

Cognitive Influences on Perceived Change in Social Support, Motivation, and Symptoms of Depression

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SUMMARY

In settings ranging from informal conversation to medical interviews and surveys, people are often asked to judge changes in subjective states that are important to them, such as perceived social support, motivation to cope with a negative life event, and symptoms of depression. How accurate are such reports, and are there theories of cognitive processes that can predict the most likely types of misperception? To address these questions, self-report survey data were collected from 224 recently unemployed adults. The measures assessed current subjective states of self and social environment at two times, separated by 4 months. Among the results, persons with high self-esteem were particularly likely to underestimate changes for the worse between the two survey waves—evidence of an optimistic response bias. When the dimension being judged was unstable and ambiguous, people were more likely to overestimate improvement—evidence of an optimistic response style. The findings were evaluated in terms of alternate theories of cognitive bias and in terms of implications for subsequent studies and application.

This study examines the degree to which people can report accurately on changes in subjective states of importance to them, such as how they feel and the effort they put forth in coping with important problems. The study also examines potential processes that may distort such judgements. The accuracy of these judgements may be of practical importance to professionals in a number of settings. In settings involving organizational change, education, or rehabilitation, for example, the client's underestimation of self-improvement may undermine future self-efficacy and motivation to improve (e.g. Bandura, 1986; deCharms, 1968).

Accurate perception of change involves accurate perception of the past and present. Previous research, however, has suggested that perceptions of the present influence recollections of the past (e.g. Pearson, Ross, and Dawes, 1992; Ross and Conway, 1986). These studies suggested that, during recall, people call upon implicit theories of stability regarding whether the past should be like the present (e.g. Aneshensel, Estrada, Hansell, and Clark, 1987; Markus, 1986; Pearson *et al.*, 1992).

The present study builds on implicit theory research. We examine whether mood,

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individual differences in self-concept or self-esteem, and the stability of what is being judged predict how people distort perceptions of change in their lives.

THE ROLE OF SELF-ESTEEM

Previous research suggests that there are at least three types of formulations regarding the influence of self-esteem on perceptions of change: (1) the minimization of cognitive inconsistencies; (2) their maximizations; and (3) the inability to muster adequate cognitive defenses against perceived inconsistencies.

Minimization

Several lines of research suggest that people are highly motivated to protect their self-identity and that cognitive schema serve to encode and give meaning to events and other forms of information that may affect one's self-perception (e.g. Alba and Hasher, 1983; Cantor and Mischel, 1977; Hastie, 1984; Sherwood, 1965). A basic assumption of such frameworks is that people are motivated to avoid events and information that threaten their self-identity.

Cognitive consistency formulations (e.g. Shrauger, 1982; Stangor and McMillan, 1992) suggests that when perceived change in people's situations are not consistent with their self-expectations, they will reinterpret their perceptions to minimize the inconsistency. Persons with high self-expectations, or high self-esteem, should generally expect outcomes that are consistent with such expectations, such as being competent, well-liked, and effective at coping. In a derivation of such theory, Swann (Swann, Griffin, Predmore and Gaines, 1987; Swann, 1992) proposes that persons with low self-esteem should generally expect negative information about themselves and how others act towards them, and that evidence to the contrary will be rejected because it is inconsistent with their self-concept.

Applied to the perceptions of change, this formulation suggests that persons with low self-esteem should expect that their situation will either change for the worse or not improve; persons with high self-esteem should expect that their situation will improve rather than worsen. Accordingly, persons with high self-esteem should distort and reject perceived changes for the worse by underestimating them, but should be relatively accurate with regard to perceived changes for the better. Persons with low self-esteem should reject changes for the better and bias them downwards, but should have relatively veridical perceptions of changes for the worse (e.g. Shrauger and Kelley, 1988; Shrauger and Rosenberg, 1970). Overall, according to this formulation, cognitive biases should operate to minimize the perception of changes that are inconsistent with the self-concept, whether the self-concept is a positive or negative one (Taylor, 1991).

Exaggeration, maximization

A second formulation suggests that, rather than minimize the perceptions of changes that are inconsistent with self-expectations, people will exaggerate or maximize them. This prediction derives from studies that suggest that people weight negative information more heavily during recall and recognition tasks (Kahneman and Tversky,

1984; meta-analysis by Stangor and McMillan, 1992). Negative information is defined as any event that may threaten the current or future satisfaction of a motive (Lazarus and Folkman, 1984).

The maximization formulation would suggest that persons with high self-esteem should exaggerate or overestimate changes that run counter to their expectancies of successful outcomes because such information signals that action needs to be taken (after Schwarz, 1990) to maintain a world of outcomes consistent with their self-concept. In comparison, persons with low self-esteem should exaggerate or overestimate changes that run counter to their expectancies of setbacks or worsening because such changes also threaten the motive to maintain a world consistent with their self-concept.

Inability to muster defences

A third formulation suggests that contrary to consistency formulations described above, persons with low self-esteem find changes for the worse as aversive as do persons with high self-esteem. Persons with low self-esteem, according to this formulation, should be more veridical about changes for the worse because they are unable to muster strategies for minimizing such events (Taylor, 1991). This formulation suggests that low self-esteem may result from, rather than be antecedent to, a lack of defensive distortion of negative outcomes.

In sum, the minimization formulation suggests that people with high self-esteem will minimize change for the worse, whereas people with low self-esteem will minimize change for the better. The maximization formulation suggests that such inconsistent changes will be magnified and exaggerated rather than minimized and underestimated. The 'failure to muster' formulation suggests that changes for the worse are aversive for people in general, and that persons with low self-esteem lack the defence required to minimize such changes.

