the values in Column 1 was .90 for both positive and negative events.[3]

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[2] All statistical tests reported in this article are two-tailed.

[3] The possibility that artifacts might have been introduced by the use of a response scale with unequal intervals was tested by ignoring the response labels and simply treating the choices as a 15-point, equal-interval scale. The insensitivity of the results to such changes is indicated by the correlation of .98 between event means from this new scale and the mean values from Column 1. In addition, a pilot study examined a simple scale labeled: "1—below average, 2—slightly below average, 3—average, 4—slightly above average, and 5—above average." This scale was completed by 98 members of an introductory psychology class for 15 of the events included in the present study. A correlation of .91 was found between the mean rating of the events on this 5-point scale and the values in the first column of Table 1.

An additional calculation tested whether differences in comparative judgments for positive and negative events might have been caused by unintended differences in the perceived probability, personal experience, perceived controllability, or stereotype salience of the two types of events. To control for the possible effects of such differences, the partial correlation was calculated between the mean comparative judgments (Column 1) and event type (a dummy variable differentiating between positive and negative events; -1 = negative event; 1 = positive event) controlling for these four other variables. The significant result ($r = .74$, $p < .001$) demonstrates that event type has a powerful effect independent of the effects of the other event characteristics.

Event Characteristics Influencing Unrealistic Optimism: Hypotheses 2–6

It is clear from Table 1 that the amount of unrealistic optimism evoked by different events varied greatly. In many cases the mean comparative judgment was not significantly different from zero, indicating the absence of a significant optimistic bias. Hypotheses 2 through 6 attempt to explain these variations. They were each tested separately by means of a linear model that included the terms event type (positive or negative), event characteristic (the mean rating for the characteristic cited in the hypothesis; median probability ratings were used because of the large variability of these estimates), and Type × Characteristic interaction. (Hypothesis 6 makes a specific prediction only for negative events and was tested by a separate correlation coefficient for each type of event.)[4]

The event characteristic term in the models tests whether the pooled within-type regression coefficient for that characteristic is significantly different from zero. The Type × Characteristic interaction tests whether the regression lines for positive and negative events have the same slope.[5] The data for these analyses consisted of the mean comparative judgments for the 42 events, the mean characteristic ratings, and the type designations. Consequently, significance tests refer to the null hypothesis that the effects are zero in the larger population of events from which the present sample was drawn.[6]

The significance levels for the event characteristic terms and the magnitudes of the corresponding pooled within-type correlation coefficients are shown in the first column of

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[4] The dependent variable in the models that tested the contributions of degree of desirability, perceived probability, and personal experience was the mean comparative judgment from Column 1 of Table 1. Hypothesis 5, however, was phrased differently, predicting a positive association between perceived controllability and optimism. Therefore, the dependent variable in the test of this hypothesis was the degree of optimism produced. For positive events, the mean comparative judgment indicates the size of the optimistic bias, but for negative events, the measure of optimistic bias was obtained by reversing the sign of the mean comparative judgment.

[5] If the analysis found no appreciable Type × Characteristic interaction ($p > .2$), the event characteristic effect was estimated after first removing the event type sum of squares from the total sum of squares. If a Type × Characteristic effect did appear to be present ($p < .2$), both event type and Type × Characteristic sums of squares were removed before estimating the event characteristic effect. The latter procedure was needed only for degree of desirability, interaction $F(1, 38) = 1.91$, $p = .18$, and perceived controllability, interaction $F(1, 38) = 3.23$, $p < .08$.

[6] Because the data were analyzed on an event basis, with variables averaged over all subjects, it was not necessary for the same individuals to rate both the event characteristics and their own chances of experiencing the events. What was necessary was that the perceptions of the event characteristics and the amount of personal experience with these events be essentially the same for the comparative rating group and the event rating group. In addition to the fact that all subjects were students at the same university, there are several specific indications that this condition was satisfied. In a pilot study, a mixed-sex group of students from another of the special interdisciplinary courses from which subjects in Study 1 were drawn rated 21 of the events in Table 1 on three of the dimensions used here. Correlations between the pilot ratings and those utilized in Study 1 were: controllability, .78; desirability, .98; and probability, .50 (.54 among positive events and .80 among negative events). Thus, ratings seem unlikely to change greatly from one group to another, although probability ratings do seem to be somewhat variable. It was also found that the relationships between event characteristics (rated by females) and comparative judgments were the same when the judgments of male and female members of the comparative rating group were examined separately. Apparently the event characteristic ratings were equally relevant to males and females.