INSTABILITY/AMBIGUITY

In addition to differences in the level of social relationships, motivation, mood, and other facets of life, there can be differences in the stability of such facets. Instability may directly undermine the accuracy of people's judgements about change in their lives, by generating ambiguity regarding the direction and degree of change that the person is experiencing. Research suggests that as a method of coping with ambiguity, instability will trigger optimistically-based judgements of perceived change that are unrelated to the level of actual change. This prediction derives from research that indicates that when people are given ambiguous feedback about their performance, they tend to interpret it positively rather than negatively (Jacobs, Berscheid and Walster, 1971). Research suggests this bias occurs because people generally hold positive self-conceptions about their attributes (Taylor and Brown, 1988), which, in ambiguous situations, should lead people to underestimate changes for the worse.

Nevertheless, not everyone has a positive self-concept. Consequently, a more general level of prediction is that instability should make people more susceptible to whatever bias their dominant self-schema generates. Whether the self-schema generates an optimistic bias, a pessimistic one, minimization, maximization, or failure-to-muster, such hypothesized processes should be most detectable when the

person is judging change in a dimension that has been characterized by unstable rather than stable patterns of change.

NEGATIVE MOOD

There is little evidence that the cognitive effects of mood are detectable outside highly-controlled laboratory settings (see the review by Mandler, 1992) or in normal, clinically non-depressed samples (Lewinsohn and Hoberman, 1982). Given these findings, no effects of mood were expected because this study involved a normal population in a field setting. Nevertheless, mood was examined as a potential determinant of change because data on it were readily available. As has generally been the case in other field studies, there were no significant effects of mood, and the findings are not discussed further.

METHOD

Sample and data collection

A detailed description of the methods is presented elsewhere (Caplan, Vinokur, Price and van Ryn, 1989). The data were gathered from persons who had lost their jobs and were engaged in job seeking, an event that affects an estimated 10 million persons annually (U.S. Department of Labor 1986). These persons form a potentially good model for examining sources of bias in perceived change because of the documented effects of job loss on influencing social relationships, job-seeking motivation, and mood (Dew, Penkower, and Bromet, 1991; Kessler, House, and Turner, 1988; Vinokur and Caplan, 1987).

The subsample examined in this study was drawn from an initial sample of 1087 adults who lost their jobs within the 6 weeks prior to the experiment. Trained interviewers recruited these adults at state employment compensation offices in southeastern Michigan for a field experiment in promoting return to work and prevention of poor mental health and demoralization. The responders were asked to judge the state of three aspects of their lives: (1) social support from others; (2) their own job-seeking motivation; and (3) their emotional well-being. These three dimensions figure prominently in theories of the stress and coping process (Cohen and Syme, 1985; Dohrenwend and Dohrenwend, 1974; Thoits, 1982) as well as in studies of job loss (Caplan *et al.*, 1989; Kasl and Cobb, 1979; Kessler *et al.*, 1988; Vinokur, Caplan and Williams, 1987).

Four months later respondents were again asked to judge the degree to which these three states had or had not changed since the last interview. This design made it possible to determine: (1) how much each person's subjective state had actually changed; and (2) the correspondence between that change and the person's judgement of such change. Data were also collected on three potential determinants of distortion in cognitions regarding change: (1) self-esteem or self-concept; (2) the instability of what is being judged; and (3) mood. The addition of these data made it possible to assess the degree to which hypothesized mechanisms, described above, bias such cognitions.

Data were gathered at three separate points in time. Of those who agreed to

participate in the experiment, 83% mailed back pretest (T_1) questionnaires. Response rates at T_2 and T_3 —1 and 4 months post-test, respectively—were 88 and 81% of the preceding pretest. Most of the analyses deal with data that were collected only at T_2 and T_3 . The sample represented a broad range of unemployed persons over 16 years of age in the U.S. population, and was representative of community survey samples of unemployed persons (Kessler *et al.*, 1988). To maximize within-group homogeneity of variance on life events relative to variance in the hypothesized mechanisms of perceived change, the sample in this analysis was restricted to 224 adults who remained unemployed at all three times of data collection.

Data were gathered by self-administer questionnaires that were mailed to respondents along with a prepaid self-return envelope and a \$5 bill as payment for completing the instruments. Of the 224 persons used in this study, 34.8% were male and 65.2% were female. The mean age was 40.0 years, with a standard deviation of 11.4 years. The mean number of years of education was 13.0, with a standard deviation of 2.0 years. The percentage of blue collar workers in the sample was 31.5% while the percentage of white collar workers was 68.5%.

Measures

With one exception, all measures are multi-item indices. Described below are the component measures used to calculate actual change in subjective states, perceptions of change in those states, and measures of hypothesized sources of bias in judging such change.

Perceived changes

Perceived change was assessed at T_3 , by asking the respondent to rate the amount of change in each state since the time the respondent completed the T_2 questionnaire, 3 months earlier. These measures were designed to parallel the content in the measures used to estimate the actual change of subjective states. Consequently respondents were asked to estimate the amount of change in social support from the subject's 'spouse or other closest person', in job-seeking motivation and in negative mood. Responses were measured on 5-point Likert scale from 1 = 'a great decrease' to 5 = 'a great increase.'

Perceived change in the amount of social support

This was the only single-item measure and was stated as 'Since the last time you filled out this questionnaire about 4 months ago, how much decrease or increase has there been in how much care and concern your spouse or other closest person has shown towards you?'

Perceived change in job-seeking motivation

As reported by the job seeker, this was assessed as the composite of the following three items ($\alpha = 0.73$): (1) 'Since the last time you filled out this questionnaire about 4 months ago, how much decrease or increase has there been in how worthwhile you feel it is to try hard to look for a job?'; (2) 'How much decrease or increase has there been in how optimistic you are about finding a job?'; and (3) 'How much

decrease or increase has there been in how much effort you put into looking for a job?"