Table 2
Correlations Between Mean Comparative Judgments[a] and Mean Ratings of Event Characteristics[b]

Event characteristic and hypothesis number	All events (n = 42)[c]	Positive events (n = 18)	Negative events (n = 24)
Degree of desirability (2)	.30*	.45*	.14
Perceived probability (3)	.49**	.74***	.29
Personal experience (4)	.39*	.35	.42*
Perceived controllability (5)	.52***[d]	.32	−.67***
Stereotype salience (6)	—[e]	.26	−.76***

[a] Means over subjects in comparative rating group.
[b] Mean over subjects in event rating group. (The median estimate was used for perceived probability.)
[c] Pooled within-type correlation coefficient, with positive and negative events as separate types. Significance levels refer to the magnitude of the corresponding pooled within-type regression coefficient, the parameter directly tested by the statistical analysis.
[d] Correlation between event characteristic and optimism. For positive events, own chances greater than others' implies optimism. For negative events, own chances less than others' implies optimism.
[e] For Hypothesis 6, positive and negative events were examined separately.
* $p < .06$. ** $p < .01$. *** $p < .001$.

Table 2. Separate correlations for positive and negative events are presented in Columns 2 and 3. The figures show that all of the correlations predicted by Hypotheses 2–6 were in the predicted direction and that all of the event characteristic terms were statistically significant. Columns 2 and 3, however, reveal different patterns of associations for positive and negative events. (Differences in the sizes of the positive event and negative event correlation coefficients were statistically significant only for perceived probability, $p < .06$, and stereotype salience, $p < .05$.) For positive events, perceived probability and degree of desirability were significantly correlated with the amount of optimistic bias; for negative events, the correlations with stereotype salience, perceived controllability, and personal experience were significant.

Multiple Regression Analyses

Further calculations revealed significant correlations between two pairs of event characteristics: between stereotype salience and perceived controllability, .69 and .78 for positive and negative events, respectively, and between perceived probability and personal experience, .53 and .57 for positive and negative events, respectively (cf. Lichtenstein et al., 1978). Since these event characteristics are interrelated, the significant correlations in Table 2 do not necessarily identify independent predictors or unrealistic optimism. To examine this issue further, multiple regression analyses were carried out for positive and negative events to predict the size of the optimistic bias from event characteristics. Since the number of degrees of freedom in these calculations was quite small, however, the statistical power was necessarily low, and conclusions reached from these multivariate analyses must remain tentative.

In a stepwise regression for positive events, perceived probability ($p < .001$) and degree of desirability ($p < .1$) entered the prediction equation, $R = .79, F(2, 15) = 12.55, p < .001$. With all five variables entered, however, only the contribution of perceived probability was still statistically significant ($p < .02$). For negative events, stereotype salience ($p < .001$) and personal experience ($p < .02$) entered the stepwise prediction equation, $R = .82, F(2, 21) = 22.74, p < .001$. With all five variables, only stereotype salience was still significant ($p < .005$). The failure of perceived controllability to appear in the negative event equation was clearly due to its very high correlation with stereotype salience.

Discussion

The present data provide evidence of unrealistic optimism for both positive and negative life events. As expected, the magnitude of this optimistic bias varied from event to

event, but most of the variability could be explained by reference to a few dimensions on which the events differed.

Although all six hypotheses posed in the introduction were supported, different factors appeared to govern responses to positive and negative events. For negative events, optimism, perceived controllability, and stereotype salience were all strongly intercorrelated. When an event was judged to be controllable, a stereotype existed in subjects' minds of the kind of person to whom the event generally occurred. Presumably, this person was believed to be at risk because he or she failed to take any action to control the risk. Subjects seemed to compare themselves with the stereotypic victim, leading them to conclude that their own risks were less than average. For events perceived to be uncontrollable, there was no stereotype of the victim, and subjects did not show any systematic bias.

In retrospect, some of the different correlations for positive events are not surprising. It seems likely that everyone would want to avoid the negative events in this study; yet just because the result of an event is desirable does not mean that everyone is committed to achieving that result. For example, an award for community service may be very attractive, but it may be a goal for very few people. The finding that optimism was not greater among the positive events judged to be controllable or found to be associated with a stereotypic, high-chance group may simply reflect the fact that many subjects were not attempting to control (i.e., influence) these events.

This same explanation may account for the strong correlation for positive events between perceived probability and comparative judgments. Examination of the positive events in Table 1 suggests that the high probability events are the only ones likely to be widely accepted as personal goals. Subjects are presumably working toward these goals, and because their efforts should increase the likelihood that they will succeed, they mistakenly conclude that their prospects are better than average. Of course, one can only work toward a goal if the outcome is somewhat controllable, and in fact, the high probability positive events in the study were also relatively high in controllability.[7] There is no obvious reason why personal experience and degree of desirability were significant for one type of event but not the other.

Thus, for both positive and negative events, an optimistic bias appears to result when two conditions are satisfied. First, the event is perceived to be controllable, so that there are things one can do or contemplate doing to influence the event. Second, people have some degree of commitment or emotional investment in the outcome. Under these conditions, optimism arises because people compare themselves with an inappropriate standard: a person who does little or nothing to improve his or her prospects.

Contrary to expectations based on a motivational interpretation of optimism, degree of desirability had no appreciable effect on the size of the optimistic bias for negative events. In fact, optimism was not appreciably greater for the seven life threatening events in the sample—numbers 20, 22, 25, 28, 38, 39, and 42 ($M = -20.4\%$)—than for the other negative events ($M = -19.5\%$).

Study 2

Previously it was suggested that people may be optimistically biased because their image of other people is inaccurate or incomplete. Aware of the factors that improve their own

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[7] The proposed difference in commitment between the positive and negative events in this study was subjected to a preliminary test. A mixed-sex group of students from Cook College ($n = 64$) rated all events on a scale that ranged from 1 (not at all important to me whether or not the event occurs) to 4 (quite important to me whether or not the event occurs). It was expected that: (a) negative events would be rated higher in importance than positive events; (b) importance would be positively correlated with optimism for both positive and negative events; and (c) for positive events, importance would be strongly related to event probability. The results strongly supported all three predictions. Mean ratings of importance for negative and positive events were 3.22 and 2.58, respectively, $t(40) = 4.05$, $p < .001$. The correlation of importance with optimism was .62 ($p < .01$) for positive events, and .46 ($p < .025$) for negative events. Finally, importance and probability were strongly correlated for positive events, .63 ($p < .01$), but uncorrelated for negative events (−.22, *ns*).

chances of achieving desirable outcomes, they may not realize that others may have just as many factors in their favor. The different conditions created in Study 2 were designed to manipulate subjects' awareness of the factors that other people consider when estimating their chances of experiencing various events.

Subjects in Study 2 made written lists of the factors that increase or decrease the likelihood that specific events would happen to them. (It was hypothesized that people normally prepare similar mental lists when making comparative judgments, so requiring subjects to prepare such lists was not expected to influence their optimism.) Some subjects were then given copies of the lists generated by others and asked to make comparative judgments of their chances of experiencing these events as in Study 1. It was predicted that exposure to others' lists would decrease and perhaps eliminate subjects' optimistic biases. Furthermore, since participants in this experiment both made comparative judgments and listed the event-influencing reasons, it was possible to examine the relationship between these two variables at the individual level.

One other variable was added to the experiment to examine the possibility that subjects in Study 1 were incorrectly reporting the perceived likelihood that events would happen to them rather than the relative likelihood using their peers as a comparison group. Half of the subjects in each condition of Study 2 were explicitly warned about making this mistake and received suggestions designed to help them remember to make comparative judgments.

Method

Subjects

Students in this experiment were 120 female members of an introductory psychology class at Rutgers University who participated to fulfill a course requirement.

Materials

Comparative rating booklets. A booklet was prepared containing many of the events that had evoked unrealistic optimism in Study 1. The booklet was divided into three parts (pretreatment events, treatment events and posttreatment events) that were similar in the numbers of positive and negative events and the amount of optimistic bias that had been produced by these events. The exact sequence of events (using identification numbers from Table 1) was: 8, 24, 40, 13, 23, 30, 1, 22, and 27 (pretreatment events); 31, 2, 19, 25, 32, 3, 21, and 26 (treatment events); and 10, 34, 38, 11, 28, 36, 4, 20, and 29 (posttreatment events). The response format was unchanged from Study 1.