Perceived change in mood

This was assessed by the following two items ($\alpha = 0.69$): (1) 'Since the last time you filled out the questionnaire about 4 months ago, how much decrease or increase has there been in how upset you feel about things?'; and (2) 'How much decrease or increase has there been in how delighted you have felt with your life as a whole?'

Perceived states

Perceived social support

This was assessed using an 8-item measure ($r_{kk} = 0.92$) based on indices developed by Abbey, Abramis, and Caplan (1985). For example, the respondents were asked to think of their spouse or a person they see often or feel close to and estimate on a 5-point Likert scale, ranging from 1 = 'not at all' to 5 = 'a great deal', 'How much does this person show that he or she cares about you as a person?'

Job-seeking motivation

This was assessed by a combined set of three indices ($r_{kk} = 0.78$) based on Fishbein and Ajzen's (1975) attitude-behaviour model. The indices included questions about subjective norms, attitudes towards a behaviour, and intentions to engage in that behaviour (Vinokur and Caplan, 1987).

Depression

This was assessed by an 11-item subscale ($r_{kk} = 0.90$) from the Hopkins Symptom Checklist (Derogatis, Lopman, Rickels, Uhlenhuth and Covi, 1974). Using procedures outlined by Cronbach and Furby (1970), estimates of change in these self-reports or perceptions between these two assessments were represented as a residual change score. The full content of these multiitem indices is detailed elsewhere (Caplan *et al.*, 1989).

Potential sources of bias in perceived change

Self-esteem was assessed by a 5-item measure developed by Rosenberg (1965) ($\alpha = 0.77$). Negative mood was assessed by an index of the following three scales from the Hopkins Symptom Checklist (Derogatis *et al.*, 1974): a 9-item anxiety scale ($\alpha = 0.89$); an 11-item depression index; and an 8-item scale measuring psychosomatic symptoms ($\alpha = 0.87$); as well as a 4-item anger scale ($\alpha = 0.90$) developed by Caplan and colleagues (1985). The overall coefficient alpha of the negative mood index was 0.90.

Instability in each assessed state (social support, negative mood, and job-seeking motivation) was calculated as its average adjusted change across waves 1 to 3. This adjusted score was calculated as the percentage of the change possible given a person's initial state. For example, for respondents who initially rated their state of depression on a 5-point Likert scale as 5 = 'a great deal,' the maximal amount of change possible in depression would be a rating of 1 = 'none at all,' and any change would be divided by four units.

Analytic procedures

All statistical tests are two-tailed and the analyses are viewed as exploratory rather than confirmatory, based on the presence of alternative, and not necessarily mutually exclusive, hypotheses and predictions. Hypothesized effects of biasing mechanisms on the accuracy of perceived change were tested for each measure of perceived change in a stepwise multiple regression of the following general form of its last step:

$$Y = [\text{intercept}] + b_1\text{Demog} + b_2S_2 + b_3S_3 + b_4C_3 + b_5C_3S_3 + \text{error}$$

where b is the estimate of the slope, Y represents perceived change (e.g. perceived change in social support); S_2 and S_3 represents the respondent's corresponding perceived states (e.g. of social support) at T_2 and T_3 respectively; C_3 represents a hypothesized biasing variable; and C_3S_3 represents the biasing or integration effect of the hypothesized biasing variable on residual change in perceived state.

The first step of the regression analysis controlled for a cluster of demographic variables composed of age, sex, and years of education ($b_1\text{Demog}$). Analyses indicate that the demographic set of variables had no significant effect on the variance (less than 3%) of the dependent variables.

In the second step, the T_2 and T_3 measures of perceived states that correspond to the dimension assessed by Y (b_2S_2 and b_3S_3) were added to the equation. This step removed variance in the perception of change that was accounted for by actual change in each relevant perceived state. The variance in perceived change that would remain after this step would represent the potential effects of systematic bias plus random error.

The third step examined the main effect of the hypothesized biasing variable (b_4C_3 , such as self-esteem). Its contribution at this stage would constitute a response style, an effect that exists regardless of the level of the estimated actual change in perceived states from T_2 to T_3 .

The fourth step added to the equation the interaction between the hypothesized biasing mechanism and actual change $b_5C_3S_3$. A significant increase in the overall percentage of variance accounted for, R^2 , at this stage would be evidence of a biasing mechanism that depends on the level of actual change for its effect on perceived change. Such an effect would be present, for example, if persons with high self-esteem underestimated changes for the worse whereas persons with low self-esteem underestimated changes for the better.

Significant effects at this fourth step were checked to determine if there were any cases in which the beta for the past state, S_2 , dropped significantly, and the beta for the current state, S_3 , did not. Such a pattern would suggest that the effect of the biasing variable operated primarily on recall of the past state and not on perception of the current residual change (Baron and Kenny, 1986). No such effects occurred.

This model assumes linearity. To test this assumption, and to determine if higher-order relationships existed that were not accounted for by the model, we added squared main and interaction effects at a subsequent step.

Changes in R^2 were tested for statistical significance using the following F -test:

$$F = \frac{R^2_{\text{Full}} - R^2_{\text{Reduced}}}{K_{\text{Full}} - K_{\text{Reduced}}} \cdot \frac{R^2_{\text{Full}}}{N - K_{\text{Full}} - 1}$$

where R^2_{Full} is the amount of variance accounted for by the full model; R^2_{Reduced} is the amount of variance accounted for by the reduced model; K_{Full} is the number of variables added to the reduced model to make it a full model; K_{Reduced} is the number of variables in the reduced equation; and n is the number of observations used to calculate the R^2 .

RESULTS

Overview

The first section describes the degree to which people's perceptions of change correspond to the amount of change in their subjective perceptions. These analyses set the stage for the tests of the main hypotheses by laying out the percentage of variance which is *not* shared between change in perception and perception of change, and which remains, accordingly, to be explained as potential bias. Subsequent analyses examine what factors might account for the unexplained variance. Tables 1 and 2 present the means and standard deviations of the key measures as well as their intercorrelations.

Table 1. Means and standard deviations of the measures of cognitive biases, subjective and perceived change and their commensurate measures

Variable name	<i>n</i>	Mean	SD
Social support T_2	215	3.85	0.93
Job seeking motivation T_2	215	4.57	1.17
Mood T_2	217	1.84	0.76
Social support T_3	214	3.77	0.99
Job seeking motivation T_3	212	4.46	1.32
Mood T_3	216	1.91	0.78
Self-esteem	218	4.04	0.80
Negative mood	216	1.86	0.69
Perceived change in social support	218	3.25	0.74
Perceived change in job-seeking motivation	218	3.16	0.80
Perceived change in mood	218	2.97	0.87

Validity of the perceived change measures

Regression analyses were conducted to determine whether measures of perceived change reflect change in subjective perception. Table 3 presents the correlations among the three measures of perceived change (mood, social support, and job-seeking motivation) explained by the commensurate T_2 and T_3 measures after controlling statistically for any associations with the demographic variables of age, sex, and gender. The demographic variables were entered at the first stage of the regression equation and accounted for an insignificant percentage of the explained variance

Table 2 Correlations among perceived change, actual change, commensurate T_2 and T_3 measures of change ($n = 210$)

	Time 2			Time 3			Moderators			Measures of perceived change				Measures of actual change			
	1	2	3	4	5	6	7	8		9	10	11	12	13	14		
<i>Time 2</i>																	
1. Social support	(0.92)																
2. Job-seeking motivation	-0.02	(0.87)															
3. Mood	-0.23*	0.22*	(0.90)														
<i>Time 3</i>																	
4. Social support	0.76*	-0.02	-0.19*	(0.92)													
5. Job-seeking motivation	-0.14*	0.55*	0.19*	-0.11	(0.87)												
6. Mood	-0.19*	0.23*	0.64*	-0.33*	0.22*	(0.90)											
<i>Moderators</i>																	
7. Self-esteem	0.32*	-0.23*	-0.40*	0.41*	-0.22*	-0.65*	(0.77)										
8. Negative mood	-0.19*	0.19*	0.62*	-0.30*	0.21*	0.92*	-0.62*	(0.90)									
<i>Measures of perceived change</i>																	
9. Social support	0.11	0.03	0.02	0.36*	-0.01	-0.12	0.16*	-0.12									
10. Job-seeking motivation	0.10	0.28*	-0.05	0.14*	0.35*	-0.04	0.09	-0.04	0.13*		(0.73)						
11. Mood	0.12	-0.25*	-0.19*	0.24*	-0.36*	-0.44*	0.39*	-0.45*	0.23*	0.05	(0.69)						
<i>Measures of actual change</i>																	
12. Social support	0.00	0.05	-0.03	0.65*	-0.01	-0.30*	0.28*	-0.29*	0.42*	0.08	0.22*						
13. Job-seeking motivation	-0.15*	0.00	0.13*	-0.13*	0.83*	0.11	-0.11	0.11	0.00	0.25*	-0.23*	-0.02					
14. Mood	-0.07	0.20*	0.00	-0.28*	0.12	0.77*	-0.50*	0.68*	-0.17*	-0.02	-0.40*	-0.35*	0.00				

* $p < 0.05$.

in each of the measures of perceived change. Perceived change in negative mood, social support, and job-seeking motivation accounted for 6 to 16% (all $p < 0.01$) of the variance in changes in the respective subjective states.

Table 3 Unique amount of variance accounted for in perceived change by actual change in subjective states after controlling for indicators of socioeconomic status ($n=218$)

Actual change in subjective state	Perceived change in:		
	Social support (%)	Job-seeking motivation (%)	Negative mood(%)
Social support	16*	0	5*
Job-seeking motivation	0	6*	5*
Negative mood	3*	0	16*

* $p < 0.01$.

These small or moderate indicators of effect size provide evidence of predictive validity for the measures of perceived change. Additional support for the validity of these measures comes from a comparison of the strength of relations in Table 3 between change in subjective states and perception of their change when both are measured along commensurate compared to non-commensurate dimensions. The commensurate dimensions are consistently more intercorrelated than their non-commensurate counterparts (average percentage of explained variance = 12.7 compared to 2.2).

Accounting for the discrepancy between change in subjective states and the perception of their change

Although perceived change and change in perception were correlated, the results also mean that 84 to 97% of the variance in perceived change was unexplained and may represent random error and bias in perception. Self-esteem, negative mood, and instability of the perceived state were examined as potential biases of people's perceptions of change. These three variables were examined both as main effects that might have direct effects on the perception of change (i.e. function as indicators of response styles that are independent of actual change in perception) and as components of interaction effects that might condition how change in perceptions might become processed into perceptions of change.

Effects of self-esteem

Effects on perceptions of change in social support

Self-esteem had no significant main effects on the perception of change in social support but it did have moderating effects, accounting for an additional 4% of the variance perceived change in social support ($b = -0.18$, $F_{\Delta R\text{-squared}} = 7.11$ (1,179), $p < 0.01$). Figure 1 shows the pattern of the interaction in the context of the main effect for persons divided into tertiles on level of self-esteem. Reports of change for the worse in social support were more accurate for persons with low rather than high self-esteem. Persons with high self-esteem tended to minimize such changes, reporting change for the worse as 'no change' and no change as an improvement or increase in social support.