A cover sheet on half of the booklets was entitled *Warning.* It stated: "It's easy to forget the directions and start to respond to events in terms of how likely they are INSTEAD of how likely they are for you compared to other students .... Don't do that." A specific example was then given. The warning concluded: "To help you keep this in mind, when you see the choice '40% more,' think of it as 'my chances are 40% more than other students'.' "

Own reasons lists. Subjects generated lists of the factors that tend to increase or decrease the chances that the eight treatment events would happen to them. A detailed instruction sheet requested subjects to "think of things you do now and things you might do in the future" and to think of any personal characteristics—"including your personality, abilities, physical characteristics, attitudes, etc."—that would influence the chance of this event happening to them.

Others' reasons packets. During the first day of the experiment only control groups were tested. Multiple copies of the lists of personal reasons prepared by these groups were prepared. The packets of others' reasons given to subjects in the experimental group were then made up. Each packet contained five lists chosen at random from among the 19 lists that had been reproduced. Twenty-five different packets were prepared in this way. This random-selection procedure assured that, on the average, the reasons read by subjects in the experimental group were just as numerous and as optimistic as the reasons they listed themselves.

Procedure

Three different conditions were created, one experimental condition and two controls. During every session, two of the three conditions were conducted simultaneously in adjacent rooms by different experimenters. Subjects arriving for the study were assigned randomly to one of these conditions. All subjects worked independently.

The experimenters' introductory instructions were essentially the same as those in Study 1. Subjects in all conditions then made comparative judgments for the pretreatment events. Next, members of the experimental group (n = 39) were told, "We want to get your thoughts about the factors that increase or decrease the chances that certain events will happen to you," and they were given a blank form on which to list their own reasons concerning the treatment events. Then experimental group subjects received one of the packets of others' reasons for these same events along with the explanation: "These forms were taken at random from people who were in our study

Table 3
Optimism of Experimental Groups on Different Sets of Events

Events	% difference between own chances and others' chances		
	Experimental group[a]	Control Group 1[b]	Control Group 2[c]
Positive events			
Pretreatment	11.0	18.0	14.4
Treatment	17.3	24.0	40.1
Posttreatment	18.3	27.2	21.4
Negative events			
Pretreatment	−24.2	−25.6	−31.5
Treatment	−17.4	−31.7	−35.7
Posttreatment	−13.2	−12.2	−15.5

Note. Entries are group means over all events of the type specified. All means are significantly different from zero, $p < .001$.
[a] Own and others' reasons group, $n = 39$. [b] Own reasons group, $n = 41$. [c] No reasons group, $n = 40$.

in the past. Each set is different. Their ideas may be helpful to you in estimating how your chances compare to others', but keep in mind that you're supposed to compare yourself with all Rutgers females, not just these five." Finally, experimental group subjects made comparative judgments for the treatment events and for the posttreatment events.

Control Group 1 ($n = 41$) was employed to test whether just listing one's own reasons might influence the degree of optimism expressed on treatment events. Their procedure differed from the experimental group only in that they did not receive the packet of others' reasons. Members of Control Group 2 ($n = 40$) made comparative judgments without either generating their own lists of reasons or seeing lists produced by other students. Subjects in Control Group 2 did, however, list their own reasons for the treatment events after they finished the comparative rating booklet.

Half of the subjects in each group received a comparative rating booklet with the cover sheet warning them to make comparative judgments. To conclude the sessions, participants in all conditions rated the characteristics of 21 events as described in Study 1.

Results and Discussion

Effects of Experimental Treatments

Mean comparative judgments are presented in Table 3 for each of the three groups in the study. Figures are given for each set of events, and values for positive and negative events are presented separately.

The data were first examined by an analysis of variance that included the variables group, warning, and event set. Event set was a within-subject variable, whereas group and warning were between-subjects variables. Positive and negative events were tested separately. The calculations revealed that the warning manipulation main effects and interactions were not significant, $ps > .2$. Apparently, even without the extra reminder, subjects understood the comparative nature of the task and tried to compare their own chances with those of other students.

In contrast, Group × Event Set interactions for both negative and positive events were statistically significant, $F(4, 227) = 2.80$, $p < .05$, and $F(4, 227) = 2.48$, $p < .05$, respectively. These interactions show that the experimental treatments did change the responses of the experimental groups. These changes were studied in additional analyses that treated pretreatment event responses as covariates and tested for group differences on treatment and posttreatment events (Huck & McLean, 1975). These calculations showed that the manipulations produced group differences on negative and positive treatment events, $F(2, 116) = 6.20$, $p < .005$, and $F(2, 116) = 5.06$, $p < .01$, respectively. Comparisons among the covariance adjusted negative events means (SAS Institute, 1979) indicated that the experimental group was significantly less optimistic than the two control groups ($ps < .005$), and that the control groups did not differ from one another ($p > .2$). For positive events, both the experimental group and Control Group 1 were significantly less optimistic than Control Group 2 ($p < .01$), but they did not differ from one another.