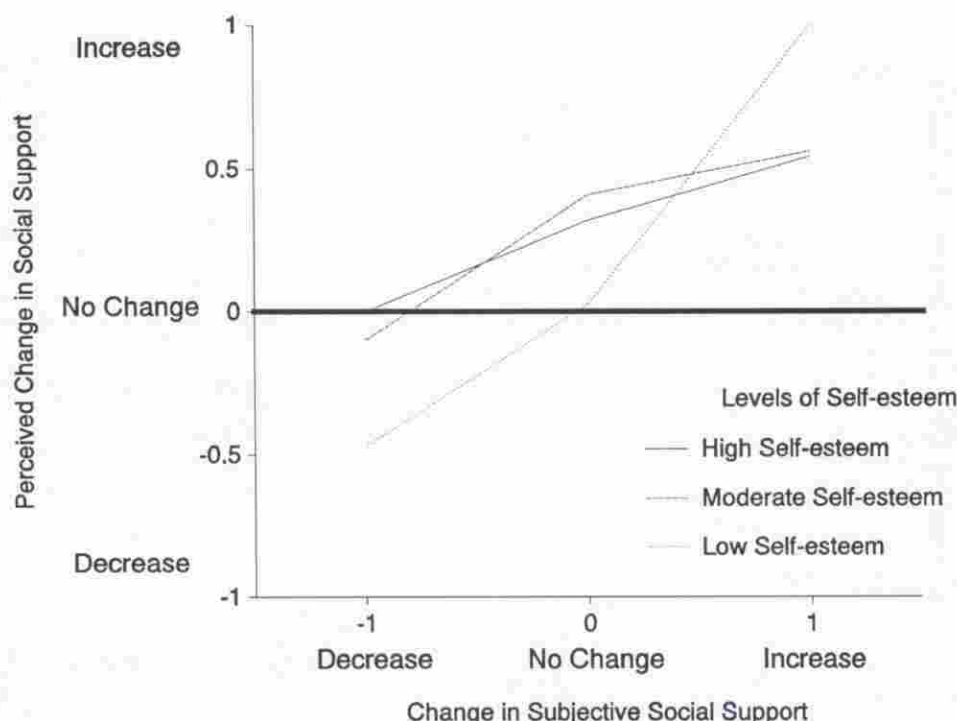


Figure 1. Effects of self-esteem on the relationship between change in subjective social support and the perception of social support's change.

With regard to changes for the better, persons with low self-esteem tended to overestimate such changes—evidence of maximization. Persons with low self-esteem estimated improvements in social support as twice as intense as was reported by persons with high self-esteem. Persons with moderate levels of self-esteem showed effects that were similar to those for persons with high self-esteem.

Effects on perceptions of change in job-seeking motivation

Self-esteem had a weak positive main effect on the perception of change in job-seeking motivation, accounting for an additional 4% of the unexplained variance in the perception of change in job-seeking motivation ($b = 0.18$, $F_{\Delta R\text{-squared}} = 6.70$ (1,184), $p < 0.01$). This trend suggests that persons with high levels of self-esteem optimistically biased perceptions of change in job-seeking motivation upwards *regardless* of the actual change in perceived job-seeking motivation.

Self-esteem also moderated the effect of changes in job-seeking motivation on the perception of change in motivation, accounting for an additional 7% of the unexplained variance in perceived change in job-seeking motivation ($b = 0.18$, $F_{\Delta R\text{-squared}} = 8.89$ (1,181), $p < 0.01$). Figure 2 shows the pattern of interaction in the context of the main effects. Persons with low self-esteem tended to report decreases and no change in job-seeking motivation more accurately than did persons with high self-esteem. Persons with high self-esteem tended to minimize decreases in motivation by reporting 'no change' when there was a decrease and by reporting an 'increase' where there was no change. This time there were no differences among

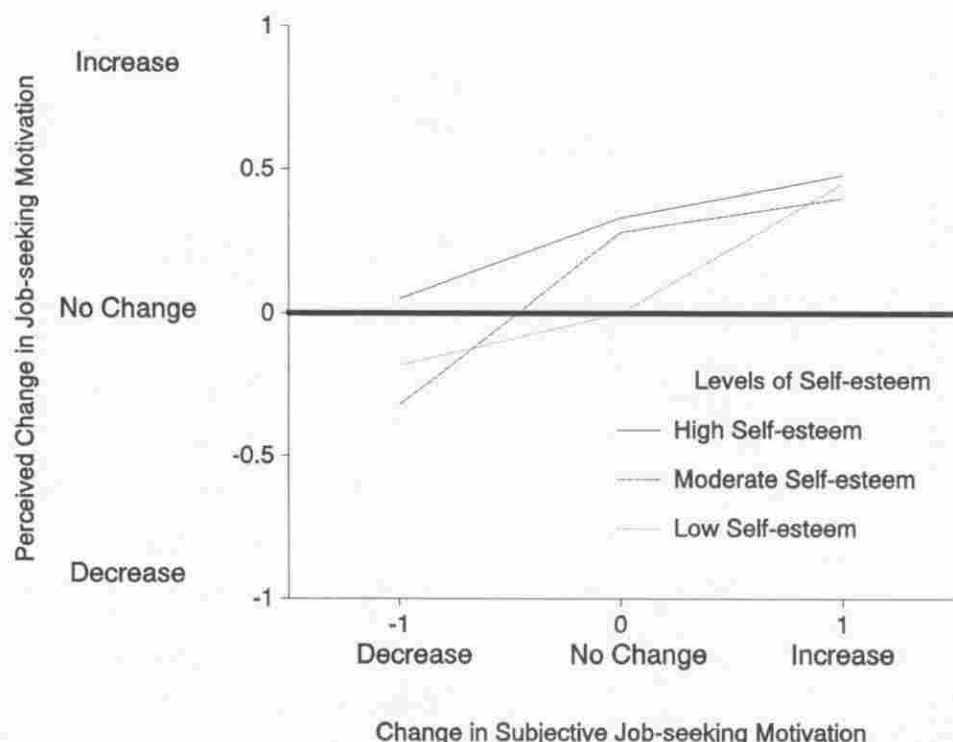


Figure 2. Effects of self-esteem on the relationship between change in subjective job-seeking motivation and the perception of motivation's change.

the three self-esteem groups regarding how increases in job-seeking motivation were perceived. In each case, an increase tended to be perceived as such. Persons in the middle tertile on self-esteem showed no consistent tendency to be either more like those with low or high self-esteem in their responses.