The negative event results provide support for the proposition that people tend to use an inaccurate image of others when making comparative judgments. In the case of positive events, however, just asking subjects to list the factors that influence their own chances decreased their optimism, and providing information about others had no additional effect. This second finding suggests that people's first thoughts about their future may be more optimistic than their later, more reflective conclusions. Further research is

Table 4
Relationships Between Optimism and Reasons Influencing Event Likelihood

Event	% difference between own chances and others' chances[b]	Number of reasons listed[c]			Reasons–optimism r[d]
		Increasing chances	Decreasing chances	t	
Positive events					
Owning your own home (2)[a]	42.3	3.22	.98	11.1	.38**
Starting salary > $10,000 (3)	21.6	2.53	.83	8.5	.48**
Negative events					
Having a drinking problem (19)	−53.8	1.05	3.46	11.4	.49**
Divorced a few years after married (21)	−52.0	.84	3.58	11.9	.25*
Getting lung cancer (25)	−29.0	1.32	2.19	4.2	.57**
Having gum problems (31)	−23.7	1.41	2.66	6.2	.57**
Having to take unattractive job (32)	−16.4	1.83	1.88	.2	.54**

[a] Number of event as it appears in Table 1.
[b] Mean rating for subjects in Control Groups 1 and 2. All entries significantly different from zero, $p < .001$.
[c] Mean for subjects in all groups. Student's $t(df = 119)$ tests the hypothesis that the number of reasons listed that increase chances equals the number listed that decrease chances. All *t*s significant beyond the .001 level except the last, *ns*.
[d] Correlations based on individual responses of control group subjects between the degree of optimism and the difference between the number of goal facilitating and goal inhibiting reasons, $df = 79$.
* $p < .05$. ** $p < .001$.

needed to clarify these apparent differences between positive and negative events.

The analyses of covariance found no significant group differences on posttreatment events (*F*s < 1). The experimental interventions were only able to reduce optimistic biases temporarily.

The preceding analyses suggest that optimistic biases arise because people tend not to think carefully about their own and others' circumstances or because they lack significant information about others. Yet there also appear to be more persistent sources of optimism, ones that cannot be eliminated just by encouraging people to think more carefully about their comparative judgments or by providing them with information about others. The treatment event data in Table 3 reveal that the experimental manipulations reduced but did not eliminate optimistic biases. Comparative judgments were still unrealistically optimistic ($p < .001$) for both positive and negative events. A detailed examination of the judgments for negative events showed that experimental group subjects gave fewer strongly optimistic responses and more mildly optimistic responses and responses of "average" than subjects in the control groups. Exposure to others' reasons did not, however, increase the frequency of pessimistic responses.

Relationships Between Reasons and Optimism

When the reasons listed by subjects were examined (Columns 2 and 3 of Table 4),[8] it was found that favorable reasons—those increasing the likelihood of a positive event or decreasing the likelihood of a negative event—outnumbered unfavorable reasons. (Recall, however, that this was not a random sample of events. They were included in the comparative rating booklet expressly because they

[8] Event 26, "not being able to have a child because you're sterile," was not included in Table 4 because a substantial number of the reasons listed did not conform to the instructions (e.g., "I may never marry," or "I don't want to have children"). None of the conclusions about group differences in comparative judgments would be changed if Event 26 were excluded from the statistical analysis of treatment effects.

had evoked unrealistic optimism in Study 1.) The size of the t statistics in Column 4 demonstrates that the preponderance of favorable reasons was very consistent across subjects.

Further calculations revealed that there was greater excess of favorable reasons for the two negative treatment events that had produced the greatest optimism (Events 19 and 21) than for the two negative events that evoked the least optimism (Events 31 and 32), $t(119) = 8.71$, $p < .001$. Similarly, the excess of favorable reasons over unfavorable reasons was greater for positive Event 2, which elicited strong optimism, than for positive Event 3, which evoked less optimism, $t(119) = 2.16$, $p < .05$.