A comparison of the findings from Figures 1 and 2 suggests that the most consistent pattern of results occurred with regard to changes for the worse and no change. Persons with low self-esteem tended to be more accurate in reporting these types of changes; persons with high self-esteem tended to minimize them.

Effects on perceptions of change in depression

There were no main or interaction effects of self-esteem on perceptions of change in depression.

Effects of instability

The index of instability had no main effects on the perception of change in social support and job-seeking motivation but had a main or response-style effect on cognitions regarding change in mood. Instability in depressive mood during the preceding 4 months accounted for an additional 10% of the variance in the perception of change in mood ($b = 0.37$, $F_{\Delta R\text{-squared}}(1,159) = 17.26$, $p < 0.01$). Persons with ups and downs in mood were more likely to bias their perception of their change in mood towards a change for the better and away from a change for the worse, indepen-

dent of their actual change in perceived mood. This effect is consistent with evidence that people are generally optimistic in the face of ambiguous situations (Taylor and Brown, 1988). Instability had no interaction or biasing effects on any of the measures of perceived change.

DISCUSSION

This study has examined the accuracy with which people perceive change in their subjective situations and the mechanisms that influence such accuracy. The analyses are largely exploratory, and consequently, the discussion centers on issues of interpretation and their implications for replication.

Upper limits on the accuracy of perceived change

Between 3 and 16% of the variance in perceived change appeared to reflect actual changes in subjective states. How likely is it that these estimates might be attenuated by inadequate reliabilities of the measures?

The internal reliabilities of the measures from which actual change was computed ranged from 0.77 to 0.90, and those for the multiitem indices of perceived change were 0.62 and 0.73, respectively. (The single-item measure of perceived change in social support had the lowest potential internal reliability, but it correlated with its respective measure of change in perception as high or higher than the other dimensions, motivation mood.)

For the multiitem indices, corrections for attenuation due to the unreliability of measures (Nunnally, 1978: p. 204) generated estimates suggesting that change of perception of job-seeking motivation might explain 10% rather than 6% of the variance in perceived change in such motivation. Similarly, these corrections suggested that change of perception in negative mood might explain 29% rather than 16% of the variance in perceived change in mood. These estimates suggest that even with the most optimistic scenario—the presence of perfectly reliable instruments—there would still be a substantial amount of variance in persons' perceptions of change that could not be explained by changes in their perceptions.

Inadequate construct validity could be another potential limit on the degree of overlap between change in subjective states and the perception of those changes. Evidence from other research on the studies' measures, using this sample and other ones, indicates that the T_2 and T_3 measures of social support, job-seeking motivation, and mood have good predictive validity. The measures predict to one another in meaningful ways (Vinokur and Caplan, 1987; Vinokur, Schul, and Caplan, 1987b) and are sensitive to preventive experimental interventions in predicted directions (Caplan *et al.*, 1989; Vinokur, Price, and Caplan, 1991). Furthermore, the measures of mood were shown previously to have substantial associations with blind psychiatric ratings (Derogatis, *et al.*, 1974).

With regard to content validity, it is possible that the association between change in subjective states and the perceptions of such change would be higher if the measures of perceived change were exactly commensurate with those used to estimate change from T_2 to T_3 (Lewin, 1935). One illustration of the importance of commensurate

measures was provided in Table 3, where commensurate measures of change in perceptions and perception of their change were more likely to be related to one another than were non-commensurate measures.

Putting these findings together, the attenuation estimates suggest that: (1) the relationship between change in subjective states and the perception of that change might increase a little with more reliable measures; and (2) some part of the gap, perhaps a substantial one, between change in subjective states and perceived change represents cognitive misperceptions that cannot be attributed to measurement artifacts. By using multiple indicators of each construct to estimate links among latent constructs, new studies should be able to generate improved estimates of the cognitive gaps between change in subjective states and the perceptions of change.

Which cognitive mechanisms are the most plausible in explaining the gap between actual change in perceptions and perceived change?

When Figures 1 and 2 are compared, the most consistent findings deal with the perception of changes that are inherently for the worse or inherently negative. In both analyses, persons with low self-esteem tended to perceive a worsening or no change accurately and person with high self-esteem tended to minimize or underestimate such changes, reporting them to be more positive. The formulation that is most consistent with these results has two components. The first component is that a change for the worse provides inherently negative feedback, whether the recipient has high or low self-esteem. The second component is that persons with low self-esteem, unlike those with high self-esteem, appear to be unable to muster the resources necessary to defend against inherently negative feedback relating to the self. As alternative formulations, neither the theory that inconsistencies are minimized nor the theory that negative changes are maximized and are harder to suppress can, alone, explain this pattern of results (Taylor, 1991).

Recent research by Campbell (1990), adds further support to the failure-to-muster explanation and suggests a mechanism for it. Campbell's results indicate that persons with low self-esteem have poorly articulated self-schema (e.g. Markus, 1977). Persons with well articulated self-schema may be able to more effectively identify threats to the self and defend cognitively against them compared to persons with less articulated schema.

Is no change a positive or a negative outcome?