The last column in Table 4 shows that this relationship between the kinds of reasons listed and the degree of optimism persists between subjects. When individual students in Control Groups 1 and 2 made their comparative judgments,[9] the responses they gave for each event correlated strongly with the difference between the number of likelihood-increasing and likelihood-decreasing reasons they had listed for those events. The magnitudes of these correlations were the same whether they were based only on Control Group 1 subjects, who listed their reasons before estimating their chances, or Control Group 2 subjects, who listed their reasons only after completing the comparative rating booklet. This close correspondence between the degree of optimism reported and the number of favorable and unfavorable reasons listed—both across events and between subjects within events—reinforces the suggestion that the generation of similar mental lists forms an important stage in the process of deciding whether one's own chances differ from average.

Relationship of Desirability to Optimism Between Subjects

A final set of calculations looked for an association between an individual's rating of the desirability of an event and the degree of optimism shown by that individual. Correlation coefficients based on data from Groups 2 and 3 between desirability ratings and optimism were greater than zero for seven of the eight positive events, but the coefficients were quite small (median $r = .14$). For negative events, the correlations tended to be negative and small (13 negative, 5 positive, median $r = .13$). That is, individual students who regarded a negative event as particularly undesirable were slightly more optimistic about avoiding it than students who did not think that the event was so undesirable, a finding similar to that reported by Kirscht et al. (1966). Thus, 20 of 26 correlation coefficients were in the direction predicted by a motivational interpretation of optimistic biases ($p < .01$ by the binomial test).

General Discussion

In the past, unrealistic optimism about the future was regarded as a defensive phenomenon, a distortion of reality motivated to reduce anxiety (e.g., Kirscht et al., 1966; Lund, 1925). The present article has described several ways in which purely cognitive errors might be responsible for optimistic biases. Two studies were carried out to test hypotheses about the conditions under which unrealistic optimism would appear, hypotheses derived from both cognitive and motivational considerations. Although the results provide some support for both points of view, the studies were not designed to pit one against the other, nor is there any reason why optimism cannot have both cognitive and motivational sources.

What these investigations have demonstrated is the existence of an optimistic bias concerning many future life events. As predicted in Hypothesis 1, students tend to believe that they are more likely than their peers to experience positive events and less likely to experience negative events. Cognitive and motivational considerations led to the identification of five event characteristics—degree of desirability, perceived probability, personal experience, perceived controllability, and stereotype salience (Hypotheses 2–6)—

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[9] Data from subjects in the experimental group were excluded from these calculations and from Column 1 of Table 4 because their comparative judgments had been affected by the lists of others' reasons.

that were shown in Study 1 to determine the amount of optimistic bias evoked by different events. It was also demonstrated in Study 2 that providing information about the attributes and actions of others reduced the optimistic bias for negative events but did not eliminate it.

The results suggest a mechanism that may partly explain these optimistically biased expectations. In comparing their chances with those of their classmates, it appears that students brought to mind any personal actions, plans, or attributes that might affect their chances of experiencing the events. If an event was one they perceived to be controllable and if they were commited to a particular outcome, the majority of factors they brought to mind were ones that increased the likelihood that it would turn out the way they would like. Comparing themselves to an unrealistic stereotype of a person who does nothing to improve his or her chances or even engages in counterproductive activity, students concluded that their own prospects were better than average.

Yet there seems to be more to unrealistic optimism than just an inappropriate comparison group or a possible bias in the recall of relevant actions, plans, and attributes. When experimental group subjects in Study 2 received the packet of event-influencing factors listed by other students, they should have concluded that their chances were about the same as those of their classmates. Their classmates had listed the same types of reasons and just as many optimistic reasons as they had. Instead, subjects continued to claim that they were more likely to experience positive events and less likely to experience negative events. Unfortunately, we do not know how they justified this conclusion.

Further research is obviously needed to test the event characteristics and mechanisms proposed here, with other populations of subjects, with a wider sample of events, and with other methods of assessing optimism. Optimistic biases may be much less prevalent among older people, for example. Studies must also examine the relationship between unrealistic optimism and self-protective behavior. People who believe, falsely, that their personal attributes exempt them from risk or that their present actions reduce their risks below those of other people may be inclined to engage in risky behaviors and to ignore precautions. To discover whether unrealistic optimism about the future increases individual and societal vulnerability to disease, accidents, criminal victimization, and hazard loss is thus a central goal for future research.

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