Without understanding the context of a situation, there is probably no *a priori* basis for determining if no change in subjective states represents inherently negative and threatening or positive and non-threatening information. In this study, the sample consisted of continuously unemployed job-seekers for whom improvement in perceived social support, job-seeking motivation, and mood would appear to be inherently positive news, whereas no change might be negative. In this context, the pattern of results seems to fit with the interpretations provided above. Lacking the resources to distort such information upwards, persons with low- self-esteem generally reported no change as accurately as they reported a worsening. Persons with high self-esteem, on the other hand, generally minimized both no change and worsening by tending to report no change as an improvement and a worsening as no change.

Are some dimensions of perceived change more susceptible to bias than others?

Instability across survey points in the dimension being recalled had a direct and optimistic response-style effect only on the perception of change in mood whereas self-esteem had a biasing effect only on the perception of changes in social support and job-seeking motivation. This pattern of results suggests a pair of hypotheses for future study. The first hypothesis is that the more inherently ambiguous the dimension of perceived change being judged, the more likely that it will be susceptible to ambiguity-induced response styles such as optimistic bias (Jacobs, Berscheid, and Walster, 1971; Taylor and Brown, 1988). Mood appears, anecdotally and conceptually, to be a more ambiguous dimension for persons to judge than social relationships and job-seeking motivation. For the hypothesis to be supported, future research would need to demonstrate that mood is a significantly more ambiguous and difficult-to-judge construct than social relationships and job-seeking efforts.

A second hypothesis is that persons with low self-esteem are more susceptible to self-relevant social cues than to non-relevant cues (Brockner, 1984). The hypothesized failure-to-muster effect for persons with low self-esteem supports this hypothesis. What remains to be addressed, however, is the issue of what constitutes 'relevant' social cues? Perceived social support and job-seeking motivation would appear to be particularly relevant in the context of this study because all of the respondents were unemployed job-seekers. Mood, as noted above, is a potentially more abstract concept than social support or job-seeking motivation and, accordingly, may be less likely to be linked to specific schema that deal with the self as job-seeker.

Implications for application

The findings from this study are consistent with Pearson and colleagues (1992) observation that, in the face of ambiguity, people will bias reports of the past to be consistent with their expectancies. In some cases, those expectancies are that life is unchanging. In other cases, those expectancies are that life should change either for the better or the worse depending on the specific expectancy.

The expectancies examined in this study have to do with a person's self-esteem. The findings suggest that respondents are motivated to perceive of change in a manner that is consistent with their expectancies about, or image of, themselves. The design of the study does not permit us to determine the degree to which these expectancies are a consequent response, occurring to fill a gap when memory fails, or are an antecedent that motivates the failure of memory.

This distinction between expectancy as consequence and as motivator has important implications for interventions aimed at increasing the accuracy of perceived change or of recall in general, whether in survey situations or in the office of a clinical practitioner. If these expectancies are triggered by ambiguity, then the many already-identified strategies for decreasing respondent recall burden and aiding in recall (for example, see Sudman and Bradburn, 1982) should reduce bias. If these expectancies themselves motivate bias, then it will be of little help to use traditional methods of reducing telescoping and other errors of retrospective reporting. Instead, it may be necessary to reduce the role of psychologically defensive needs for such expectancies. Further pursuit of these implications should await replication and extension of the current findings as discussed above.

REFERENCES

- Abbey, A., Abramis, D. J. and Caplan, R. D. (1985). Effects of different sources of social support and social conflict on emotional well-being. *Basic and Applied Social Psychology*, **6**, 111-129.
- Alba, J. W. and Hasher, L. (1983). Is memory schematic? *Psychological Bulletin*, **93**, 203-231.
- Aneshensel, C. S., Estrada, A. L., Hansell, M. J., and Clark, V. A. (1987). Social psychological aspects of reporting behavior: Lifetime depressive episode reports. *Journal of Health and Social Behavior*, **28**, 232-246.
- Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs, NJ: Prentice-Hall.
- Baron, R. M. and Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, **51**, 1173-1182.
- Brockner, J. (1984). Low self-esteem and behavioral plasticity: Some implications for personality and social psychology. In L. Wheeler (Ed), *Review of personality and social psychology*, vol. 4 (pp. 237-271). Beverly Hills, CA: Sage.
- Campbell, J. D. (1990). Self-esteem and clarity of the self-concept. *Journal of Personality and Social Psychology*, **59**, 538-549.
- Cantor, N. and Mischel, W. (1977). Traits as prototypes: Effects on recognition memory. *Journal of Personality and Social Psychology*, **35**, 38-48.
- Caplan, R. D., Andrews, F. M., Conway, T. L., Abbey, A., Abramis, D. J. and French, J. P. R., Jr. (1985). Social effects of diazepam use: A longitudinal field study. *Social Science and Medicine*, **21**, 887-898.
- Caplan, R. D., Vinokur, A. D., Price, R. H. and van Ryn, M. (1989). Job-seeking, reemployment, and mental health: A randomized field experiment in coping with job loss. *Journal of Applied Psychology*, **74**, 759-769.
- Cohen, S. and Syme, L. (1985). *Social support and health*. New York: Academic Press.
- Cronbach L. J. and Furby, L. (1970). How should we measure 'change'—or should we? *Psychological Bulletin*, **74**, 68-80.
- deCharms, R. (1968). *Personal causations: The internal effective determinants of behavior*. New York: Academic Press.
- Derogatis, L. R., Lopman, R. S., Rickels, K., Uhlenhuth, E. H. and Covi, L. (1974). The Hopkins Symptom Checklist (HSCL). In P. Pichot (Ed), *Psychological measurements in psychopharmacology. Modern problems in pharmacopsychiatry*, vol. 7, 79-110. Basel: Karger.
- Dew, M. A., Penkower, L., and Bromet, E. J. (1991). Effects of unemployment on mental health in the contemporary family. *Behavior Modification*, **15**, 501-544.
- Dohrenwend, B. S. and Dohrenwend, B. P. (1974). *Stressful life events: Their nature and effects*. New York: Wiley.
- Fishbein, M. and Ajzen, I. (1975). *Beliefs, attitudes, intentions, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Hastie, R. (1984). Causes and effects of causal attribution. *Journal of Personality and Social Psychology*, **46**, 44-56.
- Jacobs, L., Berscheid, E. and Walster, E. (1971). Self-esteem and attraction. *Journal of Personality and Social Psychology*, **17**, 84-91.
- Kahneman, D. and Tversky, A. (1984). Choices, values, and frames. *American Psychologist*, **39**, 341-350.
- Kasl, S. V. and Cobb, S. (1979). Some mental health consequences of plant closing and job loss. In L. A. Ferman and J. P. Gordus (Eds), *Mental health and the economy* (pp. 255-300). Kalamazoo: W. P. Upjohn Institute for Employment Research.
- Kessler, R. C., House, J. and Turner, B. (1988). The effects of unemployment on health in a community survey: Main, modifying, and mediating effects. *Journal of Social Issues*, **44**, 69-86.
- Lazarus, R. S. and Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
- Lewin, K. (1935). *A dynamic theory of personality*. New York: McGraw-Hill.
- Lewisohn, P. M. and Hoberman, H. M. (1982). Depression. In A. S. Bellack, M. Hersen,

- and A. E. Kazdin (Eds), *International handbook of behavior modification and therapy* (pp. 397-430). New York: Plenum Press.
- Mandler, G. (1992). Memory, arousal and mood: A theoretical integration. In S.-A. Christenson (Ed), *Handbook of Emotion and Mood*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Markus, H. (1977). Self-schemata and processing information about the self. *Journal of Personality and Social Psychology*, **35**, 63-78.
- Markus, G. B. (1986). Stability and change in political attitudes: Observed, recalled, and explained. *Political Behavior*, **8**, 21-44.
- Nunnally, J. C. (1978). *Psychometric theory*, 2nd edn. New York: McGraw-Hill.
- Pearson, R. W., Ross, M. and Dawes, R. M. (1992). Personal recall and the limits of retrospective questions in surveys. In J. M. Tanur (Ed), *Questions about questions: Inquiries into the cognitive bases of surveys* (pp. 65-94). New York: Russell Sage.
- Rosenberg, M. (1965). *Society and the adolescent self image*. Princeton, NJ: Princeton University Press.
- Ross, M. and Conway, M. (1986). Remembering one's own past: The construction of personal histories. In Sorrentino, R. M. and Higgins, E. T. (Eds), *Handbook of Motivation and Cognition* (pp. 122-144). New York: Guilford Press.
- Schwarz, N. (1990). Feelings as information: informational and motivational functions of affective states. In R. Sorrentino and E. T. Higgins (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (vol. 2, pp. 527-561). New York: Guilford Press.
- Sherwood, J. J. (1965). Self-identity and referent others. *Sociometry*, **28**, 66-81.
- Shrauger, J. S. (1982). Selection and processing of self-evaluative information: Experimental evidence and clinical applications. In G. Weary and H. L. Mirels (Eds), *Integrations of clinical and social psychology* (pp. 128-153). New York: Oxford University Press.
- Shrauger, J. S. and Kelley, R. J. (1988). Global self-evaluations and changes in self-description as a function of information discrepancy and favorability. *Journal of Personality*, **56**, 709-728.
- Shrauger, J. S. and Rosenberg, J. E. (1970). Self-esteem and the effects of success and failure feedback on performance. *Journal of Personality*, **38**, 404-417.
- Stangor, C. and McMillan, D. (1992). Memory for expectancy-congruent and expectancy-incongruent information: a review of the social and social developmental literatures. *Psychological Bulletin*, **111**, 42-61.
- Sudman, S. and Bradburn, N. M. (1982). *Asking questions*. San Francisco: Jossey-Bass.
- Swann, W. B. Jr. (1992). Seeking 'truth', finding despair: Some unhappy consequences of a negative self-concept. *Current Directions in Psychological Science*, **1**, 15-18.
- Swann, W. B. Jr., Griffin, J. J., Predmore, S. and Gaines, B. (1987). The cognitive-affective crossfire: When self-consistency confronts self-enhancement. *Journal of Personality and Social Psychology*, **52**, 881-889.
- Taylor, S. E. (1991). Asymmetrical effects of positive and negative events: The mobilization-minimization hypothesis. *Psychological Bulletin*, **110**, 67-85.
- Taylor, S. E. and Brown, J. D. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin*, **103**, 193-210.
- Thoits, P. A. (1982). Conceptual, methodological, and theoretical problems in studying social support as a buffer against life stress. *Journal of Health and Social Behavior*, **23**, 145-159.
- U.S. Department of Labor (1986, December). *Economic adjustment and worker dislocation in a competitive society: Report of the Secretary of Labor's Task Force on Economic Adjustment and Worker Dislocation*. Washington, DC: Author.
- Vinokur, A. and Caplan, R. D. (1987). Attitudes and social support: determinants of job-seeking behavior and well-being among the unemployed. *Journal of Applied Social Psychology*, **17**, 1007-1024.
- Vinokur, A., Caplan, R. D. and Williams, C. C. (1987). Effects of recent and past stress on mental health: Coping with unemployment among Vietnam veterans and nonveterans. *Journal of Applied Psychology*, **72**, 710-730.
- Vinokur, A., Schul, Y. and Caplan, R. D. (1987b). Determinants of perceived social support: Interpersonal transactions, personal outlook, and transient affective states. *Journal of Personal and Social Psychology*, **53**, 1137-1145.
- Vinokur, A., Price, R. H. and Caplan, R. D. (1991). From field experiments to program implementation: Assessing the potential outcomes of an experimental intervention program for unemployed persons. *American Journal of Community Psychology*, **19**, 543-562.

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